ND Department of Emergency Services

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Bismarck, ND 58506-5511 Fax: (701) 328-8181 Website: www.nd.gov/des

"Ensuring a safe and secure homeland for all North Dakotans"

TESTIMONY
INFORMATION TECHNOLOGY INTERIM COMMITTEE
JUNE 18, 2014
BY MIKE LYNK
DIRECTOR, DIVISION OF STATE RADIO
NORTH DAKOTA DEPARTMENT OF EMERGENCY SERVICES

Mr. Chairman and members of the committee, my name is Mike Lynk. I am the director of the Division of State Radio, North Dakota Department of Emergency Services (NDDES). My purpose is to provide testimony relating to the State Radio Communication Plan and related issues.

The SIEC was established through Executive Order 2007-17 by Governor Hoeven, reaffirmed by Governor Dalrymple, and placed into law through SB 2353. It purpose is to coordinate and manage use of all State Radio designated infrastructure and state licensed radio frequencies and working with all wireless communication user groups and associations to ensure interoperability among all public and emergency response wireless communication systems. Since the passage of SB 2353 the SIEC has met seven (7) times: March 13, 2013; July 10, 2013; August 27, 2013; October 16, 2013; November 21, 2013; April 22, 2014; and May 28, 2014. The information from the meeting has been provided to you.

The SIEC has focused on two major areas:

1. Examine all current land mobile radio (LMR) infrastructures (State, Local and Tribal).
2. Analyze and determine future infrastructure needs and required actions or steps necessary to implement newly emerging technologies (FirstNET).

The SIEC has received presentations from the Federal Office of Emergency Communications (OEC) and Televate, a nationwide company assisting with the State's preparation for FirstNet. The SIEC reviewed the last State Radio land mobile study updated in 2000. At the May 28th meeting the SIEC agreed to distribute a user based survey to define the user's experience with the current LMR system. This survey is not limited to State Radio but all public safety answering points (PSAP's) and all first responders (Law, EMS, and Fire). The preliminary results are attached.

The SIEC is currently attempting to put together a collation to fund a LMR study.

At this time I will respond to member questions.

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PUBLIC MEETING NOTICE
AGENDA
DEPARTMENT OF EMERGENCY SERVICES
STATE INTEROPERABILITY EXECUTIVE COMMITTEE MEETING
March 13, 2013 - 10:00 a.m.
Fraine Barracks Building #35
(DES Conference Room)

(1st Draft)

March 13, 2013

10:00 – 10:05	Adjutant General Update	MG Sprynczynatyk
10:05 – 10:35	First Net Grant Application Update	Travis Durick
10:35 – 10:55	Open Discussion	
10:55 – 11:00	Next Meeting	MG Sprynczynatyk

Jack Dalrymple
Governor

Greg M. Wilz
Director - Division of Homeland Security

Major General David Sprynczynatyk
Director - Department of Emergency Services

Mike Lynk
Director - Division of State Radio

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"Ensuring a safe and secure homeland for all North Dakotans"

To: State Interoperability Executive Committee (SIEC)

From: MG Sprynczynatyk

Topic: SIEC Meeting Executive Summary – March 13, 2013

Date: March 14, 2013

Mike Lynk welcomed members and initiated introductions. He explained FirstNet constitutes a federal plan to develop a nation-wide interoperable 911 public safety system using dedicated broadband in the 700 MHZ spectrum. Mike indicated states were allowed to opt out. He said at this point, the governor wants to proceed with the planning application and will make the final determination once total cost estimates are derived.

FirstNet Planning Grant – Travis Durick, ITD Broadband Technology Manager

Travis explained details of the grant. The PowerPoint presentation used to guide the overview is attached and entitled, "SIEC – FirstNet Planning Grant".

FirstNet Planning Grant Application – Travis Durick

The SIEC reviewed each section of the application. Travis inserted changes and members charged with providing additional information to strengthen the document's viability were given a submittal **deadline of 10:00 a.m. Friday, March 15**. Upon incorporating changes, the application will be sent for final review and a vote on adoption will occur via email.

Open Discussion

Senate Bill 2353 essentially creates a separate Statewide Interoperability Board that duplicates responsibilities of the SIEC recognized by the Federal Communication Commission as the official decision making body for interoperable communication in North Dakota. Discussion focused upon the inefficiency of two similar entities and the need to codify the SIEC as the single entity responsible for an effective statewide interoperable communication system.

Mike Dannenfelzer seconded Greg Wilz's motion to adjourn. Motion carried unanimously.

North Dakota
Information Technology Department

FirstNet Planning Grant

March 13, 2013

SIEC

FirstNet Details

- Nationwide wireless data network for public safety
  - Think "4G" for public safety
- Provides additional features commercial networks don't
  - Priority + Pre-emption
  - Dedicated spectrum
  - Additional roaming options

- Just beginning to take shape
  - Likely to be a phased implementation
  - Unlikely to see true FirstNet for a few years
- Not replacing LMR near term
  - Lot's of hurdles
  - Long term, that may be the direction

- FirstNet will basically be an additional "carrier" that public safety entities could choose to use
- Nobody is required to use the network
- Business model + pricing is yet to be determined

- Combination of commercial carriers + D-Block + Satellite
  - Likely to see some initial commercial based services
  - Device costs TBD

SLIGP?

- State & Local Implementation Grant Program – SLIGP
  - Governance & needs assessment
  - Education & outreach
  - Asset identification
  - Carrier network assessment
  - Technology utilization survey
- ND allocated $1.19M

- Direct engagement
  - 53 counties
  - 4 Tribal nations
  - Secondary users
- Single point of contact needed
  - Leverage 911 coordinators
  - Need someone who knows "everyone" in their Public Safety community

- Carrier Assessment – May/June
  - Distribute phones for signal / speed data
  - Run regular routes and hot spots
  - Give NTIA data on what is currently not working

- City/County Kickoff Meetings – Aug/Sept.
  - Organize public safety leaders
  - Provide Q&A
  - Start gathering info on each counties emergency plans

- Technology Utilization Survey – Aug-Oct
  - In depth view of who is/isn't using tech
    - Why not?
  - Used to feed the demand of FirstNet
  - Also useful for other grant applications

- Asset Identification – Q1 2014
  - Identify all tower structures in each county
    - Environmental considerations
- MOA Development
  - Encourage facility / asset sharing

- Education and Outreach
  - Presentations coordinated with committee meetings
  - Provide project updates
  - Introductions to applications
  - Ideas?

- Education and Outreach
  - Presentations coordinated with committee meetings
  - Provide project updates
  - Introductions to applications
  - Ideas?

How?

- Governance through SIEC
  - Need everyone's email for sharepoint
- Program management through ITD
- Most work using contractors
  - Need to establish an RFP committee
  - Possibility of working with neighbors
    - SD, MT, NE, WY, Others?

	Total	Personnel	Fringe Ben	Travel	Equip	Supplies	Contractual	Other	
Program Management	$ 405,356.00	$ 115,311.08	$ 37,509.02	$ 247,971.90	$ 1,500.00	$ 3,064.00			Person assigned for grant program management and oversight
Program Project Management	$ 28,200.00						$ 28,200.00		Resources for management of overall grant program
Kickoff Meeting Tour	$ 104,604.30						$ 104,604.30		Introductory meetings with 53 counties and 4 tribal nations. Establish local point of contact for each county and urban area.
Education Meetings	$ 9,450.00					$ 9,450.00			Regular meetings coordinated with all public safety associations within the state
Governance & Needs Assesment	$ 198,000.00						$ 198,000.00		Evaluation of current emergency response plans and incorporation of broadband needs to these plans
Technology Utilization Study	$ 47,000.00						$ 47,000.00		In-depth study of technology utilization for every responder agency statewide. Establishment of a database for continued tracking of technology utilization.
Asset Identification and Inventory	$ 199,750.00						$ 199,750.00		Data collection for phase 2
MOA Development	$ 109,800.00						$ 109,800.00		Development of legal agreements or understandings for FirstNet access to assets
Carrier Assessment Maintenance	$ 93,840.00				$ 93,840.00				Continuation of carrier assesment program
	$ 1,196,000.30	$ 115,311.08	$ 37,509.02	$ 247,971.90	$ 95,340.00	$ 12,514.00	$ 687,354.30	$ -	
Funds Available	$1,196,000								
Unallocated Funds	$0								

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PUBLIC MEETING NOTICE
AGENDA
DEPARTMENT OF EMERGENCY SERVICES
STATE INTEROPERABILITY EXECUTIVE COMMITTEE MEETING
July 10, 2013 - 1:00 p.m.
Fraine Barracks Building #35
(DES Conference Room)

July 10, 2013

1:00 – 1:10	Welcome and Introductions	MG Sprynczynatyk
1:10 – 1:40	Reorganization (Based on SB 2353)	MG Sprynczynatyk
1:40 – 2:00	First Net Grant Update	Travis Durick
2:00 – 2:10	SIEC Charter Discussion	MG Sprynczynatyk
2:10 – 2:25	Open Discussion	
2:25 – 2:30	Next Meeting	MG Sprynczynatyk

Jack Dalrymple
Governor

Greg M. Wilz
Director - Division of Homeland Security

Major General David Sprynczynatyk
Director - Department of Emergency Services

Mike Lynk
Director - Division of State Radio

ND Department of Emergency Services

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To: State Interoperability Executive Committee (SIEC)

From: MG Sprynczynatyk

Topic: SIEC Meeting Executive Summary – July 10, 2013

Date: July 11, 2013

MG Sprynczynatyk welcomed members and initiated introductions.

SIEC Reorganization – MG Sprynczynatyk

The General explained SB 2353 created a new committee that will retain the same name. He said official authority in law was positive and the committee would decide if a recommendation should be made to rescind Executive Order 2007-17 which initially organized the SIEC. He also stated $25,000 had been allocated for operational costs over the biennium. MG Sprynczynatyk asked Mike Lynk to address major tenets of the bill.

Mike indicated legislative intent is to put in place a statewide integrated radio system that will more effectively achieve the goals of public safety personnel and better serve North Dakota citizens. He said the SIEC, after due consideration from all stakeholder groups, is charged with preparing recommendations regarding a statewide integrated radio system to the Information Technology Interim Committee. This legislative committee will study issues concerned with development of the current radio communication plan, costs and components, and evolving technologies.

SIEC Charter – MG Sprynczynatyk

Committee members reviewed the charter and made several modifications mainly to sections reflecting SB 2353. MG Sprynczynatyk indicated the document will be sent to members and further reviewed during the organizational meeting.

FirstNet Planning – Duane Schell, ITD Director of Network Services

Duane said the FirstNet application had been submitted and received tentative award status until the FirstNet Board completes its evaluation of the technology study, carrier assessment, and asset identification components. He explained four vendors had responded to a request for proposal to perform a statewide evaluation of resources that can be leveraged by FirstNet.

He stated the estimated $1.3 million grant retains an 80/20 match and after calculating ITD in-kind dollars, $100,000 was still required. Duane requested members track costs and when asked, said he would create a form enabling agencies to log time and costs for in-kind purposes. He told members the FirstNet Board plans to visit North Dakota in late August or early September. Mike Lynk indicated a four page summary describing FirstNet plans, goals, and objectives would be sent to members upon receipt from FirstNet. He said it was important for members to reach out to constituencies in order to identify anticipated uses for FirstNet.

Duane said FirstNet's goal was 95-98 percent coverage using private/public collaboration for ground based wireless augmented by satellite communication. He also indicated the system's significant advantage is public safety personnel have first priority and can preempt others, a capability that does not now exist.

Next Meeting

The next meeting is scheduled for Tuesday, August 27 at 1:00 p.m. in the DES Conference Room, Fraine Barracks.

NORTH DAKOTA
STATE INTEROPERABLITY EXECUTIVE COMMITTEE
CHARTER

1. Mission Statement. The Statewide Interoperability Executive Committee (SIEC) will gain and maintain interoperable communications for state wireless spectrum used for public safety.

2 Senate Bill 2353 newly constituted the SIEC during the 63rd Legislative Assembly.

3. SIEC Committee Responsibilities/Major Work Tasks/Outcomes.

- Foster cooperation and coordination among public safety and emergency response organizations regarding wireless spectrum.
- Coordinate use of wireless spectrum for public safety.
- Facilitate and coordinate with the federal government in matters relating to allocation, use, and licensing of wireless spectrum.
- Seek federal support and other funding for state-sponsored wireless communications systems for public safety.
- Develop legislative recommendations to promote interoperable state wireless communications systems.

4. Committee Composition.

a. Membership. The SIEC will consist of twelve (12) members from the following government agencies, organizations, and associations.

(1) Office of the Adjutant General
(2) Division of Homeland Security
(3) Division of State Radio
(4) North Dakota Highway Patrol
(5) North Dakota National Guard
(6) North Dakota Department of Transportation
(7) North Dakota Sheriffs' Association
(8) North Dakota Emergency Management Association
(9) North Dakota Fire Chiefs' Association
(10) North Dakota EMS Association
(11) North Dakota 911 Association
(12) North Dakota Chiefs of Police Association
(13) North Dakota Peace Officers' Association

b. The specific Committee representative from each shall be determined by the individual entity.

c. Committee member terms will be a minimum of two years. Organizations may seat members for longer terms and may replace them at will. Members who do not regularly attend scheduled meetings or are considered divisive will be released and the representative organization will be asked to reseat a new member.

5. Advisory Committee Officers and Meeting Conduct. The committee shall elect a chairman and vice chairman for terms of two years upon its initial meeting. (SB 2353)

a. Meetings. Regularly scheduled meetings will be held bi-annually at the call of the Chairperson. Special meetings will be called by the Chairperson or in his absence, the Vice-Chairperson. At the onset, SIEC members will be asked to attend meetings more often for the purposes of finalizing the charter, conducting strategic planning, setting goals and objectives, and developing work and oversight processes that connect with the many stakeholders groups who use and or support emergency communications.

b. Committee quorum will be seven (7) of 13 voting members (majority). The Chairperson will be a voting member. Motions resulting in ties will be modified until passed. The use of voting proxies is authorized. Members who must miss a scheduled meeting are encouraged to send a proxy from their represented group or contact other Committee members to arrange for their views and voting preferences presented prior to the meetings.

c. Committee Maintenance. Any member who is absent for three consecutive meetings is considered to have voluntarily resigned his or her seat. The Chair shall notify the Committee Member and represented agency or organization, in writing, of member's resignation under this section. The member may petition the Committee for reinstatement by showing good cause for absenteeism. Reinstatement will occur only if a majority of the quorum votes in favor.

d. DES will provide a recorder and will arrange for a meeting facilitator as needed.

e. Sub-committees. The SIEC may, as required, establish sub-committees and or working groups to assist the basic workings or sub tasks of the committee's work.

6. Resources/Logistics. Committee members are entitled to reimbursement at state rates for expenses associated with travel to meetings providing funding is available.

7. Communications. While it is the intent that Committee Members have full authority and responsibility to communicate with their represented agency or

organization, some information may be sensitive or restricted based upon law and or agency determination. The following matrix addresses release authority for communications.

Level Of Communication	Authorized by
General/Routine	All Committee Members
Sensitive	Owning agency or by the Committee in concurrence with owning agency.
Restricted	Owning agency

a. **General/Routine** information should be considered public record. It is information that may be released by any member. Information in this category is meant to inform the public and advise stakeholders. It will generally not result in negative effects on the Department, represented stakeholder groups, or the public.

b. **Sensitive** information is that which if released improperly may cause undue stress or harm to an agency, represented stakeholder groups, or the public.

c. Restricted information is either classified or law enforcement sensitive. If released or released improperly, this information could cause serious or grave harm to agency operations or citizens of the State.

Approved:

Date: _____

Date: _____

_____
David A. Sprynczynatyk
Chairperson, SIEC

_____
Mike Lynk
Vice-Chairperson, SIEC

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PUBLIC MEETING NOTICE
AGENDA
DEPARTMENT OF EMERGENCY SERVICES
STATE INTEROPERABILITY EXECUTIVE COMMITTEE MEETING
October 16, 2013 - 1:00 p.m.
Fraine Barracks Building #35
(DES Conference Room)

October 16, 2013

1:00 – 1:10	**Welcome and Introductions**	**MG Sprynczynatyk**
1:10 – 1:20	**Bank 5 Modification Request**	**Mike Lynk**
1:20 – 1:45	**First Net Grant Update**	**Travis Durick**
1:45 – 2:00	**ESC Committee Survey (Frequency Question)**	**Mike Lynk**
2:00 – 2:40	**Action Items**	
	- Federal Engineering Study	**Mike Lynk/ Dave Kleppe**
	- State Radio LMR Overview	**Mike Lynk**
	- Local Presentations for January (LMR Capabilities)	**Mike Dannenfelzer**
2:40 – 2:55	**Open Discussion**	
2:55 – 3:00	**Next Meeting**	**MG Sprynczynatyk**

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To: State Interoperability Executive Committee (SIEC)

From: MG Sprynczynatyk

Topic: SIEC Meeting Executive Summary – October 16, 2013

Date: October 21, 2013

MG Sprynczynatyk welcomed members and all attendees for participating and then initiated introductions.

Bank 5 Modification Request – Mike Lynk

It was explained the SIEC had received a letter requesting the need for a repeatable or duplex channel. A motion was passed to move State Radio Channel 1 into the Channel 2 slot on Bank 5 and form a subcommittee to gather and discuss additional issues related to Bank 5.

FirstNet Grant Update – Travis Durick, Information Technology Department

Members from Televate, the company selected to gather statewide data for the FirstNet Project, were introduced and subsequently presented the methodology to be used in building a communication network to best serve North Dakota user needs. Committee members agreed with the approach. The Televate PowerPoint presentation is attached and entitled, "SIEC – Televate FirstNet Project 10-16-2013".

ESCCC Survey – Mike Lynk

SIEC members indicated the survey question relating to frequencies used by PSAPs should be omitted because the information was easily obtainable through other sources.

Action Items

It was pointed out the state pursued options in the 2000 update of the Federal Engineering Study (page 7) to purchase P25 compliant radios and to adopt digital emissions. The revolutionary option of a statewide trunking system for $60 million (in year 2000 dollars) was not selected but remains a possibility.

The revolutionary option of a statewide trunking system for $60 million (in year 2000 dollars) was not selected but remains a possibility.

The PowerPoint used to provide an overview State Radio LMR is attached and entitled, "Lynk – SIEC LMR Presentation 10-16-13."

Red River Regional Dispatch Center personnel will initiate the process of obtaining information concerning local LMR capabilities.

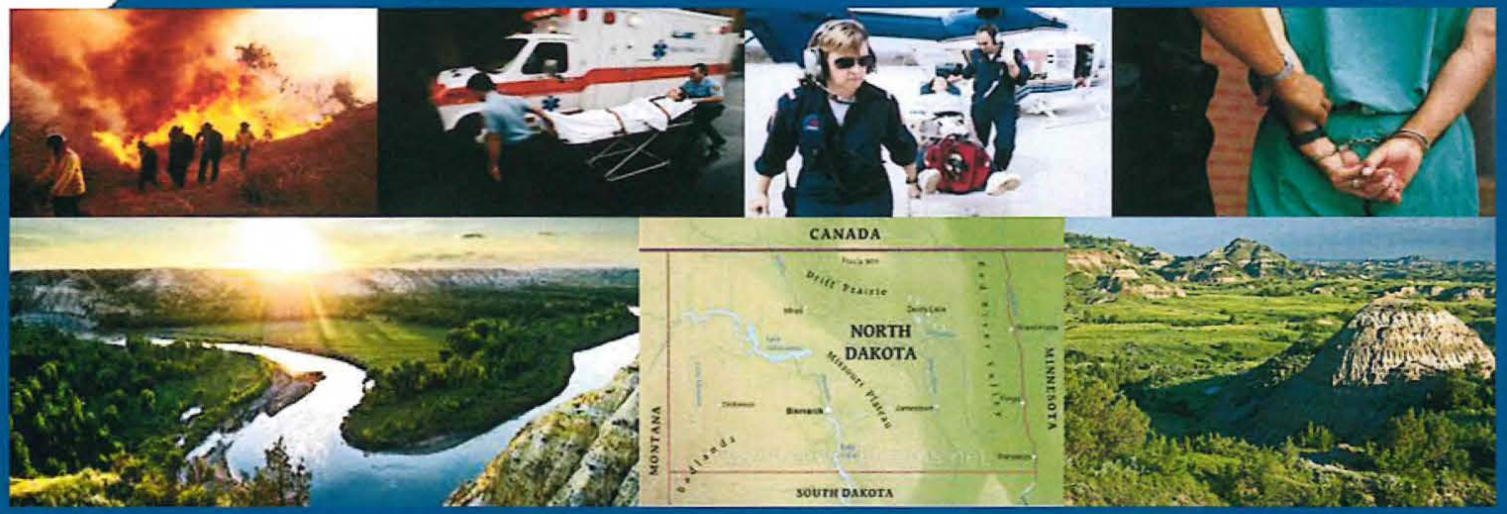
Open Discussion

General Sprynczynatyk responded to a question concerning spending authority for the appropriation in Century Code 37-17.3 by stating the criteria were very restrictive. Therefore, it was determined that individuals from Televate will be asked if under the current contract, they are able to explain various LMR technology options to SIEC members.

There was mention of ascertaining border states' technologies and capabilities.

Next Meeting

The next meeting is scheduled for Wednesday, January 15 at 1:00 p.m. in Fargo at the Red River Regional Dispatch Center.



Kickoff - FirstNet Planning Services

North Dakota Information Technology Department
Network Services Division

16 October 2013

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Agenda

- Introductions: Project Briefing from the ND Team
- Project Mission & Goals
- Project Organization & Key Points of Contact
- Project Scope of Work
- Project Tasks
- Project Plan & Schedule
- Risks
- Support Required
- Next Steps

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Project Mission and Goals

- Influence FirstNet's implementation of the NPSBN to best match the State's Objectives
- Gather the information that FirstNet will require to assess the deployment of the NPSBN within the State
- Educate & Inform the Public Safety Community on the direct consequences of the NPSBN
  - Leverage the benefits of broadband
  - Effects on Interoperability
  - Highlight potential operational changes, governance, etc.

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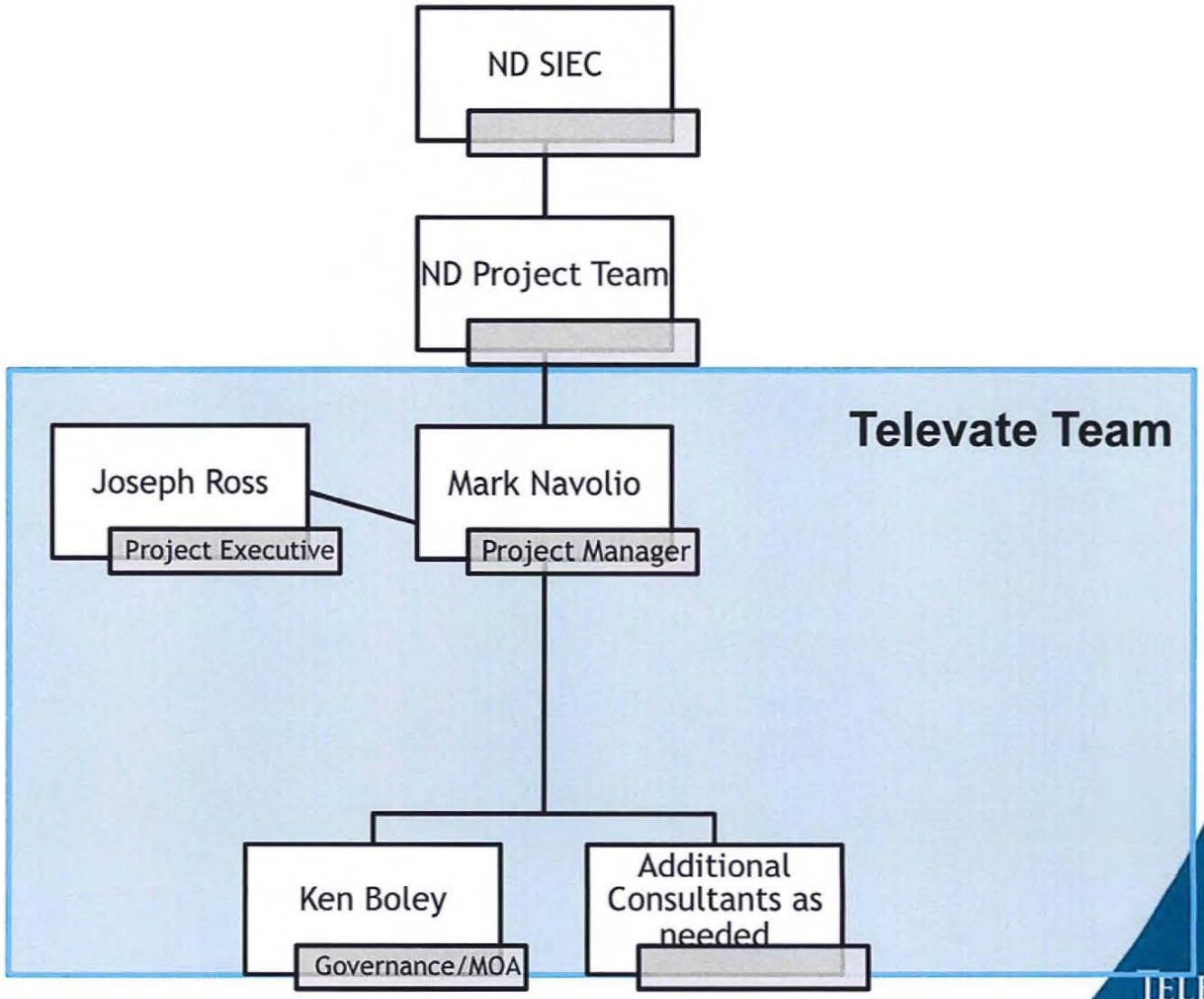
Organizational Chart



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Project Scope of Work – Main Tasks

- Kickoff
- Needs Assessment – Utilization
- Education & Outreach
- Needs Assessment - Sessions
- Standard MOA (asset sharing) Template
- Governance Assessment
- Commercial Carrier Evaluation
- Implementation Modeling
- Asset Identification Assessment & Inventory
- Project Management
  - Project Plan
  - Updates
  - Presentations

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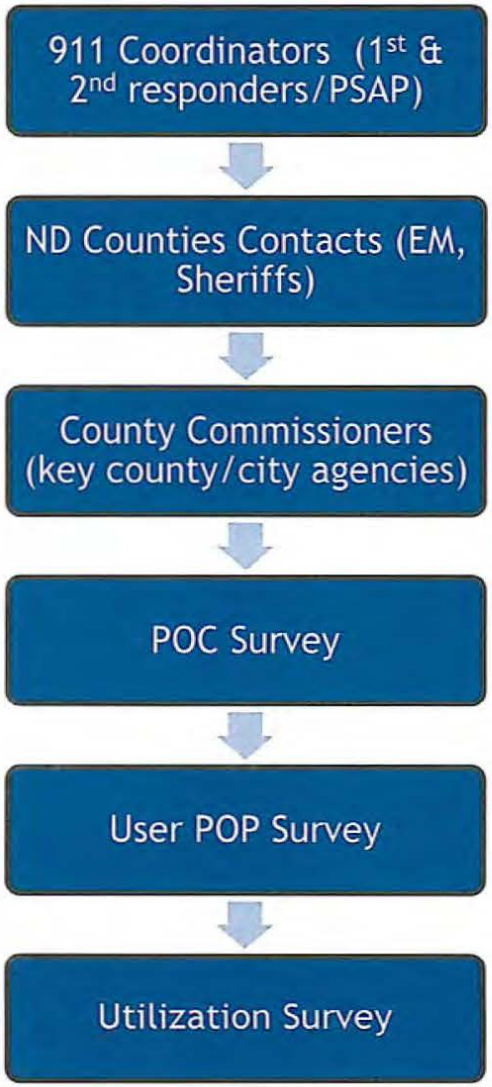
Needs Assessment - Utilization Survey

- Goal:
  - Identify stakeholders
  - Quantify the user numbers
  - Qualify the usage characteristics & device types
  - Identify high-level requirements
- Identify Stakeholders
  - See flowchart to right
- Survey Methods
  - Structured Interviews:
    - State agencies
  - User Population Survey
    - Existing users
    - Projected users
    - Unmet needs
    - Barriers to entry
  - Utilization Survey
    - types of devices & applications



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Education & Outreach

- Goal:
  - Inform and update stakeholders on the project
  - Educate/Apprised the stakeholders on LTE, FirstNet and the implementation plans for the NPSBN
- Kickoff Outreach Event
  - When: December 2 - 13
  - Where: 8-City (Williston, Minot, Devils Lake, Grand Forks, Dickinson, Bismarck, Jamestown, Fargo)
  - Duration: 8 hours each
  - Scope: Program overview, needs of stakeholders, FirstNet introduction, broadband networks and apps overview
  - Logistics: will need the State's assistance organizing the meeting venues
- Tribal Outreach
  - Central meeting with tribal representation
    - Note: Potential coordination with South Dakota (cross-border tribes)
- Quarterly Webinars throughout the project
  - FirstNet updates
  - Program updates
  - Preparatory sessions (e.g., how to respond to questionnaires)
  - Other topics as necessary

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Needs Assessment

- Goal:
  - Quantify the stakeholder requirements on a local and statewide level
- Working Groups
  - Statewide requirements
  - Major Topics
    - Service Areas
    - Security & system requirements
    - Applications (incl. NG911)
    - Devices
- County-by-county sessions
  - Detailed coverage requirements
  - Suitability of commercial carriers
  - Potential assets identification
  - Dialog regarding any obstacles to adopt FN service

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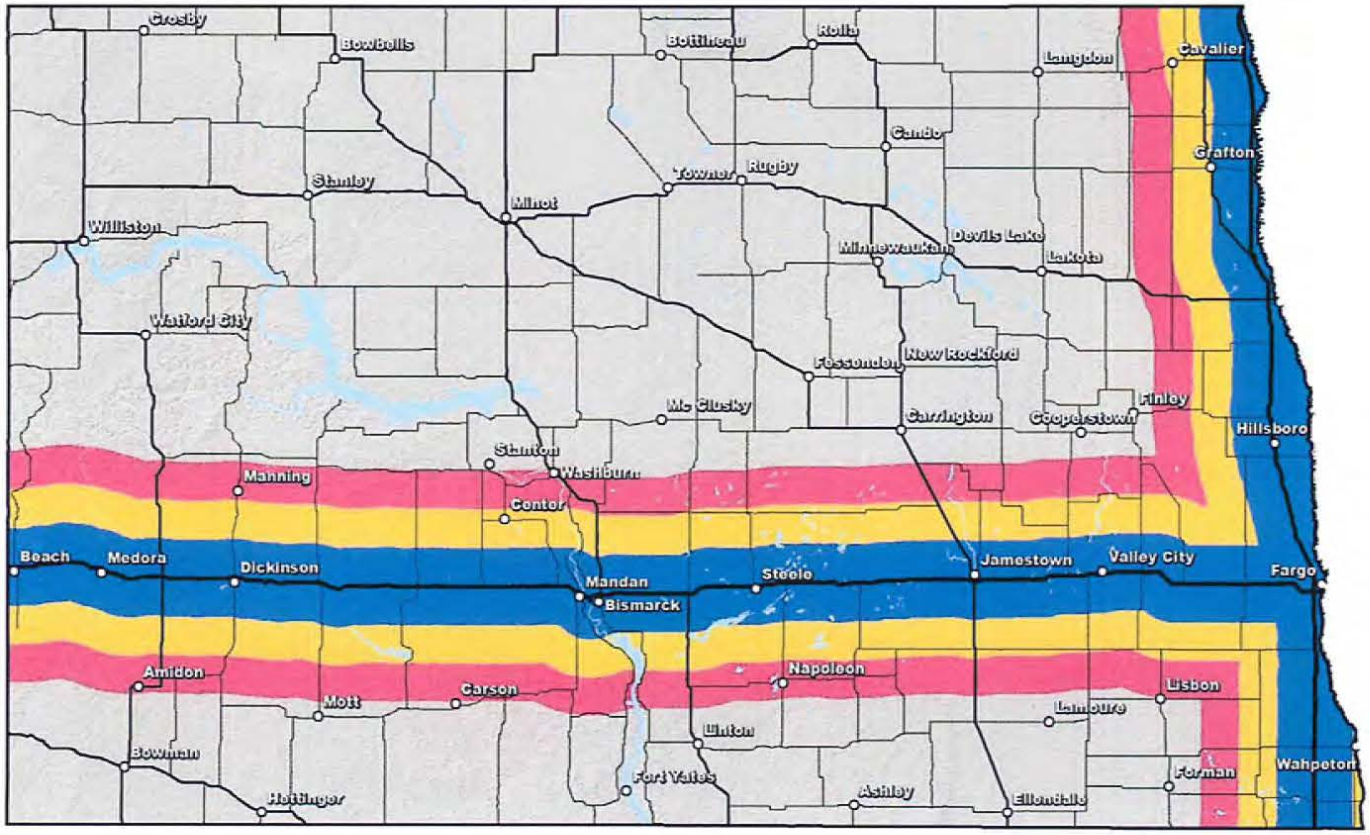
Coverage Assessment

NORTH DAKOTA BROADBAND MAPPING PROGRAM

POPULATION WITHIN DISTANCE OF INTERSTATE HIGHWAYS

10 Miles (403,035 people) 20 Miles (435,991 people) 30 Miles (458,062 people)

Total Population of North Dakota as of 2012 is 692,887



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Commercial Carrier Evaluation

- Goal:
  - Evaluate the viability of the commercial carriers to meet the needs of the State
- Structured interviews
  - Assess coverage
  - Future deployment plans
  - General ability to meet the State's requirements. E.G., :
    - Public Safety Grade availability
    - Security, Operational Control, Coverage
    - Interoperability with existing systems

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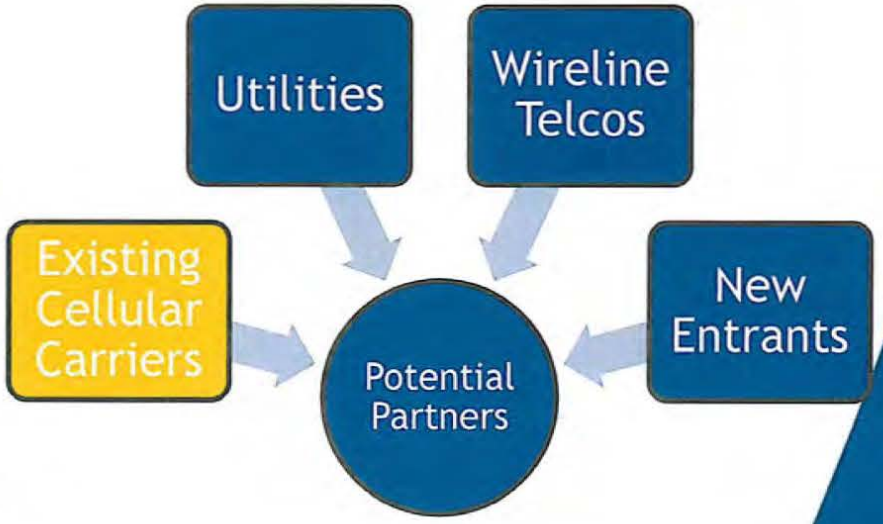
Implementation Modeling

- Goal:
  - Sample implementation model leveraging State assets to extend commercial carrier service area
- Regional implementation models
- Potential other partners
  - Could bring assets, users, and funding
  - Under consideration for scope increase



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Memorandum of Agreement (MOA) for asset sharing

Research

- Analyze existing telecom asset-sharing agreements to create an MOA acceptable to asset-owning government agencies
- Review North Dakota law for potential legal obstacles to an asset-sharing MOA

Draft

- Create single standard MOA template for individual agreements with government owners of assets such as towers, fiber, and data centers
- Lessee to be State agency; Lessor to be State, local, tribal agencies
- Lessor may assign the MOA to FirstNet upon State "opt-in" election

Deliver

- Memorandum on potential legal barriers and possible remedies in developing the standard MOA, and
- The standard MOA itself.

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Governance

Existing Bodies

- Interview knowledgeable individuals to identify, evaluate existing bodies
- Focus: information flow to/from all levels of government and the private sector
- Research structure, membership, charters, bylaws, rules, laws

Analysis & Report

- Evaluate current governance bodies, make recommendations
- Strong flow of information between FirstNet and the North Dakota PoC
- Body should be able to develop and perhaps implement priority access management process

Option: Implemen-tation

- Implement Governance Assessment Report recommendations
- Examples: draft of legislative proposals or charters, establish work groups, negotiate agreements

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Asset Identification & Inventory

- Goal:
  - Assess the suitability of the State current databases , recommend changes, monitor the data input
- FirstNet Standards
  - To be based on FirstNet requirements
  - Leverage existing STATE databases to minimize database development
  - Stakeholders to upload their own data
- Outreach
  - will perform outreach to ensure that stakeholder are prepared for the data entry
- Monitoring
  - Continued monitoring and coordination with national efforts
- Phase 1 vs. Phase 2
  - This initial effort is seen as a Phase 1 activity
  - Phase 2 option to collect additional information

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Project Schedule

Tasks	Date
Task 2 - Project Kick Off	10/17/2013
Task 15 - Project Plan	11/17/2013
Task 11 - Education Meeting	
Regional Kickoff Meetings	Dec – Jan 14
Quarterly E&O Sessions	Quarterly
Task 6 - Needs Assessment Surveys	
State Agency Stakeholder Sessions	November
POC Survey	Starting in Oct.
User POP & Utilization Surveys	Jan - Jun 14
Task 6 - Needs Assessment Sessions	
Working Groups	Nov - Feb 14
County Review Sessions	Mar - June 14
Task 4 - Develop a Standard MOA	Oct – Oct 14
Task 5 - Establish Governance Structure	Oct – Aug 14
Task 8 - Commercial Carrier Evaluation	June - Oct 14
Task 9 - Implementation Modeling	Oct – Jan 15
Task 12 - Asset Identification & Inventory	Phase 2

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Risks

Project Related

- Participation and engagement of stakeholders
- Misarticulating requirements
  - Participants don't understand questions
  - Participants aren't provided full context of decisions/requirements (set unachievable expectations as a result)

FirstNet Outcome Related

- Challenging Business Model
  - Capital investment may exceed the available FN funding
  - Revenues from the Public Safety User base may be insufficient to sustain operations
- Cannot find a "match" between public safety requirements and private partner needs to offset shortfalls
  - Hardening
  - Security
  - Priority/Pre-emption

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Support: Working Group Volunteers

Topic Area	Skill Required	Number Needed
Devices	First / Secondary Responder	5 or more (one per discipline, rural/urban)
Service Areas	First / Secondary Responder	5 or more (one per discipline, rural/urban)
Applications	First / Secondary Respond	5 or more (one per discipline, rural/urban)
Security and Network Requirements	Subject matter experts (security, radio network operators), plus technical first/secondary responders	5 or more, preferably two per discipline.

Workload (depending on final scope of each WG):

- Three to five meetings / conference calls
- Review existing documentation, propose requirements (or revisions to existing requirements)
- Estimate 24 - 36 hours over 3 months

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Support: Volunteers & SIEC

- Point of Contact Information of Stakeholders
  - PSAP Contacts: List of Response Agencies
  - County Agencies: List of secondary users
    - Transportation, school buses, public works, public health
- Volunteers for State-Agency Stakeholder Sessions
  - Agencies grouped by discipline
  - 2 - 3 hour meetings
  - Require a POC (point of contact/agency)
- Stakeholder Engagement
  - Assist project team in engaging stakeholders (completing surveys, providing requirements)
- Confirmation/Validation of Requirements
- Weigh possible consultation options. E.G.:
  - State position on secondary responder use
  - Private partner consideration

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Support: Governance & MOA

Governance

- People who know about existing governance organizations
- Documents relevant to existing governance organizations

MOA

- People who know about existing asset-sharing agreements, help obtaining those agreements
- Consultation with Attorney General's Office re: potential legal obstacles to asset-sharing MOA

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Next Steps & Proposed Schedule

- Identify PSAP & County Point of Contacts Statewide
  - Release POC Survey
- Establish Working Groups
  - Week of Nov 4 - 8
- Statewide Stakeholder Group meeting with agency representatives
  - Week of Nov 11 - 15
- Regional Kickoff (8-Cities)
  - Weeks of Dec 2 - 13
- Tribal Outreach
  - Concurrent with the Regional Kickoff (Dec 2 – 13)
- Gather Governance & MOA contacts & documentation

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Division of State Radio

NDDES
Homeland Security
State Radio

ND Department of Emergency Services

Ensuring a safe and secure homeland for all North Dakotans.

Division of State Radio

- Department of Emergency Services/Division of State Radio
  - Advisory group (Statewide Interoperable Executive Committee - SIEC)
  - Communication Center
  - Frequency Management
  - Agency Information Technology
  - Statewide Message Switch Management
  - Management of the Public Safety Communications Infrastructure

Division of State Radio

- Frequency Management
  - One (1) Employee
  - Statewide Frequency Management Plan (2010)
  - Statewide Signal Operating Instructions (2010)
  - Public Safety radio reprogramming.
  - Narrow Banding preparation and planning (January 1, 2013)

Division of State Radio

- Agency Information Technology
  - Four (4) Computer Specialists
    - One (1) Supervisor
    - Three (3) - (2) Specialists (1 Temp)
  - Responsible for all IT projects/support for DES
    - 24/7 On Call for Department
  - Support the mobile CAD clients and vendor support
  - Manage projects to improve the Department's technology (reverse 911, emergency notification systems, improve infrastructure, etc.)

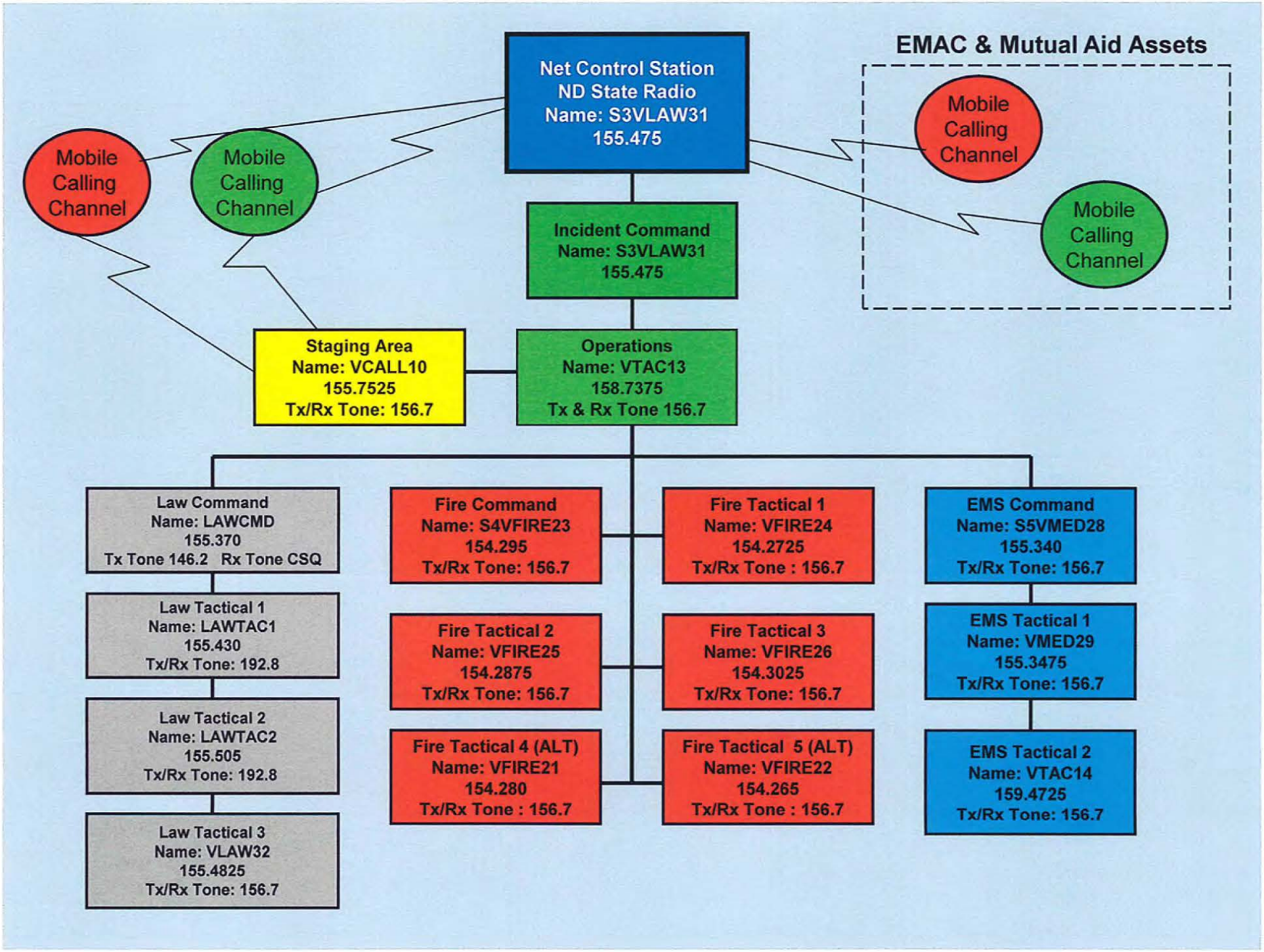
Division of State Radio

- Statewide Message Switch Management
  - Two (2) Administrative Staff Officer III positions
    - State Informational Security Officer (ISO)
    - State Criminal Justice Information Systems Officer (CSO)
  - Training and audit responsibility for all NCIC users (4,000 +). Train over 300 – 500 users per year.
  - Switch transactions:
    - 2012 – NCIC (Input 19,353,010/Output 21,692,682)
      NLETS (8,181,594)
    - 2013 to Date - (Input 15,813,014/Output 17,887,652)
      NLETS (6,938,955)

Division of State Radio

- Emergency Response:
  - Central Public Communication Center for ND
  - Communication Liaisons (ComL)
  - Portable Gateways/Towers
  - Coordination of Signal 100 response
  - Emergency after hours contact for several State Agencies
  - Back-up personnel and support for the EOC

STATEWIDE INTEROPERABILITY BANK/ZONE 5				
	Rx/Tx FREQ	Tx/Rx CTCSS Tone	Primary/Intended Use	Common Name
CH1			NOT USED	
CH2	155.475		State Radio NCS and Incident/Unified Command Net	S3VLAW31
CH3	155.475	156.7	State Radio NCS and Incident/Unified Command Net	S3VLAW31
CH4	151.1375	156.7	Incident/Unified Command Net (Alternate/Spare)	VTAC11
CH5	154.4525	156.7	Incident/Unified Command Net (Alternate/Spare)	VTAC12
CH6	158.7375	156.7	Operations Section Chief Net	VTAC13
CH7	155.7525	156.7	Staging Area Manager Net	VCALL10
CH8	155.370	146.2/CSQ	Law Command (Lead Tactical Law Enforcement Official)	LAWCMD
CH9	155.430	192.8	Law Tactical 1 (Law Division/Branch/Group)	LAWTAC1
CH10	155.505	192.8	Law Tactical 2 (Law Division/Branch/Group)	LAWTAC2
CH11	155.4825	156.7	Law Tactical 3 (Alternate/Spare)	VLAW32
CH12	154.295	156.7	Fire Command (Lead Tactical Fire Official)	S4VFIRE23
CH13	154.2725	156.7	Fire Tactical 1 (Fire Division/Branch/Group)	VFIRE24
CH14	154.2875	156.7	Fire Tactical 2 (Fire Division/Branch/Group)	VFIRE25
CH15	154.3025	156.7	Fire Tactical 3 (HazMat)	VFIRE26
CH16	154.280	156.7	Fire Tactical 4 (Alternate/Spare)	VFIRE21
CH17	154.265	156.7	Fire Tactical 5 (Alternate/Spare)	VFIRE22
CH18	155.340	156.7	EMS Command (Lead Tactical EMS Official)	S5VMED28
CH19	155.3475	156.7	EMS Tactical 1 (EMS Division/Branch/Group)	VMED29
CH20	159.4725	156.7	EMS Tactical 2 (EMS Division/Branch/Group)	VTAC14
CH21	155.160	156.7	Search and Rescue (SAR) Ground Operations	SARWFM


EMAC & Mutual Aid Assets
Net Control Station
ND State Radio
Name: S3VLAW31
155.475
Mobile Calling Channel
Mobile Calling Channel
Mobile Calling Channel
Mobile Calling Channel
Incident Command
Name: S3VLAW31
155.475
Staging Area
Name: VCALL10
155.7525
Tx/Rx Tone: 156.7
Operations
Name: VTAC13
158.7375
Tx & Rx Tone 156.7
Law Command
Name: LAWCMD
155.370
Tx Tone 146.2 Rx Tone CSQ
Law Tactical 1
Name: LAWTAC1
155.430
Tx/Rx Tone: 192.8
Law Tactical 2
Name: LAWTAC2
155.505
Tx/Rx Tone: 192.8
Law Tactical 3
Name: VLAW32
155.4825
Tx/Rx Tone: 156.7
Fire Command
Name: S4VFIRE23
154.295
Tx/Rx Tone: 156.7
Fire Tactical 1
Name: VFIRE24
154.2725
Tx/Rx Tone : 156.7
Fire Tactical 2
Name: VFIRE25
154.2875
Tx/Rx Tone: 156.7
Fire Tactical 3
Name: VFIRE26
154.3025
Tx/Rx Tone: 156.7
Fire Tactical 4 (ALT)
Name: VFIRE21
154.280
Tx/Rx Tone : 156.7
Fire Tactical 5 (ALT)
Name: VFIRE22
154.265
Tx/Rx Tone : 156.7
EMS Command
Name: S5VMED28
155.340
Tx/Rx Tone: 156.7
EMS Tactical 1
Name: VMED29
155.3475
Tx/Rx Tone: 156.7
EMS Tactical 2
Name: VTAC14
159.4725
Tx/Rx Tone: 156.7

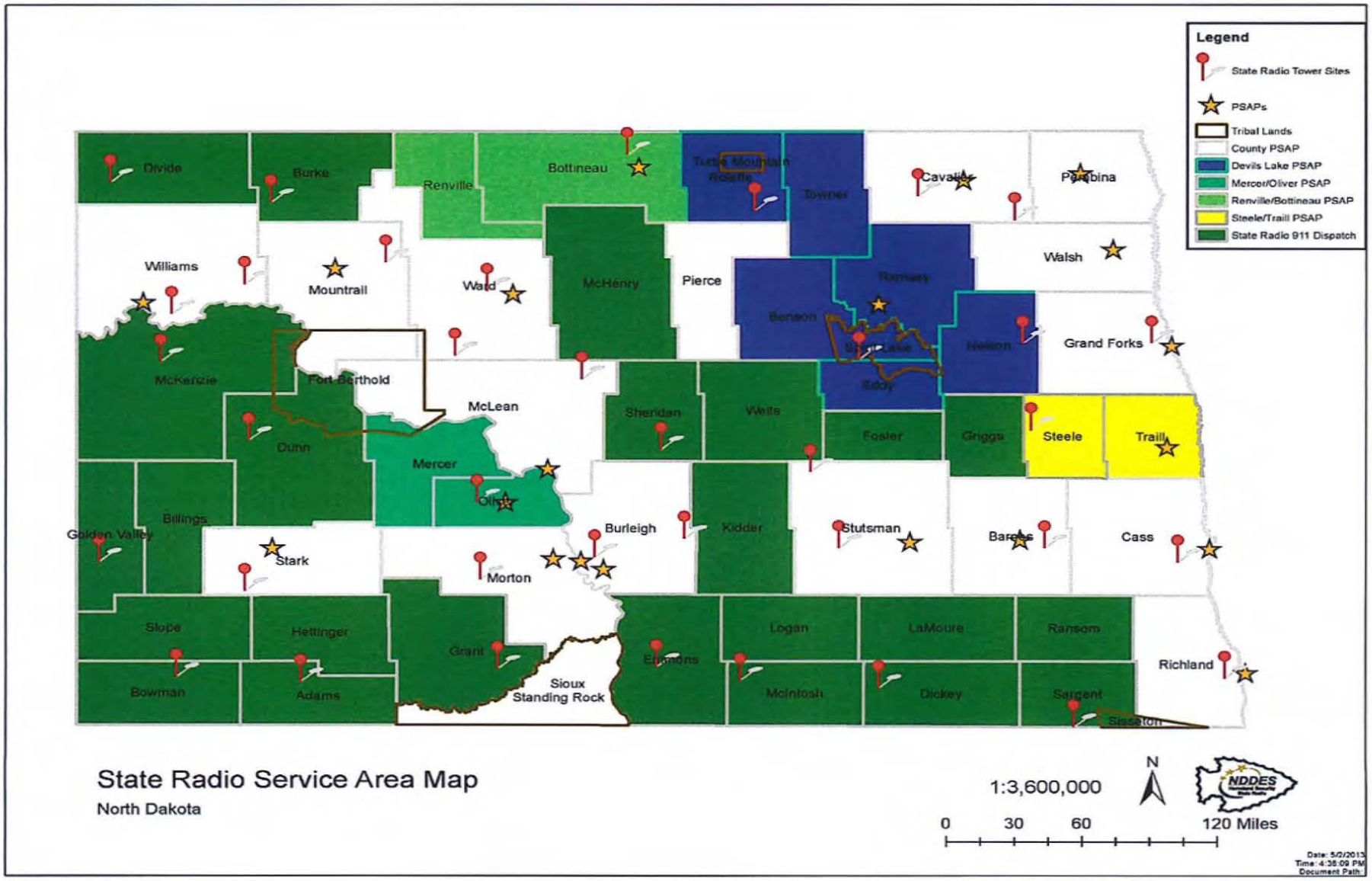
Division of State Radio

- Other Missions:
  - Lead North Dakota Statewide Baseline Mapping Project
  - Member of the North Dakota CJIS Board
  - Member of the Statewide Broadband Mapping project.
  - Federal Statewide Interoperability Coordinator (SWIC)
  - Department COOP/COG representation
  - ITD Committees
    - Enterprise Architecture Teams (security and desktop)

Division of State Radio

- Communication Center
  - Thirty-two (32) employees
  - 24/7 operations
    - 170,908 CAD events for Service (2012)
    - 153,202 CAD events for Service (2013 to date)
  - Primary dispatch for State Public Agency Response agencies and Federal LE.
  - Primary 911 dispatch for 24 of 53 counties January 2013.
  - Statewide public safety communication leadership.
  - Hazardous condition notification
  - Computer Aided Dispatch (CAD) (March 2010)
    - Joint project with Highway Patrol

State Communication System



Division of State Radio

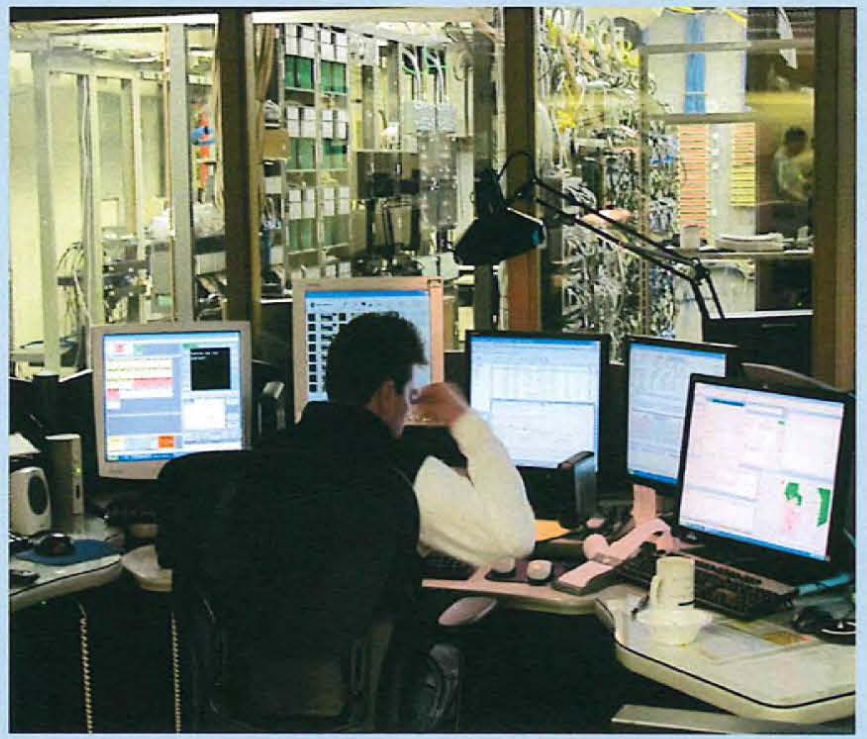
- Infrastructure Timeline
  - 1951 - State Radio established
  - 1976 to 1977 - Motorola Centracom VHF system and move to EOC (VHF 35 tower 300w analog system)
  - 2004 to 2006 - Motorola Gold Elite VHF station and tower equipment upgrade (P25 Digital/Analog Narrow Band capable reduction in power to 100w)
  - 2012 – Zetron Max (IP based and ability to add additional towers). Converted channels 1 and 2 to digital and Narrow Banded channel 3.

Division of State Radio

- Current System:
  - IP connectivity on a designated IP address
  - Ability of connect to the system from any ITD access point
  - Back-up system located at a remote location (full back-up)
  - State Radio channels
    - Channel 1 Digital (Local Jurisdiction Usage)
    - Channel 2 Digital (State Emergency Services)
    - Channel 3 Narrow banded analog (Mutual Aid)

Division of State Radio

Old System Backroom

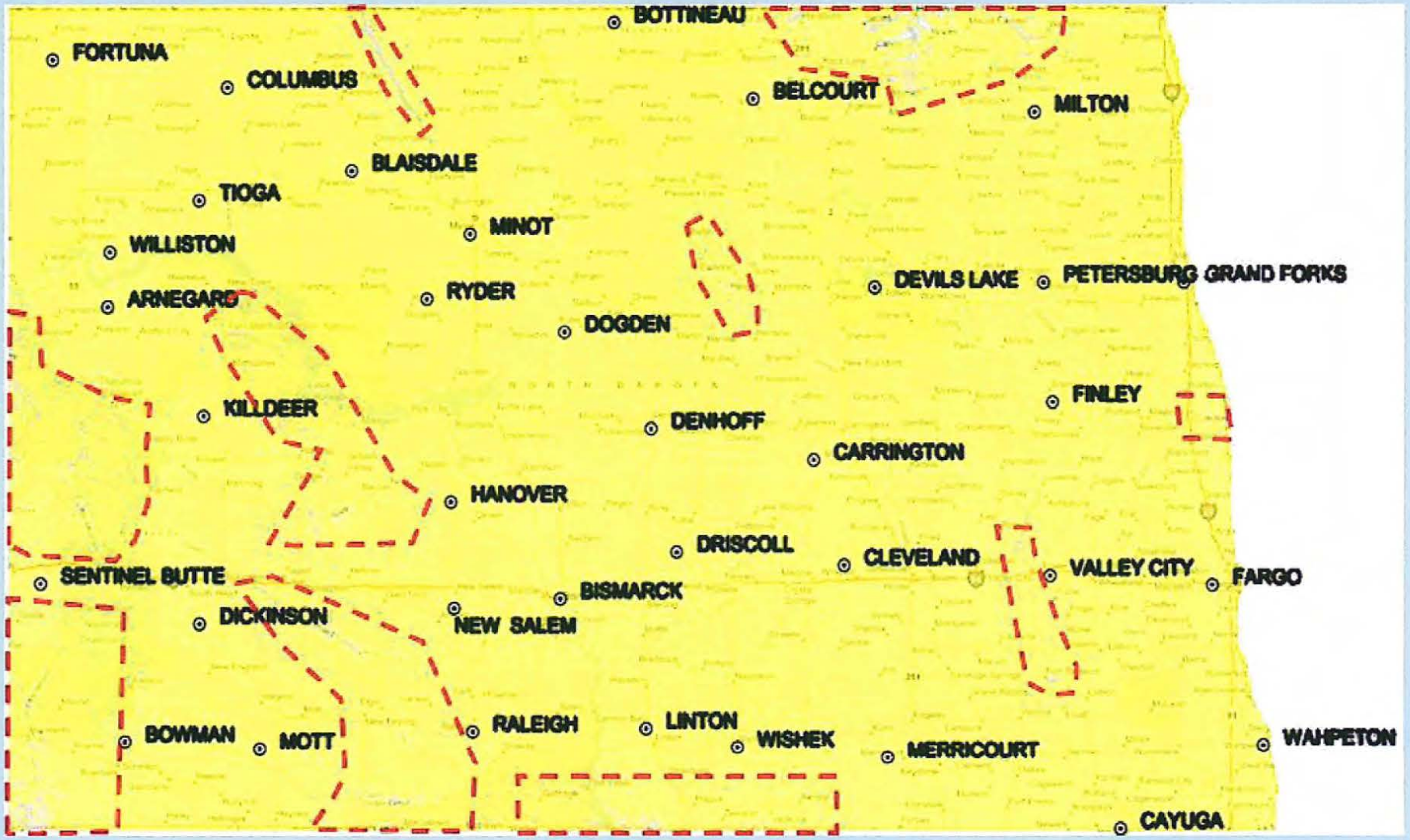


New System Backroom

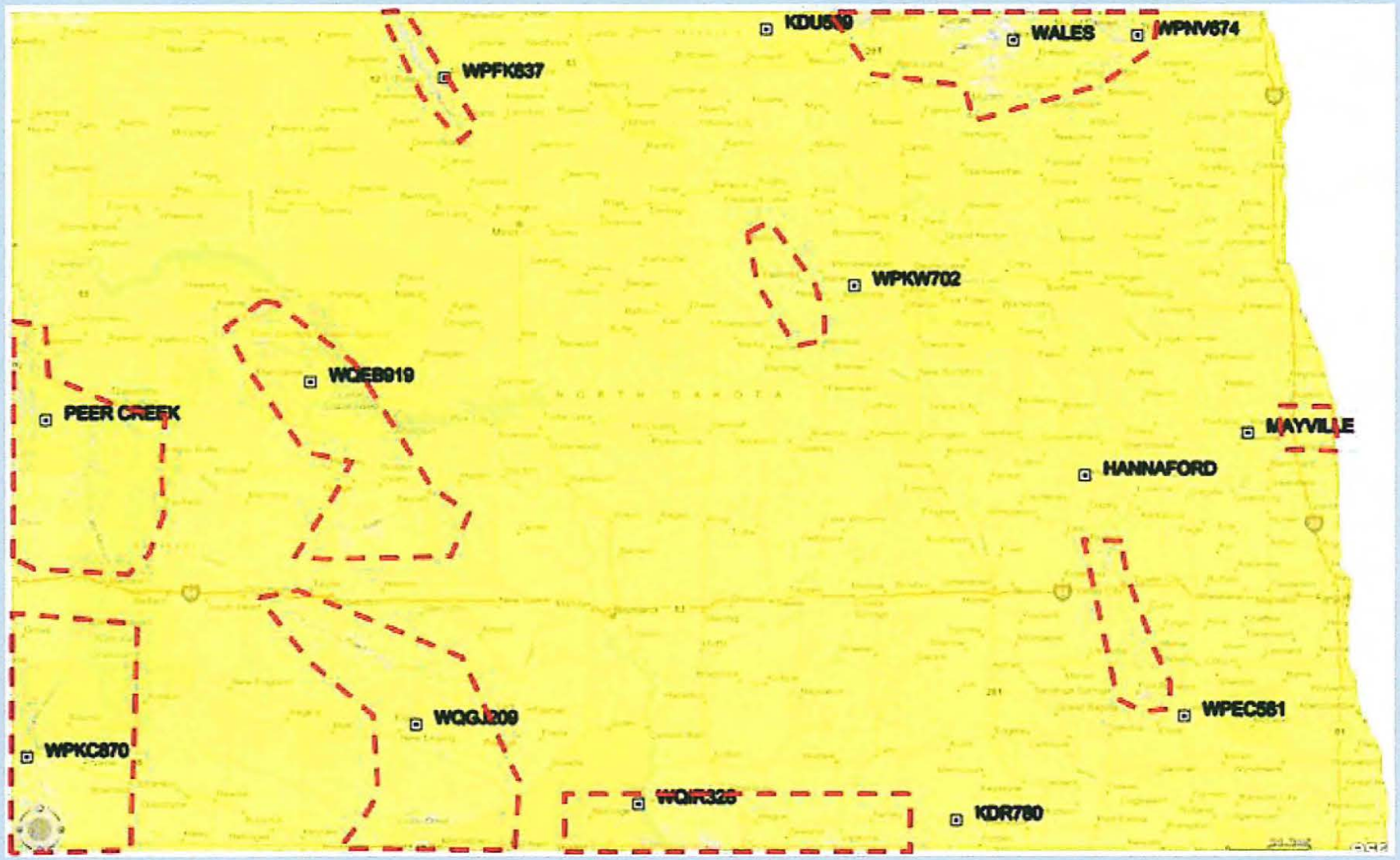
Division of State Radio

- Management of the Public Safety Communications Infrastructure
  - Supported by DES IT staff and DOT
  - Thirty six (36) State Radio towers
    - Shared infrastructure with DOT
    - Connected to Bismarck DES through T-1 or Fiber lines
    - Generator power backup at tower sites
  - Tower Gap Study (2010)
    - Twelve (12) gap areas identified
    - New Computer Electronic Base (CEB) required

Possible Communications Problem Areas



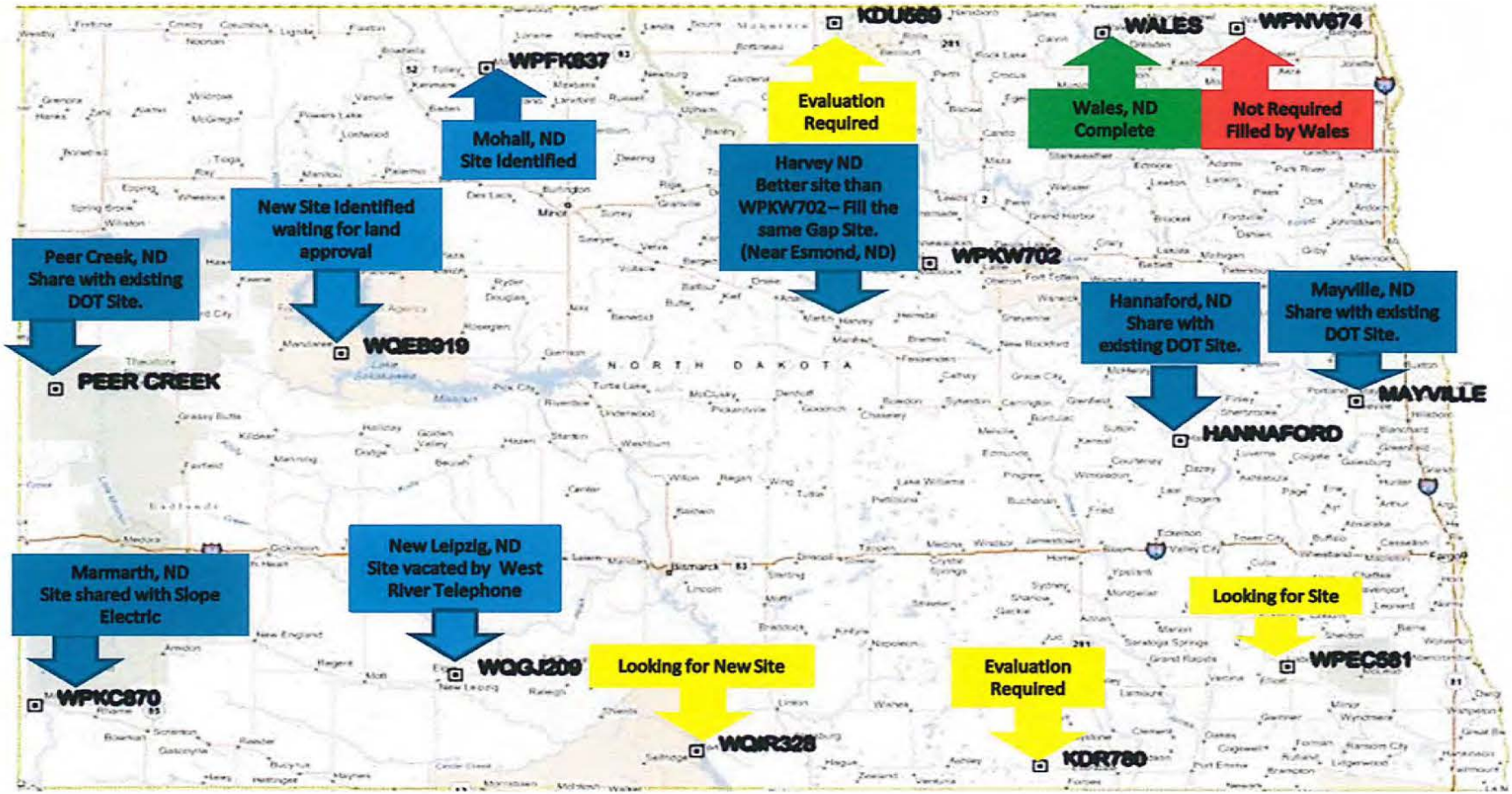
Possible New Sites – Mobile Coverage



Division of State Radio

October 14, 2013

State Radio Communication Gap Areas



Division of State Radio

- Since 2009, the Department has allocated:
  - $5,096,865 for radio equipment
  - $1,254,701 for radio programming
  - Thirty six (36) training exercises were held statewide to test communication operations
    - four (4) were conducted by the Department
    - thirty two (32) conducted by local entities.

Division of State Radio

- The following challenges presented by narrow banding have prolong a smooth transition.
  - Reduced range caused by reduces operation power (MHz)
  - Digital radio operational changes creating a learning curve
  - Improper programming by radio vendors/agency personnel
  - Radio manufacturing defects

Division of State Radio

- Narrow banding assistance
  - State Radio is adding additional tower infrastructure (study recommendations)
  - Training
    - Radio 101 – classroom four (4) phase program or online three (3) phase program
    - Radio Usage Guide (Digital/Analog tips)
    - North Dakota Public Safety Communication General Usage Guide (April 2012)
    - Frequency Management and Signal Operating Instructions Guide
  - State Radio assists users and vendors with programming, licensing and radio checks
  - Assist with the deployment of State's mobile CAD for another communication asset

Questions

North Dakota Pub[illegible] [illegible]fety Radio System
Recommendations Review

January 05, 2000

North Dakota Public Safety Radio System
Conventional *versus* Trunk Systems

Trunking is a sharing of a small number of available channels among many users

In **conventional** systems each channel is assigned a continuous, specific use (*i.e.* Your City Police) and except during periods of interoperability is only used for that specific use – inefficient use of channels

In **trunk** systems each channel is assigned as needed (on-the-fly) to a specific use and remains in that use only as long as needed, then returns to the common pool for the next use – very channel efficient (as long as the number of active users per channel is calculated correctly)

Trunk features:

- ✔ Privacy without encryption
- ✔ Waiting time minimized
- ✔ More reliable and orderly
- ✔ More efficient use of smaller number of channels
- ✔ Pre-assigned talk groups
- ✔ Dispatch/operator setup of impromptu talk groups
- ✔ All call/broadcast messages
- ✔ Several levels of priority
- ✔ When system is busy – no problem, key again and channel should be available
- ✔ Caller ID
- ✔ Emergency alarm to/from field to control
- ✔ Remote radio killing - no unwanted use of radio
- ✔ Call alert enhancements
- ✔ Replacement of cellular phones (especially where coverage is poor)
- ✔ Reduced interference
- ✔ Elimination of distractions
- ✔ Available for digital or analog systems

North Dakota Public Safety Radio System
Alternatives Examined

Baseline

- ✔ Existing system
- ✔ No improvements
- ✔ Repair and/or replace equipment as necessary

Evolutionary

- ✔ Improvements to existing system
- ✔ Stay in the 150 MHz VHF high band
- ✔ Stay with conventional, analog system
- ✔ Combine other non-State Radio systems into one statewide Public Safety system
- ✔ Extended coverage to portables without in-vehicle repeaters
- ✔ Reduced interference from within (adjacent sites) and external to ND (other uses on same frequencies)
- ✔ Increase channel functional so that all channels have "full" features
- ✔ Increased channels especially in high traffic areas
- ✔ Increased user friendliness, especially under stressful, emergency conditions

Revolutionary

- ✔ Complete modernization
- ✔ Introduce a digital trunking infrastructure
- ✔ Consider moving to 800 MHz (220, 450, 700 MHz dismissed)
- ✔ Decentralized *vs.* Centralized Control
- ✔ Availability of truly clear, pre-assigned channels
- ✔ Defacto security without encryption
- ✔ Move from dedicated channel use to prioritized use
- ✔ Move to a "National" Public Safety standard - APCO 25

North Dakota Public Safety Radio System
Baseline Alternative

A "pure" **Baseline** approach is not viable, except perhaps in the shortest term

- ✔ Serves as the basis of comparison to improved strategies
- ✔ No changes to existing system
  - Same 36 tower sites (collocated with DOT)
  - VHF high-band (150 MHz)
  - Wideband channels (25 KHz)
  - Analog equipment
  - Conventional operation
  - No encryption
  - Dedicated 4-wire telco circuits
  - Three channels
  - Other functions: HP dispatch, paging, 911 primary rural dispatch, backup 911 dispatch
  - No capital costs (assuming no new sites or channels added)

North Dakota Public Safety Radio System
Evolutionary Alternative

The **Evolutionary** approach appeared to be the most attractive were it not for the high costs and lack of standardization associated with it

- ✔ Conservative strategy
- ✔ Implementing improvements as necessary
  - Add tower sites in areas where coverage enhancements suggested (estimated ten sites) - $1.2M
  - Stay in VHF high-band (150 MHz)
  - Convert existing wideband channels to narrowband (12.5 KHz)
  - Add additional channels where traffic is congested
  - Move towards digital equipment
  - Consolidate Public Safety radio systems
  - Move towards shared trunk system
  - Upgrade telco to add/drop T1 digital circuits - $7K per month (new circuits)
  - Reduce/eliminate frequency reuse on adjacent sites
  - Maintain as much backwards compatibility as possible
  - Increase coverage to portable units without vehicle repeaters - $17.6M
  - Only use standards
  - Reprogramming, frequency coordination, project management - $1.3M
  - $20.1M does not include replacement/upgrade of equipment nor additional channels

North Dakota Public Safety Radio System
Revolutionary Alternative

The **Revolutionary** approach without an accepted universal standard should not be implemented

- ✔ Aggressive Strategy
- ✔ Move as rapid as funding will permit
  - Next generation (at time of procurement)
  - Standards based (APCO 25 - when fully open and universally accepted)
  - Trunked
  - Digital
  - Frequency options: 150, 450 or 800 MHz

    <u>150 MHz</u>
    - Decentralized control (lack standards)
    - Number of sites required like today 36, with enhanced coverage 46
    - Requires some 20-22 frequency pairs (search required)
    - Lacks roaming
    - Cost $44.1M

    <u>450 MHz</u>
    - Not considered
    - Most of the disadvantages of both 150/800 MHz

    <u>800 MHz</u>
    - Centralized control (with emerging standards)
    - Number of sites required 56
    - Frequency pairs assigned
    - Cost $62.2M
  - Virtually unlimited features (however requires shift from dedicated to priority usage)
  - Phased implementation starting in areas of highest congestion
  - Maintain existing system until statewide conversion of all users
  - With the exception of high bandwidth applications, meet all application needs (encryption and data not needed at this time)
  - Add more towers for coverage similar to existing

North Dakota Public Safety Radio System

FE Recommendations

(June 1999)

None of the "pure" alternatives as described in ***FE***'s report is judged to be in North Dakota's best interest (as of June 1999). Therefore ***FE*** recommended a hybrid that combines the best **features** of each approach:

- ✔ An 800 MHz trunked system would be most compatible with a national "Public Safety Model." Unfortunately it has not, as yet, evolved into a fully approved standard and lacks product competition. Final systems design and implementation should, therefore, await a fully-developed, national standard
- ✔ Review the funding approaches suggested to determine the best approach for North Dakota and start a funding reserve as soon as possible (before final design and implementation)
- ✔ User affordability is critical; equipment costs must be within the financial resources available to the State agencies and local governments or, alternatively, the State must provide subsidies
- ✔ As technology is rapidly changing, it is imperative that state-of-the-art systems are used to maximize system life expectancy and minimize obsolescence
- ✔ The current pilot mobile data system should afford the State time to await funding and standards development
- ✔ Interim improvements to the existing system would not be worth the expense in the long term
- ✔ Parallel operation of old and new systems will be required until full statewide implementation is financially practical
- ✔ A six to ten year migration period is recommended
- ✔ Improvements to the interconnect infrastructure should be delayed until the final system design is approved
- ✔ Continue centralized operation and control of the overall system
- ✔ Consolidate existing systems into a statewide radio communications infrastructure via trunking, ultimately reducing the number of systems and costs
- ✔ Security features should be designed in and used as needed

North Dakota Public Safety Radio System

FE Updated Recommendations

(June 2000)

FE has added clarifications to its original recommendations and has incorporated recent developments Original recommendations remain valid.

- ✔ *FE* has **not** nor is it now recommending deployment of a combined 150/800 MHz system

Additional details not provided in overview brochure:

- ✔ Federal government using/recommending 150 MHz APCO 25
- ✔ Cost sharing with Federal government
- ✔ APCO 25 is moving into Phase 2, multiple vendors starting to support it
- ✔ Equipment available for 150 MHz with features similar to 800 MHz but with better coverage and reduced cost
- ✔ Combining SR and DOT systems
- ✔ 150 MHz *vs.* 800 MHz (or any other band)
  - Not a simple, obvious choice
  - Other bands 220, 450, 700 excluded (no clear advantages)
  - Delay choice until RFP is written
  - 150 MHz advantages
    - Better coverage
    - Lower cost
    - Easier transition
    - Reuse of existing facilities
    - Familiarity with band
  - 800 MHz advantages
    - Pre-assigned frequencies
    - Less interference
    - Further developed technology
    - Wider use by Public Safety community nationwide

"Unleashing the Power of Technology"

Federal Engineering®

Public Safety Communications System Concept Design

Executive Summary
INTERIM REPORTS 1&2

Prepared for:

State of North Dakota

February 1999

Federal Engineering Inc.

Arrowhead Dr.

Fairfax, VA 22030

703-359-8200

Fax-359-8204

deng.com

Recycle

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EXECUTIVE SUMMARY

PUBLIC SAFETY COMMUNICATIONS SYSTEM CONCEPT DESIGN

1.0 OVERVIEW

This executive summary is a brief overview of the two Interim Reports produced by Federal Engineering as part of a study into North Dakota's public safety communications. It is intended to summarize the information developed during 1998, as well as current system concepts.

Interim Report 1 contained three sections and seven appendices, which included:

- SECTION 1 - INTRODUCTION
- SECTION 2 - PUBLIC SAFETY RADIO SYSTEMS
- SECTION 3 - IDENTIFY NEEDS

- APPENDIX A - (Not Used)
- APPENDIX B - North Dakota Public Safety FCC License Data
- APPENDIX C - North Dakota Non-Public Safety License Data
- APPENDIX D - North Dakota Public Safety Radio Use Summary
- APPENDIX E - Blank User Survey
- APPENDIX F - ND Public Safety Radio Channel Identification
- APPENDIX G - DEM Survey Distribution Memorandums
- APPENDIX H - State Radio Use Procedures.

Interim Report 2 added four sections and six appendices, they include:

- SECTION 4 - REGULATORY ENVIRONMENT
- SECTION 5 - TECHNICAL ENVIRONMENT
- SECTION 6 - PUBLIC SAFETY COMMUNICATIONS STANDARDS
- SECTION 7 - PUBLIC SAFETY COMMUNICATIONS STRATEGIES

- APPENDIX I - NLECT Communications Interoperability Analysis
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- APPENDIX K - Motorola, Ericsson Mobile Equipment Specifications

- APPENDIX L - DOJ/FBI: NCIC 2000 Summaries & Newsletters
- APPENDIX M - FCC: Spectrum Management - Refarming, Reallocation, Technology
- APPENDIX N - NASTD Report: Shared Statewide Radio Systems.

2.0 INTRODUCTION

2.1 Project Objective

The State of North Dakota completed its last statewide plan for public safety communications over 20 years ago. In response to the significant evolution in user needs, advances in technology, and changes in the regulatory environment, funding to develop a new plan was authorized by the 1997 Legislature.

Federal Engineering was selected to formulate a Public Safety Communications Systems Concept Design to support the mobile voice, data, and imaging requirements of the participants. A goal of this top level conceptual design is to enable local, State, and Federal public safety entities, as well as other government mobile radio users located in the State of North Dakota, to participate in and migrate to newer mobile radio technologies with minimal impact on existing services.

FE's plan will provide means for cooperative operation among all participating Public Safety Communications users to maximize the system efficiencies available through economies of scale, as well as the potential benefits inherent in the new and emerging technologies. In addition, *FE*'s plan will allow for the autonomous operation of individual agencies while promoting inter-agency communications capabilities.

The objective of this plan, therefore, is to develop an overall strategy with associated budgetary costs to support future planning and legislative funding requests by the State. In addition, various materials will be provided to explain and promote the plan. A five to ten year planning horizon has been assumed.

2.2 Project Tasks and Program Schedule

The statement of work covers 19 separate tasks:

- Task 1 - Review Current Public Safety Communications
- Task 2 - Identify Needs
- Task 3 - Identify Areas of Consolidation
- Task 4 - Identify Relationships
- Task 5 - Analyze Regulatory Environment
- Task 6 - Analyze Technical Environment
- Task 7 - Evaluate Standards
- Task 8 - Develop Overall Public Safety Communications Strategy
- Task 9 - Develop Local and Wide Area Solutions
- Task 10 - Recommend Procurement Methods
- Task 11 - Evaluate Support Requirements
- Task 12 - Provide Cost Analyses
- Task 13 - Provide Benefits Analyses
- Task 14 - Identify Funding Methods
- Task 15 - Identify Migration Strategies
- Task 16 - Define Public Relations Methods
- Task 17 - Provide PC-based Media Presentation
- Task 18 - Provide Promotional Brochure
- Task 19 - Optional Public Safety Support.

Details of each task are available in the Statement of Work. The current program schedule is contained in Appendix B.

3.0 PUBLIC SAFETY RADIO SYSTEMS

North Dakota has 1764 FCC licensed public safety facilities, where each facility is a

fixed station and its associated mobiles. Of that total 1455 facilities (82.5%) are using the VHF High Band (150 MHz), 306 facilities (17.3%) are using UHF (450 MHz), and the remaining 3 facilities (0.2%) are using the 800 MHz band. Even though facilities are licensed at VHF Low Band (25-50 MHZ), there are appears to be no activity in this band.

The vast majority of North Dakota's public safety radio systems fall into one of the following systems:

- State Radio Communications (SRC)
- State Highway Patrol (HP)
- State Department of Transportation (DOT)
- State Emergency Management Division (EMD)
- County Sheriffs' Offices
- City Police Departments
- City/County Fire Departments
- State/County/City Emergency Medical Services (EMS)
- County/City Emergency Management Services (EM)
- North Dakota Special Emergency Services.

3.1 Public Safety Radio Communications Infrastructure

There is currently installed and in use an extensive State-owned basic public safety radio communications infrastructure consisting of 39 strategically located radio communications sites complete with antenna support structures, equipment housing structures with HVAC facilities, emergency standby power, secure site enclosures, access roads, and utility services. These sites are jointly used as major radio communication equipment sites by State Radio Communications, State Department of Transportation, and other State agencies. *FE*'s report includes various exhibits showing site locations on a map of North Dakota and tables of site information (elevation, tower

height, latitude and longitude) and users at each site.

3.2 State Radio Communications

The report summarizes the creation of State Radio (SR) in 1951, through its four major radio communications services:

- Statewide Dispatch Service
- Statewide Radio Paging Service
- E-911 Emergency Services Dispatch
- Mobile Data Communications.

Each service is described with an operational narrative, maps of location and basic circuit routes, base site equipment configuration, and channel use. The mobile data communications, which is a pilot program of ten sites covering the I-29 and I-94 corridors, is also described. The SR FCC database of users and a channel chart showing SR frequencies and functions are included.

3.3 Other Public Safety Communications Users

The remaining nine major user groups are addressed in a similar manner:

- State Highway Patrol
- State Department of Transportation
- State Emergency Management Division
- County Sheriffs' Offices
- City Police Departments
- City/County Fire Departments
- State/County/City Emergency Medical Services (EMS)
- County/City Emergency Management Services (EM)
- North Dakota Special Emergency Services.

4.0 NEEDS IDENTIFICATION

The needs assessments were developed by means of on-site interviews with focus groups and/or a survey questionnaire.

4.1 On-Site Interviews

To gather user needs data, ***FE*** interviewed representatives of the seven State agencies with the greatest impact on North Dakota's mobile communications system:

- State Radio
- Highway Patrol
- Department of Corrections, Parole and Probation, and Penitentiary
- Game and Fish
- Bureau of Criminal Investigation
- Bureau of Indian Affairs
- Department of Transportation.

In addition, ***FE*** interviewed many individuals representing the following local law enforcement agencies, district emergency managers, counties, and fire departments:

- District Energy Managers
- Minot, Mandan, and Bismarck Law Enforcement
- Metro Ambulance
- 911 Association and Peace Officers Association
- Jamestown Fire Chief
- Bowman Police Chief
- Cass County Emergency
- Jamestown Police Department
- Carrington Police Department
- Stutsman County Sheriff Office
- Billings County Fire
- Mountrail County
- Linton County
- Burleigh County Sheriff Office.

Interviewees and focus group participants repeatedly voiced common concerns about the current lack of interoperability among radio systems. Communications systems developed and customized to meet individual groups' needs have resulted in numerous independent systems; this in turn has created problems with interoperability as communities and demands have grown. Non-compatible systems pose issues for everyone. There are early indications that new mobile data communications (MDC) systems are being installed piecemeal across the State without concern for interoperability.

Future plans primarily focus on acquiring MDC systems, to applying for funding grants, to installing million dollar systems. While some shared systems are being developed, often unique systems are still being designed to meet a specific need. Federal grants are the most common source of funds.

Removing barriers and developing strategies to reach future goals are addressed in the recommendation section. The following sections summarize the input received from the users who were interviewed and the focus group attendees. Comments are generally grouped by current systems, barriers, and future directions.

The two focus group meetings held in Fargo and Dickinson targeted individuals and groups with lower levels of interactions with State Radio. Attendees primarily represented law enforcement, fire departments, emergency managers, and county governments.

4.2 Survey

4.2.1 Instrument

A suitable survey instrument was jointly developed by ***FE***, the Task Force Committee Chairmen, and State Radio. It is organized into three distinct parts so as to efficiently direct information requests to those managers who are best equipped to answer the questions in each section. Section 1 (Basic User Information) was intended to be completed by top managers or other technically knowledgeable staff. Section 2 (Radio System and Equipment Information) was targeted to be completed by technical staff knowledgeable in equipment inventories. Finally, Section 3 (System and Equipment Cost Information) was intended to be compiled by financial managers.

4.2.2 Distribution

The survey was mailed to all DEMs involved in public safety. The DEMs were asked to distribute the survey, collect the completed surveys, and return them to State Radio. Each DEM was responsible for about 15 counties. Each county emergency manager sent 30 copies of the survey, together with a list of individuals who should fill them out. The DEMs were also asked to answer respondents' questions; if a DEM was unable to respond, the question was referred to State Radio for resolution.

The DEMs were asked to emphasize the importance of this survey to the integrity of the Public Safety Communications Plan. To ensure a smooth transition and full funding, the most critical plan elements are considered to be the current inventory and planned changes.

4.2.3 Survey Results

Of the approximately 1600 survey copies distributed to Federal, State, and local agencies, departments, and organizations associated with North Dakota Public Safety communications, 359 were received through early September 1998. Compared with other surveys of which *FE* has knowledge, this return percentage of close to 25 percent is considered excellent. The results are therefore considered statistically significant and representative.

5.0 REGULATORY ENVIRONMENT

Two Federal Agencies are responsible for the management of the radio frequency spectrum: the Federal Communications Commission (FCC), and the National Telecommunications and Information Administration (NTIA). The FCC has designated authority over all state and local government users, as well as private and commercial radio spectrum users. The NTIA has similar designated authority over all Federal government users. These two agencies are charged with the responsibility for initiating and ensuring compliance with the rules regarding spectrum use, the coordination of the allocation of specific frequency use to eligible users, and the designation of blocks of spectrum to be used for specific purposes and/or by specific user groups. The FCC grants authorization for spectrum use through a license to use the assigned frequencies; the NTIA grants take the form of written authorizations for use of assigned frequencies.

Neither of these Federal agencies has authority to grant authorization for the use of radio spectrum outside their specific jurisdictions. However there are provisions for an FCC authorized public safety user of radio spectrum to grant permission for a specific entity to operate a

radio unit on its assigned frequency of operation if this would serve the needs of the authorized (licensed) user for coordination and interoperability capability in emergency situations. This provision provides for a degree of interoperability between State and local government radio users and selected Federal agency users.

Although these two agencies have broad authority over regulating the wide range of existing and evolving telecommunication services, our interest focuses on the authority exercised by the FCC in relation to the radio telecommunication services currently in use, or to be used, by Public Safety Radio Communications in the State of North Dakota. By statutory authority the FCC Rules and Regulations require prime consideration in the development of any long range plan for Public Safety Radio Communications.

In addition to these two Federal agencies, and their exclusive regulatory powers; the State of North Dakota, through a 1951 Act of the State Legislature (Chapter 54-23.2), created State Radio Communications with the authority to provide radio communications services and specify certain radio communications capabilities for law enforcement entities statewide. The existence of State Radio and its ongoing operations and responsibilities also have a major part to play in the development of a long range public safety radio communications plan for the State.

6.0 TECHNICAL ENVIRONMENT

The advancement of telecommunications technology is so rapid that it threatens to outpace the ability of the Public Safety community to share in the fruits of these advancements

through the implementation of advanced systems. The main deterring factors typically include the lack of funding and insufficient advanced planning for the application of advanced technologies. Comprehensive planning with respect to the need and proposed use of advanced systems is a prime requirement in the process of securing funding for system implementation, operation, and maintenance.

The regulatory environment is gradually and cautiously being modified to encourage the application of advanced technology in the two-way transmission of voice, data, and video signals for Public Safety Radio communications as well as the rest of the private land mobile radio community of users. This will have the desirable effect of accelerating the development and application of advanced radio communication systems and facilities.

FE's report reviews and analyzes the application of new and developing technologies, as well as those technologies proven by current usage. Our principal emphasis is on their potential for incorporation, and overall effect of incorporation, in the long range planning effort for Public Safety Communications in North Dakota. Specific subsections cover the following FCC issues:

- Mobile/Portable Radio Technologies
- Satellite Mobile/Portable Radio Technologies
- Trunked Radio System Technologies
- Mobile/Portable Data Radio Technologies
- NCIC/NLETS Advanced System Technologies
- Cellular Radio Voice/Data Technologies.

7.0 PUBLIC SAFETY COMMUNICATIONS STANDARDS

In formulating a Public Safety Communications Systems Design Concept for the State, it is important that the various entities' systems interoperate, especially during public safety emergencies, with the highest feasible reliability. Since many of the State's mobile radio systems may be upgraded to incorporate newer, more efficient technologies, the operational compatibility among various equipments from a range of manufacturers is also a major consideration. The National Institute of Justice has provided quantitative data from state and local law enforcement agencies detailing recent experiences in systems interoperability and their planned use of communications equipment and services.

FE's report assesses the various standards which may be applicable to the design of the State's Public Safety Communications System.

7.1 Technical Standards

The following technical standards were examined:

- International Standards - International Telecommunications Union (ITU)
- National Standards
  - Telecommunications Industry Association (TIA)
  - APCO Project 25
  - NCIC 2000
  - National Security Agency (NSA)
  - Federal Communications Commission.

7.2 State of the Industry

The issue of standards in the radio world beyond conventional (non-trunked) analog

radio equipment is far from clear. The two major (90+% market share) vendors, Motorola and GE/Ericsson, differ in their approaches and as a consequence are non-compliant suppliers. ***FE*** examined a sampling of Motorola and GE/Ericsson products, as well as other manufacturers that may become players once true standards have been adopted.

8.0 PUBLIC SAFETY COMMUNICATIONS STRATEGIES

Since the current radio infrastructure was designed and implemented, most of the users have over the years experienced increasing demands placed on them by Federal, State, and local authorities to provide additional services, many of which can only be met by communications capability. In addition, as radio communications needs have grown, some users have implemented extensions beyond the State Radio network, in some cases even completely separate systems. These problems and concerns will accelerate if steps are not taken soon to address the needs of the entire Public Safety community.

These concerns have resulted in:

- Lack of system wide interoperability
- Shortage of necessary channels (especially in the larger urban areas)
- Non-State local/regional systems
- Non-voice system planning and/or implementations (mobile data)
- Nonexistence of a secure/encrypted voice communications system or standard
- State/regional communications overriding local tactical or situational communications
- Lack of new state-of-the-art features and capabilities
- A need to reduce interfering multiple site coverage
- The need for a more secure method of funding.

Neither the radio users nor ***FE*** believes that the system has degraded to the point

where it is unable to meet the present needs of a statewide radio system. Rather, the radio communications community must start planning and implementing an expanded system to meet both current needs and future demands. Virtually all users expressed the opinion that the existing system has served the State well and still provides the essential feature of statewide interoperability, but that improvements are needed.

8.1 Alternative Strategies

FE has developed three alternative strategies for satisfying the key requirements identified. One of these alternatives will be to maintain the "status quo." To be considered feasible and subject to further evaluation, each additional alternative must:

- Meet or exceed the functional capabilities currently offered by the existing North Dakota mobile communications systems
- Use technologies or services that exist in today's marketplace but allow migration to emerging technologies when user requirements and economics support migration
- Promote interoperability, the sharing of services and equipment, and equitable distribution of costs for these services to the system users.

The three alternative strategies under consideration are:

- Baseline, where the existing infrastructure remains unchanged
- Evolutionary, where conservative, low impact, modern improvements are suggested
- Revolutionary, where leading-edge technologies and improvements are suggested.

8.1.1 Baseline Approach

The Baseline system is included mainly to serve as the basis of comparison with the improvements recommended in the other two alternative strategies. No new departures will be considered from the current infrastructure or methods of operation. As a review the current State Radio system embodies the following features (non-State Radio facilities are not included):

- 39 radio tower sites, distributed for statewide coverage
- VHF hi-band, analog radio equipment
- No implemented encryption capability
- Multiple dedicated 4-wire leased telco circuits for voice and control
- Collocation on DOT sites (shared building, utilities, tower, and maintenance)
- Three statewide channels
  - Two duplex, one simplex channel
  - Different functional and operational uses on each channel
- Central dispatch primarily for Highway Patrol
- Statewide radio paging
- E-911 emergency dispatch primarily for rural, low population counties, with secondary backup of any non-State emergency dispatch center.

8.1.2 Evolutionary Approach

The evolutionary approach is the more conservative of the two new alternatives. It takes advantage of low risk off-the-shelf hardware to implement system improvements. As a result of implementing improvements as necessary, rather than statewide, there should be less economic

impact, both for the State and the user communities. Suggested improvements include:

- Consolidate existing State Radio and other Public Safety systems
- Share channels where practical with similar VHF hi-band systems
- Add narrowband channels
- Convert existing wideband channels to narrowband
- Move towards a completely shared trunk system for maximum channel efficiency
- Reduce or eliminate frequency reuse at adjacent sites
- Operate all channels as repeaters (with dispatch monitoring and/or full communication)
- Stay in VHF hi-band
- Redesign repeaters for statewide operation and to extend coverage to portables without vehicle repeaters
- Expand telco circuits to lower costs and improve inbound capabilities
- Use only state-of-the-art universally accepted standards, *i.e.*, maintain an open architecture
- To the greatest degree possible, avoid disruption of existing services.

8.1.3 Revolutionary Approach

The revolutionary system approach suggests moving as rapidly as financially possible into the next generation of a standards based trunked digital system. For maximum channel efficiency and virtually limitless features, the digital trunked system has no rival. Unfortunately, the current lack of standards has held back universal system acceptance and kept prices high.

This approach would be offered statewide while maintaining the existing infrastructure until all users and areas are converted over. While its economic impact would be greatest, this approach would offer the greatest likelihood of meeting all future application and use requirements. The design approach will include:

- Staying in the VHF hi-band (assuming that an adequate quantity of non-interfering channels can be found)
- Adding to the existing infrastructure a completely separate digital trunk multichannel system
- Adding more tower sites for better portable coverage and channel utilization
- Implementing in phases, starting in areas with the highest need for additional channels and/or features
- Adhering to APCO 25, once it becomes fully open and universally accepted.

8.2 Cost Recovery

While additional services and features are needed, there is considerable concern on the part of both the State, which must provide the infrastructure, and the State and local government users, who must provide the end equipment. User groups were generally happy with the funding method by which the existing State Radio infrastructure was implemented in the mid-1970s . This involved considerable Federal funding, so that users gained improved services and interoperability for very little cost. Today the picture is quite different. While some Federal money may be available through NTIA grants, major system improvements will be paid for mainly by the State, users, and ultimately the citizens of North Dakota.

Other than not making a change for technology reasons, the State cannot afford ***not*** to make the investment necessary. ***FE*** believes the most reasonable cost recovery method is to share in the costs. The State should make the initial investments for the infrastructure, and probably a portion of the end user equipment as well.

It must be recognized at the outset that complete (or even majority) cost recovery may prove too burdensome for many non-State user. While it is a good idea to make the services received proportional to the costs, even this may lie beyond the limited financial capability of the majority of small local government users. ***FE*** believes that a more acceptable method is for the majority of costs for implementation be borne by the State. Assistance for end-user implementation may also be necessary. ***FE*** believes that user fees should cover most of the operational and maintenance costs, but that cost recovery for the implementation phases would increase the user fees beyond the limit of affordability.

Exhibit 8-1 compares and summarizes the key features of each alternative.Exhibit 8-2 analyzes the various tradeoffs among the alternatives.

8.3 Optimum Strategy

What is the optimal strategy? In most scenarios doing nothing makes little sense. As time goes on, more critical applications and uses will go unfulfilled or user groups will find their own solutions, usually at higher ultimate cost.

Exhibit 8-1. COMPARISON OF THREE ALTERNATIVES

	Baseline	Evolutionary	Revolutionary
Overall Ease of Implementation	No effort	Planning, and moderate difficulty	Major planning and investment near-term
Near-term Cost	Nothing	As needed	Heavy
Long-term Cost	Grows as decision is delayed	Best	High, but probably better now than later
Interoperability	Good	Better	Fully interoperable
Technology assessment	25 year old analog design	New additions will be state-of-the-art, migratible to future	State-of-the-art
Layout	Status quo, no changes	Moderate changes as needed	Major initial changes
Grow capability	Limited, why throw more investment away if changes are needed	Moderate, limited by availability of additional frequencies	Limited by funding especially if State band moved to 700/800 MHz
Configuration flexibility	No changes practical	Allows changes where needed	Software configurations for unlimited flexibility
User community	Bigger users increasing relying on separate systems	Should attract majority of users, except those who choice to be independent	Could be all and any
Geographic coverage	Generally statewide	Increased coverage especially for portables, but more sites will be needed	Generally statewide, probably more sites for portable coverage
Channels	No changes	Greater availability of channels	Unlimited channel availability
Providing service	No changes	Reasonable per user charges	Reasonable per user charges
Staffing	No change	With consolidation, less for PS, more for State	Less for PS, more for State

Exhibit 8-2. TRADEOFF COMPARISONS

	Baseline	Evolutionary	Revolutionary
Implementation possible today	Is being done	Yes	No, awaiting universal standards
When implementation ideal	Past, 1975-1990	Into mature technology, 1990-2005	After universal standards, 2-3 years, 2001 - ???
Interoperability	Decreasing	Maintained	Universal
5-10 year strategy	Maintain, until conversion to something better at least 5 years	Ongoing planning, funding 2-3 years away, start implementation as needed	3-5 year planning and funding at best, technology not ready, phased implementation over 5-15 years
Overall performance	Par, no improvement	Better at more cost	Best at greatest cost
Cost	No additional costs today, deferred costs increase with time	Improvements will cost, but as needed only	Very high for implementation, user equipment should come down in future, maintenance of existing system
Risk	No risk, except loss of performance over time, especially as needed applications and use is not realized	Low, with the caveat that some expenses will be temporary	Far too high today, if delayed until standards accepted very low especially for future needs

The Baseline is thus not viable, except perhaps in the shortest term. At the other extreme, it makes little sense to pick the Revolutionary approach, especially in today's environment in which no universal standard exists.

The Evolutionary approach, if done properly, (*e.g.*, using only equipment that is migratible to future needs), makes the most sense for North Dakota. Its hallmarks are low risk, relatively low-cost improvements, and future capabilities.

9.0 REPORT APPENDICES

The 13 appendices contained in the combined Interim Reports 1 and 2 are:

- APPENDIX B - North Dakota Public Safety FCC License Data
- APPENDIX C - North Dakota Non-Public Safety License Data
- APPENDIX D - North Dakota Public Safety Radio Use Summary
- APPENDIX E - Blank User Survey
- APPENDIX F - ND Public Safety Radio Channel Identification
- APPENDIX G - DEM Survey Distribution Memorandums
- APPENDIX H - State Radio Use Procedures
- APPENDIX I - NLECT Communications Interoperability Analysis
- APPENDIX J - APCO Project 25: Summary Statement of Requirements
- APPENDIX K - Motorola, Ericsson Mobile Equipment Specifications
- APPENDIX L - DOJ/FBI: NCIC 2000 Summaries & Newsletters
- APPENDIX M - FCC: Spectrum Management - Refarming, Reallocation, Technology

- APPENDIX N - NASTD Report: Shared Statewide Radio Systems.

Public Safety Answering Point (PSAP)

Serving Grand Forks County and cities therein
Police – Fire - EMS

GF Regional PSAP
Becky Ault, Director
122 S. 5th St.
Grand Forks ND 58203

Phone: 701-746-2542
Fax: 701-746-2599

MEMO

To: Mike Lynk, State Radio Director
From: Becky Ault, GF PSAP Director, 701-787-8042 Becky Ault
Date: October 8, 2013
Re: Lessons Learned from Bank 5 Exercises and Real World Use

Thank you for the opportunity to provide feedback regarding the interoperable use of Bank 5, and for your time discussing our concerns.

Grand Forks Public Safety Answering Point and Emergency Management have been training our responders on Bank 5. We held a countywide table top in November of 2012 where a need for per department radio training was identified as well as additional information to responders in the field re: how to use Bank 5.

We have since been to all but 2 of our rural departments and held a Radio Training (review of how to change banks and channels), a review of how to use the local radio frequencies for a mutual aide event, and finally how to utilize Bank 5 for a large scale event involving agencies from outside our county, followed up by a table-top to demonstrate how effective Bank 5 can be. We have followed up table tops with drills testing radios.

Last month, we participated in a Full-Scale Exercise at the Grand Forks Airport with one area being tested as communications utilizing Bank 5. Again, in the full scale event, when we initially had communications going on our local repeated channels, they were good – when we switched to Bank 5 – range was a real issue. One of our HP officers asked me if there could be a possibility of putting a repeated channel like State 1 or 2 on Bank 5. I told him State 2 would likely not be a good choice since PSAP's can't transmit on it, but would ask about the possibility of permission for State 1 to be used in Bank 5.

For our airport communication plan, the Incident Commander plans to rewrite the ICS 205 to contain a combination of local repeated frequencies and the use of the Bank 5 TAC channels. I believe this will be the case for our Regional Search and Rescue Team. We will have a firmer idea in that regard after a training and drill with them that we have set up for October 16.

In every instance we have tested, we are running into issues of range. Part of this was remedied by training and telling responders that things like vehicles, buildings, obstacles, etc. can affect range.

However, we are still finding a range issue consistently – across the county. Our radio technician has participated in our radio training events across the county – I wanted to see if there was a technological issue regarding why we are experiencing these problems. Our tech indicated that with narrowband analog, our range has significantly been reduced. He said we should not count on more than 2 miles. In reality we are finding we are down to much less than that.

We have attempted to utilize Bank 5 for several real events. A couple of instances I can tell you about is the Search and Rescue Team attempting to utilize the system along with our responders on both the MN and ND side when searching for a lost autistic boy on the Red River. Communications consistently were a problem; we ended up using a local repeated channel.

Our radio tech suggested we may want to convey that if Bank 5 was switched to digital, we may find we have a better range. We switched our local Fire TAC channels to digital when we narrowbanded our radios this last reprogramming project. The changeover was a success, I think it actually is better than the narrowband analog. We realize that these are national channels. Is there a plan for migration to digital on a national level in the near future for the National Interoperability channels?

We will do some testing out in the rural areas with our local fire TAC channel that is digital and compare it with the narrowband analog TAC channels in Bank 5 and will provide the results to you. Perhaps another agency has had experience with this already and can provide additional information.

Since we have Regional Response Teams in Grand Forks, we felt an additional responsibility to ensure we tested Bank 5 and ensured our responders all know about it and how to use it. We have been quite aggressive with training and exercising. I think when our regional response teams are deployed; it would be a big benefit to them to have a repeated channel on Bank 5 as a safety net – especially in some of these more rural locations.

Of course, we still have areas in our state with inadequate radio coverage, we can't solve them all.

Thank you for the creation of Bank 5. It is being extremely well received. We recently trained in Emerado. The fire chief said it would have been so helpful to have this in place when they responded to the Tornado in Northwood. Another instance we discussed was an elevator fire that had multiple agencies a couple of years ago that occurred in Walsh county – communications was such a problem. With bank 5 they would know they have mutual channels they can talk to each other on –

Thank you for the opportunity to convey our thoughts. Please feel free to call or email with further questions or concerns.

ND Department of Emergency Services

NDDES
Homeland Security
State Radio

PO Box 5511
Bismarck, ND 58506-5511

Tel: (701) 328-8100
Fax: (701) 328-8181

Email: nddes@nd.gov
Website: www.nd.gov/des

"Ensuring a safe and secure homeland for all North Dakotans"

PUBLIC MEETING NOTICE
AGENDA
DEPARTMENT OF EMERGENCY SERVICES
STATE INTEROPERABILITY EXECUTIVE COMMITTEE MEETING
November 21, 2013 - 2:30 p.m.
Fraine Barracks Building #35
(DES Conference Room)

November 21, 2013

2:30 – 2:40	**Welcome and Introductions**	**MG Sprynczynatyk**
2:40 – 5:30	**Technical Assistance Presentation by Office of Emergency Communications and Televate**	

Next Meeting Date:	**Wednesday, January 15**
Time:	**1:00 p.m.**
Location:	**Red River Regional Dispatch Center in Fargo**

Jack Dalrymple
Governor

Major General David Sprynczynatyk
Director - Department of Emergency Services

Greg M. Wilz
Director - Division of Homeland Security

Mike Lynk
Director - Division of State Radio

ND Department of Emergency Services

NDDES Homeland Security State Radio

PO Box 5511 | Tel: (701) 328-8100 | Email: nddes@nd.gov
Bismarck, ND 58506-5511 | Fax: (701) 328-8181 | Website: www.nd.gov/des

"Ensuring a safe and secure homeland for all North Dakotans"

To: State Interoperability Executive Committee (SIEC)

From: MG Sprynczynatyk

Topic: SIEC Meeting Executive Summary – November 21, 2013

Date: November 22, 2013

MG Sprynczynatyk welcomed members and attendees for participating and then initiated introductions.

DHS Office of Emergency Communications Presentation

Representatives from the Office of Emergency Communications provided information and data that will assist North Dakota prepare its FirstNet application.

The presentation is attached.

Next Meeting

MG Sprynczynatyk reminded SIEC members the next meeting is scheduled for Wednesday, January 15 at 1:00 p.m. in Fargo at the Red River Regional Dispatch Center.

ND Department of Emergency Services

NDDES Homeland Security State Radio

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"Ensuring a safe and secure homeland for all North Dakotans"

PUBLIC MEETING NOTICE
AGENDA
DEPARTMENT OF EMERGENCY SERVICES
STATE INTEROPERABILITY EXECUTIVE COMMITTEE MEETING
April 22, 2014 - 1:00 p.m.
Red River Regional Dispatch Center
211 9th Street, Fargo, ND

April 22, 2014

1:00 – 1:10	Welcome and Introductions	MG Sprynczynatyk
1:10 - 1:30	FirstNet Region Meetings	Travis Durick
1:30 - 2:30	Topic Updates	
	- ITD NG 911 RFP	Duane Schell
	- New Technologies	Mike Lynk
	- Legislative Considerations	Mike Lynk
2:30 – 2:55	Member Discussion	
2:55 – 3:00	Next Meeting	
3:00	Red River Regional Dispatch Center Presentation and Tour	Byron Sieber

To access the telephone bridge, dial 1-877-820-7831 (toll free) or 1-720-279-0026. The passcode is 950503.

ND Department of Emergency Services

NDDES Homeland Security State Radio

PO Box 5511 | Tel: (701) 328-8100 | Email: nddes@nd.gov
Bismarck, ND 58506-5511 | Fax: (701) 328-8181 | Website: www.nd.gov/des

"Ensuring a safe and secure homeland for all North Dakotans"

To: State Interoperability Executive Committee (SIEC)

From: MG Sprynczynatyk

Topic: SIEC Meeting Executive Summary – April 22, 2014

Date: April 28, 2014

Vice Chariman, Mike Dannenfelzer, welcomed all attendees initiated introductions.

<u>FirstNet Grant Update</u> – Travis Durick

Travis said Televate representatives had organized seven meetings throughout the state and provided an overview of methodologies and activities to approximately 300 participants concerning build out of the communication network in North Dakota. He indicated volunteer responders provided crucial input about the lack of data service available in their homes, which makes it difficult to establish initial response communications. Travis also said working groups were established to discuss issues regarding coverage requirements along with devices and applications already in use to determine an accurate model broadband throughput in specific areas.

He explained in upcoming meetings, Televate personnel will conduct county by county review sessions to isolate specific needs of not just the county but jurisdictions residing within. The information will be shared with FirstNet to help influence the build out in a manner and direction that provides needed solutions. Because the FirstNet Board hopes to provide its initial state consultation in June or July, completion of county reviews is critical by that timeline.

He pointed out FirstNet finally approved collecting CAD data to develop coverage area information. During review sessions, input of CAD data to portray usage areas will be collected.

Travis encouraged members to attend a FirstNet Conference held June 3-5 in Westminster, CO. It will be very technical and could be insightful concerning LTE for more rural areas. Grant dollars are available; if interested, contact Travis for more detailed information.

Red River Regional Dispatch Center (RRRDC) – Byron Sieber

Director Byron Sieber presented a detailed and comprehensive PowerPoint regarding the RRRDC. The presentation is attached and entitled, "SIEC Meeting January 15, 2014". Members were afforded a tour of the modern facility.

Open Discussion

Karen Kempert pointed out the importance of taking action to implement roaming agreements and spectrum solutions with Canada.

Mike Dannenfelzer reported Bismarck and other PSAPs requested ND Information Technology Department (ITD) personnel to prepare and issue an RFP for 911 Premise Gear Next Generation infrastructure. He said anIntent to Award had been issued and the process has entered the contract negotiation phase. The core will be established in Bismarck and Fargo and has capability for multi-users to leverage the system.

Mike Lynk indicated State Radio is deploying Motorola's Premier I RMS System, which will be made available to CJIS and others who want to join. Although there is no guarantee, he is attempting to offer the service at no direct cost. Mike said State Radio is upgrading from Integraph (CAD) 8.3 to 9.3; the hub and spoke system should be completed this fall. The technology will format by county and individual response disciplines. He reported coordinating with ITD to issue an RFP for a statewide recorder to provide solutions broken out by PSAP and located on one virtual server.

Byron Sieber said the 911 Legislative Committee changed some terminology and definitions in NDCC 57-40.6 to more precisely reflect the current environment. Those changes will be presented to the ESCCC for approval.

Lengthy discussion focused upon funding issues and a process to study land mobile radio use. A subcommittee consisting of Karen Kempert, Travis Durick, Byron Sieber, and Mike Lynk were charged with developing a survey. At the next SIEC meeting, members including representatives from the Office of Emergency Communications (OEC) and Televate will provide input into the final survey draft.

Karen Kempert asked that it be restated the SIEC passed a motion to move State Radio Channel 1 into the Channel 2 slot on Bank 5

Next Meeting

The next meeting is scheduled for late May but is contingent upon the availability of OEC and Televate personnel.

Red River Regional Dispatch Center

State Interoperability Executive Committee

(SIEC)

April 22, 2014

History of RRRDC

- 2000 – Early Discussions to combine 3 Dispatch Centers
- 2001 – Joint Powers Agreement (JPA) entered into between Fargo, Cass County, Moorhead, and Clay County (representing 2 of the 3 area Dispatch Centers)
- 2002 – Employees from the Fargo/Cass and Moorhead/Clay Dispatch Centers become new employees of the RRRDC
- 2003 – Moved into current facility at 300 NP Ave
- 2008 – JPA amended and West Fargo Dispatch Center is joined with the RRRDC
- 2008 Contract signed with New World Systems for Public Safety Software (64 modules and/or interfaces for CAD/RMS)

Joint Powers Agreement

City/County - North Dakota/ *Minnesota*

- City of Fargo, North Dakota
- *City of Moorhead, Minnesota*
- City of West Fargo, North Dakota
- *Clay County, Minnesota*
- Cass County, North Dakota

RRRDC

- Serves approximately 210,000 people within the two-county region
- 2,810 square miles across two states
- Dispatches for 57 Agencies
  - 7 Police Departments
  - 2 Sheriff Departments
  - 3 Metro Fire Departments
  - 28 Rural Fire Departments
  - 15 EMS response agencies
  - **1 FM Ambulance**

JPA Funding for RRRDC

Population Based

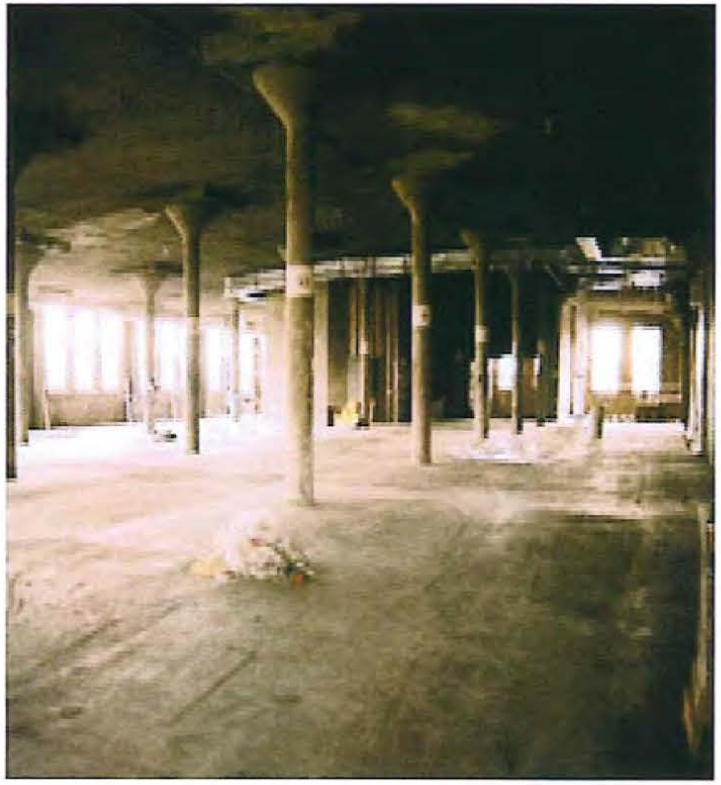
- 50.6 % - City of Fargo, ND
- 18.2% - City of Moorhead, MN
- 12.4% - City of West Fargo, ND
- 10.0% - Clay County, MN
- 8.8% - Cass County, ND
- 100 %

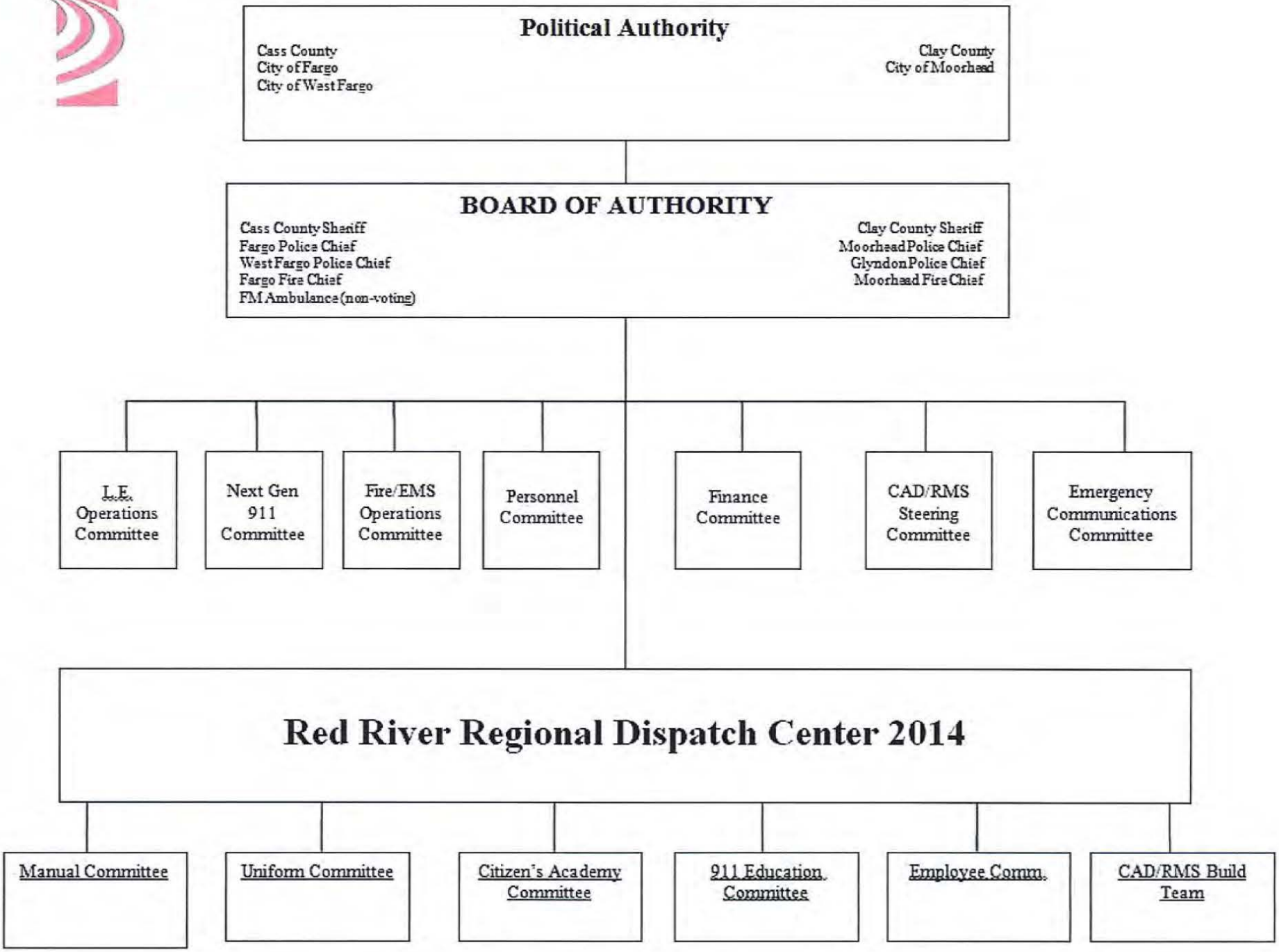
2014 Budget

	Based on 2010 population with the two county region	
Fargo	50.6%	1,746,635
Moorhead	18.2%	628,236
West Fargo	12.4%	428,029
Clay County	10.0%	345,184
Cass County	8.8%	303,762
	100%	**3,451,848**

300 Northern Pacific Ave

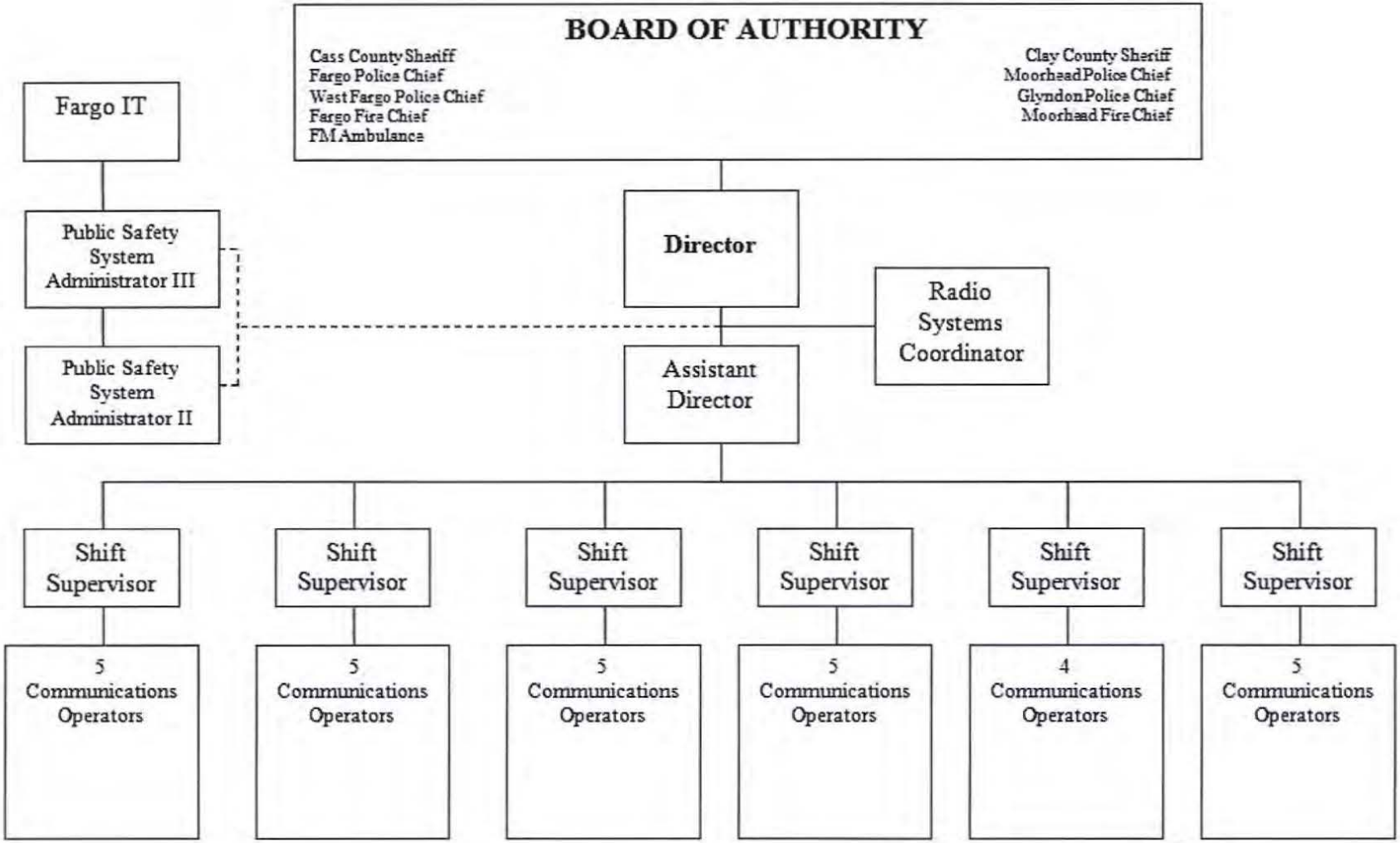
Before and After




Political Authority
Cass County
City of Fargo
City of West Fargo
Clay County
City of Moorhead
BOARD OF AUTHORITY
Cass County Sheriff
Fargo Police Chief
West Fargo Police Chief
Fargo Fire Chief
FM Ambulance (non-voting)
Clay County Sheriff
Moorhead Police Chief
Glyndon Police Chief
Moorhead Fire Chief
L.E. Operations Committee
Next Gen 911 Committee
Fire/EMS Operations Committee
Personnel Committee
Finance Committee
CAD/RMS Steering Committee
Emergency Communications Committee
Red River Regional Dispatch Center 2014
Manual Committee
Uniform Committee
Citizen's Academy Committee
911 Education Committee
Employee Comm.
CAD/RMS Build Team

Board of Authority

- Moorhead Fire Chief Rich Duysen (Chair)
- Fargo Police Chief Keith Ternes (Vice-Chair)
- Clay County Sheriff Bill Bergquist
- Fargo Fire Chief Steve Dirksen
- Glyndon Police Chief Mike Cline
- Moorhead Police Chief David Ebinger
- Cass County Sheriff Paul Laney
- West Fargo Police Chief Arland Rasmussen (Past-Chair)
- FM Ambulance Director Sherm Syverson (non-voting member)



Red River Regional Dispatch Center 2014

Authorized Personnel	
Director	1
Asst. Director	1
Radio Cord.	1
Supervisors	6
Operators	29
Part-time	0
TOTAL	38

Radio System Coordinator

- Frequency Management Plans
- FCC Licensing
- Narrowbanding Preparation and Planning
- Public Safety reprogramming
- Federal and State Liaison

Information Technology

- Computer Services and Assistance Agreement with the City of Fargo
- 23 Employees
- 3 solely dedicated to CAD/RMS software
- 24/7/365 CAD support from New World Systems

PUBLIC PERCEPTION OF 9-1-1
9-1-1 REALITY

CAD Events and Calls-For-Service

CAD EVENTS

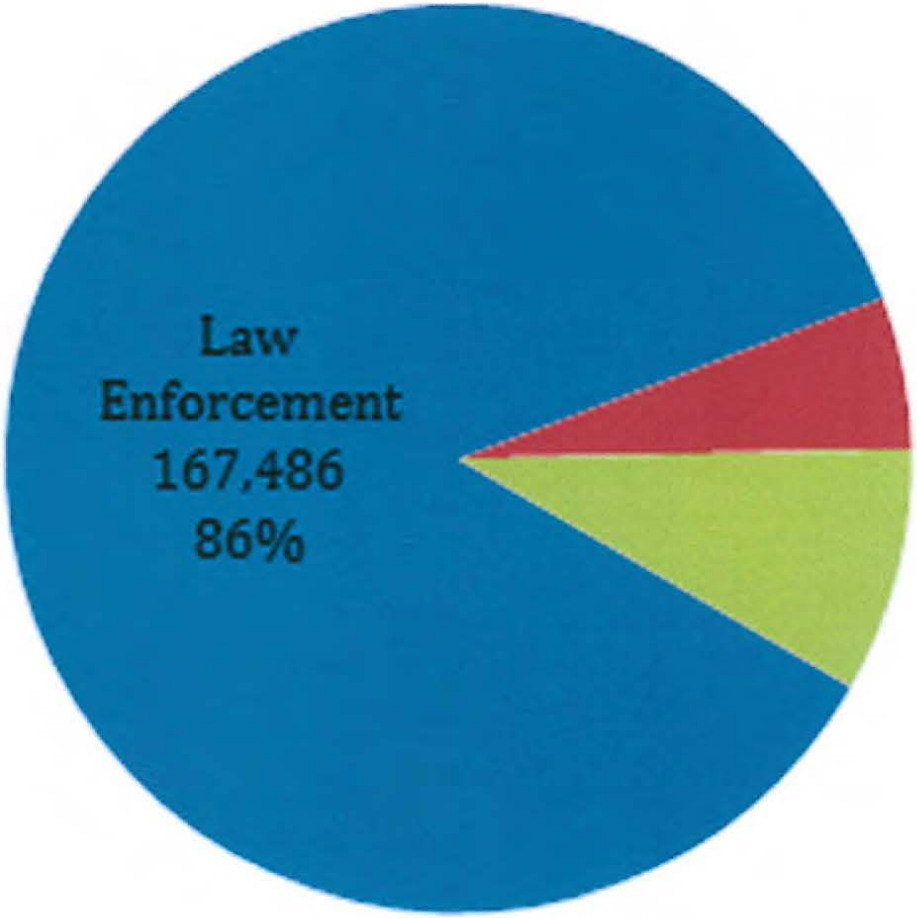
- 2012 213,848
- 2013 208,072

CALLS-FOR-SERVICE

- 2012 198,477
- 2013 194,951

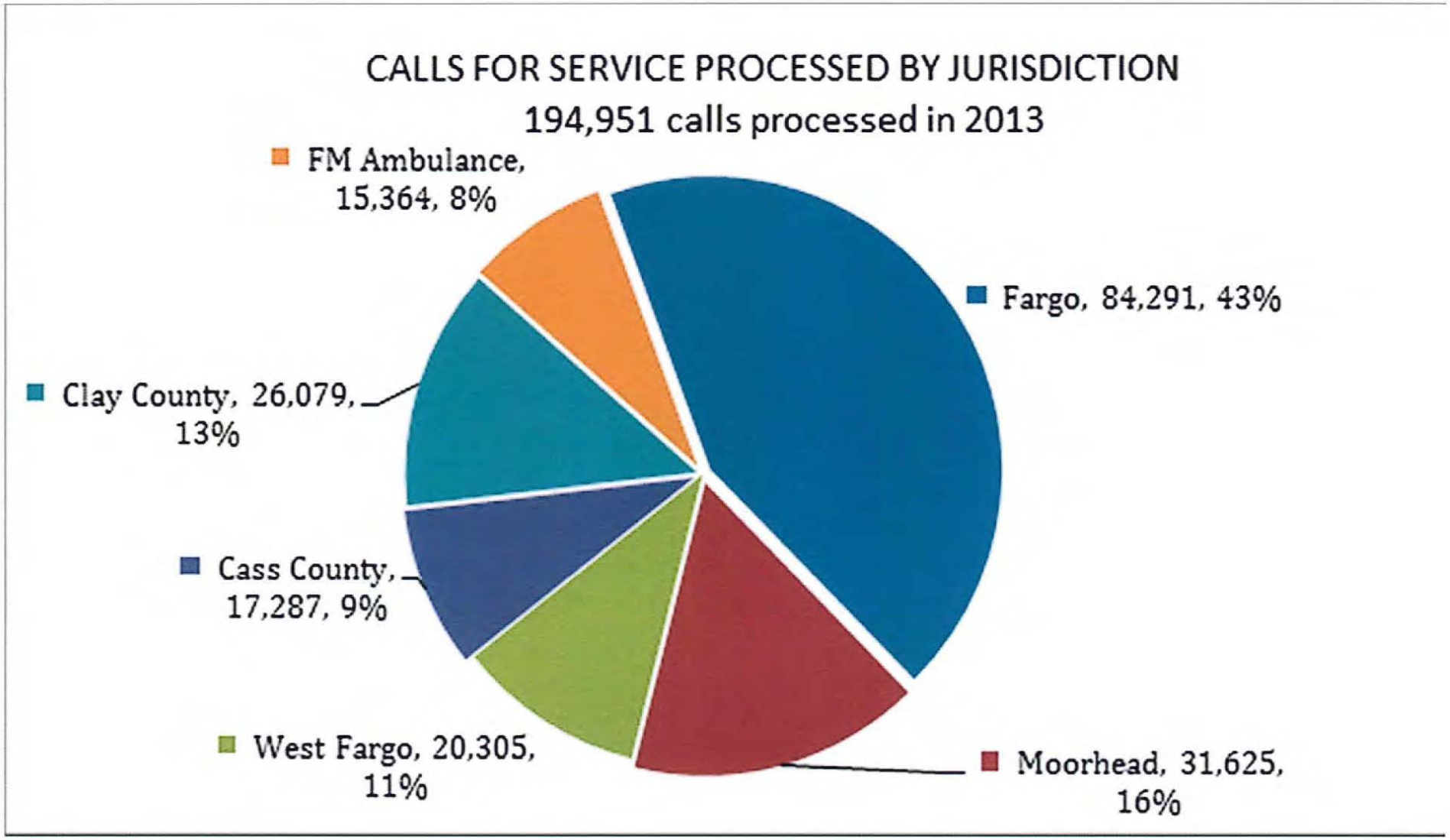
Calls For Service By Agency Type in 2013

194,951 calls



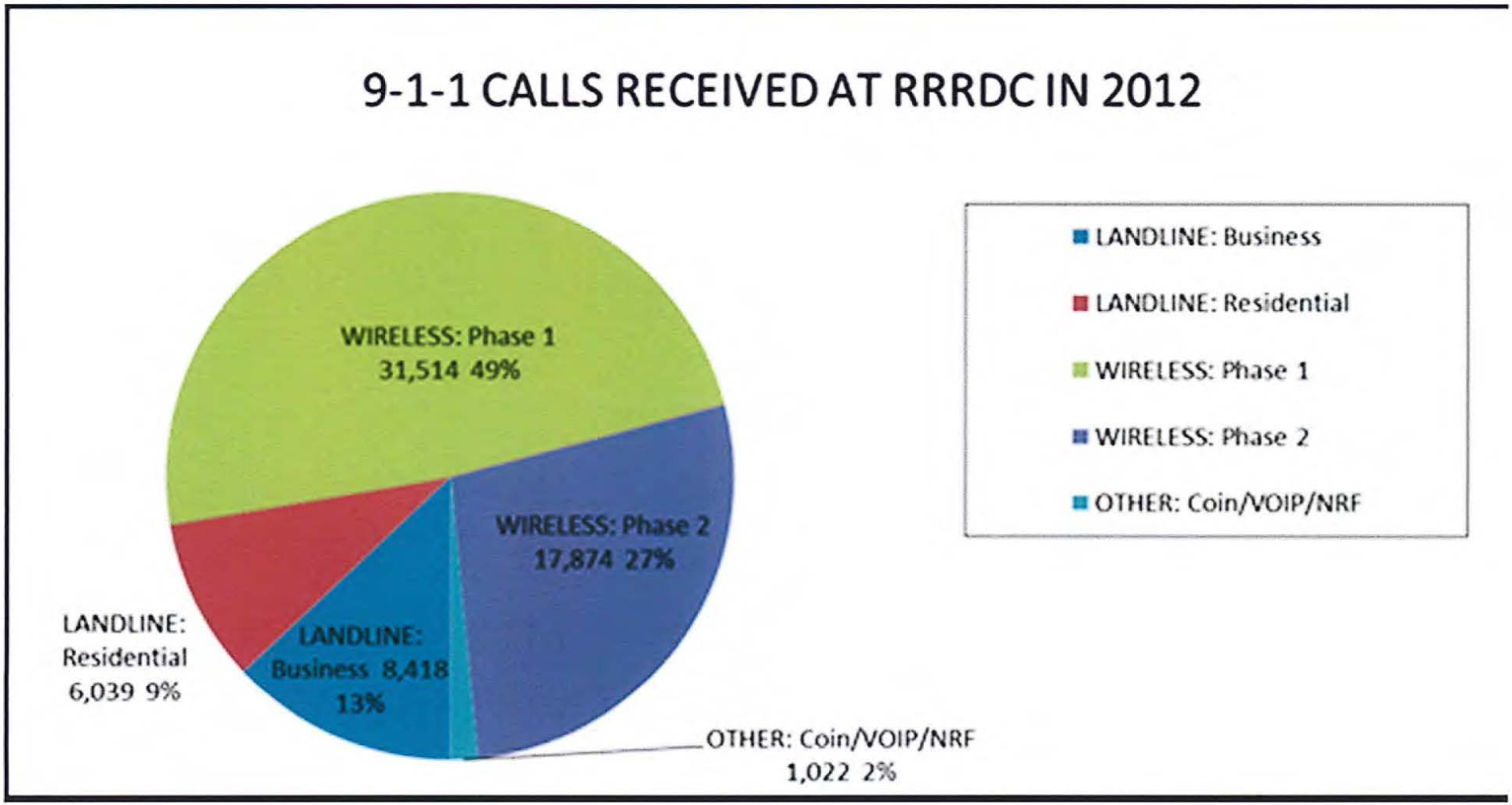
Fire Agencies
10,556
5%

EMS Agencies
16,909
9%


CALLS FOR SERVICE PROCESSED BY JURISDICTION
194,951 calls processed in 2013
FM Ambulance, 15,364, 8%
Fargo, 84,291, 43%
Clay County, 26,079, 13%
Cass County, 17,287, 9%
West Fargo, 20,305, 11%
Moorhead, 31,625, 16%

Total Calls Processed in 2013

393,066



911 Calls by Hour in 2013
2,022
1,869
1,287
1,039
963
1,290
1,863
2,442
2,563
3,112
3,281
3,496
3,494
3,846
4,225
4,538
4,738
4,234
3,960
3,778
3,494
3,113
2,617
2,302
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM

RRRD Console 1 2 7 & 8 .ELT - CENTRACOM Elite Dispatch

Configuration View Features Folders Page Help

MOTOROLA

08:50:14

ND RADIO | ND TONING | MN RADIO | MN TONING | ND PAGETEST | SIRENS

Intercom Call

Patch 1 | Patch 2 | Patch 3

Msel 1 | Msel 2 | Msel 3

CASS Co S.O.
Clear Tx
Main Active

00003516	08:39:26
00003510	08:34:57
00003508	08:28:41

FM AMB
FM AMB 1
Volume=5

FARGO PD 1
Clear Tx
Main Active

00040075	08:50:03
00041077	08:48:33
00041297	08:46:51

FARGO FD 1
DISPATCH
Volume=5

CASS Co. ADMIN
FIRE / EMS
Main Active

NDSR1
NDSR1CT
Volume=5

FARGO FD 2
RADIO CH
Volume=5

FFD ENG 806	08:50:14
FFD ENG 803	08:47:28
FFD CHIEF TRI	08:46:27

FARGO PD 2
Clear Tx
Volume=5

00040087	08:49:24
00041227	08:28:29
00041172	08:25:17

NDSR2CT
ST RAD 2
Volume=5

VLAW31
ST 3 / MINSEF
Volume=5

W FARGO PD
Clear Tx
Volume=5

VFPD V638	08:48:24
00060134	08:02:09
VFPD V639	07:58:51

METRO
Clear Tx
Volume=5

00040143	08:49:14
00040145	08:48:53
00003513	08:20:33

FGO PUB WORK
ST/FRST/H&M
Volume=0

WF FD RADIO
RADIO
00010002

NAWAS
Volume=5

WF FD PAGING
TONING
Volume=5

NDSU PD
Volume=5

Activity Log - CE...

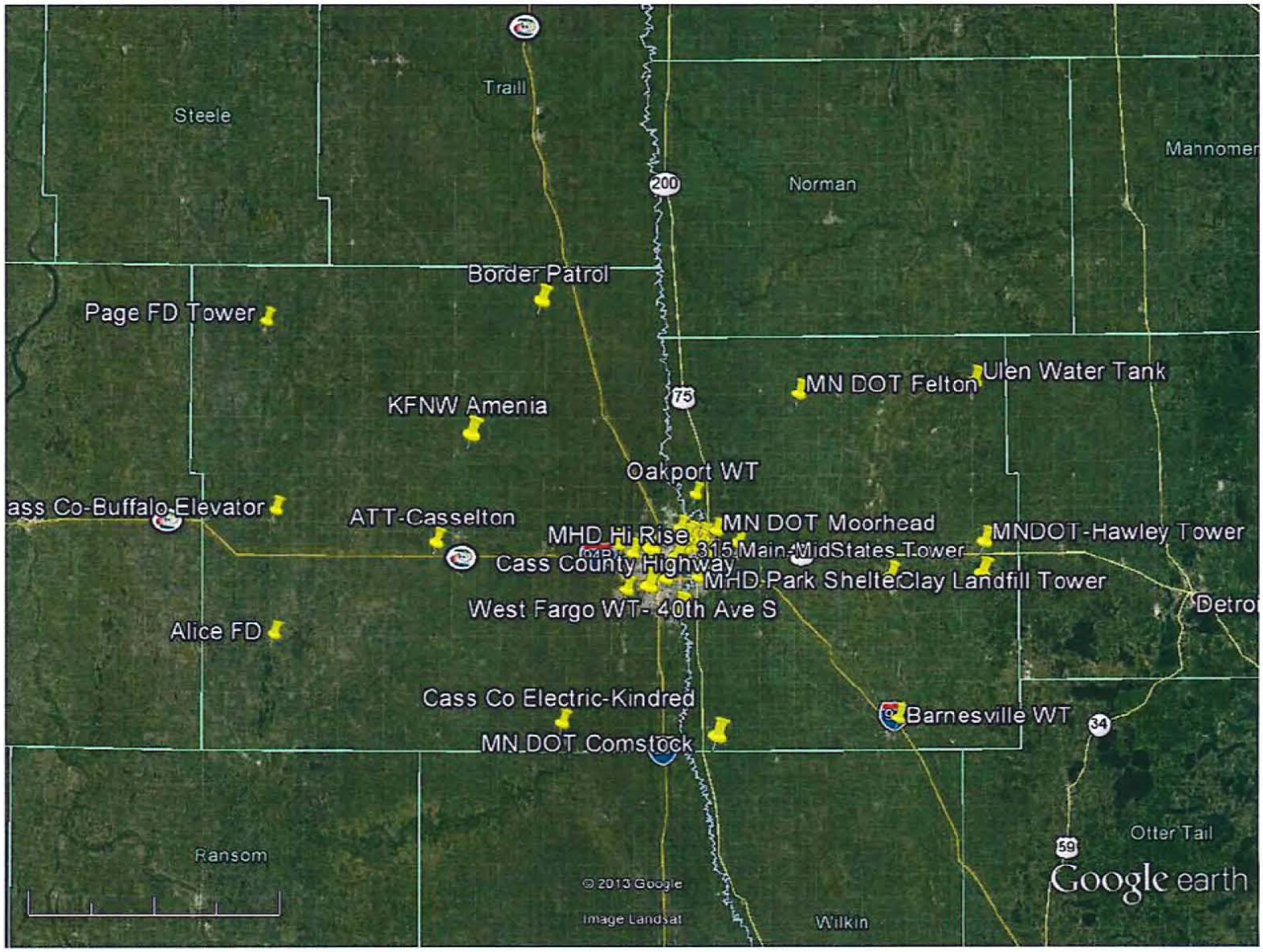
FARGO FD 2	FFD ENG 8
FARGO PD 1	00040075
FARGO PD 1	00040075
FARGO PD 2	00040087
MNCOMM	

Initiate or answer an intercom call.

RRRDC

- Since 2008
  - 13 Radio Equipment Grants
  - Federal Funding $9,518,483
  - Local match varied from 0% - 50%

37 Tower Sites

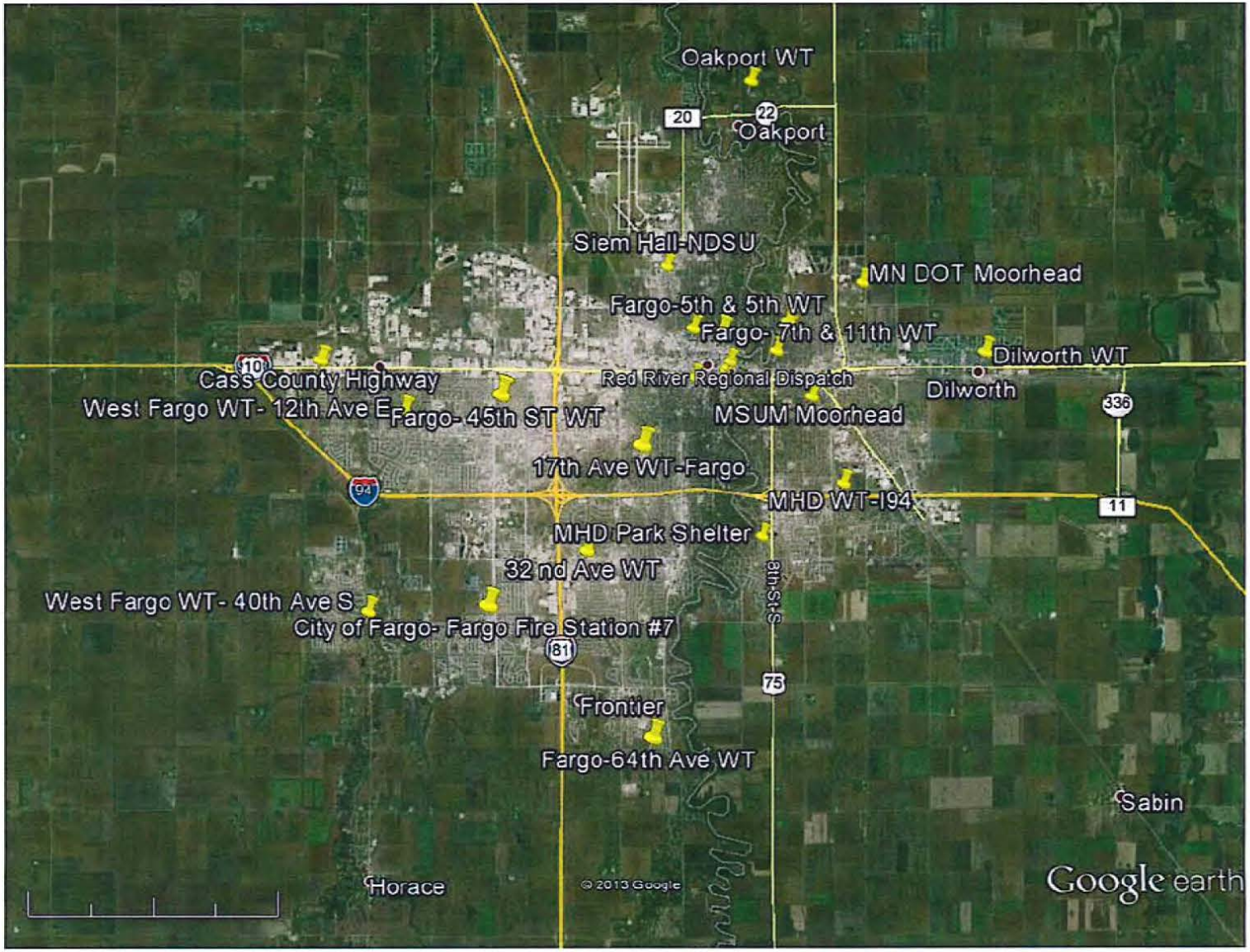


Google earth

miles 50

km 90

Metro Area Towers



Google earth

miles 10

km 10

VHF Digital

- 40 Channels
- Narrowbanded
- Single Site, Multicast, Simulcast

Fargo PD Radio Template

Revised 11-23-13

	FARGO PD	METRO	MN	ND	EMERGENCY	FIRE
#	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F
1	FPD 1	FPD 1	MPD1	ND EMS	VCALL10	FFD 1
2	FPD 2	FPD 2	MPD LOOP	NDSR2CT	VTAC11	FFD 2
3	METRO	METRO	METRO	METRO	METRO	METRO
4	CAS SO1	MPD N	CLY HWY	CAS ADM	VTAC12	MFD 1
5	CLY SO1	MPD LOOP	CLY SO1	CAS SO1	VTAC13	MFD 2
6	MPD 1	MPD 1	CLY FDMA	FM AMB1	VTAC14	WFFD
7	NDSU PD	NDSU PD	BVL FD	NDSR1CC	CCTAC1	CAS FD
8	WF PD	MPD-S	DIL FD	NDSR2CC	CCTAC2	CLY FDMA
9	NDSR1CT	MFD 1	HAW FD	WF FD	CCTAC3	DIL FD
10	NDSR2CT	MFD 2	FEL FD	VMED28	VLAW31	HAW FD
11	VLAW31	VLAW31	ULN FD	VLAW31	VFIRE23	FLN FD
12	MSP C2D	FFD 1	MSP C2C	TRL SO	VMED28	BVL FD
13	FFD 1	FFD 2	MNCOMM	RCHLD SO	MNCOMM	HAR FD
14	FM AMB1	FM AMB1	CLY JAIL	BARN SO	MPDLOOP	VFIRE23
15	FGO PW	FGO PW	CLY SO2	RNSM SO	ND DEM	ND AGFD
16	SWAT2	WF PD	CLYTACR	CASS LGR	WX1	WX1

	SWAT	CASS INV	CLAY INV	FARGO INV	MPD INV	WF INV	SWAT EMS	STATE OF ND	OR	STATE OF ND
#	Zone G	Zone H	Zone I	Zone J	Zone K	Zone L	Zone M	Zone S		Zone S
1	SWAT1R	CAS SO1	CLY SO1	FPD 1	MPD 1	WF PD	SWAT1R	*		VTAC11
2	FPD 1	CAS INV1	CLY INV1	FPD INV	MPD INV	WF INV	FPD 1	*		*
3	METRO	METRO	METRO	METRO	METRO	METRO	METRO	VLAW31		VLAW31
4	MPD 1	CAS BUG	CLY BUG	FPD BUG1	MPD BUG	WF BUG	MPD 1	VTAC11		VTAC13
5	CAS SO1	CLY BUG	CAS BUG	FPD BUG2	MPD INV2	CAS BUG	CAS SO1	VTAC12		VCALL10
6	CLY SO1	FPD BUG1	FPD BUG1	WF BUG	FPD BUG1	FPD BUG1	CLY SO1	VTAC13		LAWCMD
7	WF PD 1	MPD BUG	MPD BUG	MPD BUG	CLY BUG	CLY BUG	WF PD 1	VCALL10		LAWTAC1
8	FPD 2	CAS INV2	CLYTACR	FPD NRC	MPD INV2	MPD BUG	FPD 2	LAWCMD		LAWTAC2
9	VLAW31	ND BCI	ND BCI	ND BCI	ND BCI	ND BCI	VLAW31	LAWTAC1		VFIRE23
10	MPD LOOP	BCA 1	BCA 1	BCA 1	BCA 1	BCA 1	MPD LOOP	LAWTAC2		VFIRE24
11	ND BCI	BCA 2	BCA 2	BCA 2	BCA 2	BCA 2	ND BCI	VLAW32		VFIRE25
12	GF SWAT	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	GF SWAT	VFIRE23		VFIRE26
13	ND EMS	SWAT 2	SWAT 2	SWAT 2	SWAT 2	SWAT2	ND EMS	VFIRE24		VMED28
14	WCT	WCB	WCB	WCB	MPDBUGR	WCB	WCT	VFIRE25		VMED29
15	METBOMB	WCR	WCR	WCR	CLY SO1	WCR	METBOMB	VFIRE26		VTAC14
16	SWAT2	WCT	WCT	WCT	FPD1	WCT	SWAT2	VFIRE21		SARNFM
								VFIRE22		
								VMED28		

SWAT Zone G & M are set in surveillance mode, no sounds or lights.

West Fargo PD Radio Template

Revised 11-23-13

	WF PD	METRO	MN	ND	EMERGENCY	FIRE
#	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F
1	WFPD 1	FPD 1	MPD1	ND EMS	VCALL10	FFD 1
2	WF ADM	FPD 2	MPD LOOP	NDSR2CT	VTAC11	FFD 2
3	METRO	METRO	METRO	METRO	METRO	METRO
4	WF FD	MPD N	CLY HWY	CAS ADM	VTAC12	MFD 1
5	WF PW	MPD LOOP	CLY SO1	CAS SO1	VTAC13	MFD 2
6	FPD 1	MPD 1	CLY FDMA	FM AMB1	VTAC14	WFFD
7	FPD 2	NDSU PD	BVL FD	NDSR1CC	CCTAC1	CAS FD
8	CAS SO1	MPD-S	DIL FD	NDSR2CC	CCTAC2	CLY FDMA
9	FM AMB1	MFD 1	HAW FD	WF FD	CCTAC3	DIL FD
10	ND BCI	MFD 2	FEL FD	VMED28	VLAW31	HAW FD
11	NDSR1CT	VLAW31	ULN FD	VLAW31	VFIRE23	FLN FD
12	NDSR2CT	FFD 1	MSP C2C	TRL SO	VMED28	BVL FD
13	VLAW31	FFD 2	MNCOMM	RCHLD SO	MNCOMM	HAR FD
14	NDSR1CC	FM AMB1	CLY JAIL	BARN SO	MPDLOOP	VFIRE23
15	NDSR2CC	FGO PW	CLY SO2	RNSM SO	ND DEM	ND AGFD
16	WF INV	WF PD	CLYTACR	CASS LGR	WX1	WX1

	SWAT	CASS INV	CLAY INV	FARGO INV	MPD INV	WF INV	SWAT EMS	STATE OF ND	OR	STATE OF ND
#	Zone G	Zone H	Zone I	Zone J	Zone K	Zone L	Zone M	Zone S		Zone S
1	SWAT1R	CAS SO1	CLY SO1	FPD 1	MPD 1	WF PD	SWAT1R	*		VTAC11
2	FPD 1	CAS INV1	CLY INV1	FPD INV	MPD INV	WF INV	FPD 1	*		*
3	METRO	METRO	METRO	METRO	METRO	METRO	METRO	VLAW31		VLAW31
4	MPD 1	CAS BUG	CLY BUG	FPD BUG1	MPD BUG	WF BUG	MPD 1	VTAC11		VTAC13
5	CAS SO1	CLY BUG	CAS BUG	FPD BUG2	MPD INV2	CAS BUG	CAS SO1	VTAC12		VCALL10
6	CLY SO1	FPD BUG1	FPD BUG1	WF BUG	FPD BUG1	FPD BUG1	CLY SO1	VTAC13		LAWCMD
7	WF PD 1	MPD BUG	MPD BUG	MPD BUG	CLY BUG	CLY BUG	WF PD 1	VCALL10		LAWTAC1
8	FPD 2	CAS INV2	CLYTACR	FPD NRC	MPD INV2	MPD BUG	FPD 2	LAWCMD		LAWTAC2
9	VLAW31	ND BCI	ND BCI	ND BCI	ND BCI	ND BCI	VLAW31	LAWTAC1		VFIRE23
10	MPD LOOP	BCA 1	BCA 1	BCA 1	BCA 1	BCA 1	MPD LOOP	LAWTAC2		VFIRE24
11	ND BCI	BCA 2	BCA 2	BCA 2	BCA 2	BCA 2	ND BCI	VLAW32		VFIRE25
12	GF SWAT	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	GF SWAT	VFIRE23		VFIRE26
13	ND EMS	SWAT 2	SWAT 2	SWAT 2	SWAT 2	SWAT2	ND EMS	VFIRE24		VMED28
14	WCT	WCB	WCB	WCB	MPDBUGR	WCB	WCT	VFIRE25		VMED29
15	METBOMB	WCR	WCR	WCR	CLY SO1	WCR	METBOMB	VFIRE26		VTAC14
16	SWAT2	WCT	WCT	WCT	FPD1	WCT	SWAT2	VFIRE21		SARNFM
								VFIRE22		
								VMED28		

Cass SO Radio Template

Revised 11-23-13

	CASS SO	METRO	MN	ND	EMERGENCY	FIRE
#	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F
1	NDSR1CT	FPD 1	MPD1	ND EMS	VCALL10	FFD 1
2	NDSR2CT	FPD 2	MPD LOOP	NDSR2CT	VTAC11	FFD 2
3	METRO	METRO	METRO	METRO	METRO	METRO
4	CAS ADM	MPD N	CLY HWY	CAS ADM	VTAC12	MFD 1
5	CAS SO	MPD LOOP	CLY SO1	CAS SO1	VTAC13	MFD 2
6	CAS SO2	MPD 1	CLY FDMA	FM AMB1	VTAC14	WFFD
7	NDSR1CC	NDSU PD	BVL FD	NDSR1CC	CCTAC1	CAS FD
8	NDSR2CC	MPD-S	DIL FD	NDSR2CC	CCTAC2	CLY FDMA
9	WF PD	MFD 1	HAW FD	WF FD	CCTAC3	DIL FD
10	ND HP	MFD 2	FEL FD	VMED28	VLAW31	HAW FD
11	NDSUPD	VLAW31	ULN FD	VLAW31	VFIRE23	FLN FD
12	CAS HWY	FFD 1	MSP C2C	TRL SO	VMED28	BVL FD
13	ND SO	FFD 2	MNCOMM	RCHLD SO	MNCOMM	HAR FD
14	CAS INV1	FM AMB1	CLY JAIL	BARN SO	MPDLOOP	VFIRE23
15	FPD 1	FGO PW	CLY SO2	RNSM SO	ND DEM	ND AGFD
16	SWAT 1	WF PD	CLYTACR	CASS LGR	WX1	WX1

	SWAT	CASS INV	CLAY INV	FARGO INV	MPD INV	WF INV	SWAT EMS	STATE OF ND	OR	STATE OF ND
#	Zone G	Zone H	Zone I	Zone J	Zone K	Zone L	Zone M	Zone S		Zone S
1	SWAT1R	CAS SO1	CLY SO1	FPD 1	MPD 1	WF PD	SWAT1R	*		VTAC11
2	FPD 1	CAS INV1	CLY INV1	FPD INV	MPD INV	WF INV	FPD 1	*		*
3	METRO	METRO	METRO	METRO	METRO	METRO	METRO	VLAW31		VLAW31
4	MPD 1	CAS BUG	CLY BUG	FPD BUG1	MPD BUG	WF BUG	MPD 1	VTAC11		VTAC13
5	CAS SO1	CLY BUG	CAS BUG	FPD BUG2	MPD INV2	CAS BUG	CAS SO1	VTAC12		VCALL10
6	CLY SO1	FPD BUG1	FPD BUG1	WF BUG	FPD BUG1	FPD BUG1	CLY SO1	VTAC13		LAWCMD
7	WF PD 1	MPD BUG	MPD BUG	MPD BUG	CLY BUG	CLY BUG	WF PD 1	VCALL10		LAWTAC1
8	FPD 2	CAS INV2	CLYTACR	FPD NRC	MPD INV2	MPD BUG	FPD 2	LAWCMD		LAWTAC2
9	VLAW31	ND BCI	ND BCI	ND BCI	ND BCI	ND BCI	VLAW31	LAWTAC1		VFIRE23
10	MPD LOOP	BCA 1	BCA 1	BCA 1	BCA 1	BCA 1	MPD LOOP	LAWTAC2		VFIRE24
11	ND BCI	BCA 2	BCA 2	BCA 2	BCA 2	BCA 2	ND BCI	VLAW32		VFIRE25
12	GF SWAT	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	GF SWAT	VFIRE23		VFIRE26
13	ND EMS	SWAT 2	SWAT 2	SWAT 2	SWAT 2	SWAT2	ND EMS	VFIRE24		VMED28
14	WCT	WCB	WCB	WCB	MPDBUGR	WCB	WCT	VFIRE25		VMED29
15	METBOMB	WCR	WCR	WCR	CLY SO1	WCR	METBOMB	VFIRE26		VTAC14
16	SWAT2	WCT	WCT	WCT	FPD1	WCT	SWAT2	VFIRE21		SARNFM
								VFIRE22		
								VMED28		

MPD Radio Templates

Revised 11-23-13

	MPD	METRO	MN	ND	EMERGENCY	FIRE
#	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F
1	MPD 1	FPD 1	MPD1	ND EMS	VCALL10	FFD 1
2	MPD LOOP	FPD 2	MPD LOOP	NDSR2CT	VTAC11	FFD 2
3	METRO	METRO	METRO	METRO	METRO	METRO
4	CLY-W	MPD N	CLY HWY	CAS ADM	VTAC12	MFD 1
5	FPD 1	MPD LOOP	CLY SO1	CAS SO1	VTAC13	MFD 2
6	MPD OAK	MPD 1	CLY FDMA	FM AMB1	VTAC14	WFFD
7	MPD-S	NDSU PD	BVL FD	NDSR1CC	CCTAC1	CAS FD
8	MFD 1	MPD-S	DIL FD	NDSR2CC	CCTAC2	CLY FDMA
9	FM AMB 1	MFD 1	HAW FD	WF FD	CCTAC3	DIL FD
10	CLY-E	MFD 2	FEL FD	VMED28	VLAW31	HAW FD
11	ST EMER	VLAW31	ULN FD	VLAW31	VFIRE23	FLN FD
12	FPD 2	FFD 1	MSP C2C	TRL SO	VMED28	BVL FD
13	CAS SO	FFD 2	MNCOMM	RCHLD SO	MNCOMM	HAR FD
14	MSP C2D	FM AMB1	CLY JAIL	BARN SO	MPDLOOP	VFIRE23
15	SWAT 1	FGO PW	CLY SO2	RNSM SO	ND DEM	ND AGFD
16	SWAT 2	WF PD	CLYTACR	CASS LGR	WX1	WX1

	SWAT	CASS INV	CLAY INV	FARGO INV	MPD INV	WF INV	STATE OF MN
#	Zone G	Zone H	Zone I	Zone J	Zone K	Zone L	Zone IC
1	SWAT1R	CAS SO1	CLY SO1	FPD 1	MPD 1	WF PD	VCALL10
2	FPD 1	CAS INV1	CLY INV1	FPD INV	MPD INV	WF INV	VTAC11
3	METRO	METRO	METRO	METRO	METRO	METRO	VTAC12
4	MPD 1	CAS BUG	CLY BUG	FPD BUG1	MPD BUG	WF BUG	VTAC13
5	CAS SO1	CLY BUG	CAS BUG	FPD BUG2	MPD INV2	CAS BUG	VTAC14
6	CLY SO1	FPD BUG1	FPD BUG1	WF BUG	FPD BUG1	FPD BUG1	MNCOMM
7	WF PD 1	MPD BUG	MPD BUG	MPD BUG	CLY BUG	CLY BUG	VFIRE23
8	FPD 2	CAS INV2	CLYTACR	FPD NRC	MPD INV2	MPD BUG	MNFIRG2
9	VLAW31	ND BCI	ND BCI	ND BCI	ND BCI	ND BCI	MNFIRG3
10	MPD LOOP	BCA 1	BCA 1	BCA 1	BCA 1	BCA 1	DNRTAC1
11	ND BCI	BCA 2	BCA 2	BCA 2	BCA 2	BCA 2	VLAW31
12	GF SWAT	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	SWAT 1R	VMED28
13	ND EMS	SWAT 2	SWAT 2	SWAT 2	SWAT 2	SWAT2	IR 2
14	WCT	WCB	WCB	WCB	MPDBUGR	WCB	VTAC14R
15	METBOMB	WCR	WCR	WCR	CLY SO1	WCR	NGRPTR
16	SWAT2	WCT	WCT	WCT	FPD1	WCT	LE 2

RRRDC Infrastructure

- **Radio Interoperability**
  - $9,500,000 in grants and local match
- **CAD/RMS Software**
  - 1 Hardware/Software Grant for the entire region
  - Federal Funding $3,000,000
  - Local match of $1,000,000
  - New World Systems

RRRDC Infrastructure

- **Telephone** - Customer Premise Equipment (CPE)
  - Positron VIPER $517,000 (installed in 2012)
- **Radio**
  - Motorola Centracom Elite (upgrade to MCC7500 expected in 2018)
- **Recording Logger**
  - NICE $43,882(upgrade in 2014)
- **Workstations (8)**
  - Xybix $138,000 (installed in 2013)
- **CAD/RMS Software**
  - New World Systems 10.0 SP3 HF#3 (went live in 2011)

RRRDC Infrastructure

- **Minnesota ESInet**
  - (installed in 2012)
- **Emergency Notification System**
  - CodeRED $60,750/yr (installed in 2008)
- **Emergency Medical Dispatch (EMD)**
  - Priority Dispatch – Pro QA $87,000 (installed in 2012)
- **NCIC/HOST**
  - ND FOX <u>and</u> MN Portals
- **Backup Power Supplies**
  - 500 KW Butler Generator and EATON Powerware UPS

IPAWS

Integrated Public Alert and Warning System

- RRRDC has applied to be a Collaborative Operating Group (COG)
- Allows for public and private alerts
- CodeRED which is an IPAWS compatible software is the portal to IPAWS

Text-to-911

- FCC requirement for all wireless companies to have the capability to text-to-911 in 2014
- Three methods may be used. (IP, Web based, TTY)
- RRRDC has positioned itself to take text-to-911 in a true IP environment with its' backroom equipment
- RRRDC is working with the ND NG911 Manager to receive all text-to-911 message for the entire state and relay back to appropriate PSAPs.
- Surrounding states are using a similar method to get text-to-911 started.

Back-up Dispatch Center

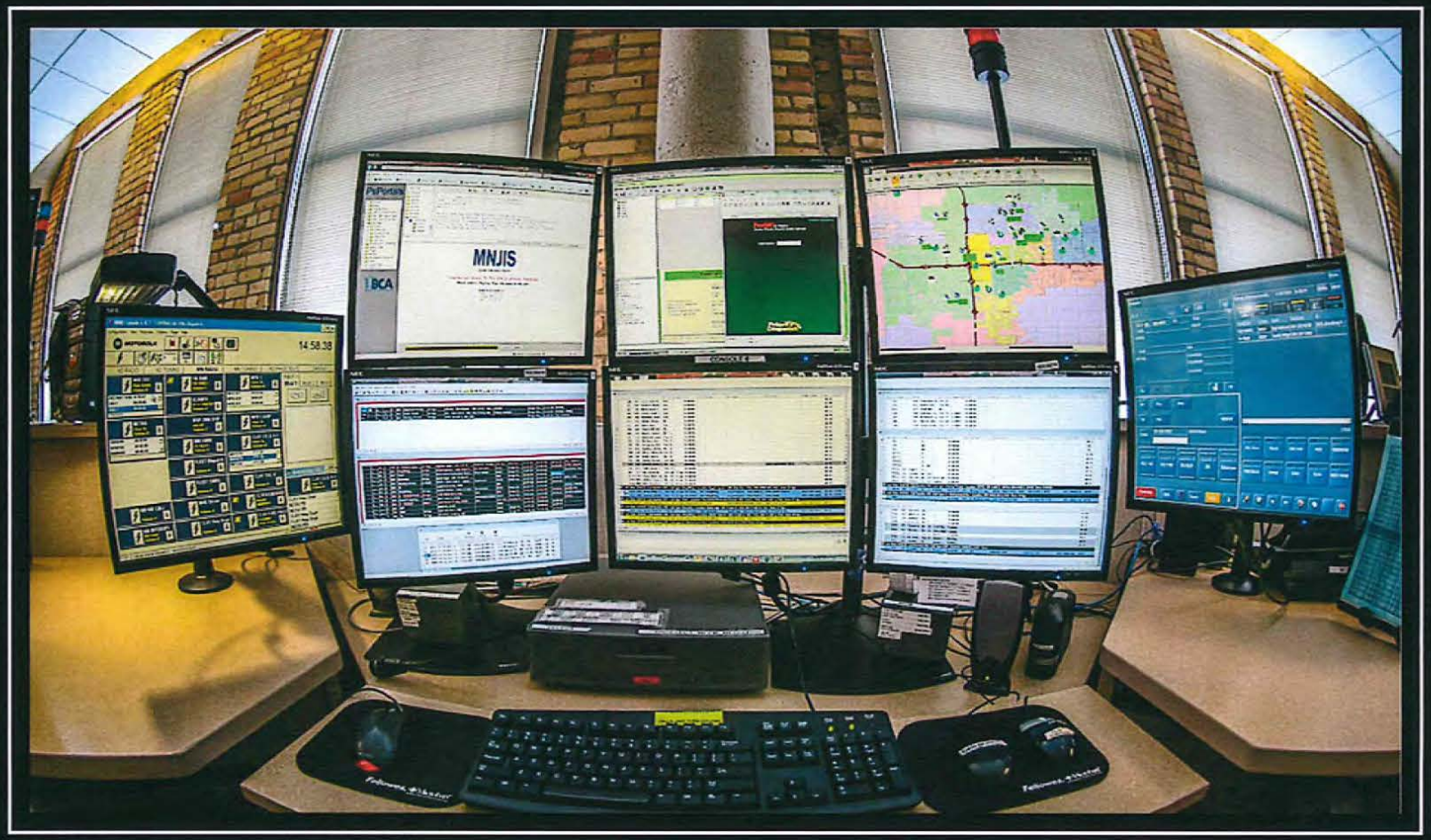
West Fargo PD

Back-up Dispatch Center

West Fargo PD

Back-up Dispatch Center

West Fargo PD



COMMUNICATIONS OPERATORS

Multi-tasking Masters

Red River Regional Dispatch Center

State Interoperability Executive Committee

(SIEC)

April 22, 2014

Hiring Process

- Typing test at ND Job Service – 40 wpm
- 4 hour video test
- Interview
- Conditional Job Offer
- Background Check
- Physical Exam to include drug screening
- Psychological Exam
- Polygraph Exam

Employee Requirements

- Ability to multi-task
- Ability to hear and understand multiple sound sources
- Work under stressful conditions
- Must have good judgment
- Ability to prioritize
- Must do shift work (nights, weekends, and holidays)
- Knowledge of computer operations
- Strong desire to serve the community
- High degree of moral character
- High degree of emotional self-control
- Must maintain respectful working relationships
- Must possess excellent communication skills

Training Program
(APCO Project 33 Certification)

- 19 week training program
- Orientation
- Phase 1
- Phase 2
- Phase 3
- Extension policy, Remedial training
- Training tasks/guidelines and standard evaluation guidelines
- Daily Observation Reports (DOR's)
- Critique forms

ND Department of Emergency Services

NDDES Homeland Security State Radio

PO Box 5511
Bismarck, ND 58506-5511

Tel: (701) 328-8100
Fax: (701) 328-8181

Email: nddes@nd.gov
Website: www.nd.gov/des

"Ensuring a safe and secure homeland for all North Dakotans"

PUBLIC MEETING NOTICE AGENDA
DEPARTMENT OF EMERGENCY SERVICES
STATE INTEROPERABILITY EXECUTIVE COMMITTEE MEETING
May 28, 2014 - 8:00 a.m.
Fraine Barracks, Building #35, Bismarck

May 28, 2014

8:00 – 8:05	Welcome and Introductions	MG Sprynczynatyk
8:05 – 8:50	Land Mobile Radio Presentation	Rick Burke, Televate
8:50 – 9:05	Member Questions	
9:05 – 9:50	Land Mobile Radio Presentation	Dan Hawkins, Office of Emergency Communications
10:05 – 10:20	Member Questions	
10:20 – 10:55	Member Discussion/Comments/Questions	
10:55 – 11:00	Next Meeting	

To access the telephone bridge, dial 1-877-820-7831 (toll free) or 1-720-279-0026.
The passcode is 950503.

ND Department of Emergency Services

NDDES Homeland Security State Radio

PO Box 5511 | Tel: (701) 328-8100 | Email: nddes@nd.gov
Bismarck, ND 58506-5511 | Fax: (701) 328-8181 | Website: www.nd.gov/des

"Ensuring a safe and secure homeland for all North Dakotans"

To: State Interoperability Executive Committee (SIEC)

From: MG Sprynczynatyk

Topic: SIEC Meeting Executive Summary – May 28, 2014

Date: June 10, 2014

Chairman MG Sprynczynatyk welcomed all attendees.

Land Mobile Radio PowerPoint Presentations:

Public Safety and Emergency Management Radio Systems – Dan Hawkins, OEC

The Office of Emergency Communications (OEC) supports states and promotes communications through tools, guidance documents, and technical assistance. The Public Safety Tools is a website for accessing frequency and licensing mapping along with documents and training. Dan concentrated his presentation on the technology portion of the Interoperability Continuum Diagram. He listed www.copsusdoj.gov as a site to access resource publications relating to interoperable communications.

The Radio Frequency Diagram was used to clarify where state and local public safety frequencies were situated and how some of the adjacent frequencies were used. He explained the eight defined interfaces of Project 25 – Digital Radio for Public Safety. Phase I was the move to 12.5 kHz channels and Phase II is the move to 6.25 kHz, which certain entities have or are currently adopting.

Dan discussed the features and benefits of digital and analog. He also pointed out differences between simplex, half-duplex, trunked systems, simulcast simplex, and simulcast repeaters with remote receivers. Channel allocations for conventional and trunked radio systems were explained. Dan presented pros and cons of trunked systems and discussed the trunked systems implemented by Montana, Wyoming, and South Dakota. The presentation concluded with discussions focused on satellite communications and the evolution to broadband.

His detailed PowerPoint presentation is attached.

State Radio Network and Recommendations – State and Local Implementation Grant Program Status – Rick Burke, Televate

The state's radio network is currently comprised of 41 towers; a total of 48 are planned. Each site has four channels in the 154-155 VHF spectrums. Rick indicated adoption of Next Generation-911 will require all public safety answering points (PSAPs) to meet new standards for processing text and video information. He said new tower construction and mutual aid analog to digital conversion needed to proceed more quickly. He suggested the SIEC use an independent source to conduct a survey as method to alleviate bias in the process of determining the direction of long range communications planning.

His PowerPoint presentation is attached.

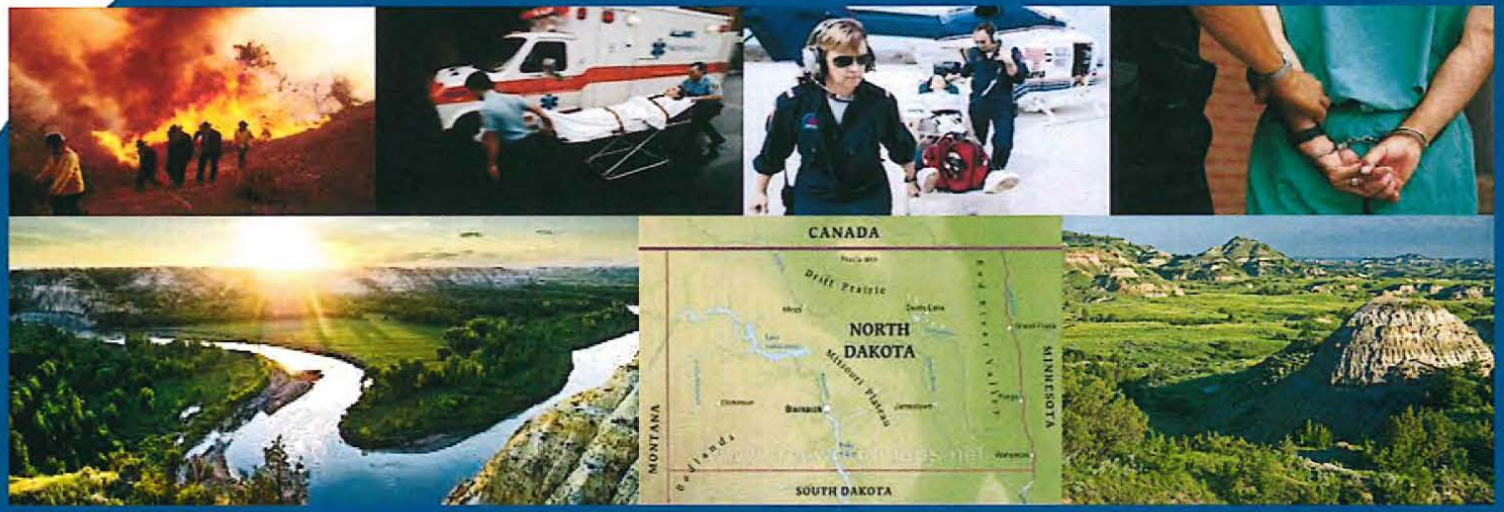
Open Discussion

Greg Wilz presented a ten question on-line survey stakeholders could complete in just a few minutes. The tool will gather basic information; data obtained will be used to construct a survey designed to gather more comprehensive information. DES will finalize and deploy the survey to responder agencies. All SIEC members were encouraged to emphasize among their individual constituencies the importance of completing the survey.

Since the last statewide communication study is outdated (completed in 1999), Greg Wilz and Duane Schell suggested the SIEC Chairman invite communication stakeholders to a meeting for the purpose of developing a coalition to fund a communication study. The legislature did not provide funding for an in depth study that is needed before the next session. However, the SIEC appropriation contains enough dollars to pay expenses for a stakeholder meeting to determine if interest and funding streams could move the project forward. This effort would have to be formalized swiftly in order to complete the process prior to the next legislative session.

Next Meeting

No date was established for the next meeting.



State of North Dakota
Statewide Interoperable Executive Committee

State Radio Network Analysis and Recommendations

State and Local Implementation Grant Program Status

May 28, 2014

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Agenda

- State Radio Network Overview
- Narrowbanding and Related Coverage Gaps
- State Radio Network Recommendations
- ND-PSBN and State Radio Network Evolution
- Question and Answer
- ND-PSBN SLIGP Project Status

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State Radio (Voice) Network Overview

State Radio Network Overview	Totals	Comments
# of sites (future)	36 (48)	12 new towers being implemented
State: 707,704 sq. mi.	95% mobile coverage	Portable coverage much less
Four (4) channels per site (future)	144 (192)	Channels allocated for State and Local usage, mutual aid
Two digital, two (2) analog (one paging)	Additional mutual aid and local channels available	Digital channels operate at lower signal levels
Co-channel assignment	All sites operate on common frequencies (PL Tone mgt.)	Potential for interference within this architecture
Mobile-to-Mobile channels	Multiple channels available	
IP Centric interoperability	IP gateway facilitates wide area communications	Requires manual patching
Unique network architecture	All indications that current architecture is working	Network deployed on minimal investment

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Impact of Narrowbanding on State Radio Performance

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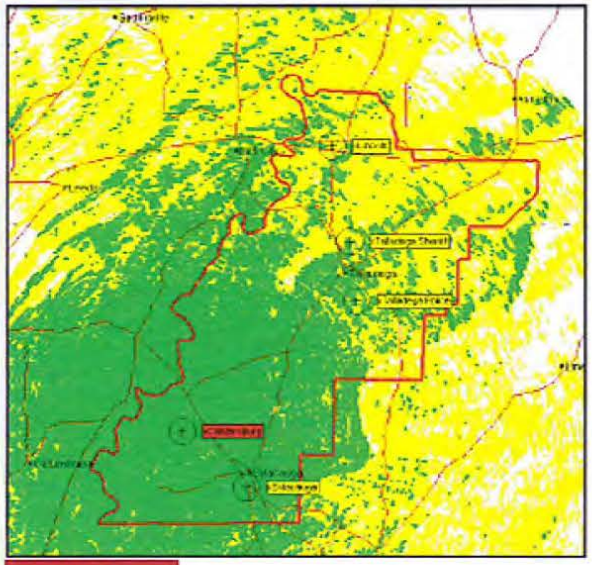
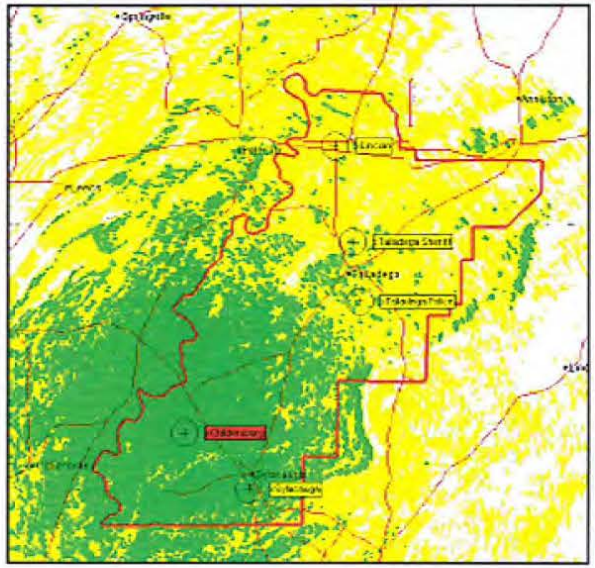
Impact of Narrowbanding on Coverage



Wideband Analog VHF



Narrowband Analog VHF

Active Site

Outdoor Coverage

Indoor Coverage

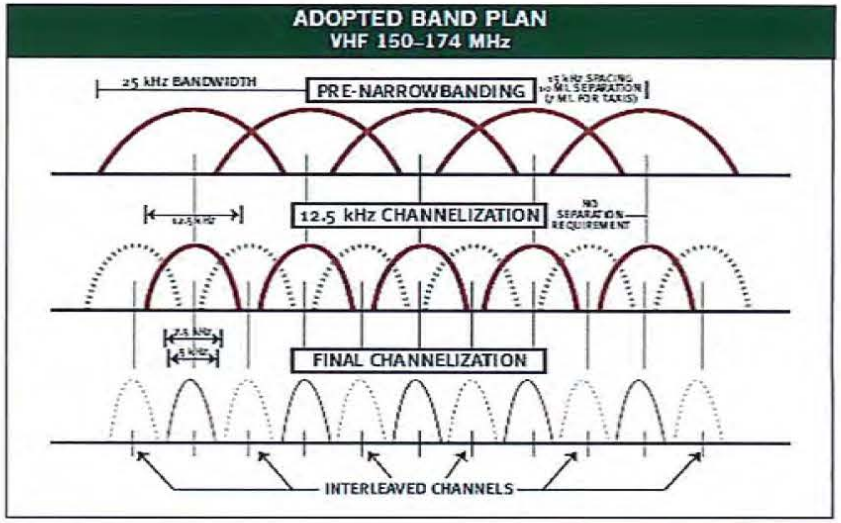
Fringe coverage areas experience greatest impact

Mobile vs. portable radio coverage considerations

Narrowbanding results in a 5-6 dB reduction is radio signal strength

- Reduction in reliable coverage

Digital radio designed to mitigate the 5-6 dB loss of analog radio (more sensitive radio receiver)



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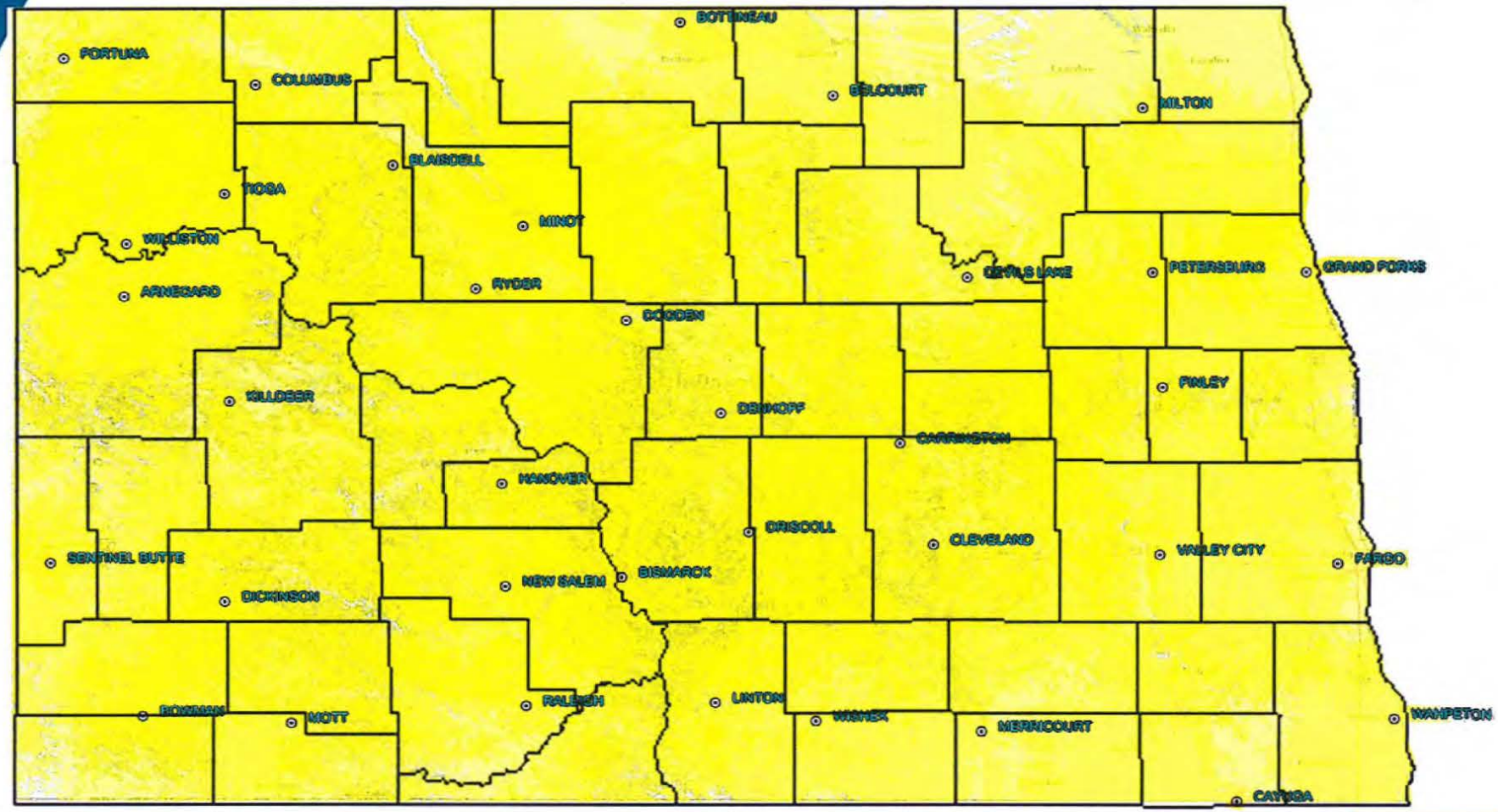
Existing State Radio Mobile Coverage



Note: Yellow indicates the area for which at least one site provides talkback coverage.

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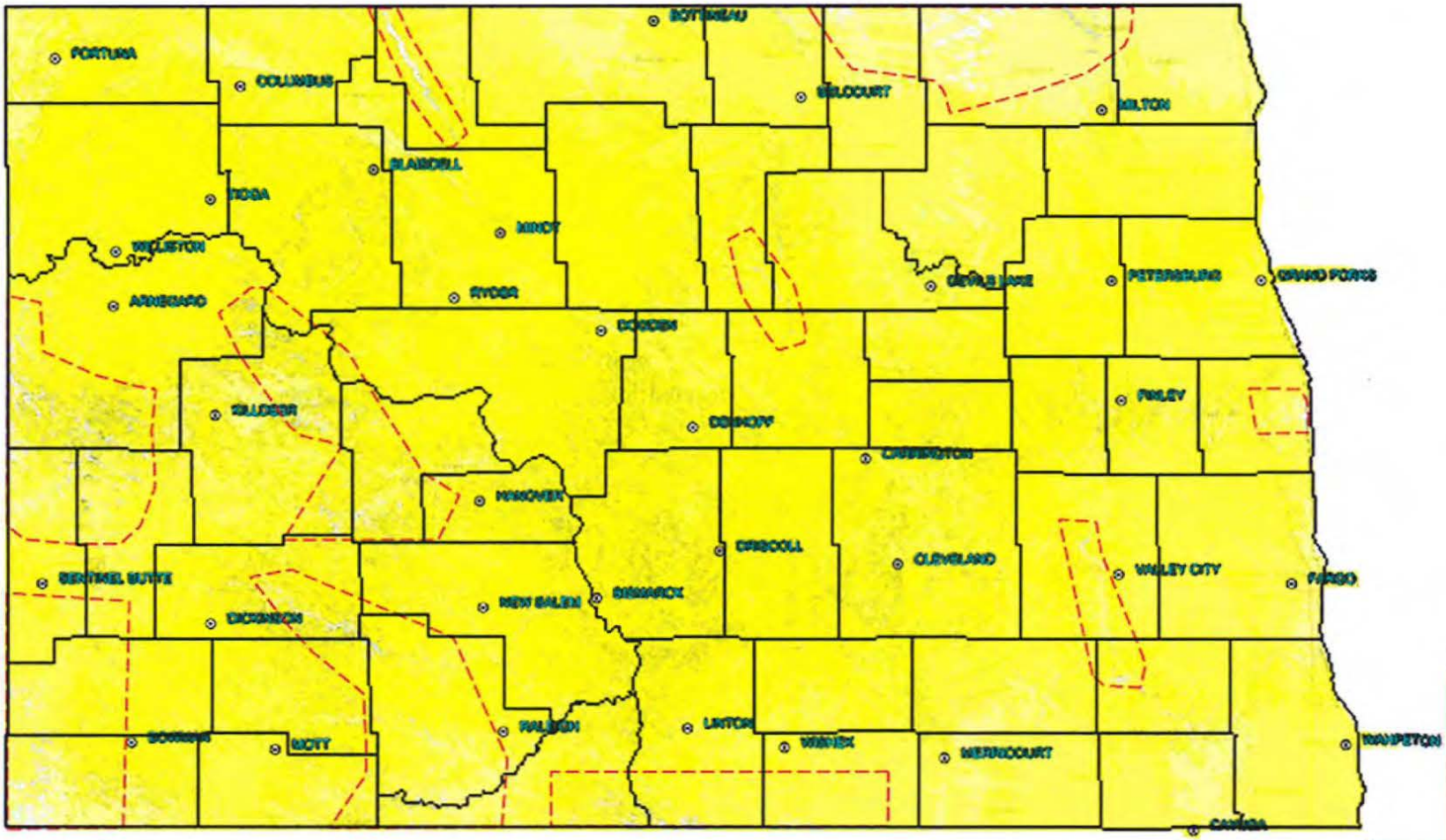
Possible Communications Problem Areas



Note: Areas outlined on map indicate weak coverage areas resulting from radio channel narrowbanding

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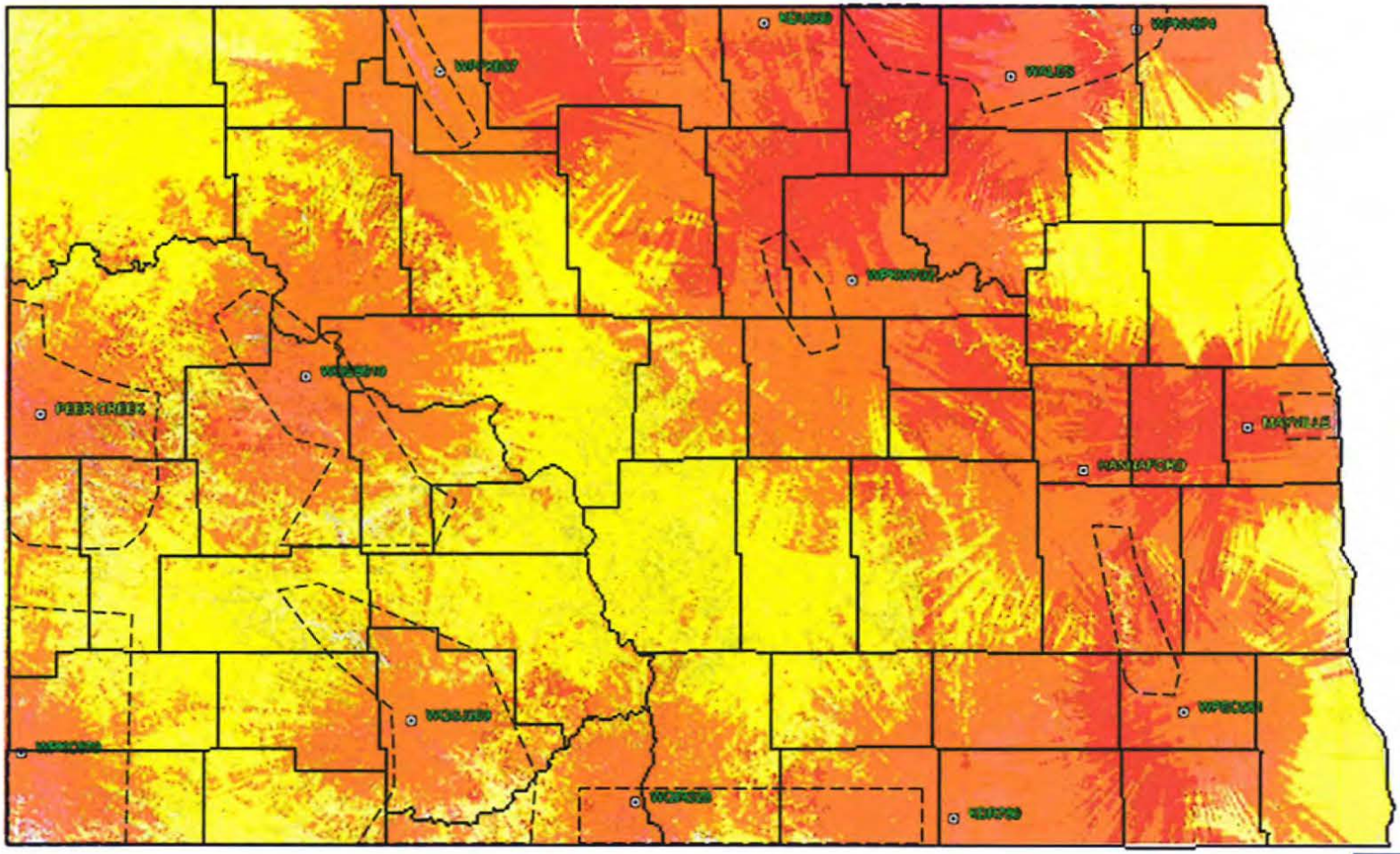
Complete Mobile Coverage with New Sites



Note: Yellow is coverage from the existing system and orange is the new site coverage. Darker colors indicate overlapping site coverage.

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"We envision a North Dakota with a seamless interoperable communications plan that includes local, tribal, state, federal and private agencies. A State, in which communications among first responders is uniform, standardized, and interoperable that allows first responders to communicate effectively …..

To reach this vision the State of North Dakota will leverage existing systems to become interoperable and invest in new technologies that provide …. capabilities to meet response needs well into the future given the changing environments we will continue to react to."

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State Radio Network Analysis and Recommendations

Public Safety communications and information technology system and solutions regularly evolve

- Radio network standards and architecture
- PSAP systems, processes and workflow
  - NG-911
  - Call taking processing and management
  - Computer Aided Dispatch (CAD)

Current State Radio network architecture is meeting known operational requirements

- Prudently designed network on a minimal budget, very creative architecture that is working, but that has limitations
- IP architecture facilitates "trunking" like interoperability, but requires manual control

State Radio Near Term Enhancements

- Speed the pace of new tower implementation
- Option to convert mutual aid analog channel to digital, quicken conversion of all radios

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State Radio Network Analysis and Recommendations

Potential State Radio Performance Issues

- Network capacity is light today and perhaps into the future, but need to study multi agency emergency incidents
- Co-channel assignments at all sites, managed by PL tones, but uplink mobile interference is still possible and likely, particularly during large incidents
- Need to understand the demand and impact of portable radio operations

Need to determine State Radio network operational objectives and scope of statewide service

Conduct comprehensive end user survey to define requirements, and determine State Radio strengths and gaps

- No need to redesign unless stakeholders requirements suggest otherwise

Future State Radio governance structure and funding of operations

- Funding must address radios, including for volunteer agencies

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Rough Order of Magnitude (ROM) Pricing for Trunking Network

ROM System Concept

- *Hybrid P25 Trunked (Multi-cast)/Analog System*
- *Typical Site Configuration*
  - *One Trunking Control*
  - *Six-audio paths (3 physical repeaters) - with frequency reuse, as applicable*
  - *One analog channel for I/O - with frequency reuse & voted/steer*

Category	Description	
PER SITE	TDMA Repeaters	$ 105,000.00
	Conventional Repeater	$ 15,000.00
	Networking + Voting Equipment	$ 13,000.00
	Site controller + Licenses	$ 12,000.00
	Partial passive RF (For new channels)	$ 8,000.00
	A&E Services	$ 37,000.00
	Shelter Eq Install	$ 25,000.00
Site Total (48)		$ 10,320,000.00
CORE	Mid-Size Core w/NMS + Interfaces	$ 2,800,000.00
SERVICES (33%)	Testing/PM/Engineering (33%)	$ 4,400,550.00
Contingency (10%)	Additonal interfaces, FSA, others, control radios, C/Os	$ 1,773,555.00
	Grand Total	$ 19,509,105.00

Radios must be upgraded

Excluded Items

- *Cabinets/racks / No Radio Consoles*
- *Tx Lines + Antennas (and corresponding install)*
- *Combiners and other RF (incremental cost included for additional repeaters)*

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ND-PSBN and State Radio Network Evolution Analysis

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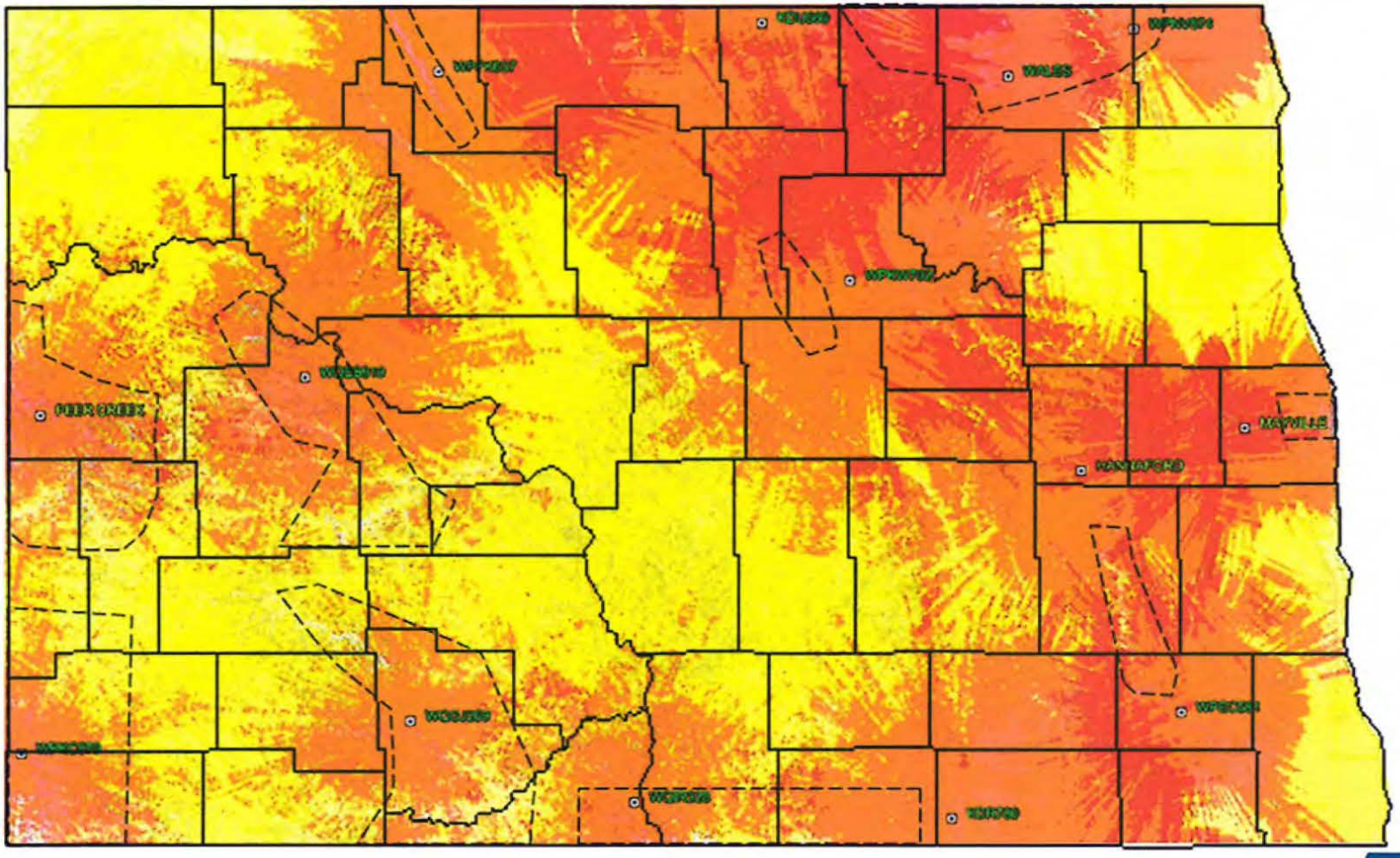
Future State Radio Mobile Coverage



Coverage based on 48 VHF radio sites

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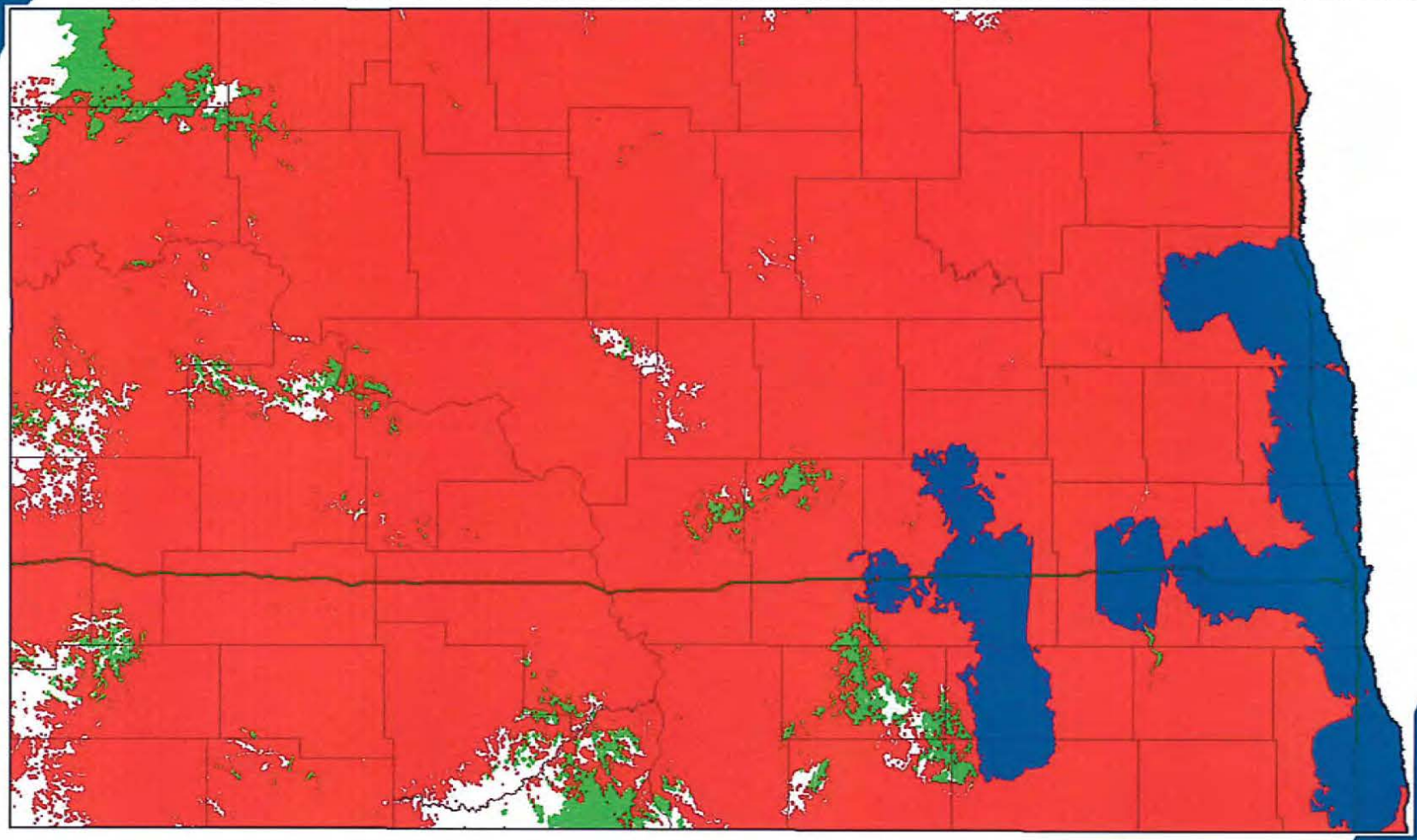
Commercial Cellular Carrier Coverage



Small Single Carrier Coverage

Large Single Carrier Coverage

All Combined Carriers Coverage

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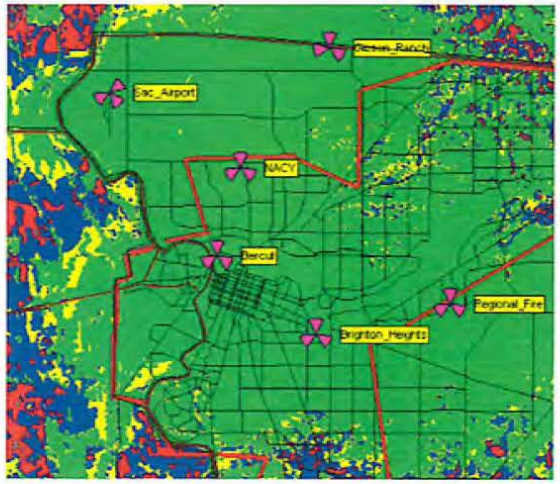
LTE Coverage Is Not Equal to LMR

LMR link budget is better than LTE at broadband speeds

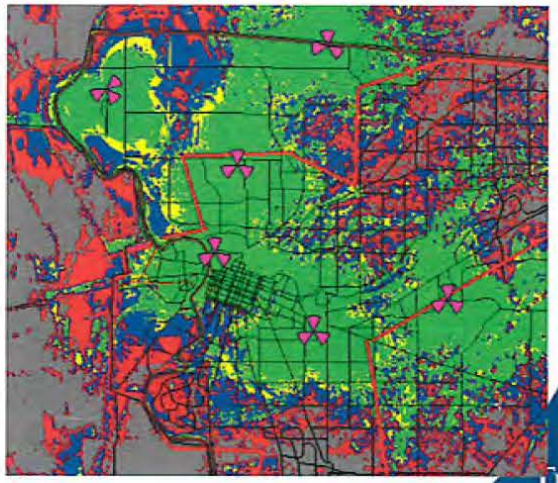
- 4G requires far more sites to match coverage
- E.G., Washington, DC - 12 broadband sites to cover 90% outdoors versus 10 LMR sites to cover 95% indoors

However, LTE could scale to non-broadband speeds (i.e., lower throughout increases site radius)

LMR Coverage



LTE Coverage



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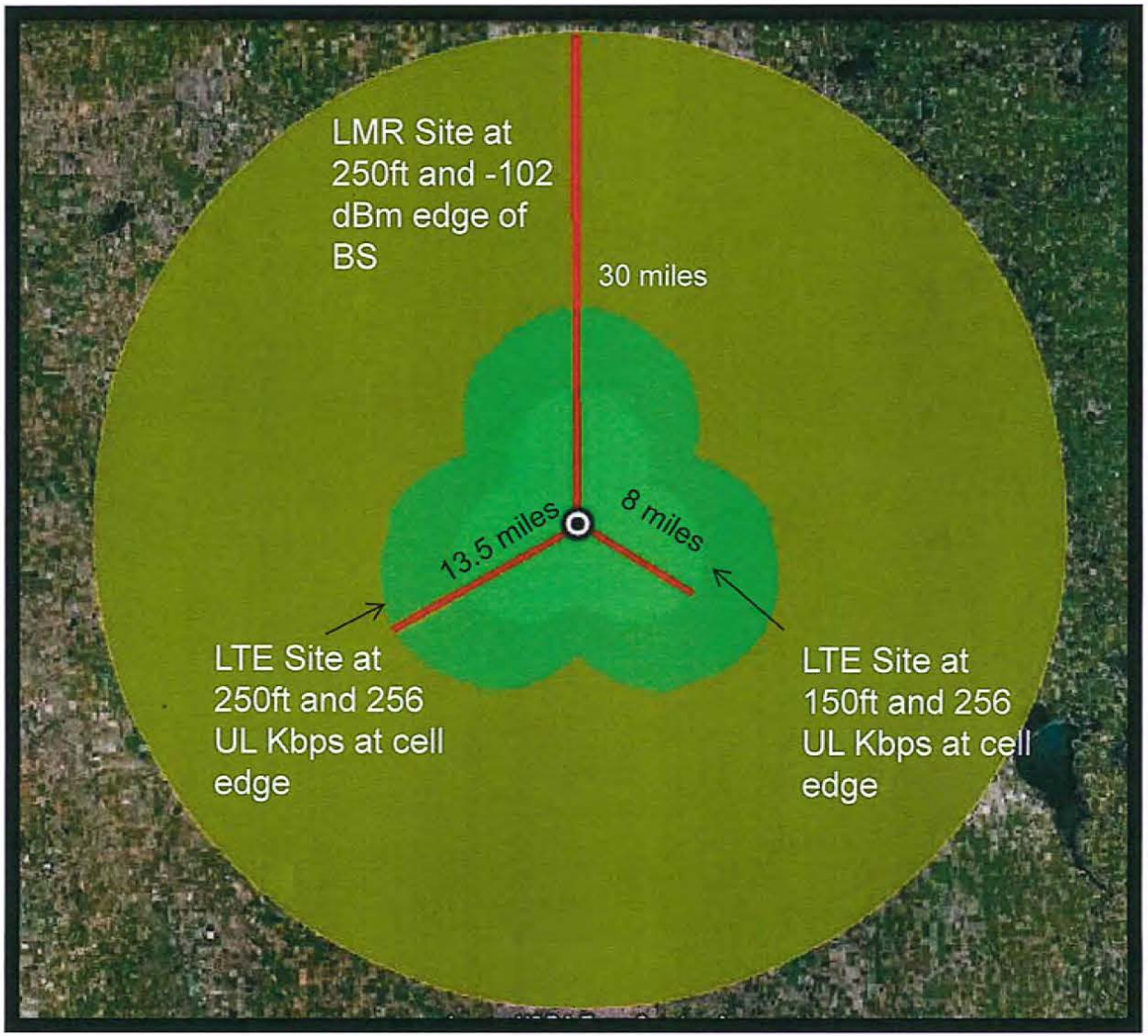
LMR vs. LTE Coverage Projections



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Rough Estimate of ND-PSBN Sites to Achieve Commercial Coverage Footprint (Televate Model)

- **Coverage Environment:** Rural, suburban, urban, dense urban; mountain, plain, water
- **Coverage Requirements:** Indoor portable, portable on street, mobile
- **Site radius:** Models based on industry research and empirical data. Note: model is based on a requirement of 756 kbps downlink and 258 kbps uplink throughput at the cell edge.

Extended Footprint Public Safety Leverage, Outdoor Coverage Hardening

			% Hard	% Cov	Com Sites	Tot. Sites
Tot. PS State % Coverage:	100%					
Comm. Carrier State % Cov.:	92%	Rural	100%	100.0%	596	647
PS Lev Model (y/n):	y	Suburban	50%	100%	12	12
Overflow PS Lev Model (y/n):	y	Urban	50%	100%	3	3
		Dense Urban	50%	100%	0	0
						662
			Coverage (sq. mi.):		64,958	70,499

Geographic area typing/population density are based on 2010 United States Census Bureau data. Need to be adjusted to reflect ND realities

Extended Footprint Public Safety Leverage, Outdoor Coverage Hardening

			% Hard	% Cov	Com Sites	Tot. Sites
Tot. PS State % Coverage:	100%					
Comm. Carrier State % Cov.:	92%	Rural	100%	100.0%	439	477
PS Lev Model (y/n):	y	Suburban	50%	100%	12	12
Overflow PS Lev Model (y/n):	y	Urban	50%	100%	3	3
		Dense Urban	50%	100%	0	0
						492
			Coverage (sq. mi.):		64,958	70,499

Note: The LTE standards body, the 3GPP, recently increased the power of mobile united to 1.25 watts that will ultimately increase the site radius for rural sites and will affect site requirements in rural areas.

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ND-PSBN Evolution to Mission Critical LMR Replacement

LTE Mission Critical Voice Challenges

- Direct Mode (Talk Around, peer-to-peer)
- Coverage (Time to match LMR coverage)
- Funding (Required to expand LTE to LMR coverage)

The Opportunities

- Nationwide interoperability
- Improved incident voice communications

The Approach

- Phase One: Standards and parallel network deployment
- Phase Two: Limited push-to-talk (PTT) over broadband and parallel network deployment
- Phase Three: Pilot broadband deployments
- Phase Four: Vigilance, trials and perfection of solution

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North Dakota Public Safety Broadband Network (ND-PSBN)

- State and Local Implementation Grant Program (SLIGP) Status (Needs Assessment)
- Public Safety Broadband Working Groups
- CAD Incident Data Analysis

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Project Status - Needs Assessment

Stakeholder Entities - County and Local

- **565** entities have been identified and contacted via the 911 Coordinators and Emergency Managers
- In the process of collecting User Population data from **326** entities, estimated completion by end of June
- Coverage Reviews per County to begin in June/July

Stakeholder Entities - State

- Coordinating kickoff meetings with various State agencies
- To be completed by mid-June
- User Population data estimated completion by end of July

CAD Incident Data

- Received data from and State Radio PSAP and 31 Counties
- 13 Counties - CJIS data confirmed
- 9 Counties pending

Summary: there are some minor delays, however the stakeholder participation has been <u>excellent</u> thus far!

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Working Group - Coverage and ND-PSBN System Requirements (request for SIEC guidance)

Coverage Scenarios

- Review the impact of the various tactical and technical assumptions required to define a coverage scenario
- Define coverage scenarios (in-building, on-street portable, mobile)
- Review of roaming/coverage issues along the Canadian border
- Practicality of coverage augmentation solutions (repeaters, high power mobiles, other)
  - Augmentation strategies included into stakeholder survey

System Requirements

- Review of the system functionality required by first responder agencies to add, subtract and manage end users
- Review of the system functionality required to locally manage the ND-PSBN at an emergency incident
- Priority, preemption, mutual aid, etc.

Commitment: 3 - 4 meetings, 3 - 5 hours of reading

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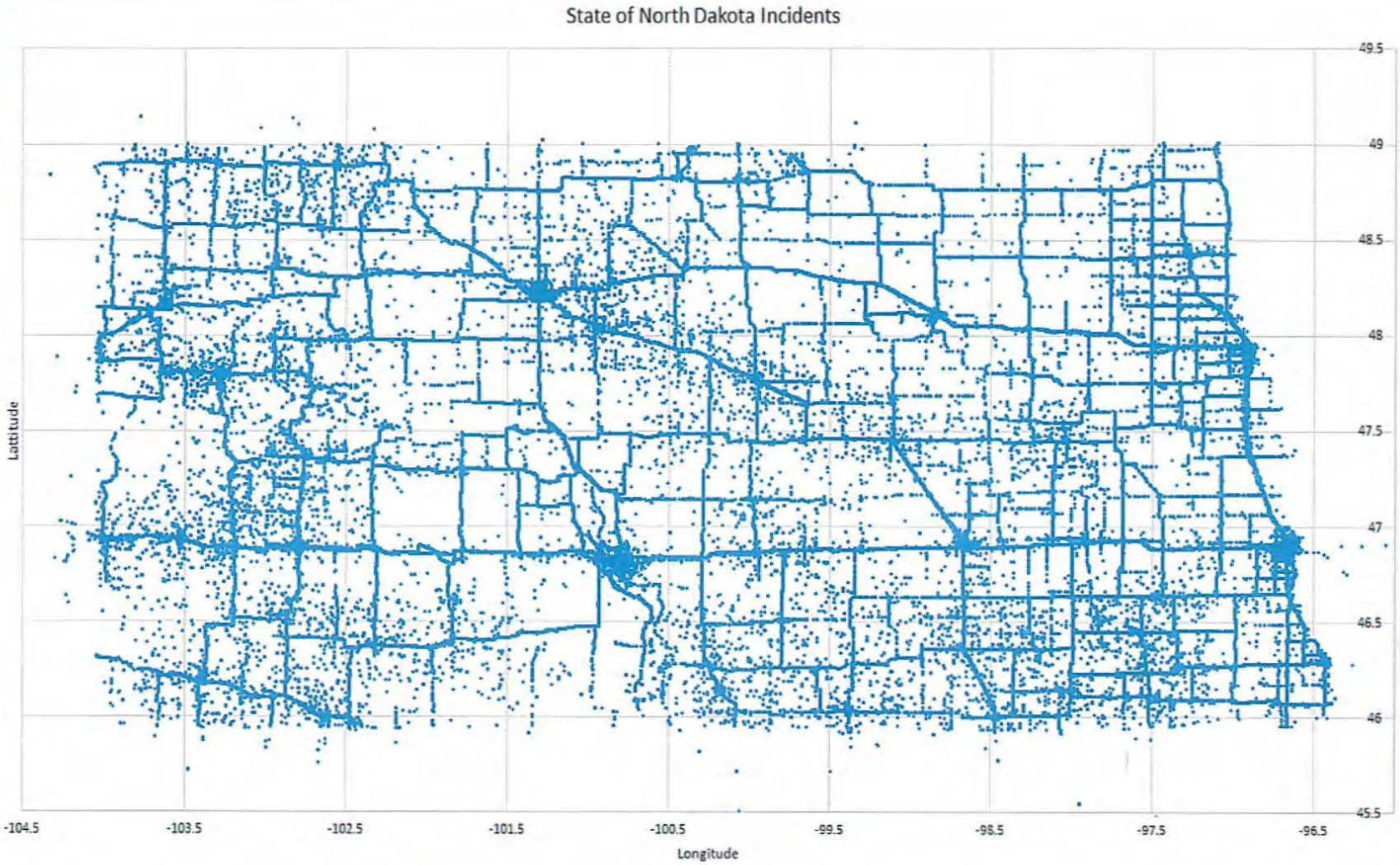
CAD Incident Data Analysis



More than 2 million CAD incident data points have been geocoded to date

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CAD Incident Data Processing and Analysis

CAD data is geo-located and assessed based on the following criteria

- By Incident
- By Agency
- By Priority (defined by working group)

CAD data assists responding agencies to prioritize coverage areas

- Statistical justification for coverage
- Network capacity analysis

Data Application Incident Analysis

- Determine data applications by agency
  - Current / Future
- Incident Types
  - Active shooter - school (urban and rural)
  - Flood - Red River
  - Derailment with HAZMAT & mass causality
  - Tornado

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Televate delivers innovative consulting solutions to power your mission critical communications.

Thank You!

A. Richard Burke
Managing Partner

Direct: 703.639.4201
Mobile: 703.587.0702
rburke@televate.com

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Homeland Security

Office of Emergency Communications

Public Safety & Emergency Management Radio Systems

Dan Hawkins, Coordinator
CO, MT, ND, SD, UT, WY

Office of Emergency Communications

Support and promote communications for emergency responders and government officials during all hazards and threats

Tools & Guidance Documents

PublicSafetyTools.info

ICTAP
Interoperable Communications Technical Assistance Program

Public Safety Technical Assistance Tools
Welcome to the Public Safety Technical Assistance Tools Website

Home | Tools | Resources | Training | PSToolsHelp | What's New (as of 12/09/2013)

Tools

- **FMT** – Frequency Mapping Tool
- **MDST** – Mobile Data Survey Tool
- **NLST** – Narrowband License Status Tool
- **NSTT** – Narrowband Summary Tracker Tool
- **PS Library** – Public Safety Library

Controlled Access: * How do I get Access?

- **CASM NextGen** – Communication Assets Survey & Mapping Next Generation
- **RLCT** – Response Level Communications Tool

Resources

- **NIFOG Info** – National Interop. Field Operations Guide
- **AUXFOG** – Aux. Communications Field Operations Guide
- **NPSBN** – Nationwide Public Safety Broadband Network
- **OEC Docs.** – Office of Emergency Communications
- **TA Request** – Technical Assistance Catalog, Request & Evaluation Forms
- **FCC Src.** – Federal Communications Commission

Training

- **Gateways** – Audio Gateway Training Materials & CBT
- **COMU** – Communications Unit Overview Training
- **AUXCOMM** – Aux. Communications Overview Training
- **Proj. Mgmt.** – Project Management Overview Training
- **Radio 101** – Basic LMR Overview Presentation
- **Tribal Outreach** – Engaging Tribal Governments Overview Presentation
- **CASM NextGen** – Targeted Training Information
- **PSTools Training** – Public Safety Tools Training Schedule

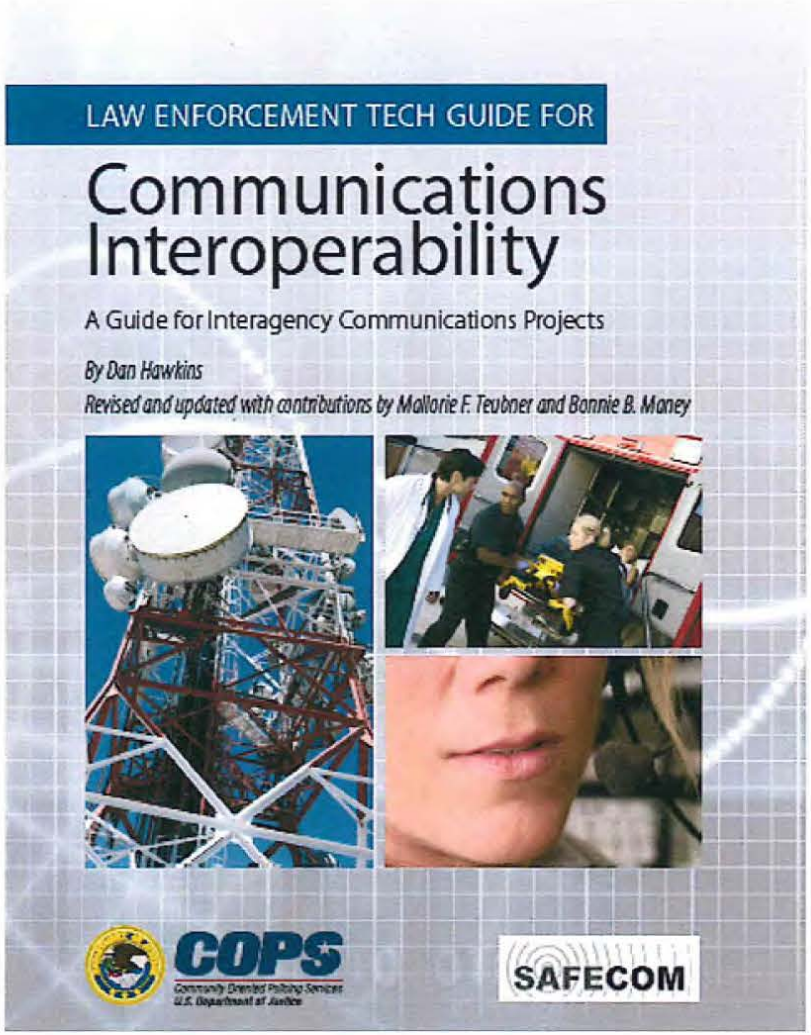
Interoperability Continuum

Limited Leadership, Planning, and Collaboration Among Areas with Minimal Investment in the Sustainability of Systems and Documentation

Governance	Individual Agencies Working Independently		Informal Coordination Between Agencies		Key Multi-Discipline Staff Collaboration on a Regular Basis	Regional Committee Working within a Statewide Communications Interoperability Plan Framework
Standard Operating Procedures		Individual Agency SOPs	Joint SOPs for Planned Events	Joint SOPs for Emergencies	Regional Set of Communications SOPs	National Incident Management System Integrated SOPs
Technology	DATA ELEMENTS	Swap Files	Common Applications	Custom-Interfaced Applications	One-Way Standards-Based Sharing	Two-Way Standards-Based Sharing
	VOICE ELEMENTS	Swap Radios	Gateway	Shared Channels	Proprietary Shared System	Standards-Based Shared System
Training & Exercises		General Orientation on Equipment and Applications	Single Agency Tabletop Exercises for Key Field and Support Staff	Multi-Agency Tabletop Exercises for Key Field and Support Staff	Multi-Agency Full Functional Exercises Involving All Staff	Regular Comprehensive Regionwide Training and Exercises
Usage	Planned Events		Localized Emergency Incidents		Regional Incident Management	Daily Use Throughout Region

High Degree of Leadership, Planning, and Collaboration Among Areas with Commitment to and Investment in Sustainability of Systems and Documentation

Materials & References



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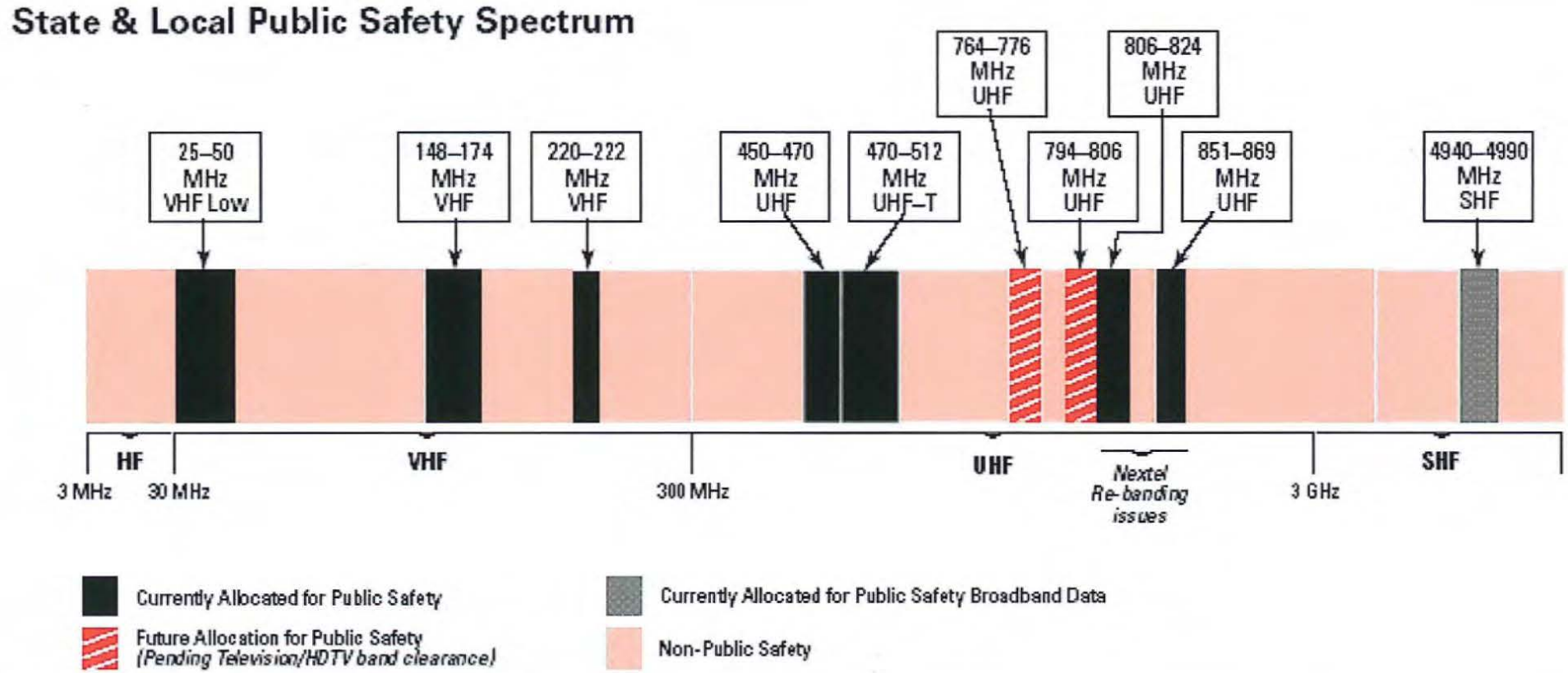
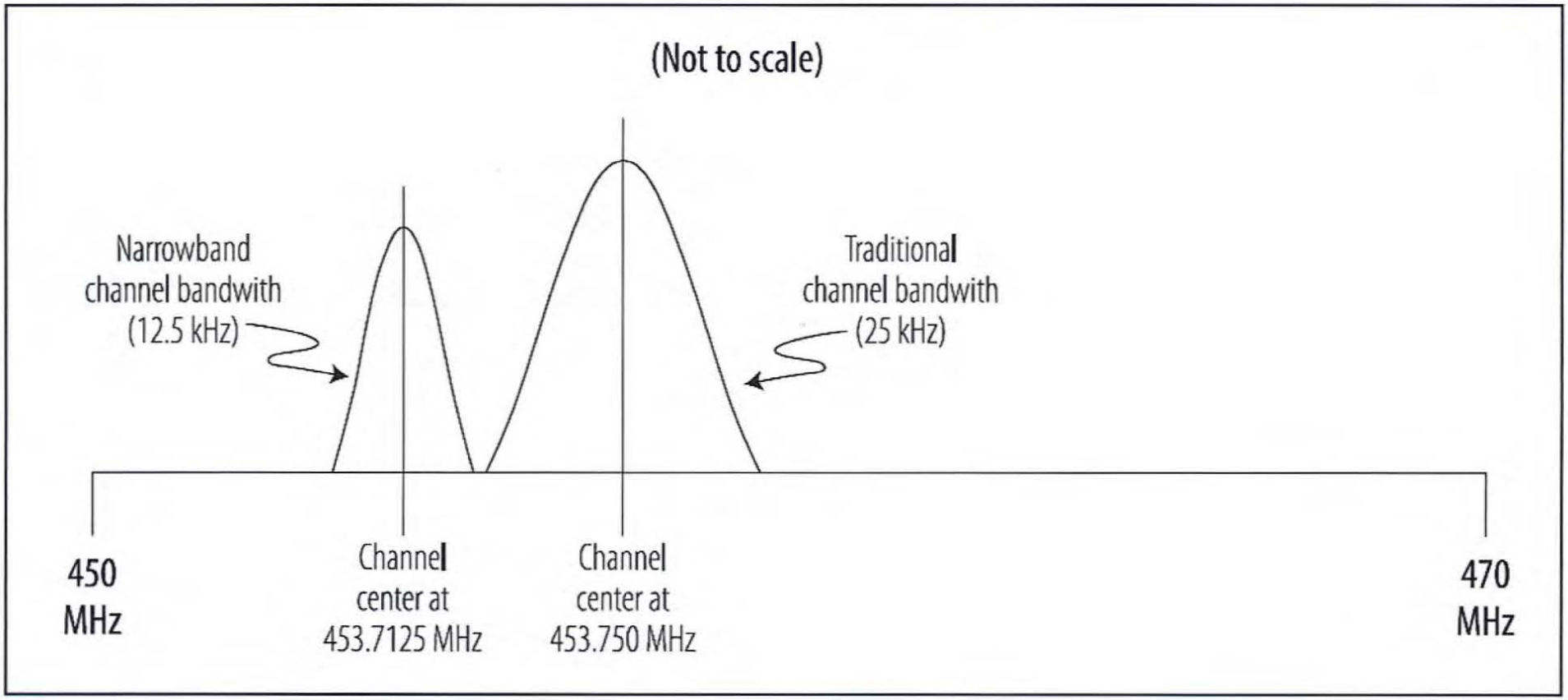
www.cops.usdoj.gov/Publications/e090687.pdf

Radio Frequency Spectrum



Source: National Institute of Justice, 2010

Narrowbanding

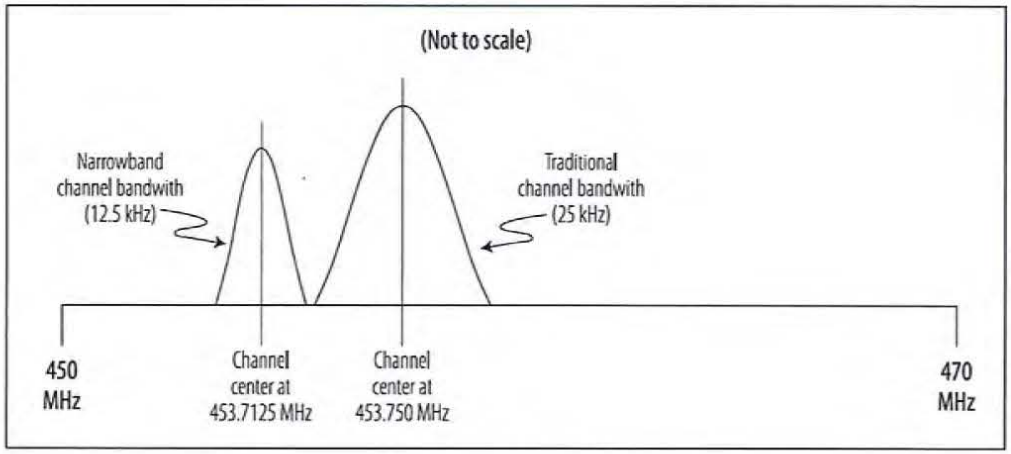


Project 25 – Digital Radio for Public Safety

- **Standards-based Shared System - P25 is synonymous with Public Safety Digital Radio Standards in the United States.**
- **Ongoing joint effort since 1989 between Association of Public-Safety Communications Officials, Intl. (APCO), the National Association of State Technology Directors (NASTD), the Telecommunications Information Administration (TIA) and agencies of the Federal Government.**

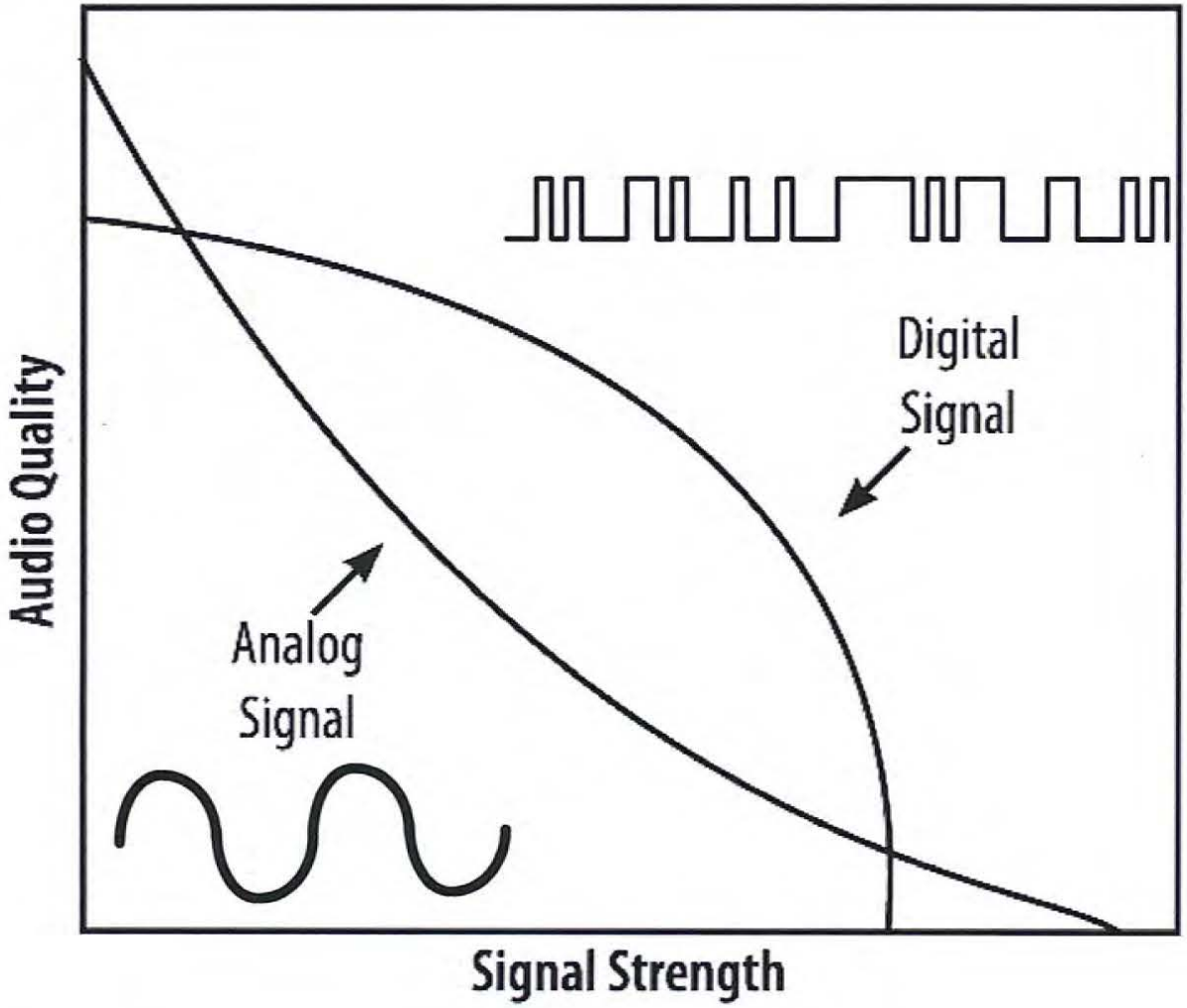
Project 25 – Digital Radio for Public Safety

- The goal of P25 is to ensure a future with an open standards-based alternative for Public Safety digital radio systems
- Phase One is for 12.5 kHz channels and Phase Two is for 6.25 kHz channels



- P25 has eight defined interfaces
  - Common Air Interface (CAI)
  - Console Subsystem Interface (CSSI)
  - Data Interface
  - Fixed Station Interface (FSI)
  - Inter-RF Subsystem Interface (ISSI)
  - RF Subsystem Interface (RFSS)
  - Subscriber Data Peripheral Interface (MDTs, etc.)
  - Telephone Interconnect Interface

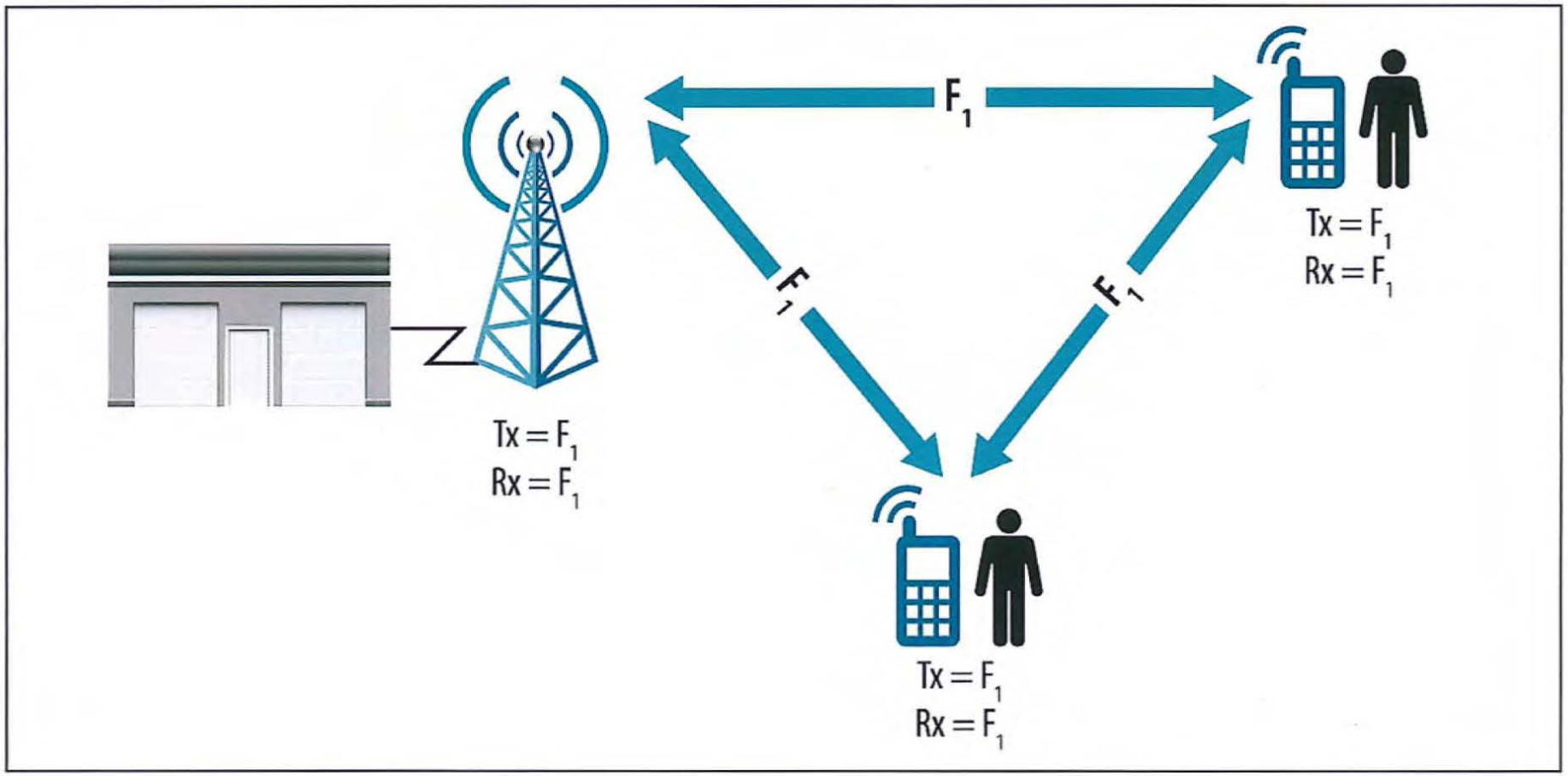
Digital and Analog: Features & Benefits



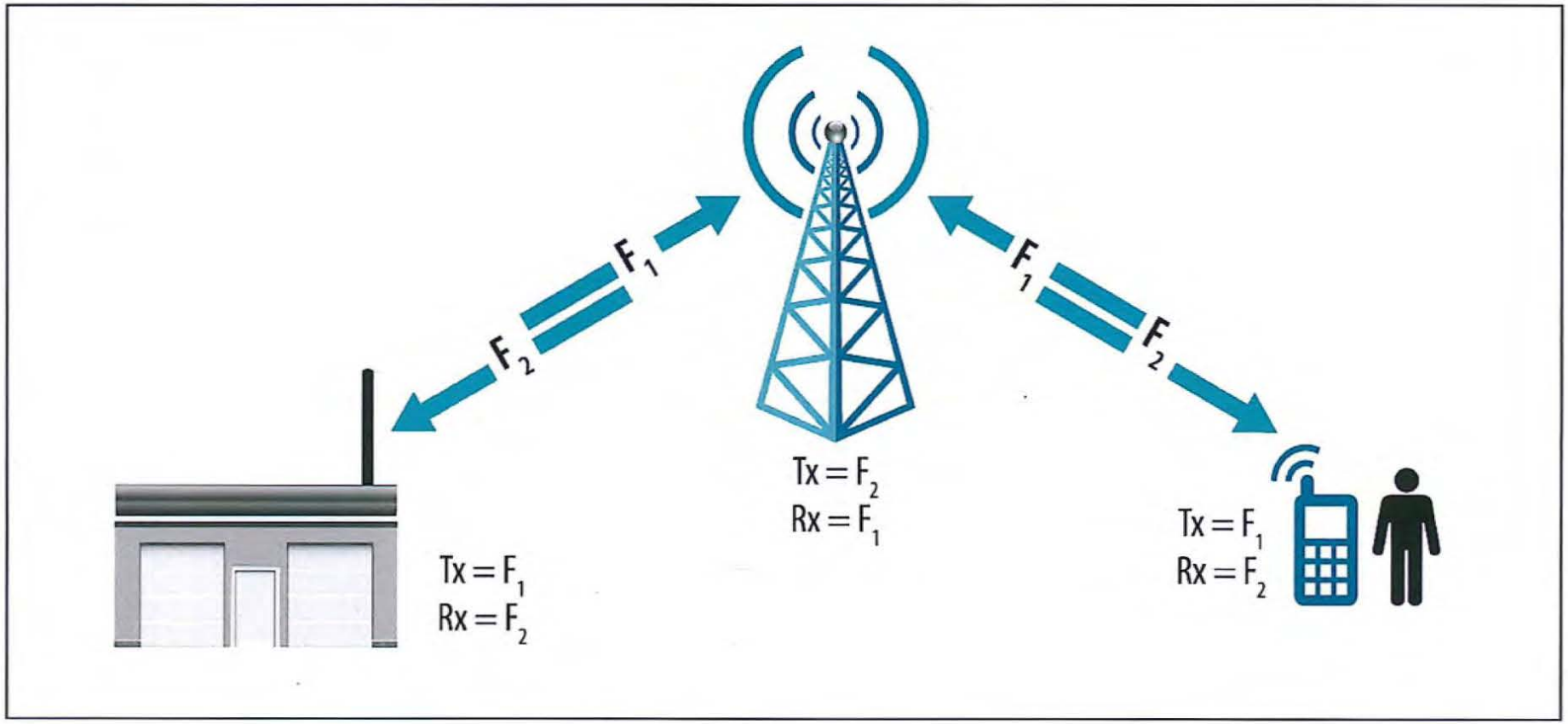
Digital Benefits:

- Effective audio improvements
- Embedded signaling options
- Encryption options

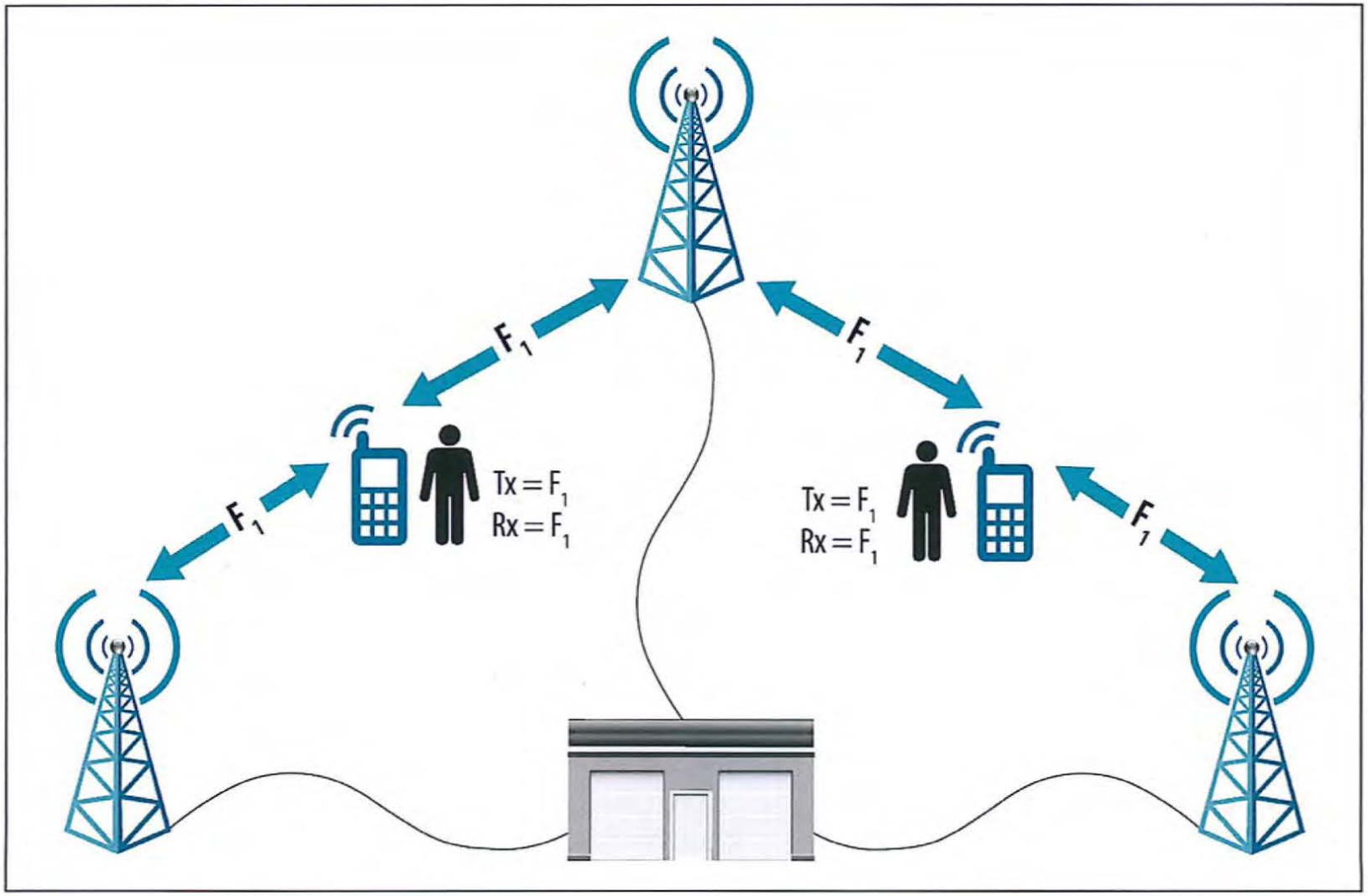
Simplex Radio (Fixed Base)



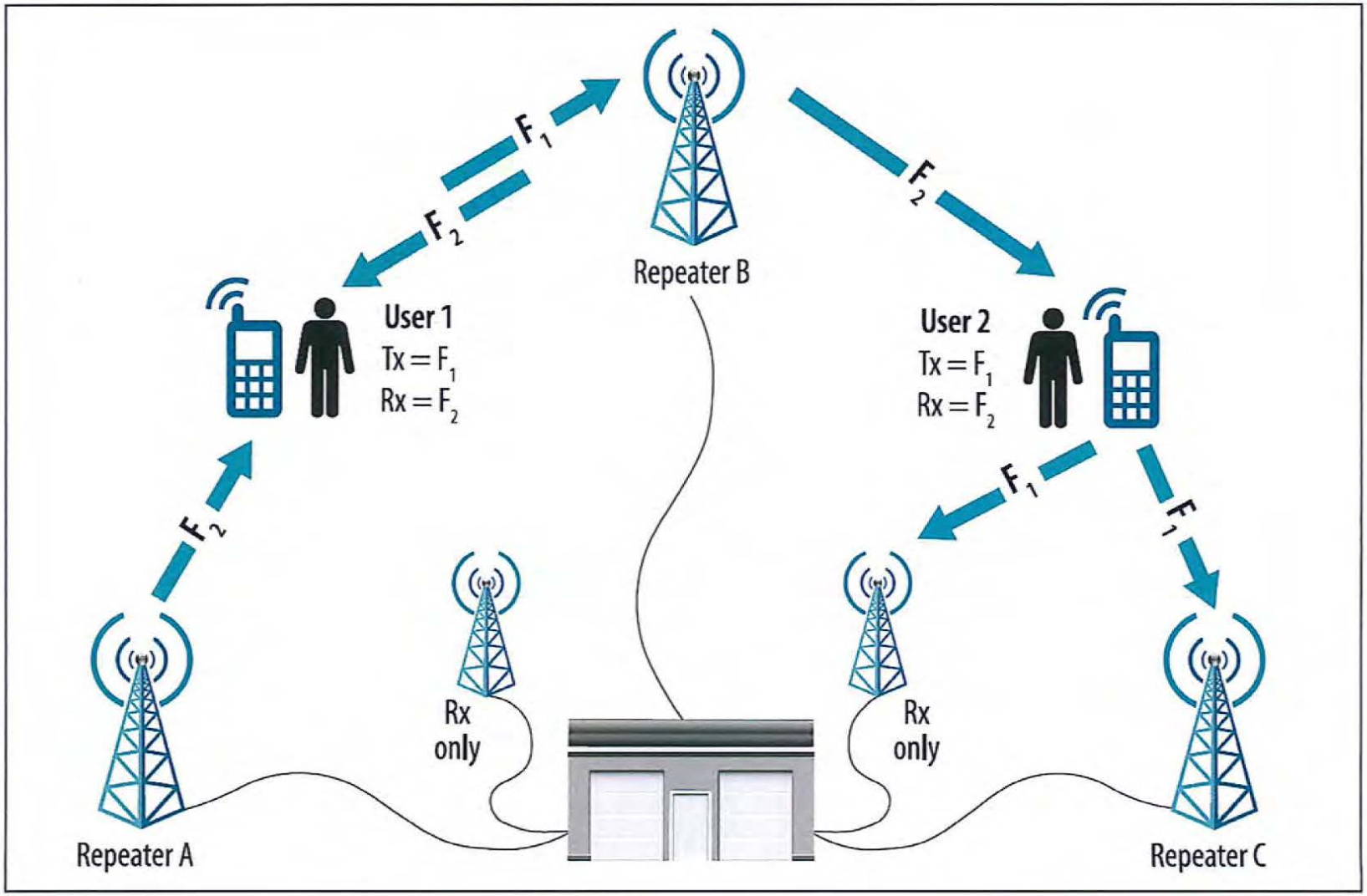
Half-duplex Radio (Repeater, Mobile Relay)



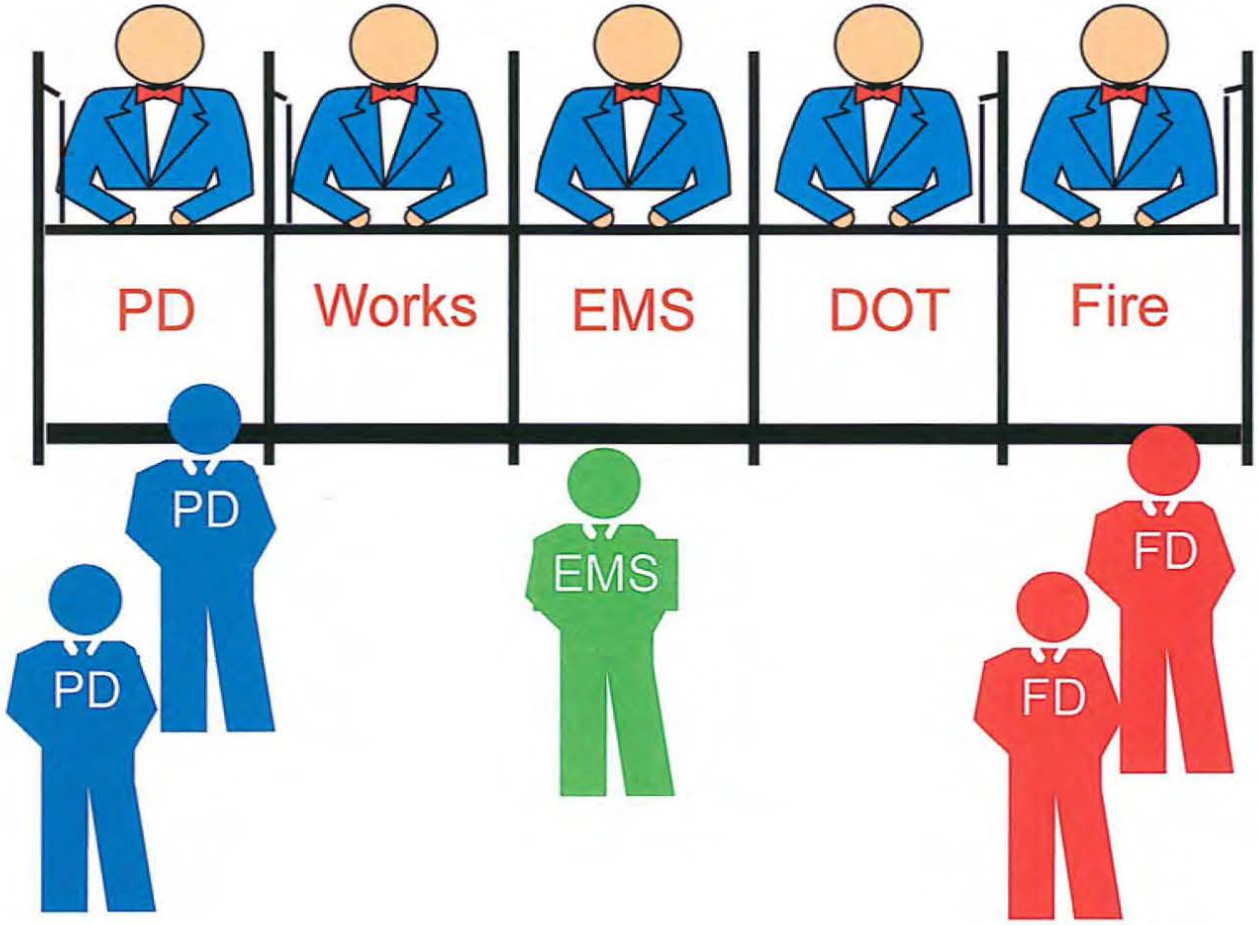
Simulcast Simplex Radio



Simulcast Repeaters w/Remote Receivers



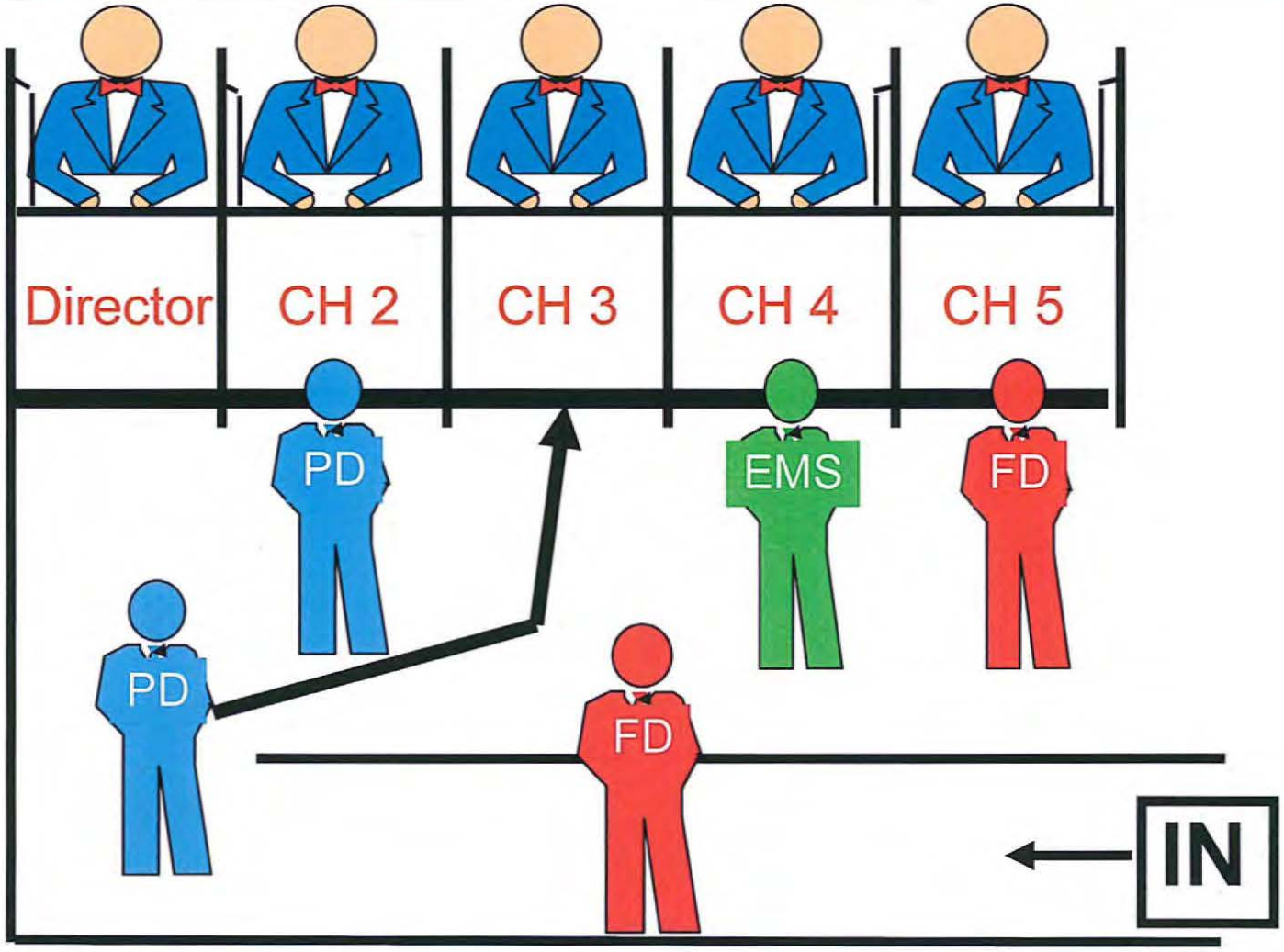
Conventional Radio – Channel Allocation



Source: GeoComm, 2010

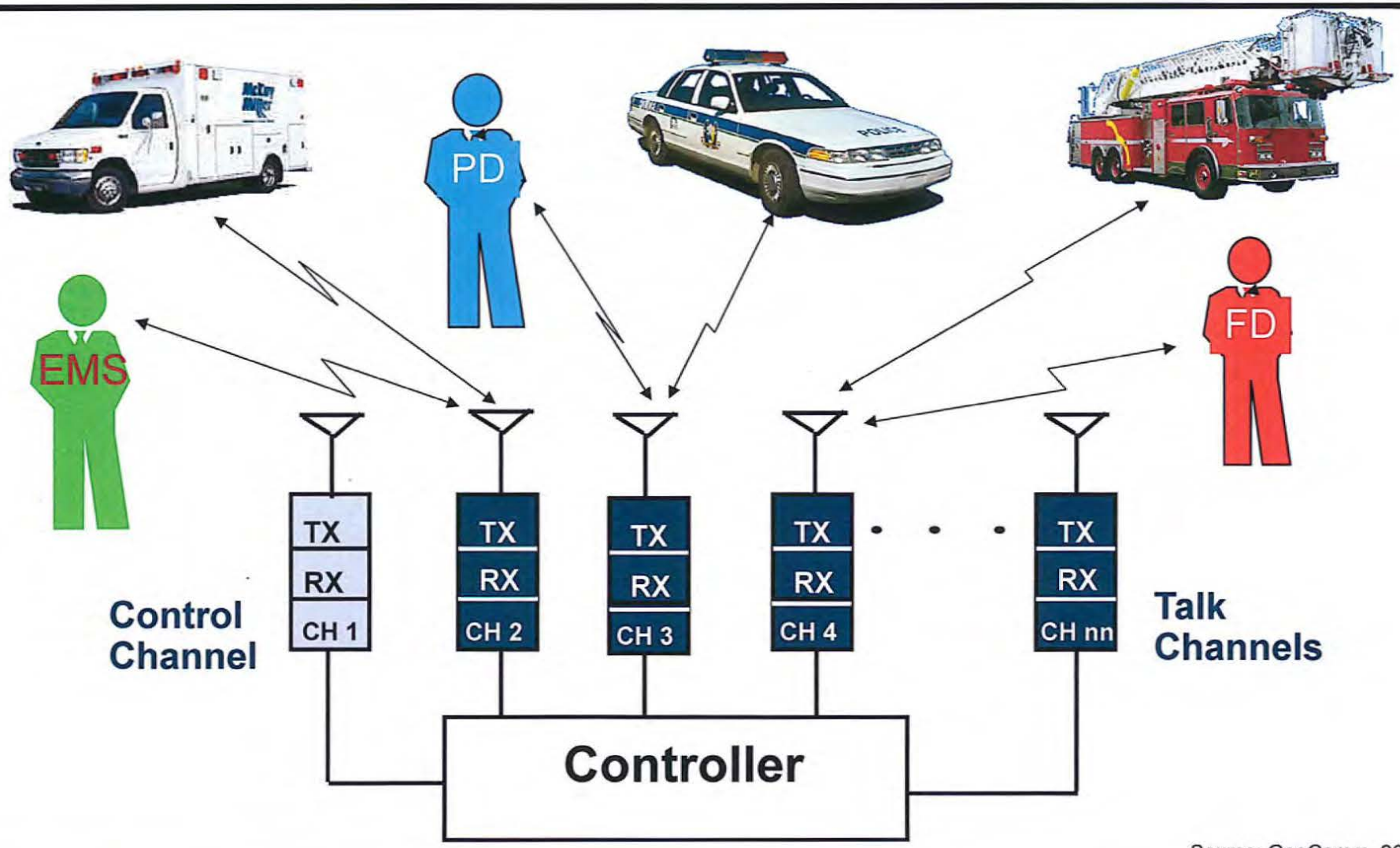
Trunked Radio – Channel Allocation

Queue Served by First Available Teller



Source: GeoComm, 2010

Trunked Radio – Block Function



Source: GeoComm, 2010

Trunked Systems - Pros

- Advanced coverage capabilities
  - Commonly incorporate simulcast and remote receiver capabilities
- Flexibility
  - System-wide ability to create virtual channels and assign radio resources as needed
- Efficiency
  - System, itself, can contribute by balancing demand across physical radio resources
  - Greater channel efficiency may mean they are the only choice where spectrum resources are scarce

Trunked Systems - Cons

- Costly
  - Expect 50% more for a trunked system over a conventional one with same number of sites and radios
- Greater complexity and potential for failure
  - Typically "fail-soft" systems, operating in degraded mode as components fail or become unavailable
    - Trunking still ultimately depends on fixed infrastructure to work
  - Final fail-soft mode for trunked radio systems is to operate conventionally
  - Either on the system or off – and that's not always clear
- Proprietary features are pushed

Trunked System Costs (VHF)

Wyoming

- 70 site system (initial plans were for 57 sites)
- Started in 2004 (RFP); 41 sites by 2009
- Current cost: $62M (w/o user radios)
- O&M: $2M/yr.
- Planned upgrade: $5M/yr. for next 10 years
  - Includes controller, site radios, and console upgrades
  - 10 years is considered the life of the system

✓ VHF-high band ✓ Trunked
✓ Fully P25 ✓ Existing backbone

Trunked System Costs (VHF)

South Dakota

- 54 site system (four more simulcast; initial plan – 35 sites)
  - Initial coverage: 90% Current coverage: 98%
- Started in 2002; full operations in October 2003
- Current cost: $75-100M w/upgrades & user radios ($20M)
- O&M: $2.7M/yr. (including $884K/yr. lease through 2025)
- Planned upgrade: Additional sites, as possible, at $250K/ea.
  - $10M more for full P25
  - Includes controller, site radios, and console upgrades

✓ VHF-high band
~~Fully P25~~
✓ Trunked
✓ Leased circuits

Trunked System Costs (VHF)

Montana

- 121 trunked site system – planned
  - 51 complete (Dec 2013)
- Started in 2004 (first county RFP)
- Not-for-Profit Disbanded in 2011
- Current cost: $56M – approximately ½ complete
- O&M: $3M appropriation for FY2014/15
- Planned upgrade: N/A

✓ VHF-high band ✓ Trunked
✓ Fully P25 ~~Existing backbone~~

Satellites?

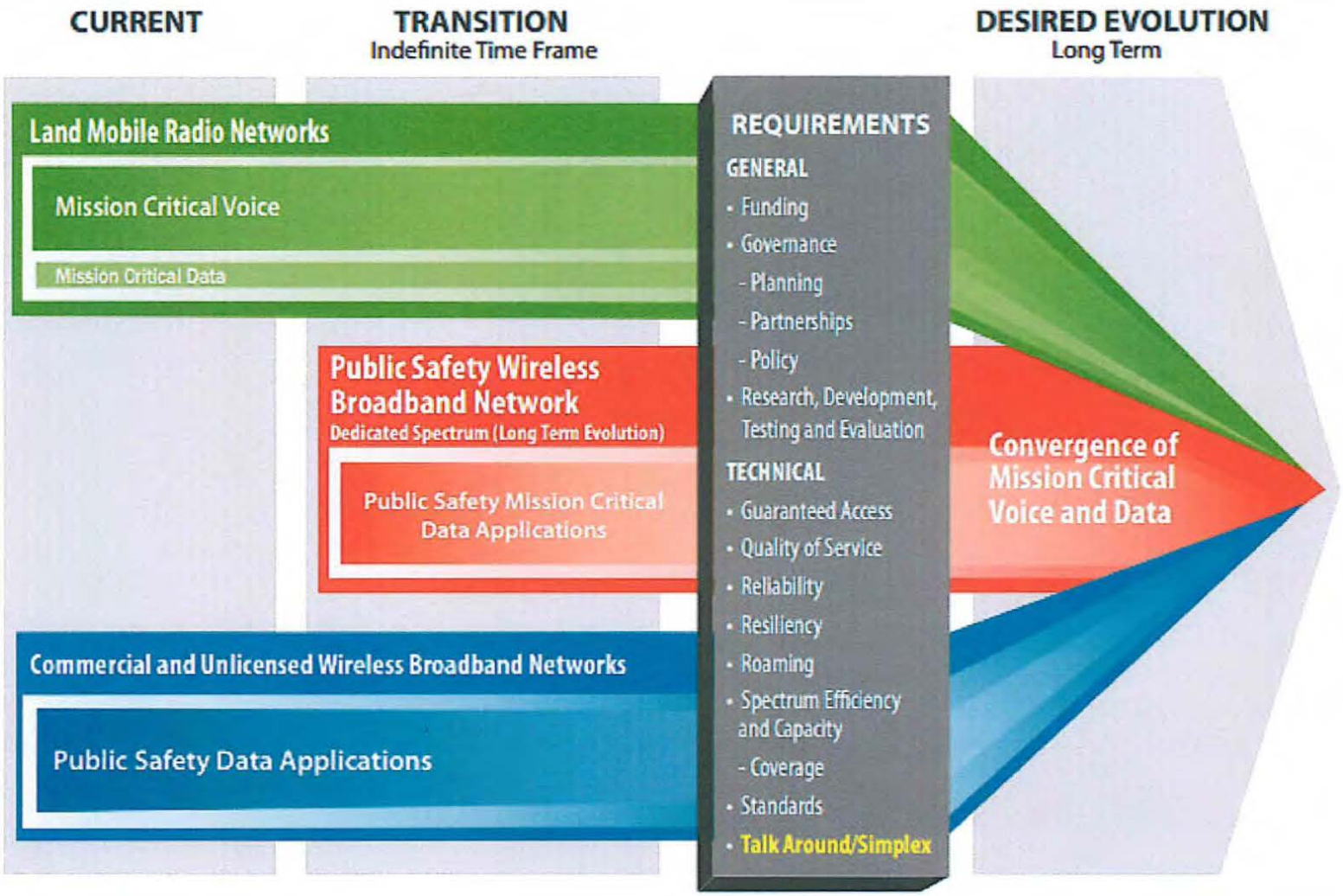
- **One-to-many communications**
  - Most commonly telephone-like services
  - Do not provide *immediate*, one-to-many sort of radio conversations expected by public safety responders
  - Lightsquared offers shared talkgroups to push-to-talk subscribers
- **Coverage**
  - Don't reach far inside buildings or dense vegetation
  - Different systems have different coverage and capacity limitations

Satellites? (cont.)

- **Portability limitations**
  - Even low-earth orbit (LEO) satellites are far away
  - Require bulkier antennas and substantial battery power
- **Capacity limitations**
  - Many channels are needed for larger events
  - One-to-one and one-to-few communications needs predominate

Evolution of Communication

Public Safety Communications Evolution



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