



Montana Public Safety Communications System

Brief to the Energy and Telecommunications
Interim Committee

By

Warren Dupuis

September 7, 2012



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Purpose

- Provide an overview of the Montana Public Safety Communications System to Include:
 - Interoperability History
 - Executive Order 13-2011
 - Current Program Overview
 - Future of the Program
 - Anticipated Legislative Involvement



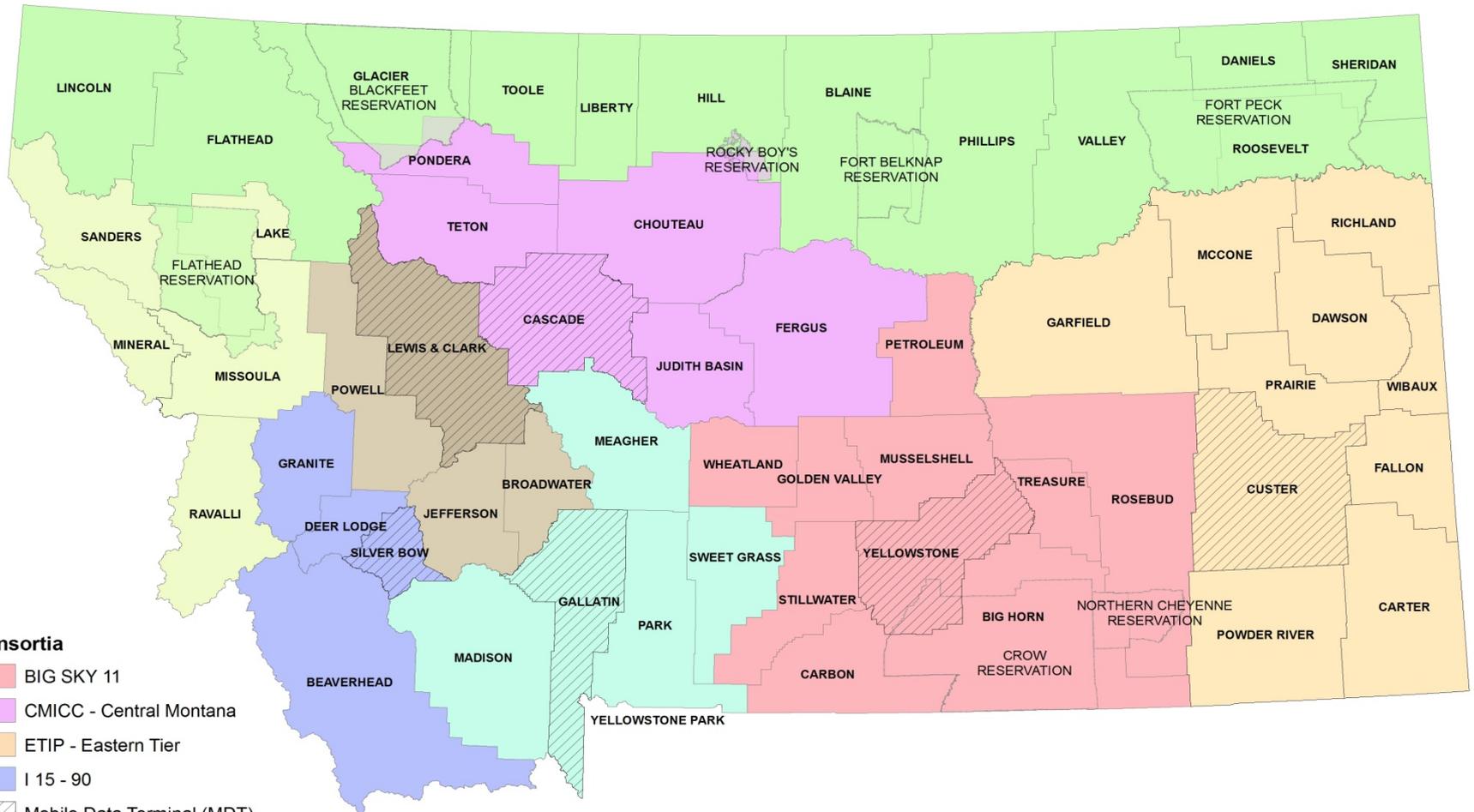
Interoperability History



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Montana Interoperability Consortia



Consortia

- BIG SKY 11
- CMICC - Central Montana
- ETIP - Eastern Tier
- I 15 - 90
- Mobile Data Terminal (MDT)
- NTIP - Northern Tier
- SCMIC - South Central Montana
- SWIP/TRI-COUNTY
- WICC - Western

0 45 90 180 Miles





Executive Order 13-2011

Establishing a statewide interoperability Governing Board to direct the operation of the statewide public safety radio system formally operated by Interoperability Montana



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Statewide Interoperability Governance Board

November 22, 2011

Meeting Time: 10:00 a.m. - 12:00 p.m.

Meeting Location: State Capitol, room 152

Contact Us

Statewide Interoperability Governance Board

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- [SIGB Members](#)
- [By-laws](#)
- [Charter](#)
- [Statewide Communication Interoperability Plan](#)
- [eCalendar](#)

Upcoming 2012 Meetings

- [February 7, 2012](#)
- [March 13, 2012](#)
- [April 10, 2012](#)
- [May 8, 2012](#)
- [June 12, 2012](#)
- [July 10, 2012](#)
- [August 7, 2012](#)
- [September 11, 2012](#)
- [October 9, 2012](#)
- [November 13, 2012](#)

Previous Meetings

- [January 10, 2012](#)
- [December 13, 2011](#)
- [November 22, 2011](#)

- [Agenda](#)
- [SIGB Bylaws](#)
- [SIGB Charter](#)
- [Metrics](#)
- [LFC Report](#) and the Expanded Project [Report](#)
- Statewide Communication Interoperability Implementation [Report](#)
- 2011 Statwide Communications Interoperability Plan update [presentation](#)





SIGB Technical Working Group

- *Advise the SIGB on operational policies and standardized operating procedures*
- *Development of state-wide standards that are consistent with the Montana SCIP; National Emergency Communications Plan; National Broadband Plan and other pertinent State and Federal documents.*





SIGB Legislative Working Group

Using the “Whole Community Approach” the working group is made up of representative from the same organizations participating on the 9-1-1 Advisory Council plus state public safety

- *A disaster & emergency services representative*
- *A public safety communications official representative*
- *A chief of police representative*
- *A county government representative*
- *An emergency medical services representative*
- *A city and municipal government representative*
- *A sheriff's and peace officers representative*
- *A state fire chiefs representative*
- *A state volunteer fire fighters representative*
- *Statewide Interoperability Coordinator*



Purpose of Legislative Working Group

The Legislative Working Group's Charter is to draft Legislation for the Board to:

- Codify the Role, Responsibility, and Authority of the SIGB
- To secure funding for the long-term operation and maintenance of the system
- To secure funding for planning and match requirements to build out the system





Expected Local Government Investment and Involvement



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Current Program Overview



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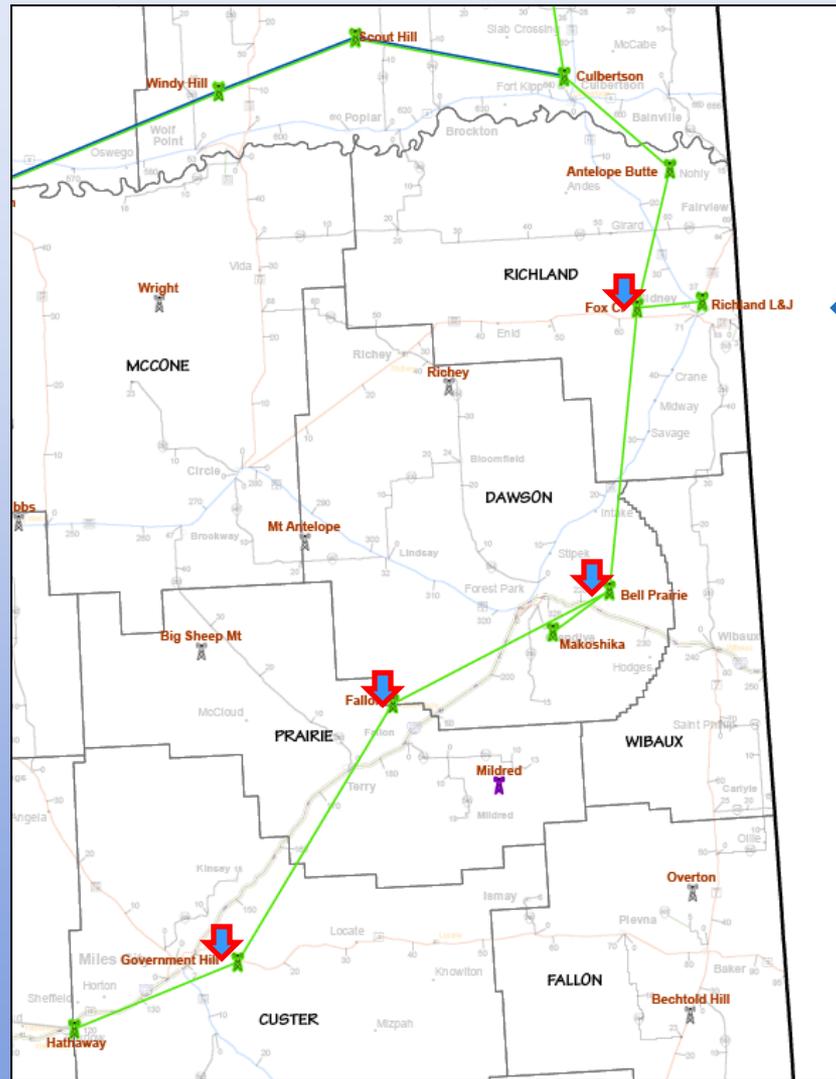


Progress Made to Original Plan

Infrastructure				Microwave				Trunking			
Complete	In progress	Planned	Total	Complete	In progress	Planned	Total	Complete	In progress	Planned	Total
96	4	42	142	86	6	48	140	48	6	66	121
68%	3%	30%		61%	4%	34%		40%	5%	55%	

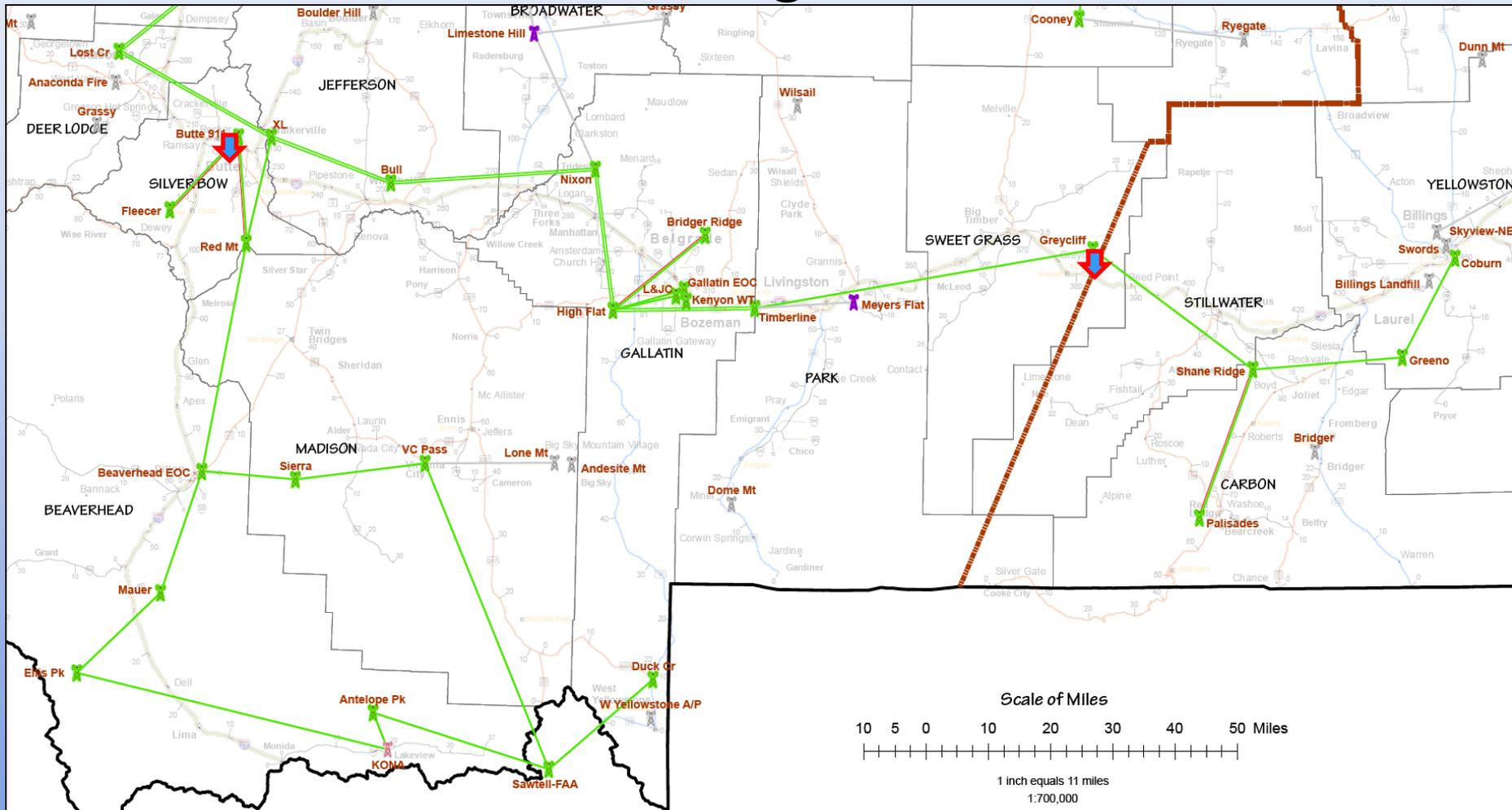


North East Microwave & Trunking



2nd Zone Controller

South West Trunking



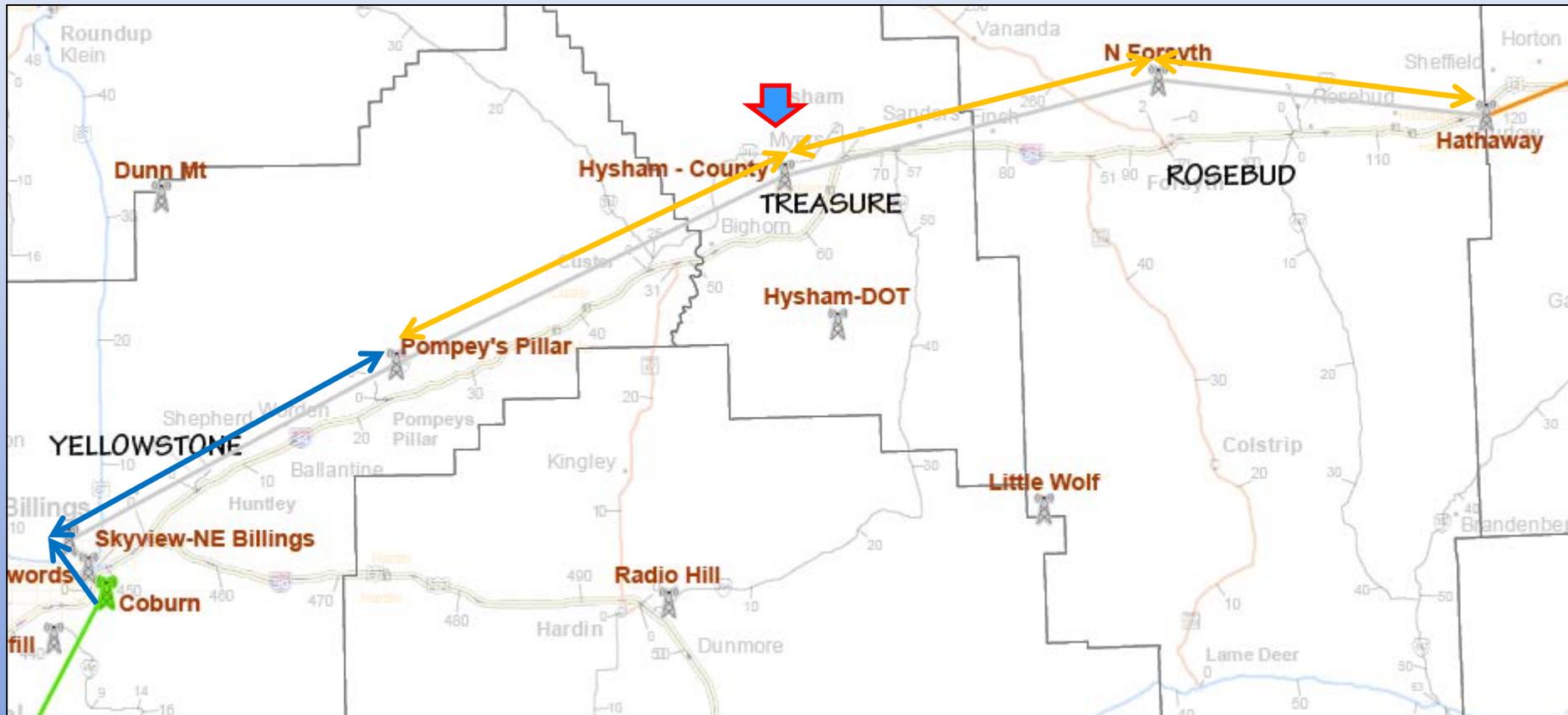
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Installed Trunked Radio System



South Central Microwave

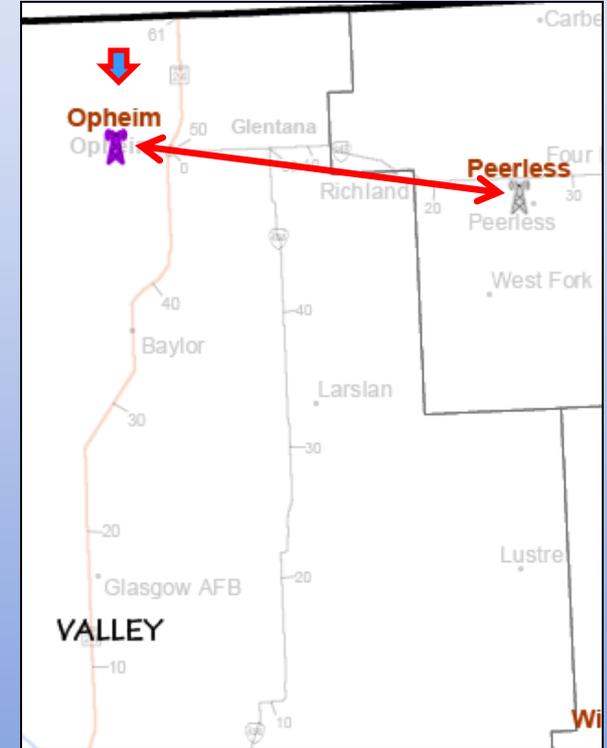




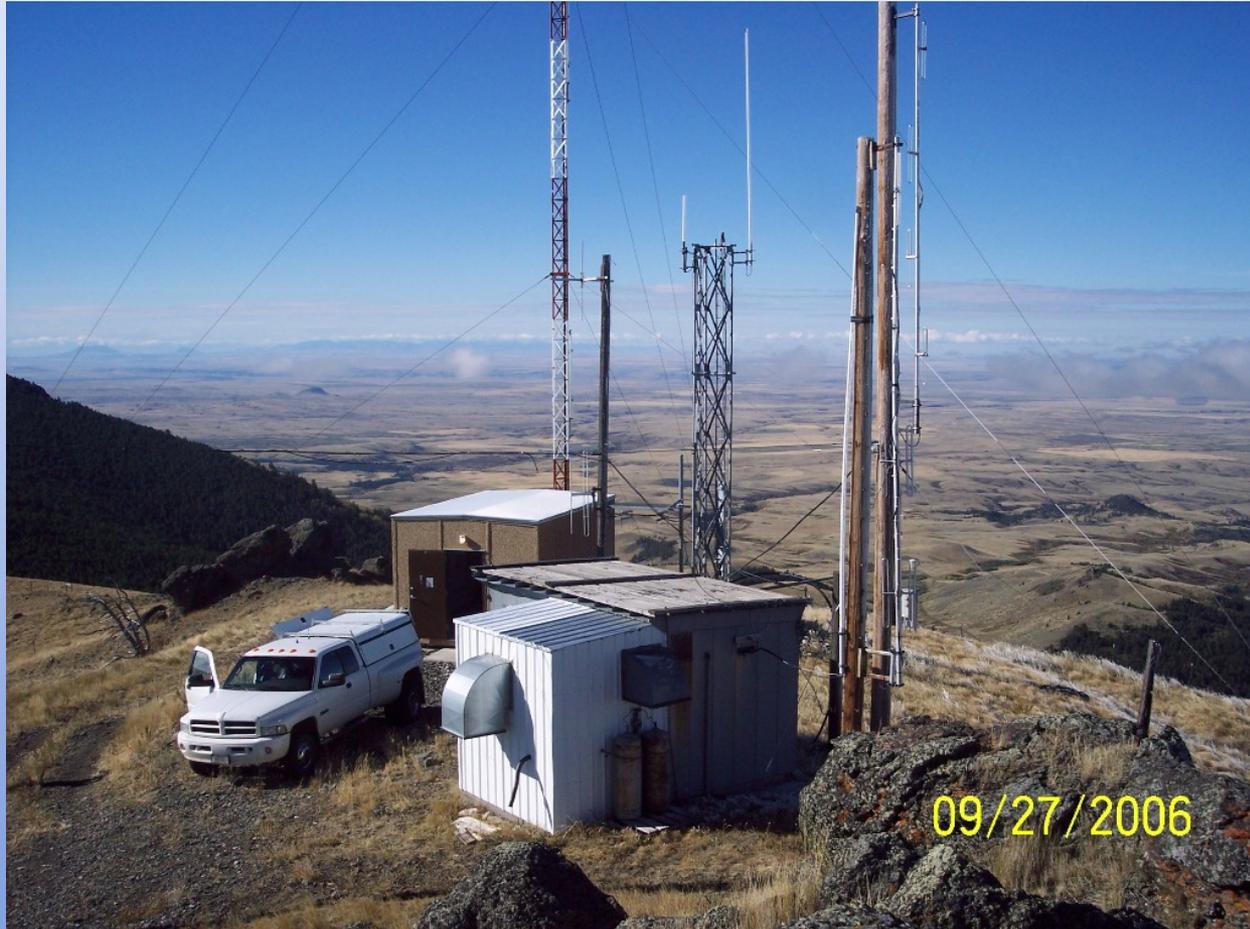
Hysham Site



Border Interoperability Demonstration Grant



BLM Site at Centennial Rocky Boys Reservation





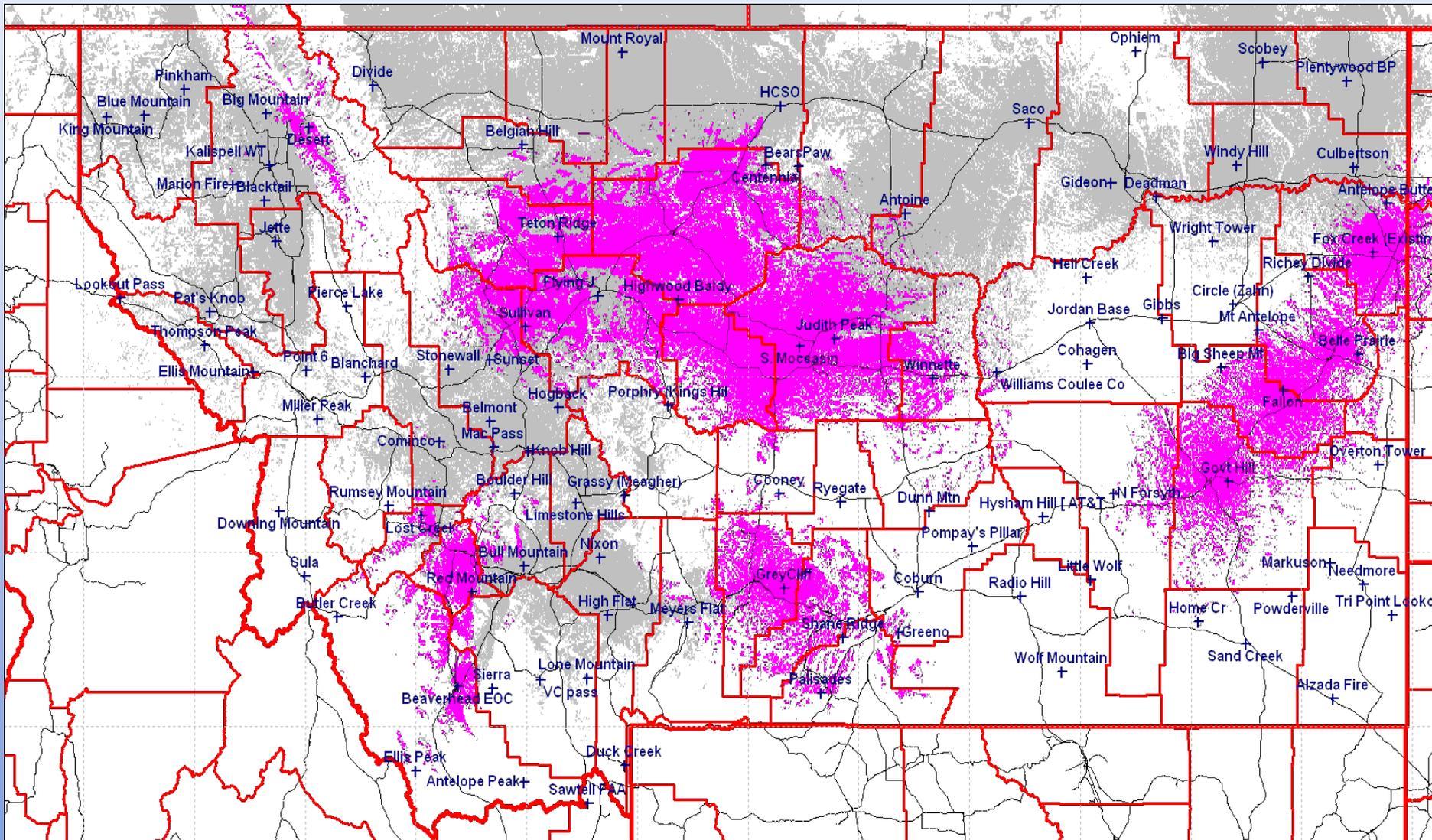
Trunked Covered Metrics

		Trunked Coverage	Montana Total
Roads (miles)	43.8%	5703	13,014
Population (towns)	34.2%	334,077	974,989
Population (county)	61%	595,106	989,415
SQ Miles	46%	67,730	147,042

Number of Operational Trunked Sites = 48
Outbound Mobile Coverage for each site as provided by Motorola.
Roads include Interstate, US, MT, Secondary only.
Population as of 2010 Source U.S. Census Bureau



Trunked Radio Coverage





Montana Public Safety Communications Status Web Site

- Microwave Status:

[//apps.arcgis.com/hosted/Legend/chrome/index.html?appid=6d51939493d4490dbec4f63130967988&webmap=999952cfa867450f9b61a692ab4de9af](https://apps.arcgis.com/hosted/Legend/chrome/index.html?appid=6d51939493d4490dbec4f63130967988&webmap=999952cfa867450f9b61a692ab4de9af)

- Trunked Status:

[//apps.arcgis.com/hosted/Legend/chrome/index.html?appid=d0a58814a2af4bc7bf08b95d6fdb17d2&webmap=53b6a74bc23f4221a25ee055fb6f9829](https://apps.arcgis.com/hosted/Legend/chrome/index.html?appid=d0a58814a2af4bc7bf08b95d6fdb17d2&webmap=53b6a74bc23f4221a25ee055fb6f9829)





Future of the Program



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Future of the Program



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Office of Emergency Communications:

Fiscal Year 2012

SAFECOM Guidance
on Emergency Communications Grants



Homeland
Security



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FY 2012 Emergency Communication Priorities

- Priority 1: Leadership and Governance
- Priority 2: Statewide Planning for Emergency Communications
- Priority 3: Emergency Communications Training and Exercises
- Priority 4: Other Integral Emergency Communications Activities
- Priority 5: Standards-Based Equipment
- Priority 6: Investment and Migration Planning for Next Generation Technologies





What is Broadband?

Broadband or high-speed Internet allows users to access information and public safety applications at significantly higher speeds than “dial-up” Internet access services.

As of 2010, the Federal Communications Commission (FCC), defines “Basic Broadband” as data transmission speeds of at least 4 Megabits per second (Mbps), downstream and 1 Mbps upstream

Broadband access is accomplished through exchanges of data over physical systems that are capable of high speed and high capacity.

Broadband technology encompasses:

- **Digital Subscriber Line (DSL)**
- **Cable Modem**
- **Fiber-Optic Cable (Fiber)**
- **Wireless**
- **Satellite**
- **Broadband over Powerline (BPL)**

Public Safety Radio Systems – Current State

Land Mobile Radio (LMR) Systems

- Major Public Safety investment
- Mission Critical Voice
- 55,000 Public Safety Agencies
- Operating Across 6 Radio Bands
- Provides data capabilities



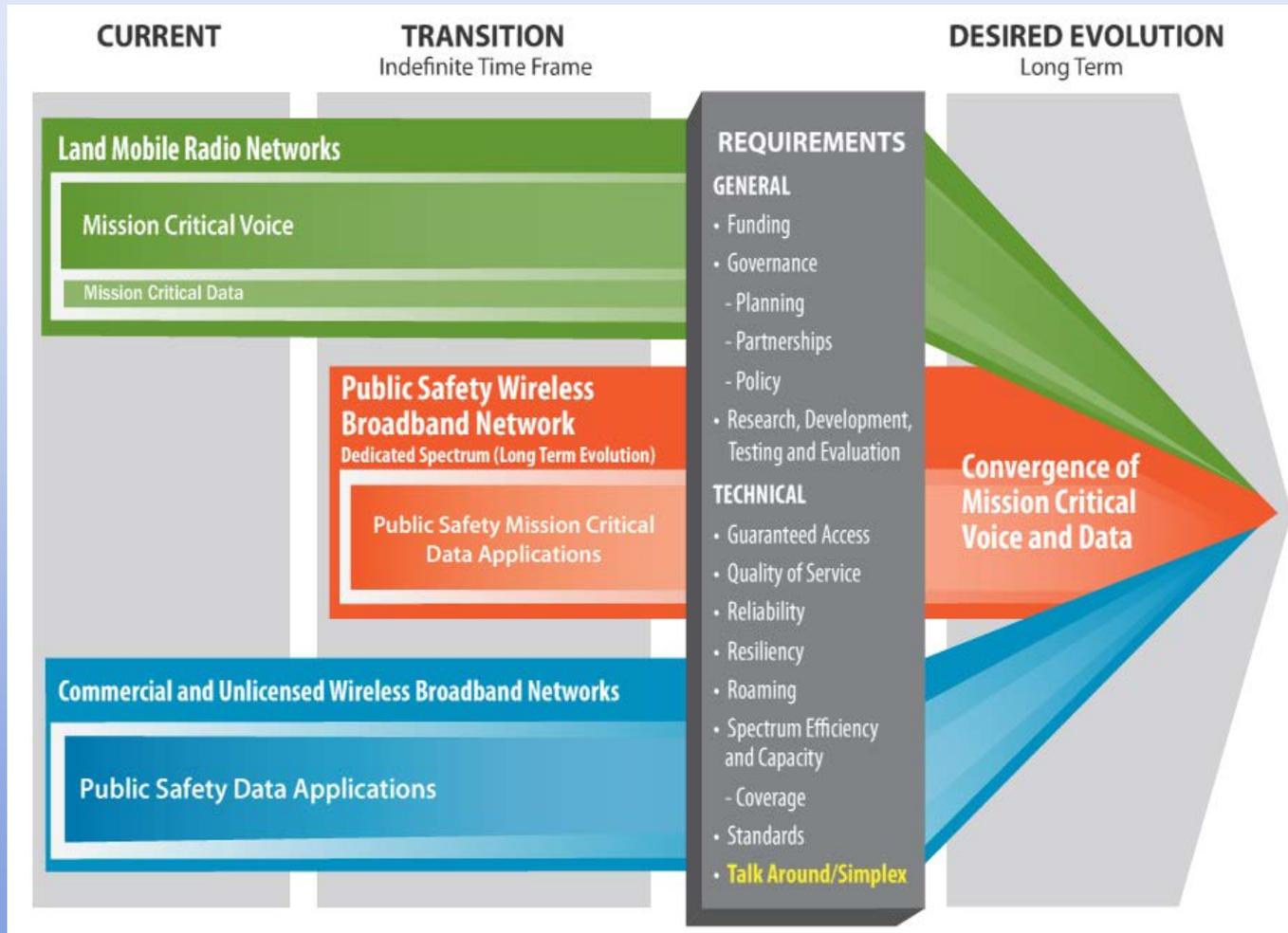
Public Safety Owned Data Systems

- Legacy technologies, some remain on analog wireless data systems
- Capacity, Speed, and Coverage less than current broadband offerings
- Use a mixture of technologies - RDLAP, Mesh, Point-to-point, point-to-multi-point, Muni-WiFi

Commercial Broadband

- Consumer grade of service
- No priority for Public Safety
 - Services may be inaccessible during significant events
- Available only where there is a significant customer base

Public Safety Communications Evolution



This conceptual framework outlines building wireless broadband data communications while maintaining LMR networks to support mission critical voice communications

What is Long Term Evolution (LTE)?

- Long Term Evolution (LTE) is a commercial wireless technology that allows substantially higher data transmission rates
- LTE is part of the Global System for Mobile Communications (GSM) evolutionary path for mobile broadband that includes EDGE, UMTS, HSPA and HSPA+
- Benefits of LTE include:
 - Reduced latency and cost from a simplified, flat architecture from an all IP, packet-based network
 - Spectrum agile supporting different bands
 - Bandwidth scalability from 1.25 to 20 MHz
 - Technology uses worldwide standards development through Third Generation Partnership Program (3GPP)





Highlights of the Enacted Legislation

Middle Class Tax Relief and Job Creation Act of 2012

Title VI: Public Safety Communications and Electromagnetic Spectrum Auctions



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Overview: Spectrum and Funding

On February 22, 2012, the President signed the Middle Class Tax Relief and Job Creation Act of 2012

- Spectrum Provisions
 - Reallocates the 700 MHz D Block spectrum to public safety
 - The Federal Communications Commission (FCC) is authorized to reallocate and auction the 470-512 MHz (T-Band) spectrum currently used by public safety entities within 9 years of enactment. Auction revenue will be used to reimburse relocation from the T-Band
- Funding Provisions
 - Authorizes the FCC to conduct incentive auctions to raise \$7 billion for building and managing the Nationwide Public Safety Broadband Network (NPSBN)
 - Authorizes NTIA to provide \$135 million to supports State and local efforts to plan and integrate with the NPSBN
 - Sets aside \$20.4 billion in incentive auction revenue for deficit reduction



Overview: Access and Governance

- Access to the NPSBN is provided for:
 - Emergency response providers, including Federal, State, and local governmental and non-governmental emergency public safety, fire, law enforcement, emergency response, emergency medical (including hospital emergency facilities), and related personnel, agencies, and authorities
 - Secondary users including non-public safety entities (e.g., utilities, critical infrastructure providers)
 - The NPSBN is precluded from providing commercial services directly to consumers
- Nationwide Governance
 - The First Responders Network Authority (FirstNet) is established for planning, construction, and operation of the NPSBN



Technical Advisory Board for First Responder Interoperability

- Responsible for developing minimum technical requirements for the NPSBN to ensure nationwide interoperability
 - Requirements were based on Long Term Evolution (LTE) standards, and consultation with OEC, NTIA, and the National Institute of Standards and Technology (NIST)
 - The FCC announced members on March 22, 2012
- 14 voting members and 1 non-voting member:
 - Four represented public safety
 - Three represented state and local governments
 - Four represented wireless providers (two national, one regional, and one rural)
 - Three represented equipment manufacturers
- Submitted 46 recommendations and 55 major considerations in the following areas to the FCC on May 22, 2012, for FirstNet consideration for future network planning
 - 3GPP LTE Standards, Interfaces & Guidelines
 - User Equipment & Device Management
 - Testing
 - Evolution
 - Handover & Mobility
 - Grade of Service
 - Prioritization & Quality of Service
 - Security





FCC's Technical Advisory Board Recommendations

- The scope of the minimum requirements was technical interoperability,
 - Defined as “the ability of two or more systems or components, from the same or different manufacturers or service providers, to successfully exchange data and use information based on underlying interface standards.”
 - Excluded governance, operational policy and procedural practices required for interoperability
 - Did not assume any particular network architecture
 - Used the Third Generation Partnership Project (3GPP) LTE Release 9 as the baseline reference point
- The FCC released a Public Notice seeking comment on the recommendations by May 31, 2012. They finalized recommendations and transmitted them to NTIA on June 21, 2012 for FirstNet’s review and use upon stand-up
- The Interoperability Board was terminated on July 6, 2012
- Link to Recommendations: <http://www.fcc.gov/document/recommendations-interoperability-board>

Nationwide Governance

	First Responder Network Authority (FirstNet)
Overview	<ul style="list-style-type: none">▪ New independent authority within the Department of Commerce - NTIA▪ Required to have a standing public safety advisory committee▪ Actual licensee for 700 MHz broadband spectrum▪ Responsible for constructing and operating the network▪ Initial funding of \$2B / Total \$7B
Board Members	<p><u>15 Total Members:</u></p> <ul style="list-style-type: none">▪ DHS Secretary▪ Attorney General▪ OMB Director▪ 12 Members (with public safety, technical, or financial expertise) including at least:<ul style="list-style-type: none">• 3 Public Safety Professionals• 3 State/Local/Tribal Representatives

Responsibilities of FirstNet

- Planning, constructing, operating, and managing the NPSBN
- Building the network based on open, commercial standards for use and access
- Issuing and managing contracts with non-Federal entities to build and operate the network
- Establishing network policies
- Issuing requests for proposals for network build-out
- Encouraging the use of existing wireless infrastructure (commercial and/or public safety)
- Act requires FirstNet to establish milestones for rural build-out & coverage
- Instructed to utilize “advantages offered through partnerships with existing commercial providers”
- Consultation: On all matters below, FirstNet will consult with Federal, State, tribal, and local public safety entities, NIST, FCC and the public safety advisory committee
 - Management
 - Standards
 - Certified Equipment List
 - RFPs
 - Commercial Infrastructure
 - Contracts
 - Cyber-Security
 - PSAPs
 - Rural Deployment
 - Prohibition on Consumer Service



NPSBN Funding

- The Act establishes the Public Safety Trust Fund to support NPSBN efforts
- As auctions revenues are deposited in the Fund, they are allocated in priority order

Fund	Distribution	Description
1) State and Local Implementation Fund (NTIA)	\$135M	Supports State and local efforts to plan and integrate with the NPSBN. Includes an 80% Federal share. [NTIA may borrow the entire amount upfront]
2) Network Construction Fund (FirstNet)	\$7B	Supports the design, construction, operation, maintenance, and upgrade of the NPSBN [NTIA may borrow up to \$2B upfront]
3) Research and Development (R&D) (NIST)	\$100M	Supports standards, technologies, and applications R&D to advance public safety communications
4) Deficit Reduction (Treasury)	\$20.4B	Supports deficit reduction
5) Grants for 9-1-1/E9-1-1/NG9-1-1 Service (NTIA/NHTSA)	\$115M*	Supports the deployment and operation of 9-1-1/NG9-1-1 services
6) Additional R&D (NIST)	\$200M*	Additional support for standards, technologies, and applications R&D to advance public safety communications



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*Funding only available if certain deficit reduction thresholds are met





State and Local Coordination

- **All Coordination with State and local entities will be with the single officer or governmental body**
- **Consultation:** FirstNet is required to consult with State/locals on issues such as:
 - Construction of an Evolved Packet Core and Radio Access Network
 - Placement of towers / coverage areas of the network
 - Adequacy of hardening, security, reliability, and resiliency
 - Assignment of priority users
 - Training needs



State and Local Planning

- **Planning:** State, regional, tribal, and local jurisdictions will identify, plan, and implement the most efficient and effective way for such jurisdictions to utilize and integrate the infrastructure, equipment, and other architecture associated with the nationwide public safety broadband network
- **Funding:** State and local implementation Grant Program provides \$135M to support planning and implementation efforts
 - NTIA, with FirstNet, must develop guidance within 6 months (August)
 - Requires 80/20% match unless waived by NTIA
 - Grant Program requires States to have designated a single officer or governmental body to serve as the coordinator of implementation of grant funds and interface with FirstNet



Established Timelines

February 2012	President Signs Legislation
March 2012	FCC Appointed Interoperability Board Members
May 2012	Interop Board Sent Technical Recommendations to FCC
June 2012	FCC Approved Technical Recommendations
August 2012	FirstNet Governance Board Members Appointed
TBD	FirstNet Issues RFP for NPSBN construction and operation <ul style="list-style-type: none">• FirstNet will inform Governors of State Plan for Build out and Funding Levels
90 Days After Completion of RFP	States inform FirstNet whether they will participate in NPSBN deployment or build their own RAN
180 Days After Opting-Out	States develop and complete RFPs for constructing, maintaining, and operating the State RAN



On-Going Funding

FirstNet is expected to be self sustaining through the following funding mechanisms:

- **Network User Fee:** Fee from each entity including public safety or secondary user that uses the Network
- **Lease Fee for Network Capacity:** Fee for agreement between the FirstNet and secondary user to permit secondary access
- **Lease Fee for Network Equipment/Infrastructure:** Fee for entity that seeks access or use of antennas, towers, etc. constructed or owned by FirstNet





Broadband Challenges

- ***“Broadband will eliminate the need for land mobile radio communications...”***
 - Despite recent advancements, VoLTE and other standardized solutions do not yet meet public safety needs for mission critical voice (i.e., “talk-around”)
- ***“A nationwide broadband network will make all public safety agencies interoperable...”***
 - Like LMR, technology is only one lane on the Interoperability Continuum
 - Agencies will still need to address interoperability at the operational level such as through standard applications, software, encryption, and proper governance
- ***“Broadband data access will be seamless across the country...”***
 - Roaming will still be limited to public safety broadband coverage areas
 - Multi-band (band class) and multi-mode (backwards compatibility) devices with prior agreements will be required to roam onto commercial networks
- ***“Data rates will be near 100 Mbps (4G)...”***
 - Data rates advertised are the peak rate under ideal conditions and for maximum bandwidth
 - Data rates depend on signal quality, user density, channel bandwidth and advanced antenna enhancements



Questions?



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