FirstNet Information Session

PSBO

Public Safety Broadband Office ™

March/April 2014

Amherst

Worcester

Plymouth

Peabody

Waltham

Agenda

- Introductions
- Overview of the Public Safety Broadband Office
- What is FirstNet and the National Public Safety Broadband Network (NPSBN)?
- Long Term Evolution (LTE) Technology
- Implementation Considerations and Challenges
- FirstNet Progress Update and State Consultation Approach
- What's Next?

Overview of the Public Safety Broadband Office (PSBO)
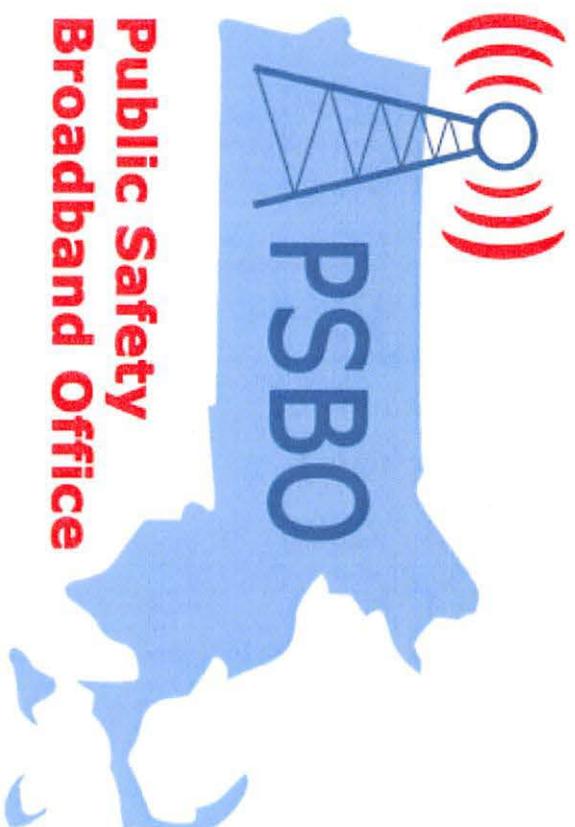
Public Safety
Broadband Office

PSBO

The PSBO Leadership Team

Governor Patrick named Curt Wood the Commonwealth's **mandated single point of contact** with NTIA and FirstNet.

Curt Wood
Undersecretary, Forensic Science & Technology

Steve Staffier
Commonwealth Statewide Interoperability Coordinator

Sean Hughes
Assistant Secretariat Chief Information Officer

Michael Saltzman
Project Director

The Role of the PSBO

The PBSO will collaborate with first responders, public safety entities and other stakeholders in preparation for the deployment of the network in Massachusetts.

- Support the Commonwealth's **mandated single point of contact** with NTIA and FirstNet
- Hold **outreach and information sessions**
- **Solicit feedback** concerning public safety broadband needs and expectations
- **Answer questions**
- Provide **up-to-date information about FirstNet** and public safety broadband activities via our website
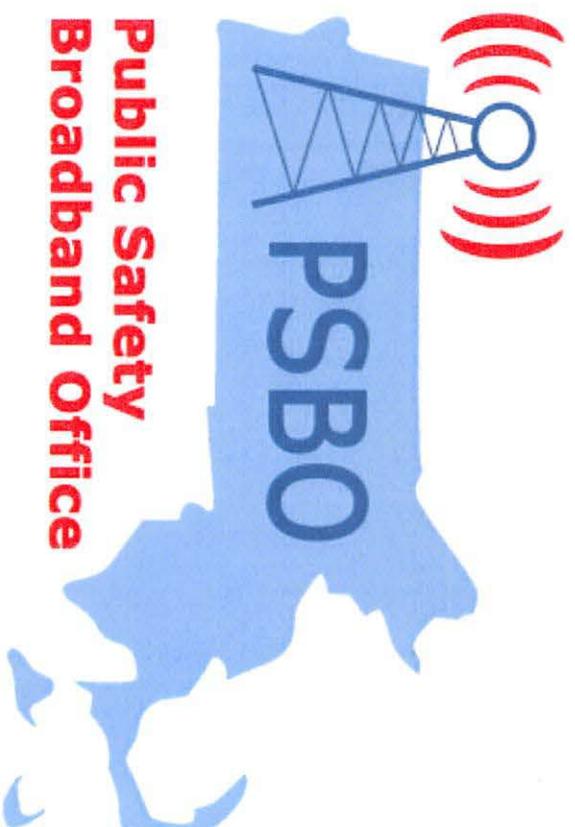
SLIGP Phases I and II Activities

Public Safety Broadband Office

The NTIA has provided funding via the State and Local Implementation Grant Program (SLIGP) for the **first two phases of the NPSBN implementation**. The PSBO is working on these activities.

Phase I: Education and Outreach

Approval to Move to Phase II

Phase II: Data Collection

- Phase I focuses on **governance**, **consultation** with FirstNet, **engagement** of all relevant stakeholders, **education and outreach**, and **identification of potential users** of the NPSBN

- Prior to moving to Phase II, **FirstNet will advise NTIA it is ready** for the commencement of data collection

- Phase II focuses primarily on **collecting requested data for FirstNet** in preparation for the public safety broadband network, as well as continuing activities started in Phase I

WHAT IS FIRSTNET AND THE NPSBN?

**Public Safety
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Origins of FirstNet and NPSBN

THE 9/11 COMMISSION REPORT — FINAL REPORT OF THE NATIONAL COMMISSION ON TERRORIST ATTACKS UPON THE UNITED STATES
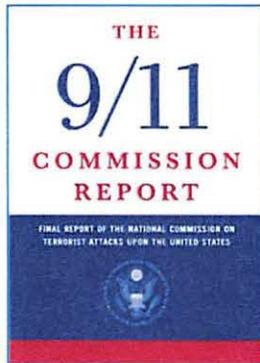
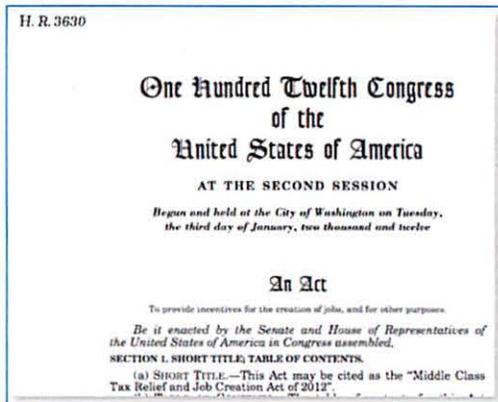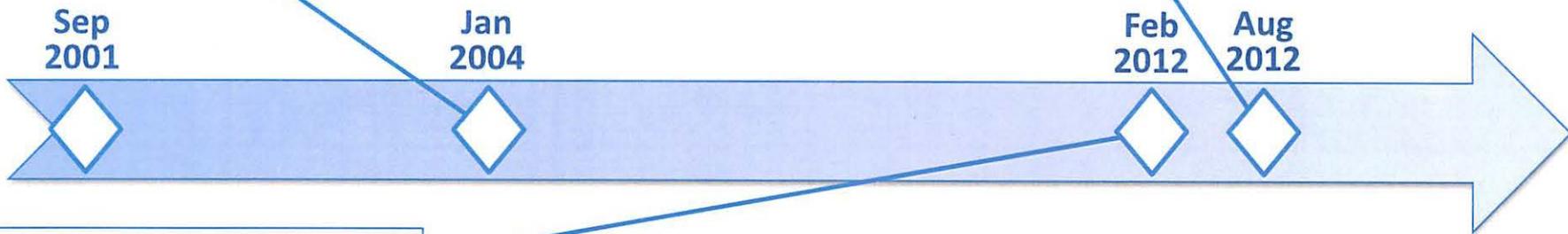9/11 Commission **recommends improved communications** for public safety and first responders.

Dept of Commerce establishes **FirstNet Board**

| Sep 2001 | Jan 2004 | Feb 2012 | Aug 2012 |

H. R. 3630

One Hundred Twelfth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and twelve

An Act

To provide incentives for the creation of jobs, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Middle Class Tax Relief and Job Creation Act of 2012".

Middle Class Tax Relief and Job Creation Act of 2012

- Establishes **Technical Advisory Board** for First Responder Interoperability within the FCC
- Authorized the NTIA to establish **FirstNet**
- Directed FirstNet to establish the NPSBN based on a **single, national network architecture**
- Reallocated **700 MHz D Block spectrum** to public safety (under license to FirstNet)
- **Authorized funding** through spectrum auctions

FirstNet and NPSBN Overview

FirstNet™

The First Responder Network Authority is an independent authority within the National Telecommunications and Information Agency. FirstNet **holds the single public safety wireless license** granted to ensure the building, deployment, and operation of the nationwide public safety broadband network.

NPSBN

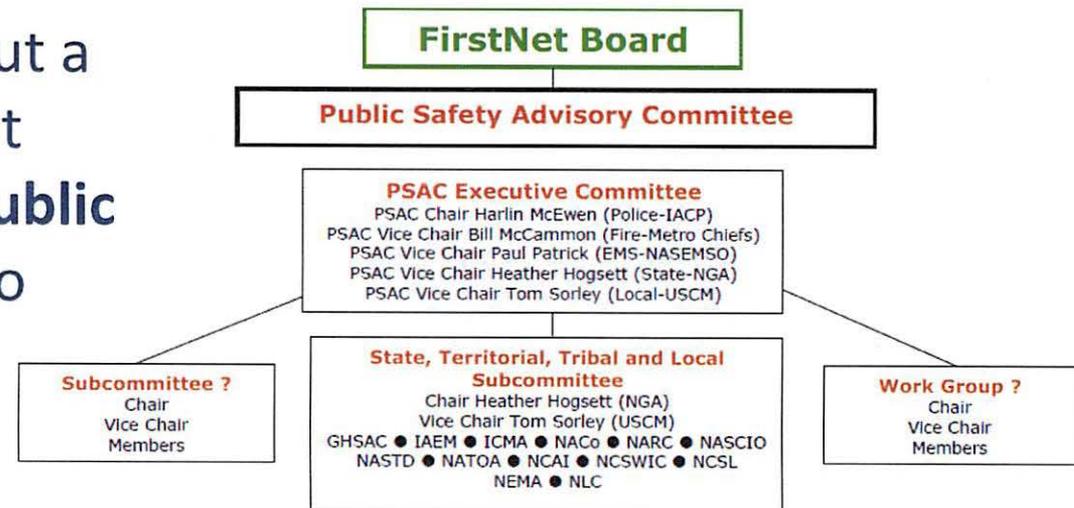The National Public Safety Broadband Network is the **data network** established in the 2012 Middle Class Tax Relief and Job Creation Act.

- The network will be designed to **Public Safety grade standards**
- FirstNet will build and **operate a core network** and **design State Radio Area Networks (RANs)** in consultation with each State
- The network will provide coverage to public safety in **every state and territory**

Public Safety Advisory Committee (PSAC)

Public Safety Broadband Office

The FirstNet legislation set out a requirement that the FirstNet Board establish a **standing public safety advisory committee** to assist it in carrying out its duties and responsibilities.

FirstNet Board

Public Safety Advisory Committee

PSAC Executive Committee
PSAC Chair Harlin McEwen (Police-IACP)
PSAC Vice Chair Bill McCammon (Fire-Metro Chiefs)
PSAC Vice Chair Paul Patrick (EMS-NASEMSO)
PSAC Vice Chair Heather Hogsett (State-NGA)
PSAC Vice Chair Tom Sorley (Local-USCM)

Subcommittee ?
Chair
Vice Chair
Members

State, Territorial, Tribal and Local Subcommittee
Chair Heather Hogsett (NGA)
Vice Chair Tom Sorley (USCM)
GHSAC ● IAEM ● ICMA ● NACo ● NARC ● NASCIO
NASTD ● NATOA ● NCAI ● NCSWIC ● NCSL
NEMA ● NLC

Work Group ?
Chair
Vice Chair
Members

- To ensure public safety and first responder input into the design of the broadband network

- 40 representatives of public safety organizations

- Partnering with DHS to leverage current breadth and depth of knowledge from the SAFECOM program

Other FirstNet Partners

- DHS Office of Emergency Communications (OEC)
- DHS Office of Interoperability and Compatibility (OIC)
- Department of Justice (DOJ)
- Federal Communications Commission (FCC)
- Federal Emergency Management Agency (FEMA)
- National Institute for Standards and Technology (NIST)
- National Public Safety Telecommunications Council (NPSTC)
- National Telecommunications and Information Administration (NTIA)
- Public Safety Communications Research (PSCR)
- Other Government and Industry Partners

FirstNet Business Model

What is the FirstNet business model?

Break even and build a self-sustaining network
* Fee for service
* Leverage value of the spectrum
* Reflect value of contributed assets and partnerships
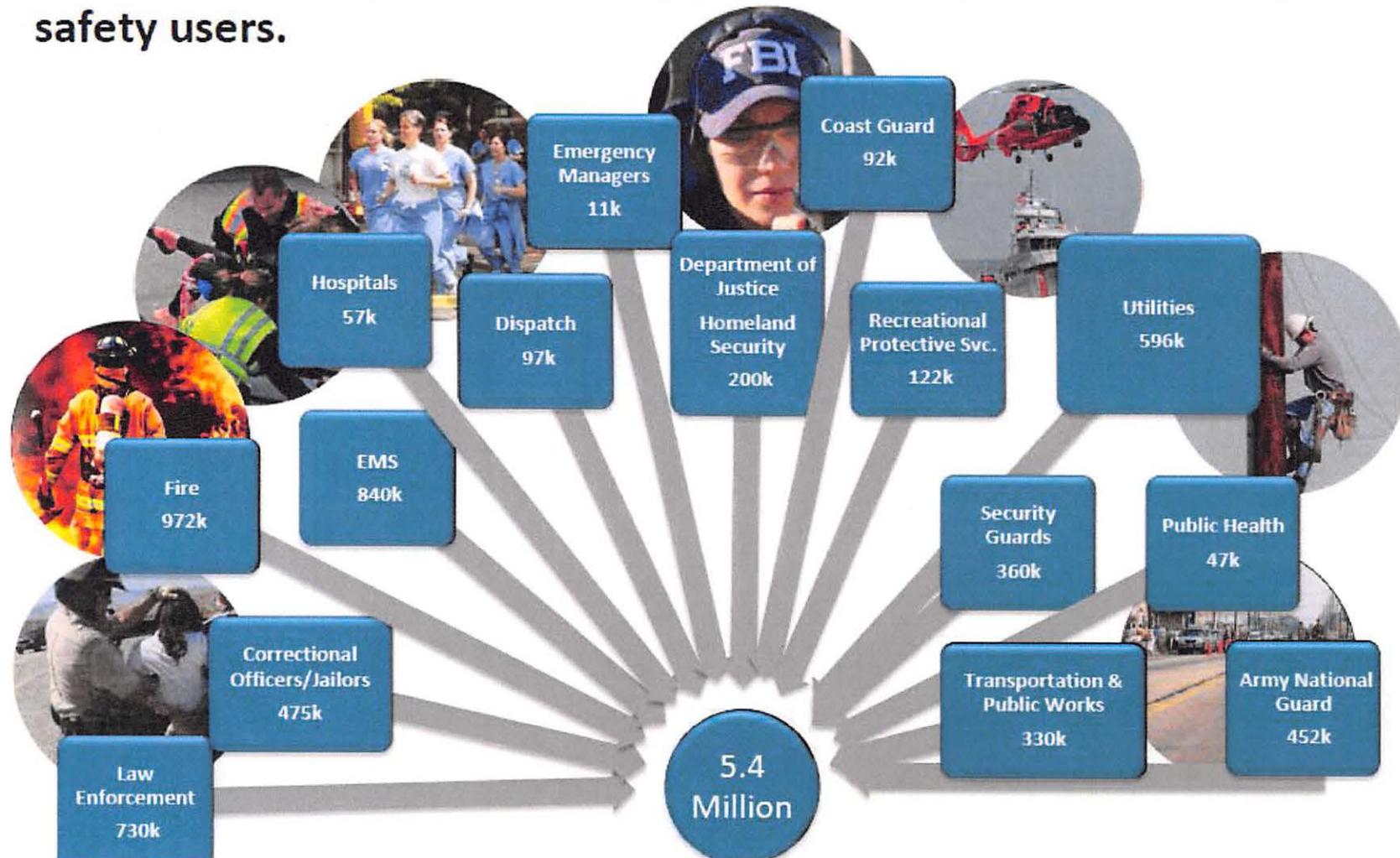
" **FirstNet intends to offer public safety grade services at a cost that's compelling to users.** "

— **FirstNet Tenet**

Reference: FirstNet Boston Regional Workshop, "Vision for the Future" Presentation, 6/19/2013, slide 12

FirstNet User Community

FirstNet has the potential to support a broadly defined set of public safety users.

- Emergency Managers 11k
- Coast Guard 92k
- Hospitals 57k
- Dispatch 97k
- Department of Justice Homeland Security 200k
- Recreational Protective Svc. 122k
- Utilities 596k
- Fire 972k
- EMS 840k
- Security Guards 360k
- Public Health 47k
- Correctional Officers/Jailors 475k
- Transportation & Public Works 330k
- Army National Guard 452k
- Law Enforcement 730k

5.4 Million

Examples Uses

The NPSBN will provide **fast access to applications** which can be shared broadly or on a limited, credentialed basis. Examples include:

- Streaming video / surveillance
- Large file transfer / download
- Situational awareness
- Field fingerprinting
- Field reporting
- GIS / Mapping tools
- Locations of local resources / infrastructure
- Electronic access to building blueprints
- Medical histories

- Medical telemetry
- Material safety information
- Command post operations
- Database queries

Reference: FirstNet Presentation at MIT /BPD Symposium on HS, "Creating a Nationwide Network for Public Safety", 11/7/2013, slide 8

Benefits of FirstNet

- Priority access and local control
- Enables more coordinated emergency response
- Improved situational awareness across the entire incident team
- Coverage based on geography, not just population
- Coverage solutions for rural and wilderness areas
- Capacity tailored to expected traffic loads and special event spikes

Reference: FirstNet Presentation at MIT /BPD Symposium on HS, "Creating a Nationwide Network for Public Safety", 11/7/2013, slide 9

FirstNet Misperceptions

FirstNet has also addressed some **commonly held misperceptions** about the Authority and the NPSBN.

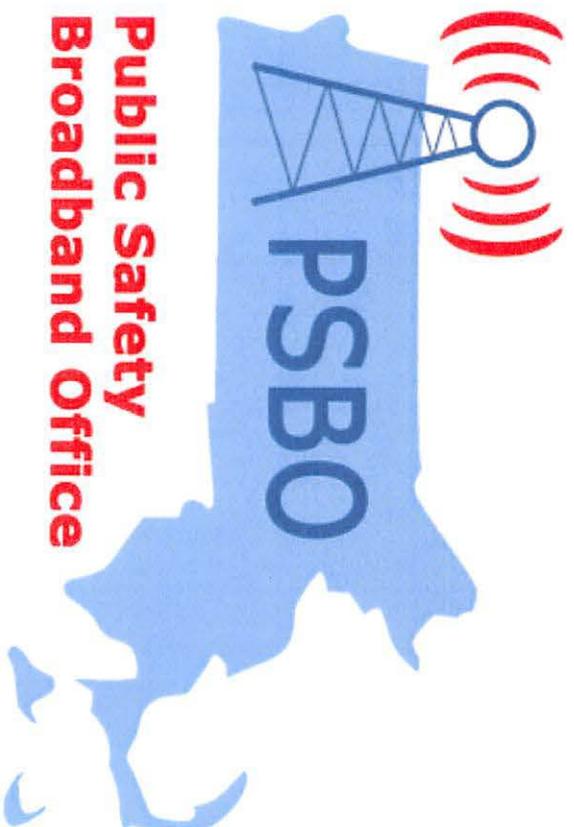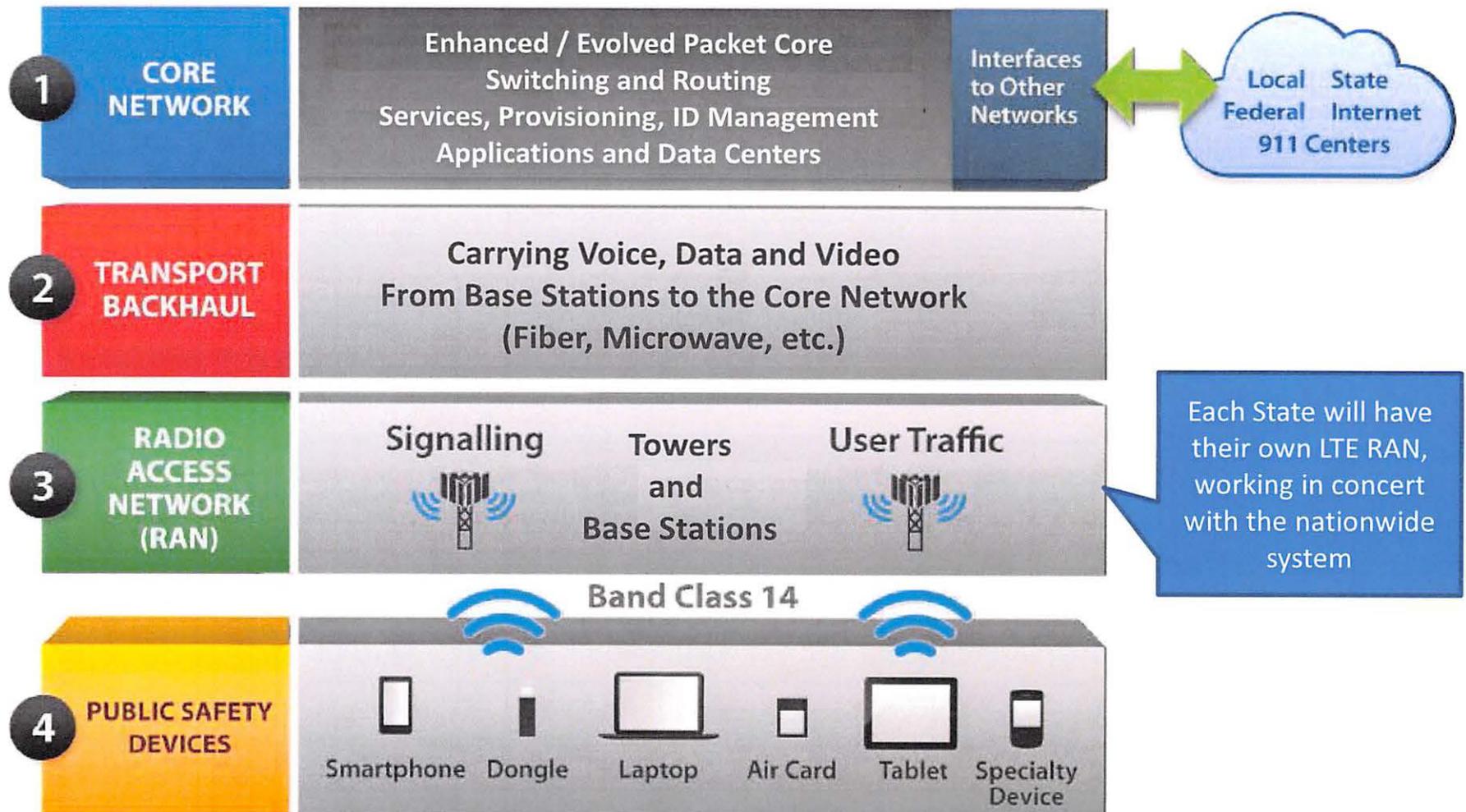| PERCEPTION		REALITY
Public safety may have to give up autonomy and control.	→	FirstNet will be a nationwide platform; Public safety sets rules locally.
Public safety will lose management of devices, users and talk groups.	→	Public safety will maintain local management.
FirstNet will cost too much to build and operate.	→	FirstNet has substantial opportunities to partner to lower construction and operating costs.
States can use FirstNet spectrum to generate revenue.	→	Fees from the use of FirstNet spectrum must , by law, be reinvested to build, operate, maintain, and improve the network.
FirstNet will replace LMR networks.	→	FirstNet will augment LMR for many years.
FirstNet has already begun designing the network.	→	FirstNet is in the research and analysis phase and must have input from states and territories to design the network.

LONG TERM EVOLUTION (LTE) TECHNOLOGY

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Anatomy of the NPSBN

Four fundamental building blocks that make up a network

1 **CORE NETWORK**	Enhanced / Evolved Packet Core Switching and Routing Services, Provisioning, ID Management Applications and Data Centers	Interfaces to Other Networks ⟷ Local State Federal Internet 911 Centers
2 **TRANSPORT BACKHAUL**	Carrying Voice, Data and Video From Base Stations to the Core Network (Fiber, Microwave, etc.)	
3 **RADIO ACCESS NETWORK (RAN)**	Signalling Towers and User Traffic Base Stations	Each State will have their own LTE RAN, working in concert with the nationwide system
4 **PUBLIC SAFETY DEVICES**	Band Class 14 Smartphone Dongle Laptop Air Card Tablet Specialty Device	

Reference: FirstNet Boston Regional Workshop, "Research and Analysis" Presentation, 6/19/2013, slide 6

FirstNet Technology Vision – 4G LTE

PSBO
Public Safety Broadband Office

4G LTE: A Proven Next Generation Technology

- Global technology standard
  - Widely deployed
  - Economy of scale, time to market
  - Rapidly evolving for commercial and consumer use and now for public safety
- Dramatic improvements over previous technologies
  - Higher bandwidth
  - Lower latency
  - Greater capacity
  - Better efficiency
  - Lower deployment cost

Public Safety LTE

- Dedicated Public Safety Spectrum
  - Band Class 14
  - Dedicated capacity
- New Standards
  - Priority Access
  - Preemption
  - Quality of Service
  - Direct device-to-device communications
    - With and without network connection
  - Group communications (one-to-many)
  - Push to talk
- "Hardened Infrastructure"

	Band 12					Band 12												
	Band 17					Band 17		Band 13		Band 14			Band 13		Band 14			
Rural Carrier	Rural Carriers	AT&T	AT&T	Qualcomm	Qualcomm Echostar	Rural Carriers	Rural Carriers	AT&T	AT&T	Verizon	D Block	Broadband	Narrowband	Verizon	D Block	Broadband	Narrowband	
6 MHz	6 MHz	6 MHz	6 MHz	6 MHz	6 MHz	6 MHz	6 MHz	6 MHz	11 MHz		5 MHz	5 MHz	6 MHz	11 MHz	5 MHz	5 MHz	6 MHz	
A	B	C	D	E	A	B	C	C		A	D	Public Safety		C	A	D	Public Safety	
CH 52	CH 53	CH 54	CH 55	CH 56	CH 57	CH 58	CH 59	CH 60	CH 61	CH 62	CH 63	CH 64	CH 65	CH 66	CH 67	CH 68	CH 69	

Devices

Public Safety Broadband Office

FirstNet will work with the vendor community on portable devices and in-vehicle routers

	Portables	In-Vehicle Routers	Specialized	Accessories
Device Types				
Category Driver	Build out to gain economies of scale		Special operational needs	Unique uses
Function	• Smartphone • Tablets • Modems	• Routers • Hotspots • Consoles	• Drones • Portable repeaters • Rovers	• Ruggedized cases • Battery packs • Chargers, mics.
Connectivity	• LTE, CDMA, HSPA • LMR/ P25 • Wi-Fi, Bluetooth • Direct mode	• LTE, CDMA, HSPA • Wi-Fi • Ethernet • USB	• LTE, CDMA, HSPA • LMR/ P25 • Satellite repeaters • Location services	• Bluetooth • USB • WiFi
Location Enabled	Yes	Yes	Some	n/a
Band 14 Support	2014	2013/2014	2015+	n/a

Reference: FirstNet Webinar, "SPOC Quarterly Briefing", 1/15/2014, slide 14

LTE and LMR

FirstNet will Augment LMR

- Public safety will rely on LMR for mission critical voice for many years

- LMR systems generally provide deeper coverage with fewer towers

- LTE needs to provide similar wide area and in-building coverage for data

- Ultimately voice may pass between the LTE and LMR networks

IMPLEMENTATION CONSIDERATIONS AND CHALLENGES

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Coverage Challenges

- 50 States
- 6 Territories
- 3250 Counties
- 3.8 Million Square Miles

| DC | Guam | Pureto Rico | Virgin Islands | Guam | NMI |

| Wilderness 27% of U.S. Land Mass	Rural 68% of U.S. Land Mass	Suburban	Urban	Dense Urban
		5% of U.S. Land Mass		
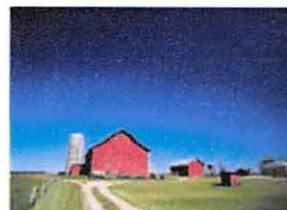
Coverage Challenges

The nature of the terrain, the density of populations, and the preexistence of other infrastructure are **factors when determining coverage approaches**.

- Rugged terrain
- Land use
- Population density
- Critical infrastructure
- Transportation and utility infrastructure
- Rural coverage
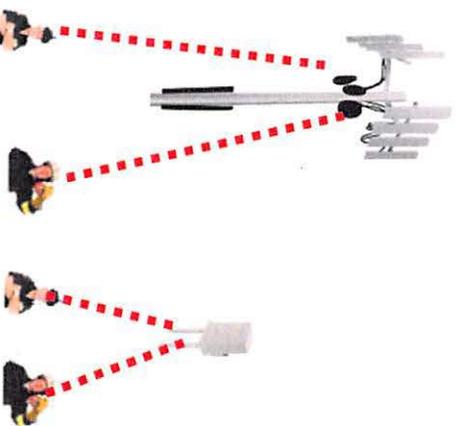- Parks and open areas
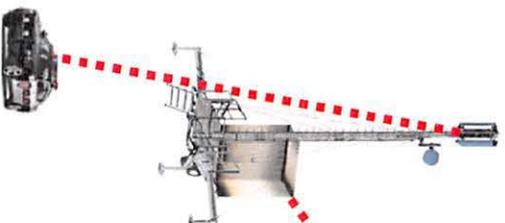- Tribal lands
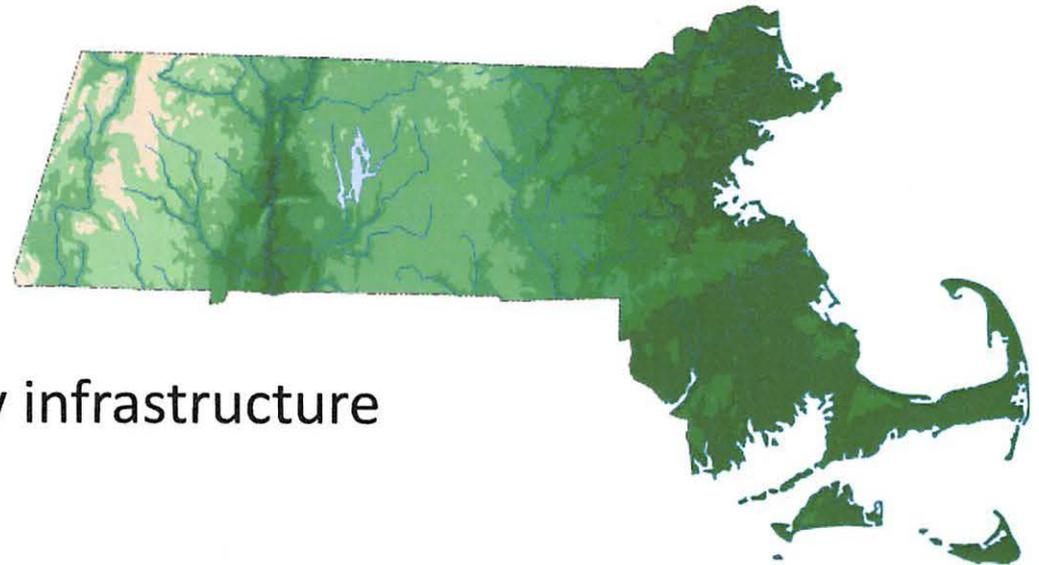
Coverage Approaches
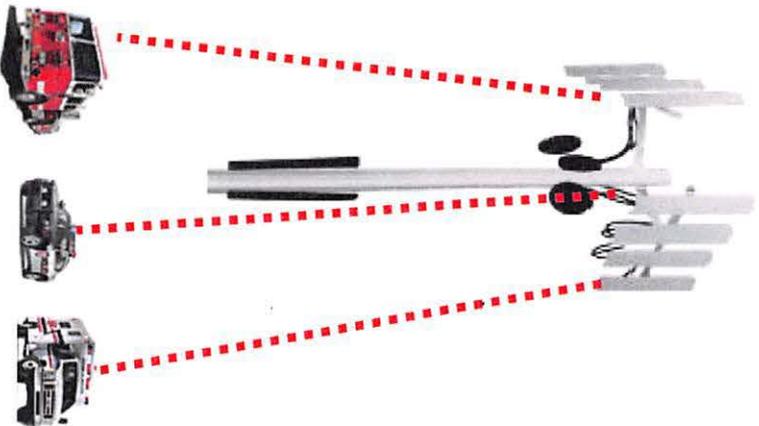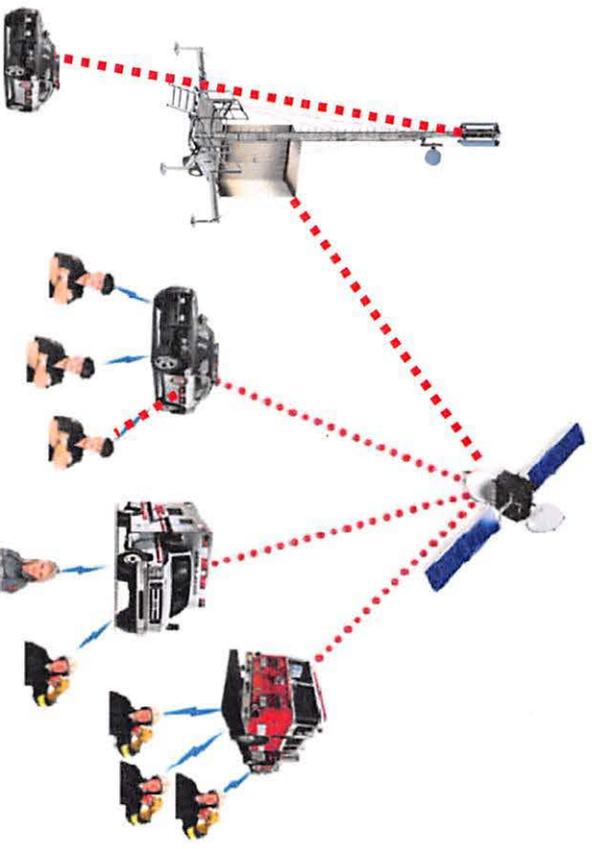
Big Cells — MacroCells

Small Cells — MicroCells / PicoCells / FemtoCells

Deployables — CoWs / SoWs — Repeaters / Vehicles / Deployables

Satellite

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Public Safety Grade Considerations

- Physical Resiliency
  - Diverse routing of cell site links
  - Redundant core
  - Site hardening (security, shelters, etc.)
  - Backup power (UPS and Generator)
- Operational Reliability
  - Security
  - Capacity and availability
  - Spares, support, time to repair
- Coverage
  - Where and when its needed
  - Deployable systems
  - Satellite
  - New technologies
- Ongoing Testing at NIST's PSCR lab in Bolder, CO
- Possible partnering with commercial carriers

Public Safety Features

- Priority Access
- Preemption
- Quality of Service
- Direct device-to-device
- Group communications
- Push to talk

Reuse of Existing Assets

- Reuse of existing assets

- Principally Towers and Backhaul

- Many local, legal, and regulatory issues

- The PSBO will be staffed to address these matters

Ideal assets

Cost

Legal / regulatory

Access / operations

Technical capacity / minimum hardening

Location (within coverage objective)

All assets

The next phase of the SLIGP grant will focus on data collection, in part to inform investment decisions for the State Plan.

Reference: FirstNet Webinar, "SPOC Quarterly Briefing", 1/15/2014, slide 11

www.firstnet.gov

FirstNet Progress Update and State Consultation Approach

William M. Casey
Region 1 Liaison

Progress Update

Key 2013 / 2014 Milestones

2013

Jul   Aug   Sep   Oct   Nov   Dec   **2014** Jan

- **Jul:** 10 Technical RFIs released
- **Jul:** Deputy GM and Government Affairs Director hired
- **Aug:** New Mexico Spectrum Lease Agreement
- **Sep:** FirstNet Board approves FY 2014 Budget and Operating Plan; Established committee structure
- **Sep:** PSAC Meeting
- **Oct:** Established Northern VA as Corporate HQ & the Boulder, CO area as FirstNet's Technical, Engineering and Network Design HQ
- **Nov:** Director of State Consultation hired
- **Dec:** Adams County and NJ Spectrum Lease Agreements; Harris County negotiations extended; PSAC Meeting
- **Jan:** Director of Outreach and Director of State Plans hired

Defining the Consultation Process

FirstNet — U.S. DEPARTMENT OF COMMERCE

Initiation
- **Initial Consultation** *(Aligned with SLIGP Phase 1)*

Design
- **State RAN Design** *(Iterative Design Reviews)*
- **Asset Identification & Selection** *(Aligned with SLIGP Phase 2)*
- **State Operations** *(National Template Customized by State)*

Approval
- **Final State Plan** *(Presented to Governor)*

■ PSAC   ■ Tribal Working Group   ■ NTIA SLIGP Monitoring/Support   ■ ECPC Federal Agency Inputs

Initial State Consultation

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U.S. DEPARTMENT OF COMMERCE

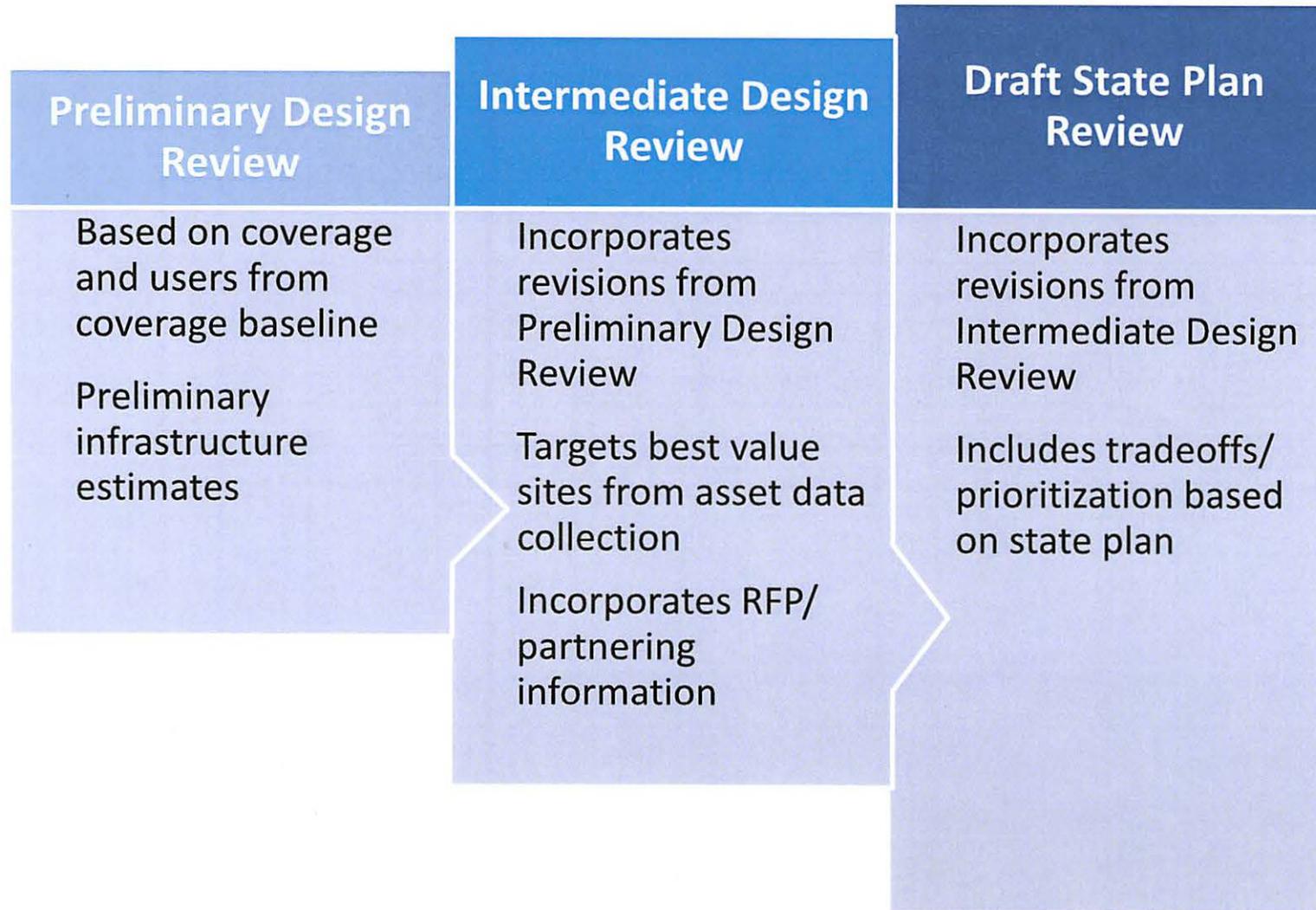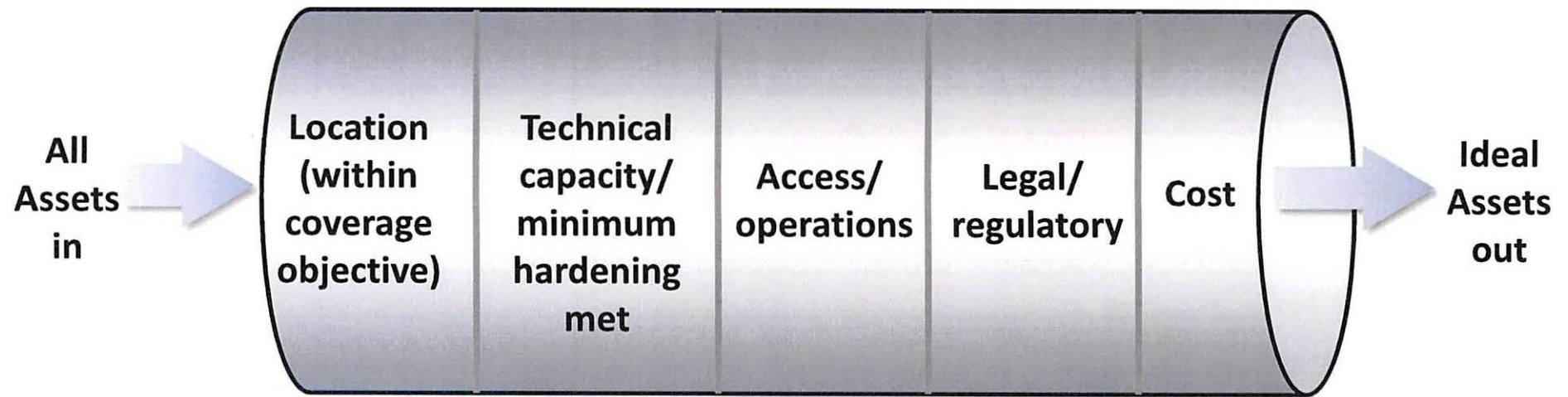| Initial Consultation Package **To The State**	SPOC Confirmation **From The State**	Analysis, Clarifications & Planning **Joint Effort**	Initial Consultation **Joint Effort**
• FirstNet initial consultation letter sent to the SPOCs • Enclosed checklists explained • Further instructions for follow up provided • On-line meeting with all SPOCs held for any questions and clarifications	• Readiness confirmation letter sent by SPOC to FirstNet • Checklist items returned • State continues to gather information necessary prior to meeting	• 56 packages reviewed by FirstNet on a rolling basis • Initial consultation agenda is sent and meeting is planned	• Meeting held within each state/territory • Open dialog between FirstNet and the state • Materials presented and reviewed • Follow up activities planned

Initial state consultation will cover a number of items to help FirstNet and the states begin the exchange of information, which will ultimately lead to the development of a state plan.

State RAN Design Process

Preliminary Design Review

Based on coverage and users from coverage baseline

Preliminary infrastructure estimates

Intermediate Design Review

Incorporates revisions from Preliminary Design Review

Targets best value sites from asset data collection

Incorporates RFP/ partnering information

Draft State Plan Review

Incorporates revisions from Intermediate Design Review

Includes tradeoffs/ prioritization based on state plan

Asset Identification & Selection (Aligned with SLIGP Phase 2)

All Assets in → | Location (within coverage objective) | Technical capacity/ minimum hardening met | Access/ operations | Legal/ regulatory | Cost | → Ideal Assets out

State Operations

- Key Steps
  - Ensure state RAN design is supported by business planning and cost considerations
  - Leverage PSAC and other key groups to discuss the overall approach to:
    - Local control
    - Prioritization
    - Training
    - Security
  - Develop operations template with areas for input/customization
  - Develop system cost structure / business plan for state based on preliminary RAN design and potential user base

Final State Plan

FirstNet
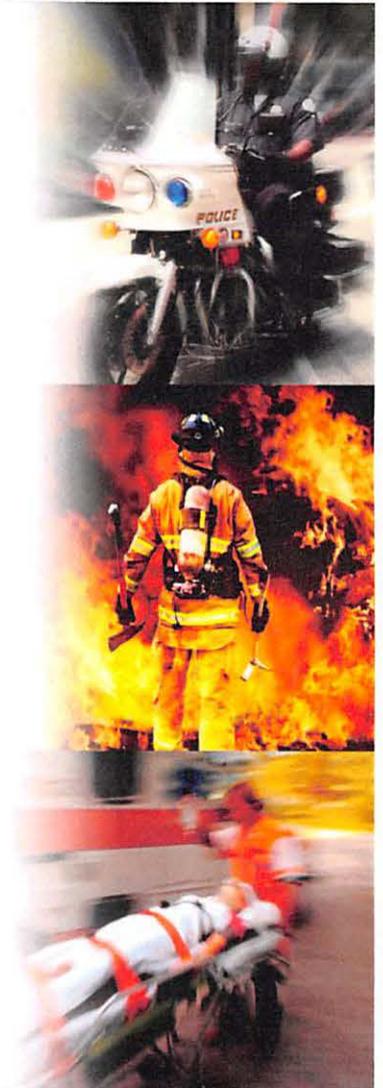
- **Key Steps**
  - Document proposed coverage and associated cost
  - Supply projected funding level
  - Provide final review with state's SPOC / governing body
  - Submit to the Governor

State Plan Requirements

- Completion of the RFP process
- Details of proposed build-out in the state
- Funding level for the state

- **Guiding Principles**
  - Address areas of consultation required by law
  - Ensure public safety stakeholders have robust involvement before state plan is presented to the Governor

Public Safety Broadband Office

WHAT'S NEXT?

What Comes Next?

- Prepare for the **data gathering and State consultation phase** of the implementation

- Conduct **more targeted meetings** with Massachusetts stakeholders for user and coverage requirements

- Establish a **working group** to support the consultation and implementation process
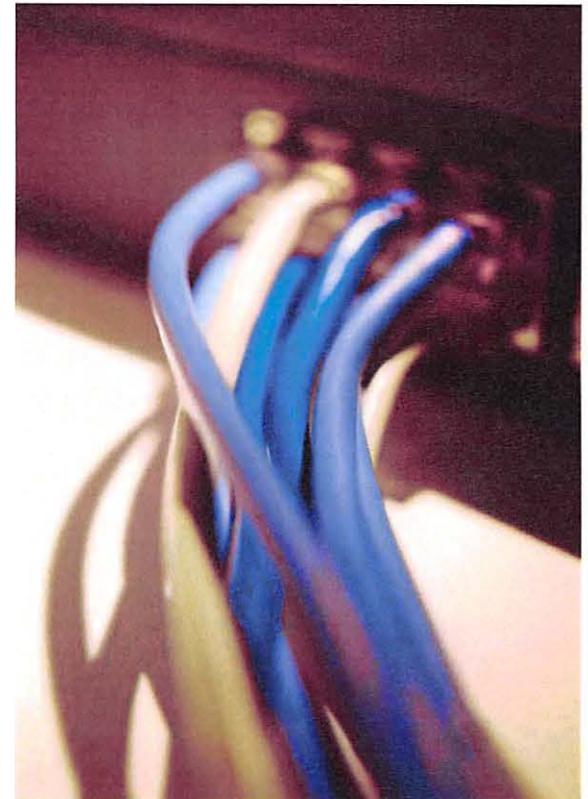
Information on the Web

PSBO — Public Safety Broadband Office

Follow updates at:

mass.gov/psbo

Commonwealth Public Safety Broadband Office (PSBO)

PSBO Information

PSBO Leadership Team

PSBO Upcoming Events

Frequently Asked Questions (FAQs)

News & Updates

FirstNet Presentation at MIT/BPD (FirstNet 11/13) 📄

The Process for Working with FirstNet (FirstNet 11/13) 📄

The Promise of FirstNet (FirstNet 9/13) 📄

FirstNet Organization and Membership (FirstNet 2/13) 📄

NPSBN Factsheet (DHS 12/12) 📄

See All

📶 Subscribe   Learn more

Contact the PSBO

Mail the PSBO at:
**Commonwealth of Massachusetts
Exec. Office of Public Safety & Security
Attn: Public Safety Broadband Office
One Ashburton Place - Room 2133
Boston, MA 02108**

Email the PSBO at:
PublicSafetyBroadband@state.ma.us

Request to be included on the PSBO Contact List

Welcome to the PSBO

The Executive Office of Public Safety and Security has established the Public Safety Broadband Office to oversee and direct all Commonwealth planning and implementation activities associated with FirstNet.

This office will coordinate and collaborate with public safety entities, local and state officials, and other stakeholders in preparing the Commonwealth for participation with FirstNet in the building and deployment of the National Public Safety Broadband Network (NPSBN).

Docs & Updates

FirstNet Documents and Updates

Outreach Kit

National Public Safety Broadband Outreach Kit

FAQs

Frequently Asked Questions

Learn More »

PSBO's Role with FirstNet and the NPSBN

Initially envisioned by the 9/11 Commission and enacted by the Middle Class Tax Relief and Job Creation Act of 2012, the First Responder Network Authority (FirstNet) is an independent Federal authority within the National Telecommunications and Information Administration (NTIA) that was established to provide emergency responders with a nationwide, high-speed, wireless network dedicated to public safety. The envisioned National Public Safety Broadband Network (NPSBN) will facilitate communications amongst first responders during emergencies and provide reliable, secure access for public safety users every day.

To begin the process of implementing the network nationally, the NTIA has issued initial grants through the State and Local Implementation Grant Program (SLIGP). Phase One of this grant program started in the fall of 2013 and focuses on education and outreach. Phase Two will focus on data collection and FirstNet requirements, including considerations specific to implementing the NPSBN in the Commonwealth. The PSBO will coordinate activities with the FirstNet regarding the creation of the NPSBN and its implementation in the Commonwealth. More

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Broadband Resources

MA Statewide Communications Interoperbility Plan 📄 15MB

NPSBN Recommended Minimum Technical Requirements

National Broadband Map

FCC Broadband Plan

DHS Nationwide Public Safety Broadband Network Outreach

See All

📶 Subscribe   Learn more

Related Links

FirstNet

Nat. Telecommunications and Information Admin. (NTIA)

DHS Office of Emergency Communications (OEC)

DHS Office of Interoperability and Compatibility (OIC)

Federal Communications Commission (FCC)

Federal Emergency Management Agency (FEMA)

Nat. Public Safety Telecommunications Council (NPSTC)

Contact the PSBO

PSBO
Public Safety
Broadband Office

You can email the PSBO at:
PublicSafetyBroadband@state.ma.us

Request to be on the PSBO Contact
List from **mass.gov/psbo**

Contact the PSBO

Mail the PSBO at:
Commonwealth of Massachusetts
Exec. Office of Public Safety & Security
Attn: Public Safety Broadband Office
One Ashburton Place - Room 2133
Boston, MA 02108

Email the PSBO at:
PublicSafetyBroadband@state.ma.us

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