

Oregon Public Safety Broadband Network Planning for FirstNet

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SWIC-OPSBN-12-02
Additional information, references, and permissions can be found in
Oregon Public Safety Broadband Network Planning For FirstNet Technical Report, SWIC-OPSBN-12-01.

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Purpose

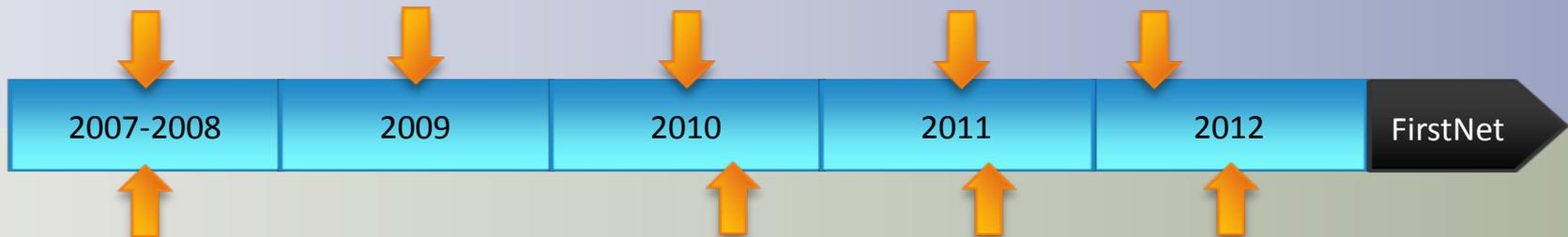
- **Presentation Purpose**
 - To provide an overview of Oregon Public Safety Broadband Network (OPSBN) *Planning for FirstNet* Report

Background and Timeline

Public Safety Communications Broadband National and Oregon Event History

National

- The Public Safety Spectrum Trust (PSST) is formed to develop opportunity for PS broadband use nationwide
- The FCC meets with public safety leaders to strategize on how to implement a PSBN using FCC spectrum
- The FCC establishes the National Broadband Plan, for PS use of the Public Safety BB Spectrum (PSBB Block)
- PSBB Block waiver by FCC a Landmark decision for Public Safety – the 700MHz spectrum has market value of \$2.7B
- National BB initiatives focused on securing additional 10MHz of 700MHz spectrum for Public Safety use
- D-Block spectrum is also valued at \$2.7B
- **Feb 22** - D-Block Legislation signed creating FirstNet under NTIA to implement NPSBN
- **Jul 30** - FCC order recalls spectrum waivers



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- Broadband is seen as a solution to mitigate future mobile data concerns raised by stakeholders and industry
- Broadband would support user requirements unsatisfied by OWIN mobile data system capabilities
- Officials from ODOT, OSP, Corrections, & Forestry along with SIEC applied for waiver to use PSBB Block to build LTE Broadband system
- Unsuccessful BTOP \$150M grant application
- **June** - Four OR representatives attended waiver jurisdiction meeting at the White House
- **Dec** - ODOT Office of Innovative Partnerships Program (OIPP) issues RFI-EI to industry to develop PSBN public-private partnerships
- **May** - RFI complete; ODOT and stakeholders suspend broadband pilot project to align OR efforts with FirstNet
- **May** - OEC completes PS broadband survey to identify future Oregon wireless BB needs
- **May** - ODOT begins *Planning for FirstNet* development effort

Summary of FirstNet Legislation

Timeline Milestones

Date	Milestone
February 2012	President signs legislation
March 2012	FCC appoints Interoperability Board members
May 2012	Interoperability Board sends technical recommendations to FCC
June 2012	FCC approves technical recommendations
August 2012	FirstNet Governance Board members appointed
February 2013	FirstNet releases State and Local Implementation Grant Program (SLIGP) Federal Funding Opportunity (FFO)
To be determined	FirstNet issues RFP for NPSBN construction and operation - FirstNet will inform states of 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 Radio Access Network (RAN)
180 Days after Opting-Out	States develop and complete RFPs for constructing, maintaining, and operating the state RAN

Public Safety Broadband Communications National and Oregon Timeline 2012 – 2013

National

- **Mar 23** - Technical Advisory Board (Interoperability Board) established by FCC
- **May 22** - NPSBN Technical Requirements established
- **Jun 21** - FCC approves / amends requirements
- **Jul 7** - Interoperability Board terminated
- **Aug 20** - FirstNet Board established
- **Aug 22** - NTIA provides SLIGP Implementation Grant (SLIGP) Guidance
- **Sep 25** - FirstNet holds first meeting
- **Oct 2** - Network & Application NOI Issued
- **Nov 15** - FCC grants FirstNet spectrum license
- **Dec 11** - FirstNet Board Meeting
- **Feb 6** - SLIGP Federal Funding Opportunity (FFO) Notice released
- **Mar 19** - SLIGP FFO Application Deadline
- **1Q** - FirstNet begins development process for Supplier RFP, starting with equipment RFIs
- **Apr** - Federal FirstNet Business Plan complete
- **Apr 23** - FirstNet Board Meeting
- **Jul 15** - SLIGP grants awarded
- **3Q** - SLIGP Phase 1 grant activities funded
- **Aug 13** - FirstNet Board Meeting
- **SLIGP Phase 2 funds** - released after state meets Special Award Condition
- **Oct 15** - FirstNet Board Meeting

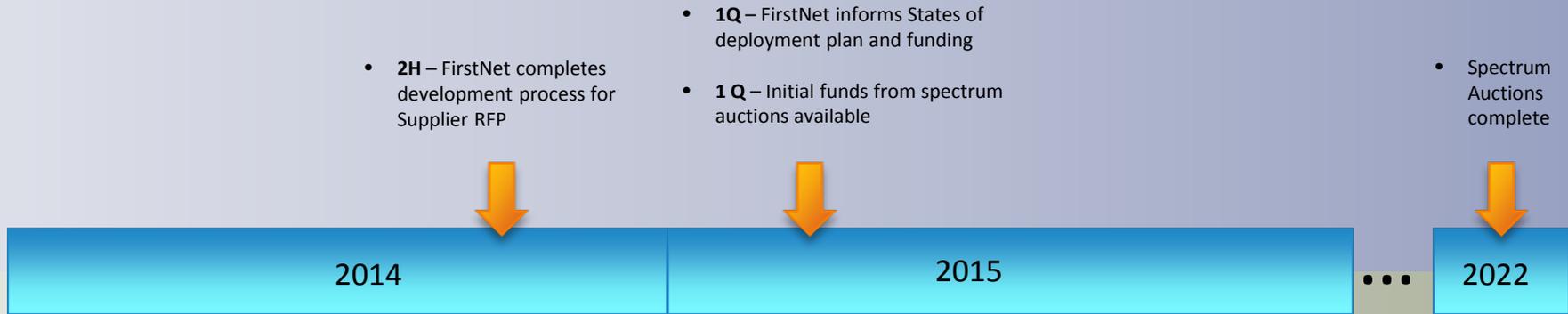


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- **Feb** - COPS Grant for funding planning activities
- **Feb** - Interim Broadband Office shifts focus from BTOP to FirstNet
- **4Q** - Identify Grant response team
- **Jan** - *Planning for FirstNet* document released
- **Feb/Mar** - Develop SLIGP FFO application response
- **Sep** - OPSBO moves from ODOT to DAS
- **3Q** - Receive SLIGP award. Begin grant activities.
- **3Q** - Prepare for and collect data for consultation

Public Safety Broadband Communications National and Oregon Timeline 2014 – 2015 through 2022

National



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90 Days After FirstNet Plan/Funding Release – Determine decision to Opt In or Opt Out

If Opt Out - Develop alternate plan for FCC approval within 180 days

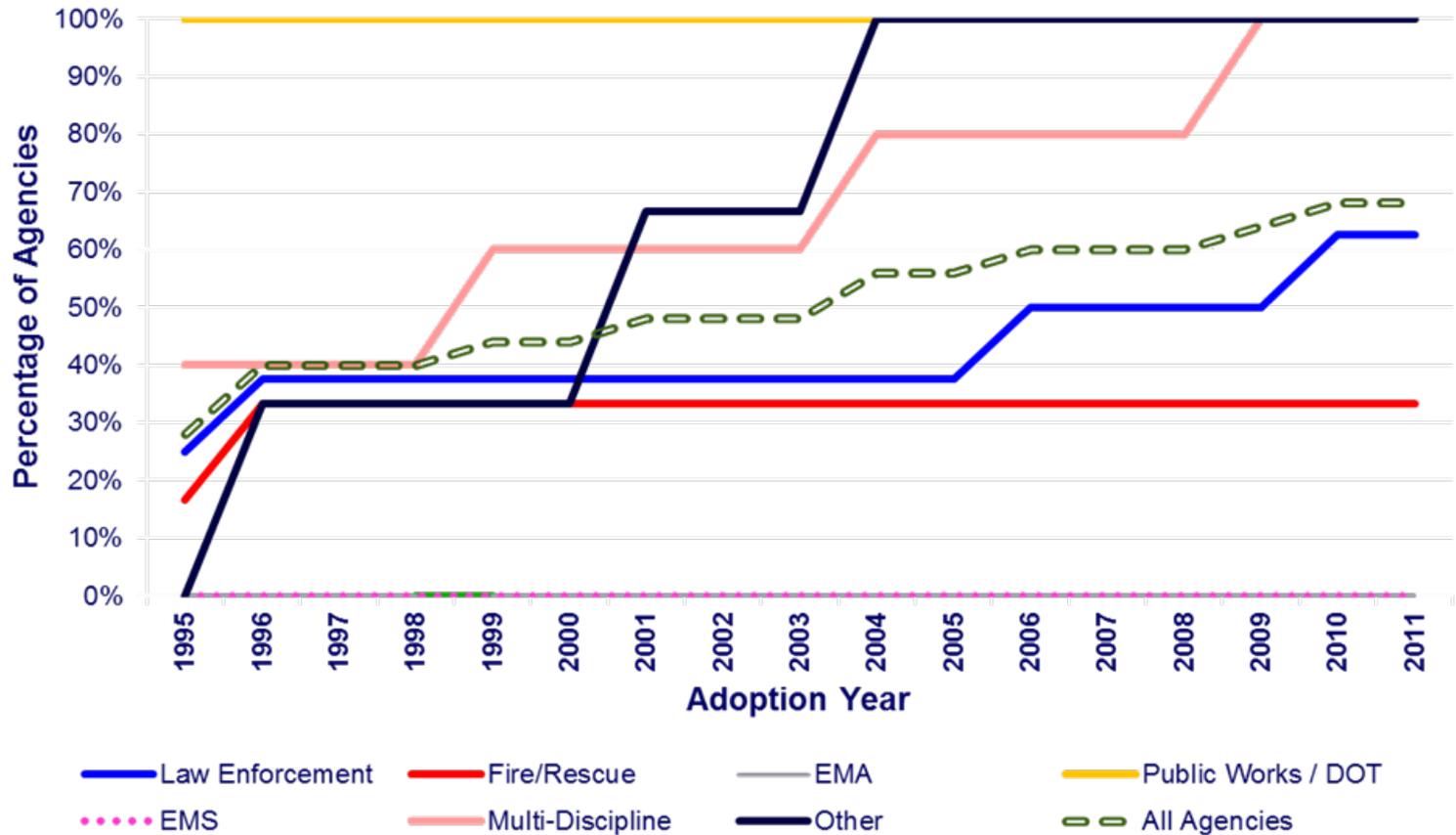
Use and Applications

Mission Critical vs. Mission Support

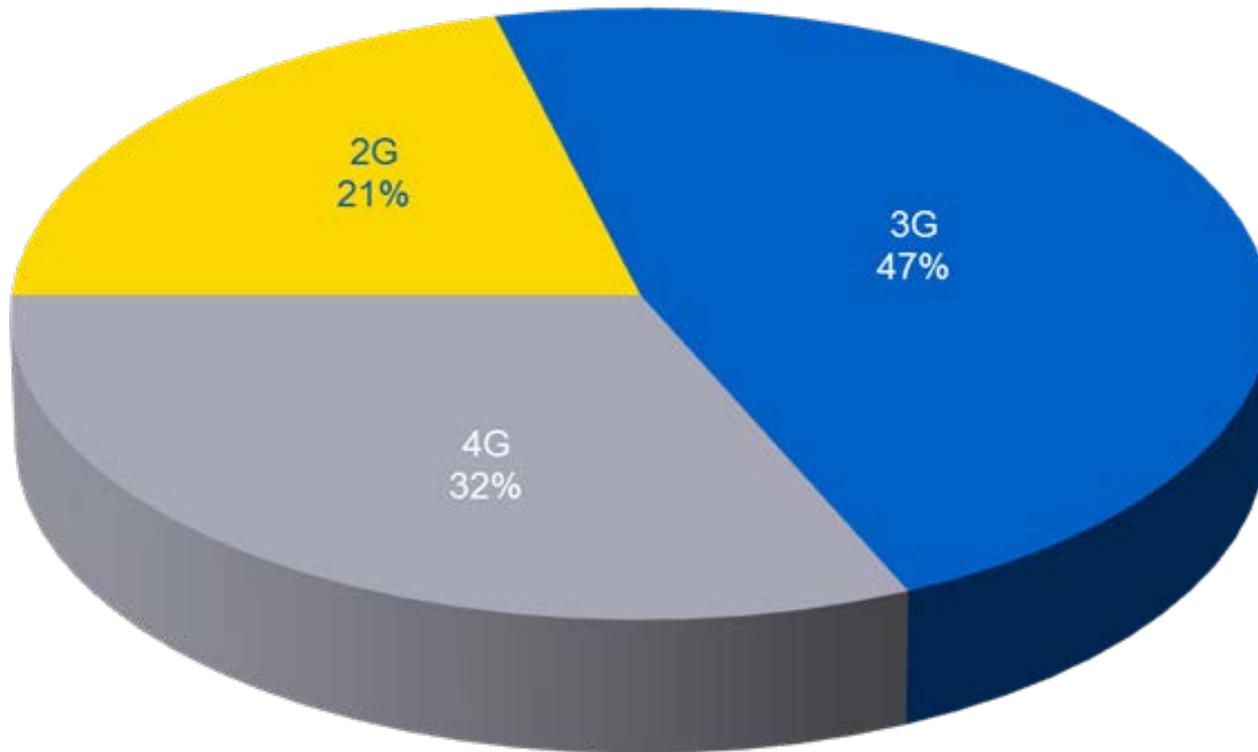
- **Mission Critical**
 - Communications that are required to maintain safety of first responders and the people with whom they interact
- **Mission Support**
 - Communications that provide improved operational efficiency, enhance safety, and augment command and control, but are not essential

*Initial OPSBN high bandwidth data applications such as streaming video will be for **mission support** use*

Oregon Public Safety Broadband Survey: Cellular Data Adoption



Oregon Public Safety Broadband Survey: Cellular Data Technologies Used for Wireless Data



High Bandwidth Data Communications are Key to Potential Public Safety Applications

Potential Public Safety Broadband Applications	
<ul style="list-style-type: none"> • Video Surveillance, Remote Monitoring (streaming) 	<ul style="list-style-type: none"> • Dynamic Mapping, Weather, Traffic
<ul style="list-style-type: none"> • Remote Database Access/Queries (mug shots, finger prints, reporting, NCIC, criminal history, hot files) 	<ul style="list-style-type: none"> • Instant Messaging, SMS, One-way Notifications, Tactical Chat Rooms
<ul style="list-style-type: none"> • Multimedia Command and Control (floor plans, incident stills, surveillance) 	<ul style="list-style-type: none"> • Real-time, One- and Two-Way Video in Vehicles or Handhelds
<ul style="list-style-type: none"> • Computer-aided Dispatch (CAD), Next Generation 9-1-1 (NG 9-1-1) 	<ul style="list-style-type: none"> • Geo-Location and Asset Tracking (vehicle, personnel, assets)
<ul style="list-style-type: none"> • Records Management Systems Access (local queries) 	<ul style="list-style-type: none"> • Mobile Office (bulk file transfer, email, Internet web access, VPN)
<ul style="list-style-type: none"> • Mobile Incident Command 	<ul style="list-style-type: none"> • Geospatial Applications
<ul style="list-style-type: none"> • Medical Telemetry 	<ul style="list-style-type: none"> • Automated License Plate Recognition
<ul style="list-style-type: none"> • Field Based Reporting 	<ul style="list-style-type: none"> • Digital Signage, Traffic Alerts, Automated Transactions
<ul style="list-style-type: none"> • Remote Control of Robotic Devices 	<ul style="list-style-type: none"> • <i>Standardized Push-To-Talk (PTT), Voice over IP (VoIP) - future</i>

Vision of the Future: Public Safety Broadband Network Applications in Action



Motorola's Kopin [Golden-I Mobile Computing](#) showcased by Verizon's recent ad campaign illustrates future integrated applications enabled by high bandwidth data networking.

FirstNet Service Categories

Communication Services

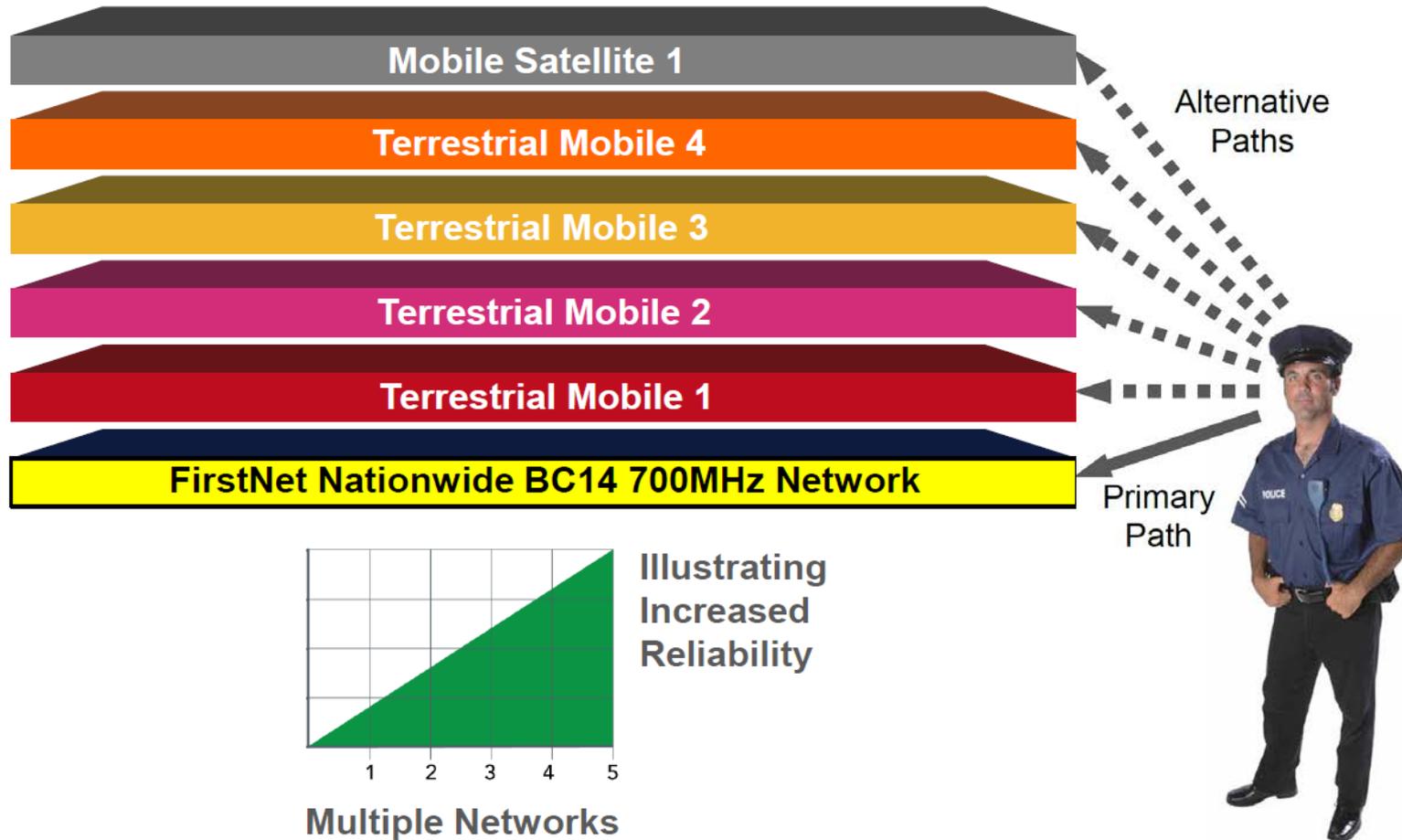
- **Voice** – e.g. Interactive voice communication, non-interactive voice communication, Defined & ad hoc voice communication communities
- **Messaging** – e.g. SMS, email, blog
- **Video** – e.g. broadcast, peer-to-peer

Applications

- **Communication services as an app** - e.g. Skype, Twitter
- **Public informational** – e.g. CPR instructions, news updates, logistics information
- **Internal department** - e.g. HR, scheduling
- **Department data** - e.g. crime records, medical records
- **Cross department data** – e.g. DMV, criminal records

FirstNet Nationwide Network

FirstNet Nationwide Network: Multiple Network Diversity Increases Reliability

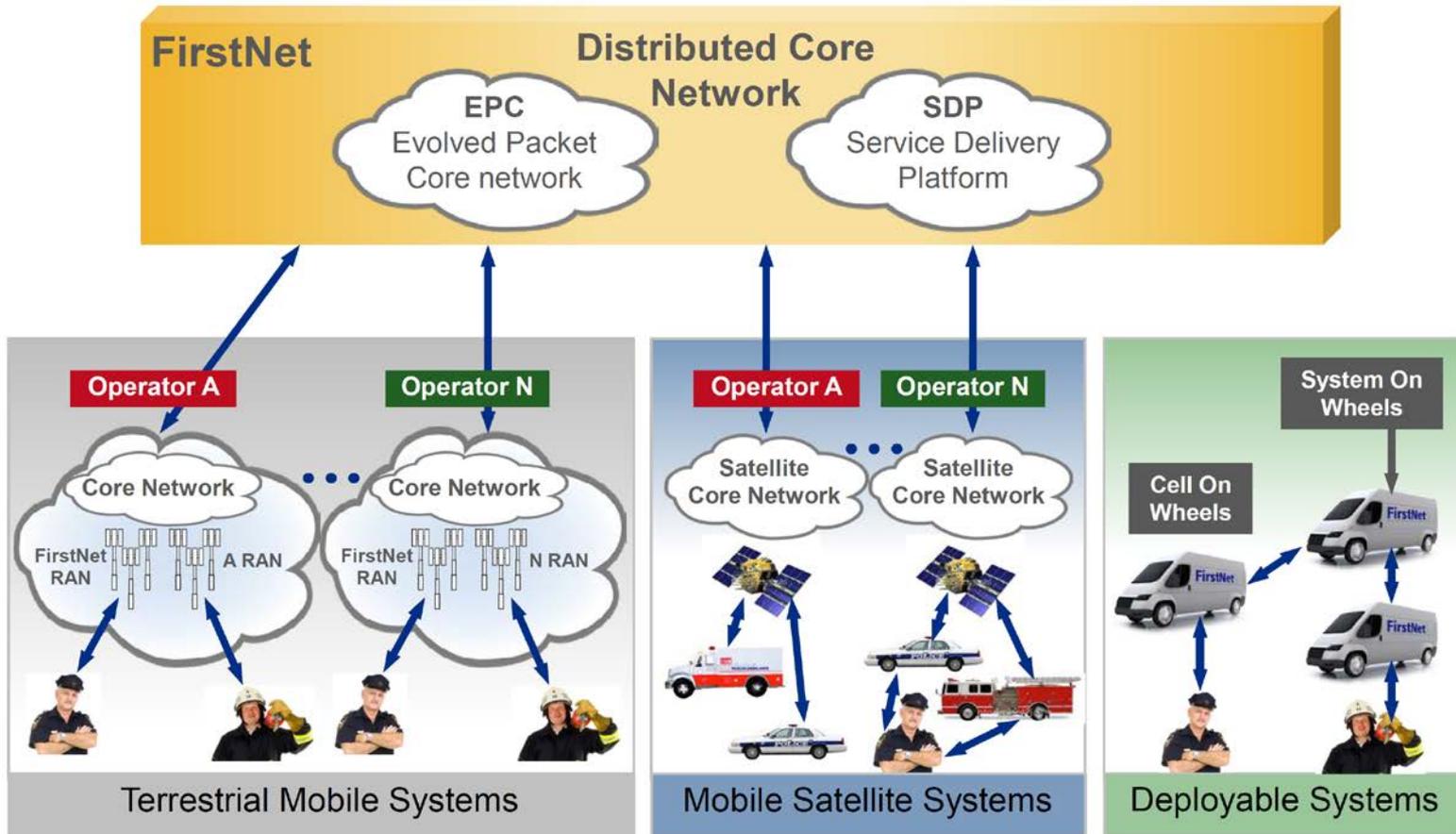


FirstNet Nationwide Network: Distributed Core Network Aspects

FirstNet integrates a **Distributed Core Network** which includes:

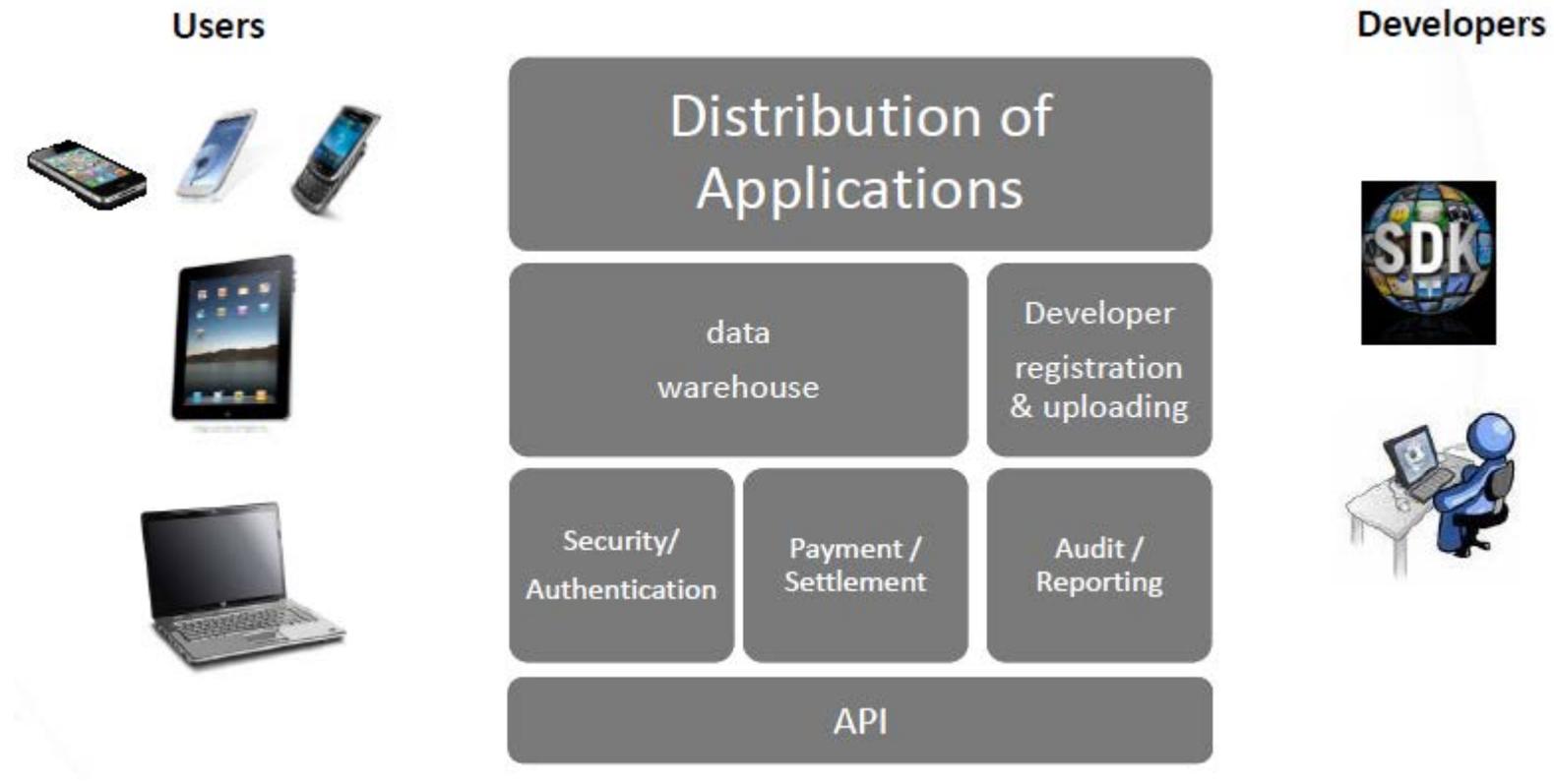
- **EPC – Evolved Packet Core network**
 - switching, routing, scheduling, user database, etc.
- **SDP – Service Delivery Platform**
 - voice, PTT, messaging, location and video application servers and data warehouses plus the FirstNet App Store
- **The FirstNet Core Network would be distributed in multiple secure, hardened locations across the US for network reliability, resilience and capacity**

FirstNet Nationwide Network: Future Vision



Service Delivery Platform (SDP)

SDP Offers Centralized Design with Local Control of Distribution and Authentication



Governance and Stakeholders

Governance – Federal Level

- **Federal Communications Commission**
 - 700 MHz public safety spectrum frequency holder
 - Established interim Technical Advisory Board for First Responder Interoperability (Interoperability Board)
- **National Telecommunications and Information Administration (NTIA)**
 - Part of the Department of Commerce
 - Selected FirstNet Board of Directors
- **First Responder Network Authority (FirstNet)**
 - Managing entity for the public safety spectrum
 - Governing authority for the Nationwide Public Safety Network (NPSBN)

FirstNet Board of Directors



Governance – State Level

- **State of Oregon Governor’s Office**
 - Per the Act, designates single officer or governmental body to coordinate with FirstNet
 - Makes the Opt-In/Opt-Out decision
- **Statewide Interoperability Executive Council (SIEC)**
 - Engages key public safety stakeholders across Oregon
 - Solicits, consolidates user input and advises OPSBO
- **Oregon Public Safety Broadband Office (OPSBO)**
 - Proposed designated body to coordinate with FirstNet
 - Acts as administrator and financial manager
- **OPSBN Management Steering Committee**
 - Oversees OPSBO activities

OPSBN Management Steering Committee

- **Management Steering Committee includes**
 - Governor's Advisor
 - SIEC Chair
 - State CIO
 - ODOT Deputy Director
 - OIPP Representative
 - ODOT MPB Manager
 - OPSBO Program Manager

Stakeholders

State Interoperability Executive Council (SIEC)

- DOT
- DAS
- OEC
- DHS
- Military Department
- Fire Chiefs Association
- Association of Chiefs of Police
- APCO/NENA
- Tribal Entities
- Cities
- Counties
- Districts

Federal

- FEMA
- FBI
- DOI
- DOD
- CBP
- USACE

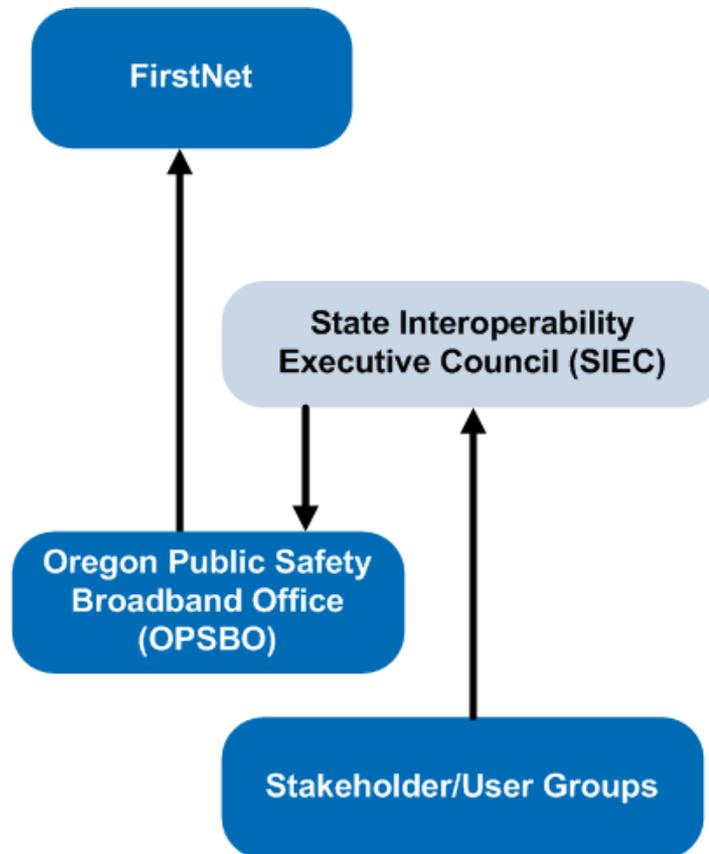
Local

- City of Portland
- City of Salem
- LCOG
- WCCCA
- C-800

Private Partners / Private Sector

- Utilities
- Telecommunications Providers
- Fiber Consortia
- Equipment Manufacturers

Stakeholder and User Information Flow



Business Model and Financial Considerations

Benefits and Value

- **Operational Benefits**

- Increased Situational Awareness
- Decrease Response Times
- Enhanced Safety
- Improved Efficiency

- **Benefits over commercial networks include**

- The ability to build a network that provides coverage where public safety operates
- The ability to control priorities for bandwidth allocation

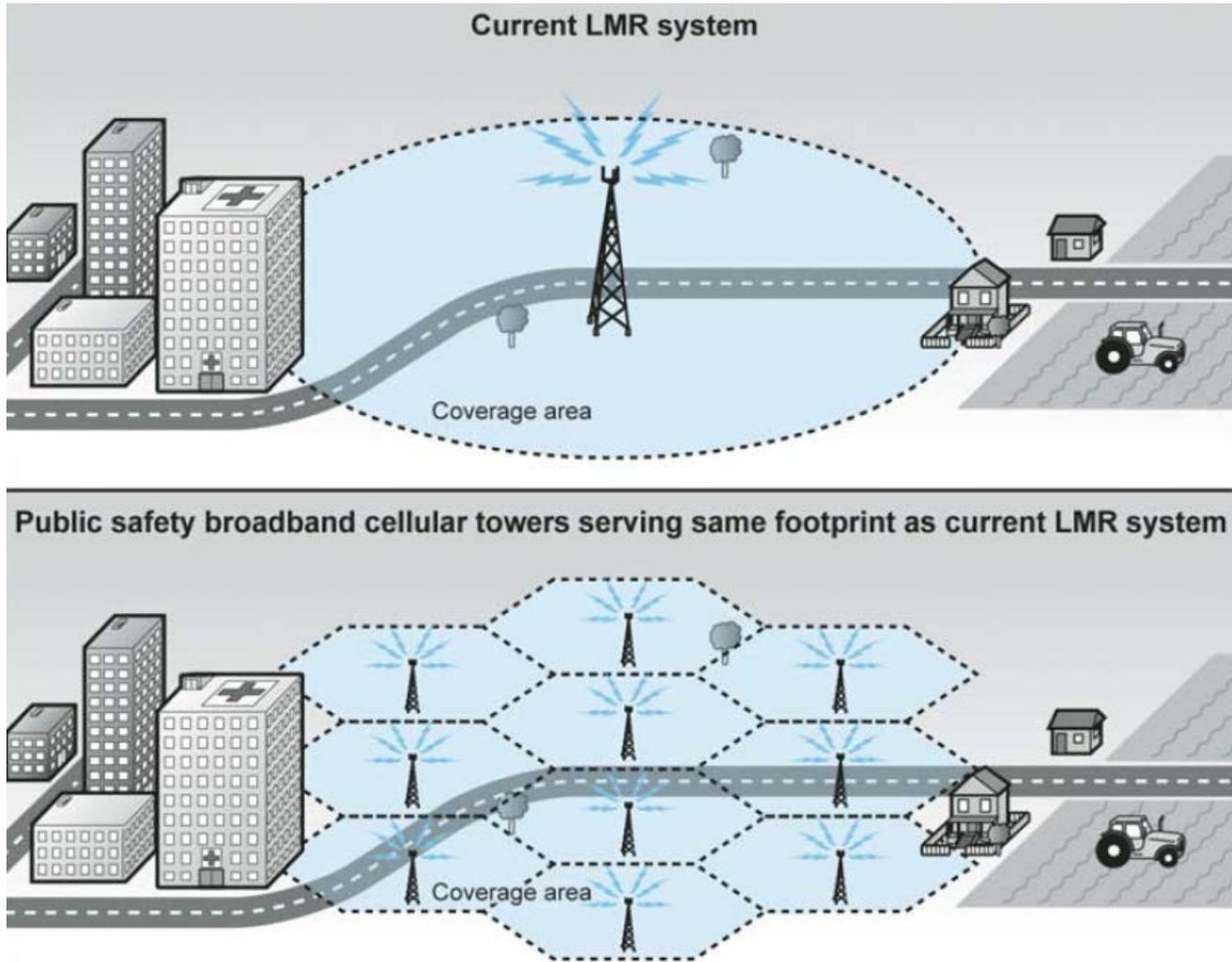
- **Societal Benefits**

- Acts as “socioeconomic equalizer” – brings broadband connectivity to rural areas currently without access, where commercial providers would not have invested

NPSBN Funding Afforded by the Middle Class Tax Relief and Job Creation Act

No.	Fund	Distribution	Description
1.	State and Local Implementation Fund (NTIA)	\$121.5M	Supports state and local efforts to plan and integrate with the NPSBN (NTIA may borrow the entire amount upfront). Oregon's Federal share is \$2.2M
1.	Network Construction Fund (FirstNet)	\$7B	Supports the design, construction, operation, maintenance, and upgrade of the NPSBN (NTIA may borrow up to \$2B upfront)

Building Out FirstNet Coverage Will Require Significant Investment



Verizon 2G, 3G, 4G
Networks
\$100B

FirstNet
\$7B

Verizon LTE
Upgrade
\$9B

OR LTE
\$1B

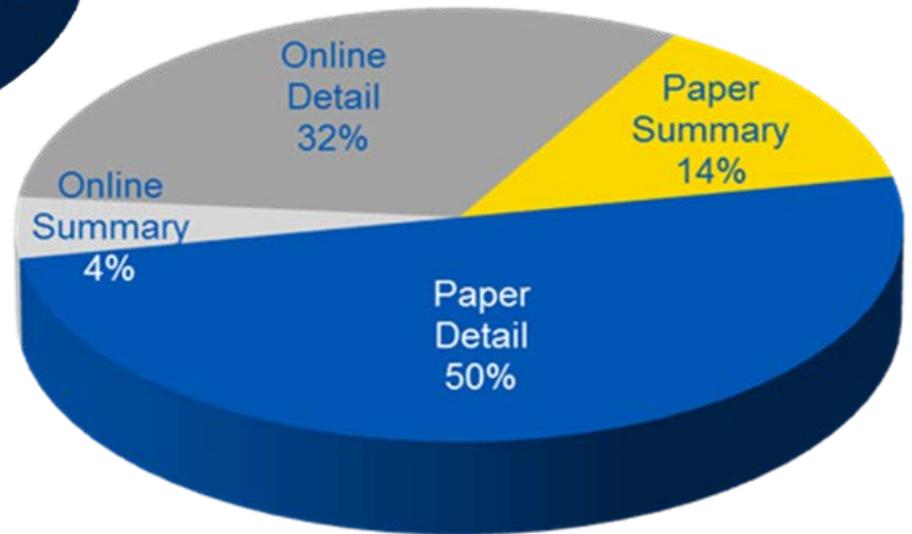
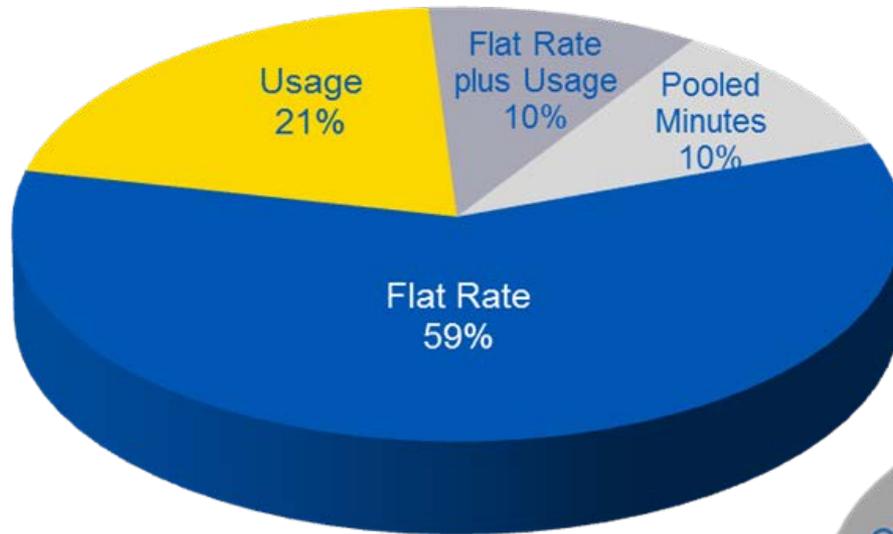
OWIN/SRP
\$600M



FirstNet Operations & Maintenance Business Model

- **FirstNet service is planned to be self-sustaining**
 - No funding for ongoing operations and maintenance
- **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 users to permit secondary access
- **Lease Fee for Network Equipment and Infrastructure**
 - Fee for entity that seeks access or use of antennas, towers, and other assets constructed or owned by FirstNet

Survey Reported Rate Structures and Billing Formats for Commercial Wireless Service



Impacts to Oregon

- Oregon's geography and demographics impact the relative importance of the major cost elements associated with a network deployment:
 - Radio Access Network (RAN)
 - Backhaul (both from eNodeBs and out to EPC)
 - LTE Core Network (Evolved Packet Core, or EPC)
 - Roaming on to commercial networks
 - In rural Oregon public safety users may be on the commercial network *more* than the dedicated private network for large areas of the state
 - Negotiating favorable roaming agreements and rates may become paramount to Oregon
 - FirstNet could negotiate a flat roaming rate across the country, enabling the densely populated big cities to offset the cost to the rural states

Summary and Next Steps

Next Steps:

State and Local Implementation Planning Grant (SLIPG)

Grant application process will require Oregon to

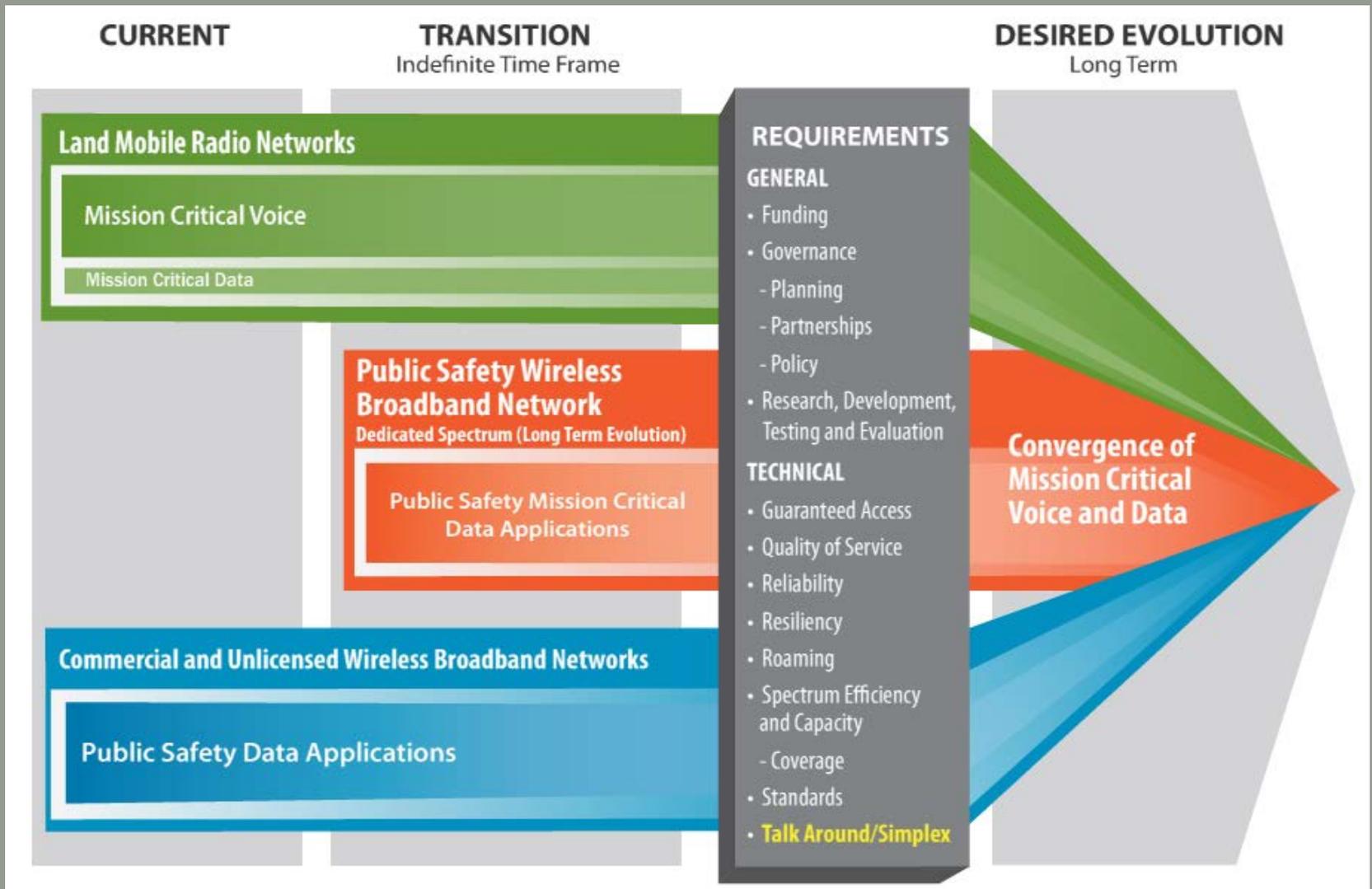
- Designate a single office or governmental body to serve as the coordinator of grant funds
- Discuss how Oregon defines and classifies local jurisdictions into rural and non-rural areas, and prioritization plans to ensure coverage in and participation by rural areas.
- Discuss how Oregon will leverage and update the SCIP
- Show how Oregon's knowledge, experience, and staffing is sufficient for accomplishing grant tasks and overseeing a broadband telecommunications project.
- Provide Detailed Budget Justification to demonstrate appropriate budget resources to execute the proposed activities of the grant.

Conclusion: Manage Stakeholder Expectations

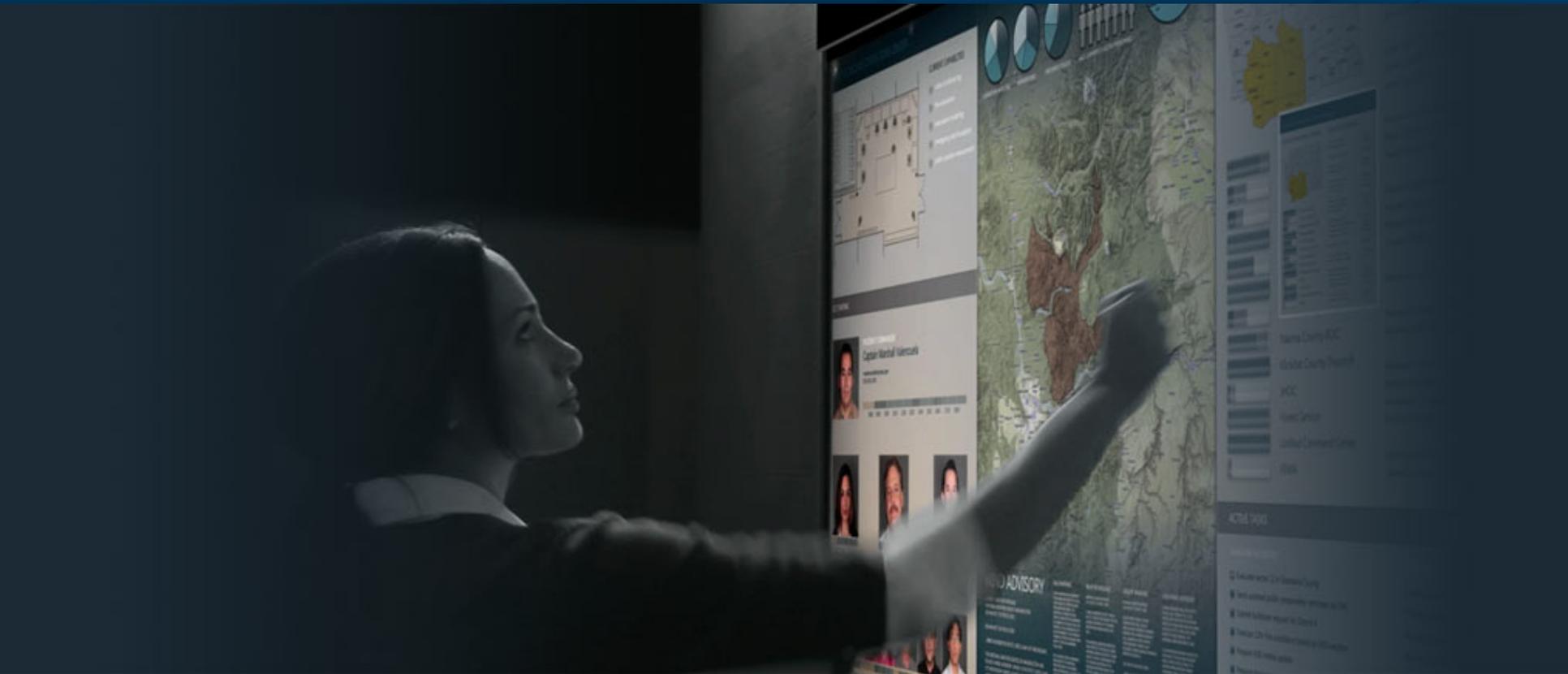
We request SIEC's assistance in managing expectations

- LTE is not a replacement for LMR technology today
- LMR will continue to provide mission critical voice communications for the foreseeable future
- LTE high speed data network introduces new capabilities to assist the first responder
 - Provides new supplementary data and video services
 - Its true power and value will be realized once useful, interoperable applications are in the hands of users
- Oregon will need to prepare its local networks and establish new processes to make full use of this promising capability

Public Safety Communications Evolution to a Single Converged Mission Critical Platform



Vision of the Future: Public Safety Broadband Network Applications in Action



[Precision Information Environment \(PIE\)](#) DHS Command, Control and Interoperability Division Basic/Futures Research program has developed a compelling video to illustrate broadband's potential within emergency management.

Thank You

Steve Noel

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