



## OREGON PUBLIC SAFETY BROADBAND NETWORK

Imagine public safety first responders

- Viewing live video from monitoring cameras inside the school while traveling in police vehicles to a school emergency
- Sending video of patient and vital health stats to the emergency room from the ambulance en route to the hospital
- Being alerted immediately to a downed firefighter via a helmet camera transmitting real-time video and aware of the dangerous surroundings and vital signs via clothing mounted heat and bio sensors

All these and more become possible with the deployment of Oregon Public Safety Broadband Network (OPSBN), a high speed broadband data communications network dedicated to public safety.<sup>1</sup> OPSBN will be part of the nationwide public safety broadband network (NPSBN), a single interoperable network that will allow police officers, firefighters, emergency medical personnel, and other public safety officials to transparently communicate with each other as appropriate across jurisdictions.

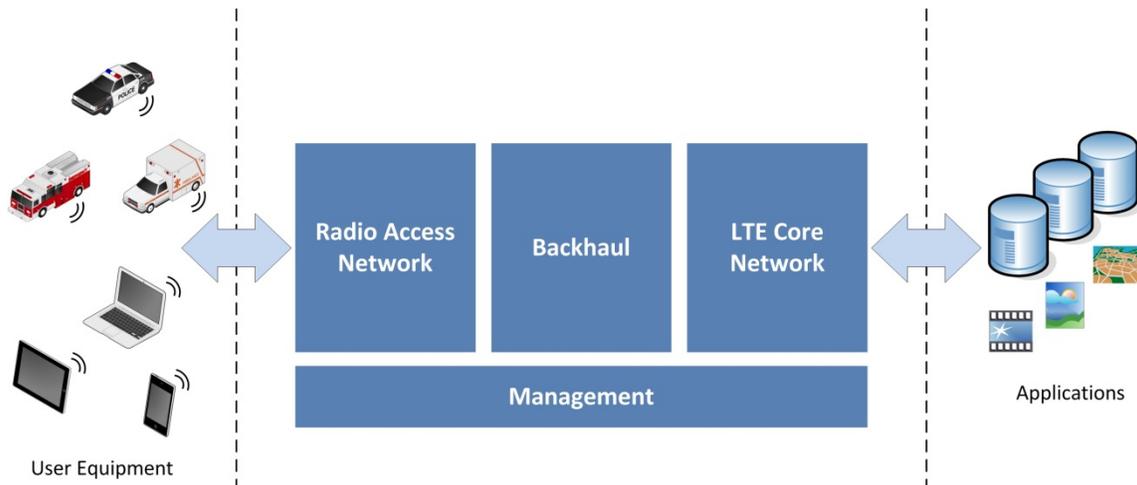
**FirstNet.** Title VI, “Public Safety Communications and Electromagnetic Spectrum

Auctions,” of the Middle Class Tax Relief and Job Creation Act of 2012 (PL112-96) includes provisions to fund and govern the NPSBN, reallocate the 700 MHz D Block spectrum to public safety, and authorize the FCC to conduct incentive auctions to raise \$7 billion for building and managing the new network. It establishes the First Responder Network Authority, or FirstNet, within the Department of Commerce’s National Telecommunications and Information Administration (NTIA) to oversee network planning, construction, and operation. FirstNet members were announced on August 20, 2012 by the U.S. Commerce Secretary and include Chief Jeffrey Johnson, the former chair of the Oregon State Interoperability Executive Council (SIEC).

**LTE Network.** To ensure interoperability and foster the availability of low cost user devices, the Act directs a specific wireless technology be used for the network – Long Term Evolution or LTE. LTE is the fourth generation (4G) cellular technology currently being deployed by commercial service providers. An LTE network consists of these major elements:

- User Equipment (UE), such as a vehicle mounted modem, laptop computer air card, handheld smartphone or tablet

<sup>1</sup> The Department of Homeland Security Command, Control and Interoperability Division Basic/Futures Research program has developed a compelling video to illustrate broadband’s potential within emergency management. See <http://precisioninformation.org>.



**Major Elements of an LTE Broadband System**

- Radio Access Network (RAN) consisting of towers and cell site base station equipment which make the wireless connection to the UE mobile devices
- Evolved Packet Core (EPC), performing core LTE controller activities, such as identifying subscribers and establishing connections between them and application packet gateways
- Backhaul network, which interconnects the RAN equipment to the EPC, typically via suitable fiber optic and microwave links
- Management functionality, which includes network management, provisioning, billing, accounting, authorization, and access control

**Applications.** However, the high speed data network in and of itself is simply the transmission medium. The real value of OPSBN is in the life changing, lifesaving public safety applications that it will enable. LTE technology opens the door to entirely new operational processes for public safety operations. The expansive data throughput of LTE broadband, which is theoretically *more than 15 times faster* than third generation (3G) cellular data today, is truly a transition “from garden hose to fire hose,” enabling a broad range of new public safety support capabilities that, until now, were simply not possible. Listed in the table on the

next page is a sampling of these exciting applications, some of which are in use today.

**Mission Support vs. Mission Critical.** When discussing applications, it’s important to make a distinction between mission *critical* and mission *support* use by public safety users. The mission critical voice communications provided by Land Mobile Radio (LMR) technology are supported today by wide coverage, highly reliable networks. Until OPSBN is similarly deployed, *LTE high bandwidth data applications such as streaming video will be for mission support use.* For example, note that the last item in the table is Push-To-Talk Voice over Internet Protocol (VoIP). LTE VoIP is still in development in standards bodies and requires a relatively dense build-out of tower and communications infrastructure as compared to LMR. Therefore, the National Governors Association (NGA) has stated, “it will be many years before VoIP will be carried over the [LTE] network, so states will need to continue to sustain LMR systems...even as they build toward public safety broadband.”

**Business Model.** Once constructed, FirstNet intends to sustain network operations using a fee based business model, with revenue coming from three sources:

- Network User Fee – Fee from each public safety or secondary network user

## Public Safety Broadband Applications

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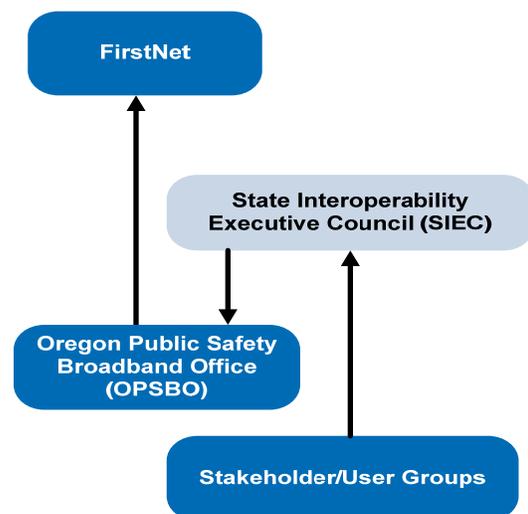
### High Bandwidth Data Communication is Key to many Public Safety Applications

- Lease Fee for Network Capacity – Access fee from secondary user
- Lease Fee for Network Equipment/Infrastructure – Fee for use of FirstNet antennas, towers, and other assets

Commercial LTE service will not be allowed on NPSBN. Secondary users, such as utilities, will be allowed to use the network on a for-fee basis, increasing the subscriber base and making the network more affordable for public safety users. There is no information yet whether the User Fee will be a flat monthly rate per subscriber or a usage based arrangement. Oregon public safety users have typically preferred a flat rate, due to its predictability and ease in budgeting.

**Governance.** The Act requires each state to designate a single officer or governmental body to coordinate with FirstNet. Oregon plans for an Oregon Public Safety Broadband Office (OPSBO) to serve as this single voice to FirstNet. Similar to the administration of the State Radio Project (SRP), the proposed OPSBO will handle day-to-day program management and coordination functions. The OPSBO will

initially reside within Oregon Department of Transportation’s Major Projects Branch (MPB), and later transition to the Department of Administrative Services (DAS). A multi-agency Management Steering Committee is proposed to advise and oversee the activities of the OPSBO. The SIEC will consolidate and communicate stakeholder and user needs to the OPSBO for conveyance to FirstNet.



**Stakeholder and User Information Flow**

**Next Steps.** Requirements for the State and Local Implementation Grant Program were released by NTIA in August 2012. The 56 states and territories are eligible for \$135M in planning funds through the program, which may be used to create or expand governance structure, ensure local and tribal consultation, plan education and outreach, and determine and manage staffing. They can also be used to establish standard Memorandums of Agreement (MOUs) to facilitate use of existing assets. A Request for Proposal (RFP) for the grant funds is scheduled to be released in the first half of 2013, with distribution and use of those grant funds for planning activities in 2013 and 2014. In the first quarter of 2015, FirstNet is expected to begin informing states of their national deployment plan and funding levels. 2015 is also when the first funding from spectrum auctions is anticipated to become available for network construction. The spectrum auction process is expected to continue through 2022.

**Opt-In or Opt-Out Decision.** FirstNet is required to develop and present a plan to each state to build, operate, and maintain both the nationwide network and the network in each state. Once FirstNet has developed a plan, notified Oregon, and provided funding levels to achieve the plan objectives, Oregon will have 90 days to decide whether to **opt in** and participate in the deployment of the nationwide public safety broadband network or **opt out** and deploy its own portion of the national network. If a state

opts out, it still must achieve the level of connectivity and interoperability that is specified by FirstNet for the nation. Based on the information that is currently available regarding FirstNet and the status of Oregon's existing network facilities, we recommend that Oregon adopt an **Opt-In** position.

**Managing Expectations.** During this long, multi-year network deployment, it will be important to manage stakeholder expectations of this exciting technology by emphasizing these key messages:

- LTE is not a replacement for LMR technology today.
- LMR will continue to provide mission critical voice communications for the foreseeable future.
- LTE introduces new capabilities to assist the first responder and makes current data applications even better. It is a supplementary technology that offers the first responder new data and video services, providing additional and timely information.
- OPSBN is a high speed data communications network. Its true power and value will be realized once useful, interoperable applications are in the hands of users.
- States will need to prepare their local networks and establish new processes to make full use of this promising capability.

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