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“Early Builders of FirstNet-Ready LTE Networks”

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- Why is FirstNet involved with Early Builder Public Safety Band 14 LTE projects?
- What do we hope to learn?
- What have we learned so far?

Brief Early Builder History



- 2009 – present - **Broadband Technologies Opportunity Program (BTOP)**:
 - \$4.7B in 233 projects
 - 7 Public Safety LTE projects for use of the 700 MHz Public Safety (PS) BB Block (**5x5MHz**)
 - \$383M Federal Investment; Total of \$455M including project matching funds
- February 2012, **Public Law 112-96**: The Middle Class Tax Relief and Job Creation Act of 2012 signed by the President:
 - created **FirstNet** in Title VI of the Act
 - merged the D Block plus the existing Public Safety BB block (**10x10MHz**)
 - issued the nationwide license of frequency band (**Band 14**) to FirstNet
 - provided FirstNet up to **\$7B** in funding via future spectrum auctions
- May 2012 - NTIA partially suspended funding to the PS BTOP projects
- 2012 - 2014 - FirstNet negotiated **Spectrum Manager Lease Agreements (SMLA's)** with four of the public safety BTOP projects and Harris County, Texas
 - LA-RICS, States of New Mexico and New Jersey, and Adams County, Colorado
 - includes **Key Learning Conditions Plan(s)** (KLCs) in return for use of FirstNet Band 14
- The only non-BTOP funded early builder project is Harris County, Texas

Band 14 PS LTE Projects



FirstNet Guiding Principal

“FirstNet will provide technical support to these projects and will share any lessons learned with the broader public safety community to enable the successful implementation of FirstNet’s nationwide network deployment. Designing and deploying a network that lives up to these principles will require an extraordinary level of coordination and collaboration among all stakeholders.”

Project	SMLA	KLCP	Sites	Primary Focus Areas / Key Learning Conditions	On-Air
1. LA-RICS	Yes	Yes	182	Secondary responders partnerships, Quality of Service, priority/pre-emption	2Q15
2. NM	Yes	Yes	7	Hosted core, int’l border spectrum management, Federal partnerships	2Q15
3. NJ	Yes	Yes	30	Deployable assets, Disaster Recovery, training exercises, Network Operations Center notification	2Q15
4. ADCOM	Yes	Yes	16	Public Safety Communications Research program/FirstNet test support, Band Class 14 device testing, demonstration access	Now
5. TX	Yes	Yes	14	Core migration, data analytics, rural coverage, special events, LTE training	Now

SMLA: Spectrum Manager Lease Agreement

KLCP: Key Learning Conditions Plan

1. LA-RICS



Key Learning Conditions:

- Establish partnership agreements with utilities and secondary responder agencies
- Define and ensure network mechanisms are in place to alert the network operator of network congestion events that impact user perceived degradation of quality of service (QoS) or invoke pre-emption
- Test/validate key Priority and QoS Requirements and Assess Priority/QoS operational management alternatives



2. State of New Mexico



Key Learning Conditions:

- Assess the feasibility of hosting a single Evolved Packet Core among multiple radio access networks (RANs)
- Assess spectrum management and use issues along the southwest border
- Assess sharing of use among Federal and State organizations



3. State of New Jersey



Key Learning Conditions:



- Demonstrate and document the use and capabilities of rapidly deployable assets
- Conduct emergency management exercises and training activities utilizing assets and provide detailed lessons learned to FirstNet
- Document best practices for Network Operations Center (NOC) notification approach including: trouble ticketing, prioritization, reporting, and close-out

4. Adams County, Colorado



Key Learning Conditions:

- In cooperation with FirstNet and the Public Safety Communications Research program (PSCR), make its operations available for the purpose of providing a real-world test system for PSCR and/or FirstNet
- Allow FirstNet and end user device manufacturers to provide user devices for purposes of testing such devices on the LTE Network
- Provide reasonable access to its operations for sponsored guests of FirstNet for high-level demonstrations of the public safety functionalities of its operations



5. Harris County, Texas



Key Learning Conditions:

- Core transition to FirstNet: Document protocol and execute core migration
- Data analytics: Understand user demand profiles based on live data providing insight on capacity models
- Rural coverage (extended mode): test long-range coverage options for LTE
- Special events: Explore quality of service (QoS) / interoperability options for supporting major events (e.g., Major Events, State/National Security)
- Training: LTE-specific adaptations to existing FEMA-approved responder training



What Have We Learned?

- Public Safety managed mobile virtual private network (MVPN) might prevent QoS, Priority, Pre-emption from operating at the application level



What Have We Learned?



- Most States and Public Safety Entities are not familiar with the relationship between “per-Gigabyte” pricing for Public Safety Users and the need for pre-pay/ Intelligent Network/Online Charging-based billing systems



What Have We Learned?



- FirstNet will not be immune to risk associated with delays due to public outcry over network build/new towers



What Have We Learned?

- In general, initial early builder networks do not have robust network performance, device, service reporting, or Operations, Administration, and Management (OA&M) platforms included



What Have We Learned?

- Relatively short life cycle of LTE equipment makes upgrades and technology replacement costly
 - Important to understand in the context of a multi-year network deployment schedule for the NPSBN





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Thank you

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