

Campus Safety CONFERENCE 2019

Making Campuses Safer — TOGETHER

LTE to LMR: Tips for Integrating Push-To-Talk Cellular into your Campus Radio System

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Housekeeping

- Cellphones on vibrate or silent
- Access to the presentation
- Q&A Session at end
- Evaluations
- Social Media



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About Me

- Chief of Police at N.M.S.U. (7 years)
- 31 years as certified police officer
- BCJ, BA – psych, MSPCI
- FBI National Academy #205
- 14 years as adjunct faculty
- NMSU is largest land-grant university in US at 172 square miles, 11 campuses, 4 remote research facilities, and 32 remote offices spread throughout state



About this Session

Session Takeaways

- Why LTE to LMR is likely to be the trend for future public safety and campus communications
- Understand options for connecting cellular to land mobile radio
- Identify hardware used in LTE to LMR
- Additional capabilities beyond simple push-to-talk that apps can provide

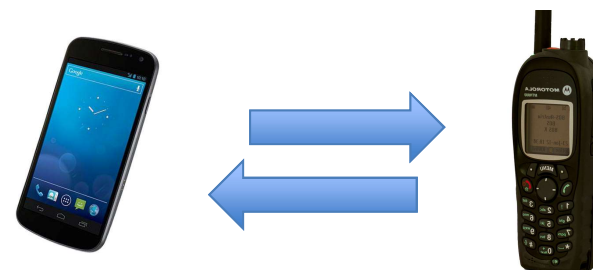
Quick History

- **FirstNet formed to create nationwide, interoperable communication (voice and data) for public safety**
- **Dedicated band of frequencies called Band 14 provides public safety priority access to the network**
- **Relies on a “private core” for public safety, though other ways of giving priority also exist (e.g., GETS/WPS)**
- **Multiple cellular providers now offering a “private core” on their networks, but connectivity between them is still not quite there**



What is LTE to LMR?

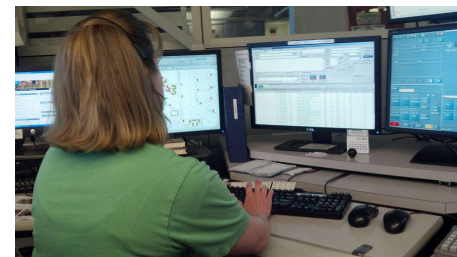
FirstNet is a driving force (beyond P25)



- **LTE** = Long Term Evolution (usually associated with cellular communication networks) – the tech path for 4G/5G service
- **LMR** = Land Mobile Radio; usually associated with traditional public safety radio systems (usually licensed through FCC)
- **LTE to LMR** = Connecting cellular based equipment to existing radio systems so users on both can communicate with each other

Why is LTE to LMR important?

- **Communications are critical to public safety!**
- **Limitations on LMR systems:** range, licensing, frequency availability, interoperability, cost of expansion
- **More than voice:** LTE brings the ability for high bandwidth data sharing, allowing video, photos, maps, locations, etc.
- **Interoperability:** Connecting cellular based equipment to existing radio systems so users on both can communicate with each other
- **Cost:** Possible to have BYOD that is secure, low cost
- **Flexibility:** Many options – not locked into a single product, vendor



How Can It Work?

- **Expand capabilities of existing cellular program:** If you currently use cellular devices, this is a good starting point and gets you ready for future LTE to LMR connectivity at the lowest cost.
- **Create a “channel” for connection, interoperability:** This is the first real LTE to LMR connection.
- **LMR replacement:** This has been talked about as a “goal”, but likely is many years away for most agencies.

A Closer Look at LTE:

Mission Critical

Technology

Products

A Closer Look at LTE – **Mission Critical**



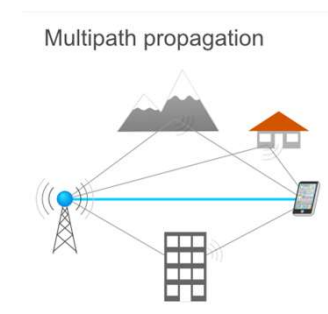
- **Prioritization:** User is *guaranteed* a higher priority than the general public
- **Features consistent with LMR radio features:** dedicated push-to-talk button, high reliability, low latency, talker ID, group calls, 1 to 1 calls, emergency calls, high quality audio, easy channel changing, etc.
- **Rugged consistent with Mil-Spec standards:** hazardous environment, water resistant/proof, shock resistant, “unbreakable”

Mission Critical Status: *Are We There Yet?*

- **Standards not in place yet**
- **Different users have different needs** (police, fire, EMS, admin, etc.)
- **Feature set still not complete across carriers:**
 - **Emergency Button** (Is there one, what does it do, where does it go?)
 - **Ability to operate locally if network is down**
 - **Integration with existing dispatch consoles**
 - **Lock out programming changes from users**
 - **Dispatch override of transmissions**

A Closer Look at LTE - Technology

- **Multi-Path:** Can use cellular network, WiFi, Band 13 *and* 14, etc.; potentially more resilient
- **Over-The-Top:** Carrier neutral; uses the cellular network but does not actually interact with the carrier
- **Carrier Integrated:** The cellular carrier has imbedded the product within the basic operation of the network, allowing for priority access/use, private core, bandwidth allocation, etc.



Technology Status: *Are We There Yet?*

- **Over-the-top has been around for years, but doesn't guarantee priority/availability**
- **Carrier integration with FirstNet core hasn't happened yet**
- **Still a lot of potential failure points between the user and the private core**
- **Band 14 still not available everywhere, and many current devices are not Band 14 capable**

A Closer Look at LTE – Product Examples



Everest Platform



Radios using LTE for connectivity

A Closer Look at LTE – Product Examples



Ruggedized Smart Phones with PTT buttons

Products: *Are We There Yet?*

- Many existing products can connect to LMR via apps
- Product design is still new, lessons being learned:
 - Button location, size
 - Screen illumination
 - Channel changing
 - Peripherals (many are not mission critical rated/capable, like cases)
 - Features within the software (e.g., “always on/first”; interaction with OS; ability to operate locally if network down)
 - Voice only, or do you want data, apps, mobile hotspot, and more?



Connecting LTE to LMR

Connecting LTE to LMR:

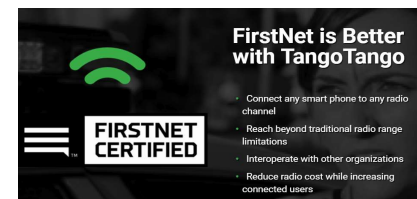
Need a physical connection somewhere with:

- Router with internet connection (LTE and/or landline)
AND
- Radio (“donor radio”)
OR
- Gateway to IP-based LMR resource



Connecting LTE to LMR: *OPTIONS*

- Turn-key solution from vendor
- Provider-based solution
- “DIY” solution
- “Lease” vs. Own
- Dispatch Consoles



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Network details & coverage maps at vzw.com. © 2019 Verizon. SB0004119

Apps Can Add Capabilities

Lots of Apps, And More To Come!

- **Geolocation & tracking of personnel**
- **Sharing of data, situational awareness**
- **Case management (narratives, photos, video, mapping, multi-user integration, etc.)**
- **Incident/Event plans**
- **Integration of multiple devices** (warrants/warrants, E-citations, cameras, etc.)
- **Fleet management**
- **Resource guides, bulletins**



INTREPID RESPONSE

Response is a simple to use sit provides real-time location data media sharing amongst team r is invaluable for any dynamic c supervisory users must be align common operating picture. Int both web browser and native r

For more information  

- Live location updates of mul

Lessons Learned

Lessons Learned with NMSU Early Adopter Program:

- **No single device is working well for everyone**
- **Timeout features intended to save battery can cause issues**
- **Smaller size is convenient to carry, harder to operate**
- **Screen-based functions require looking (peripherals help)**
- **Screen illumination can cause officer safety issues in dark**
- **Still not MCPTT, but can see progress being made**

Lessons Learned with NMSU Early Adopter Program, pg. 2:

- **Find out exactly who needs to be involved, what each party will do with the project, and what they will charge (initial & ongoing)**
- **BYOD integration possible, but check on licensing options, costs**
- **Need to manage users and groups**
- **Some of the devices really are rugged (more so than traditional radios)**
- **May need to limit user ability to change options (“cop-proofing”)**

Reminders

- Access to the presentation
- Evaluations
- Social Media

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