MOTOROLA

October 28, 2009

Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Washington, DC 20554

Re: WT Docket 06-150
PS Docket 06-229

Dear Ms. Dortch:

Pursuant to Section 1.1206(b)(2) of the Commission's Rules, this is to notify you that on October 27, 2009, Dr. David Borth, and I met with Jamie Barnett, Chief of the Public Safety and Homeland Security Bureau, Jennifer Manner and David Furth of the Public Safety and Homeland Security Bureau regarding the above captioned proceedings.

During the meeting we discussed the issues in the attached presentation providing an overview of mission critical public safety networks and the redundancy and reliability built into a network designed for mission critical operation. We also discussed how broadband and mission critical narrowband networks can be used together to meet a variety of requirements and provide an additional level of redundancy. Finally we discussed the importance of public safety maintaining control over its use of a network and how a network can be designed to allow such control under a variety of deployment scenarios ranging from a purely private public safety network to one that relies heavily on working with commercial carriers to deploy a shared network. Critical to any of these deployments is the need to ensure that public safety maintains control over its use of the network and determines the most suitable deployment scenario. Reallocating the D block to public safety and allowing public safety to determine the level of carrier involvement and sharing will help ensure that a sufficient level of control can be maintained.

Pursuant to the Commission's Rules, one copy of this notice is being filed electronically with the Commission. If you require any additional information please contact the undersigned at (202) 371-6953.

Sincerely,

/s/ Steve B. Sharkey
Steve B. Sharkey
Senior Director, Regulatory and Spectrum Policy

Cc: Jamie Barnett
Jennifer Manner
David Furth

Motorola, Inc., Global Government Affairs
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Public Safety Migration to Broadband Services

Dave Borth

Advanced Technology & Research

Public Safety System Resilience

Conventional & Trunking System Architectures

Public Safety PTT requires Broadcast not Unicast Services

Collaborating Narrowband and Broadband Devices

Deployment Scenarios for Public Safety Broadband

Public Safety has multiple levels of radio system redundancy

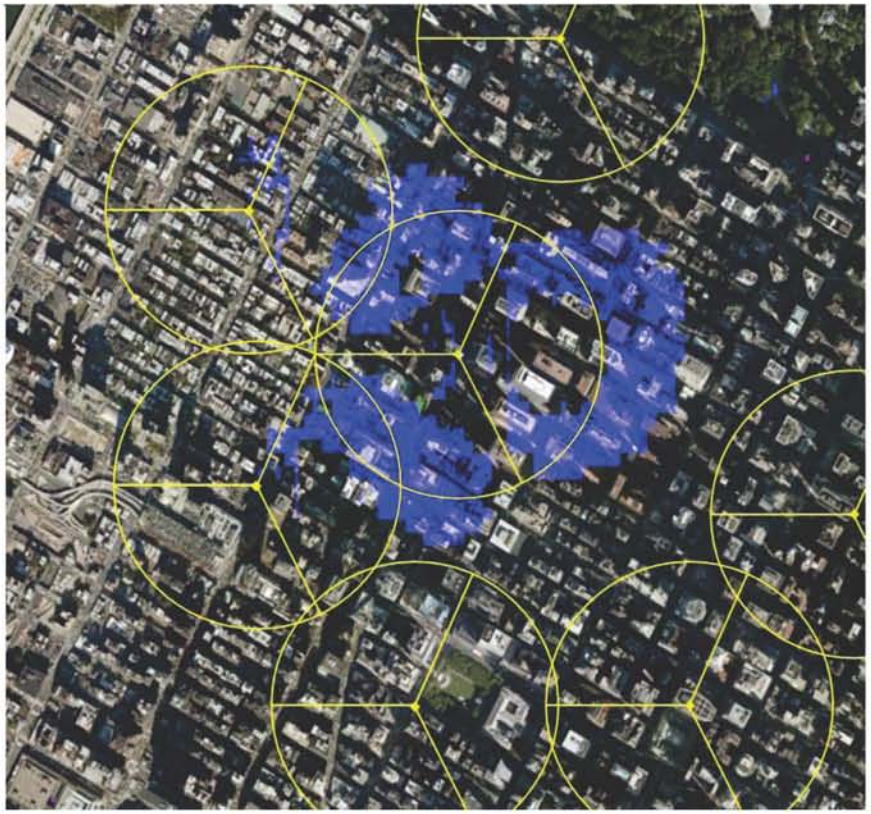
- Backup transmitters, backup comparator & hundreds of receiver sites
- Further, coverage areas overlap so adjacent areas can share resources if necessary

LMR has several levels of fallback

- Zone trunking, site trunking; failsoft
- In-cabinet repeat, talkaround

Site trunking not practical in LTE

- LTE cannot function without a core for authentication, handoff, access to application services, etc.
- Off-network sites result in interference and provide limited services over a small area



LTE Autonomous Operation – Isolated Site

Blue = very low SINR and service rates

No talkaround in LTE

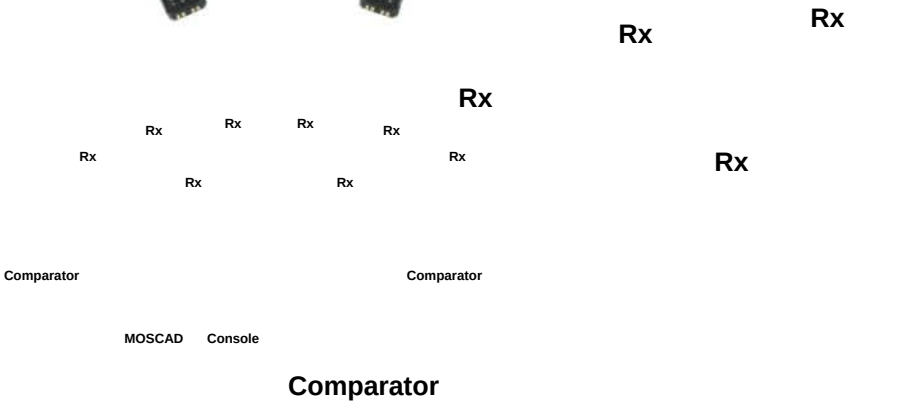
- There is nothing similar on the roadmap
- Including an LMR radio in the MC-LTE device is probably the best approach
- Wi-Fi and 4.9GHz will not support the range necessary

Fallback modes are not built in to LTE and are not a 3GPP Priority

Typical of major municipalities

Very high coverage reliability

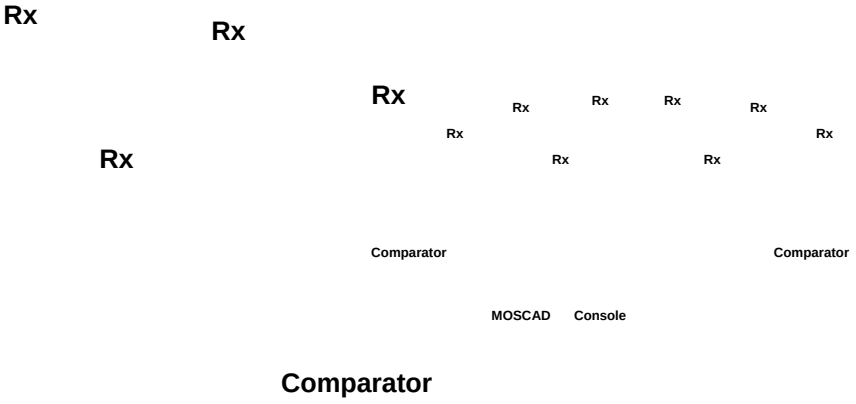
- Multiple small, overlapping coverage areas
- Satellite receiver voting



Very high availability

- Redundant transmitters
- Redundant comparators
- Redundant links
- Multiple satellite receivers
- SCADA system to control sites if wireline control fails
- Talk-around (Direct Subscriber to Subscriber without infrastructure)

Basically, two complete systems



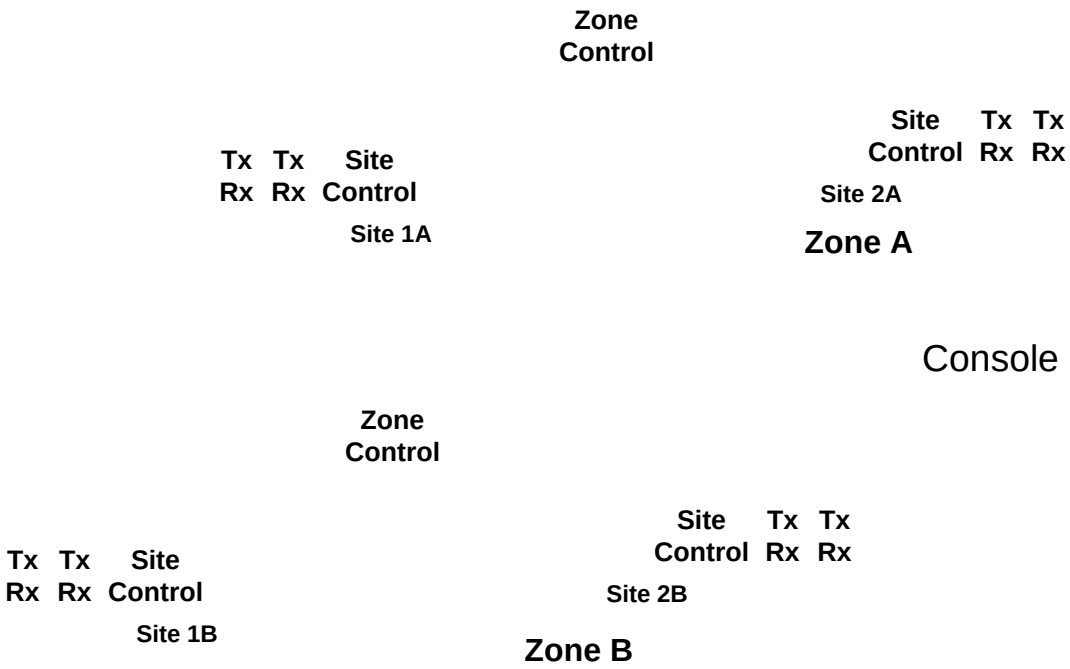
Typical of state wide systems

Very high availability

- Redundant zone controllers
- Zones can operated independently if inter-zone link fails
- Sites can operate independently if site links fail
- Repeaters can operate independently is site controller fails (also called “failsoft”)
- Talk-around

Very high coverage reliability

- Trunking systems can use voting and simulcast to improve coverage

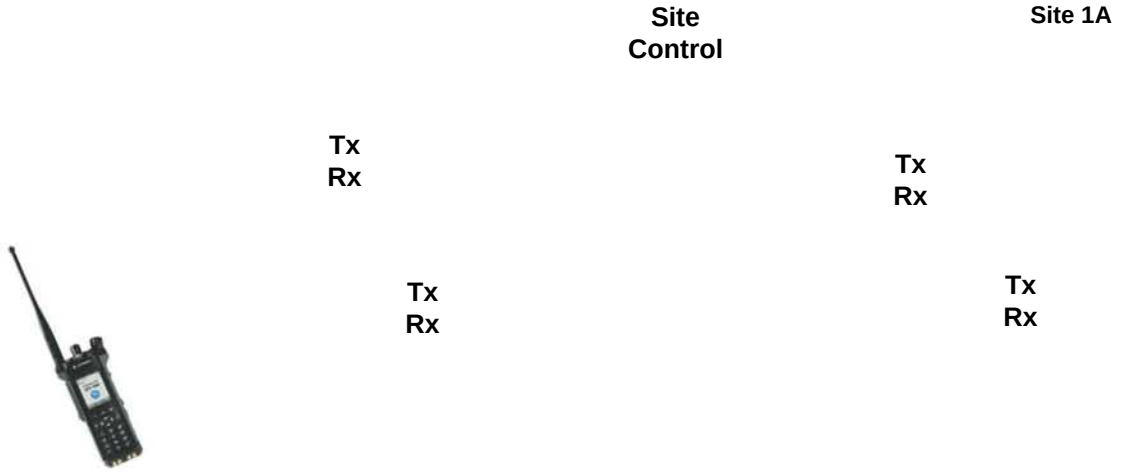


The same signal is sent from multiple sites at the same time at the same frequency into overlapping areas to increase coverage area and improve reliability of in-building portable coverage

Used with trunked and/or conventional systems

The group of sites appears as one large site to users and the system controller

The receivers at each site are voted using a comparator

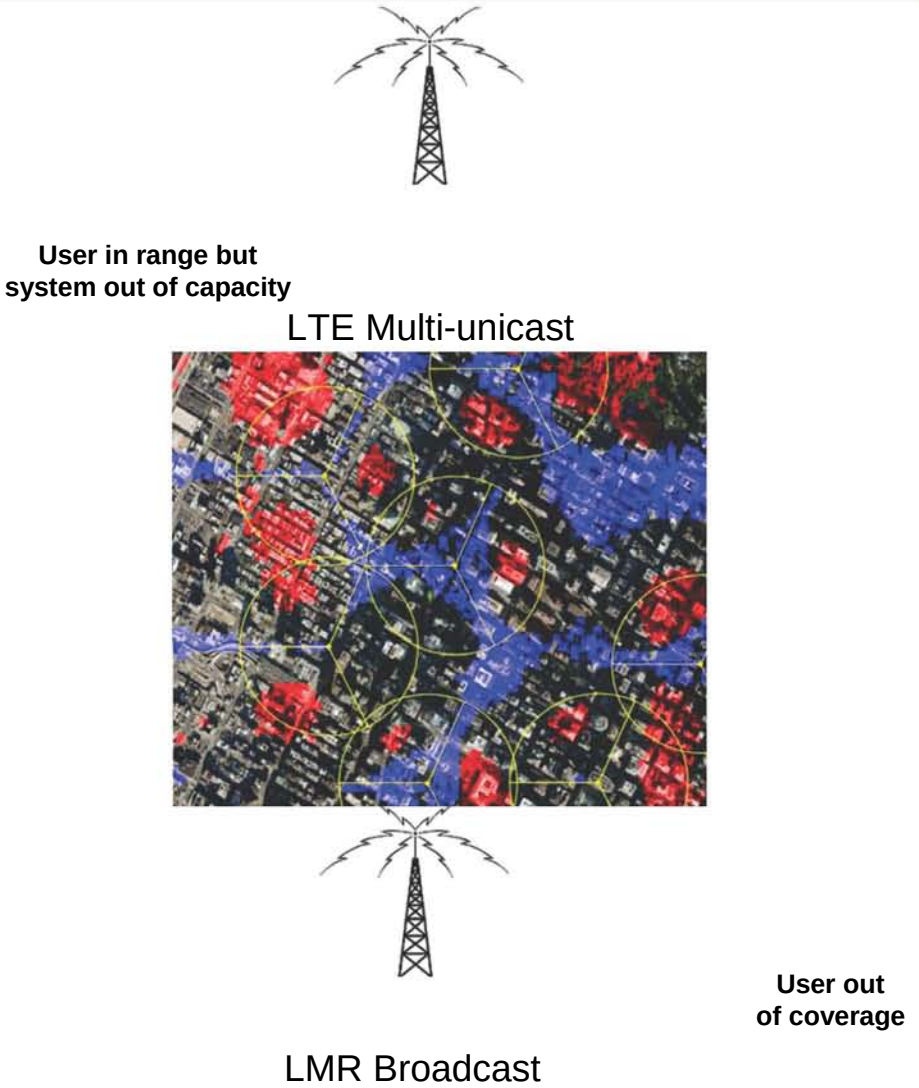


LTE Release 8 (2Q09) is inherently unicast

- Unicast is very efficient for individual data transactions because each user receives exactly the amount of capacity they need
- Public Safety must be able to support a dense group of users at the incident scene, which sometimes will be on the cell edge (3% of the area)
- Approximately only 10 – 20 low rate (<20 kb/s) QoS bearers can be supported at an incident scene with all participating users at the edge of a cell

LMR is inherently broadcast for PTT Voice

- One user transmits and any number can listen
- Outage occurs only where there is insufficient signal strength
- A separate bearer must be established for every listener; the media must be duplicated for each listener in the Group PTT server (Not LTE)



Running voice as a data application does NOT provide mission critical coverage

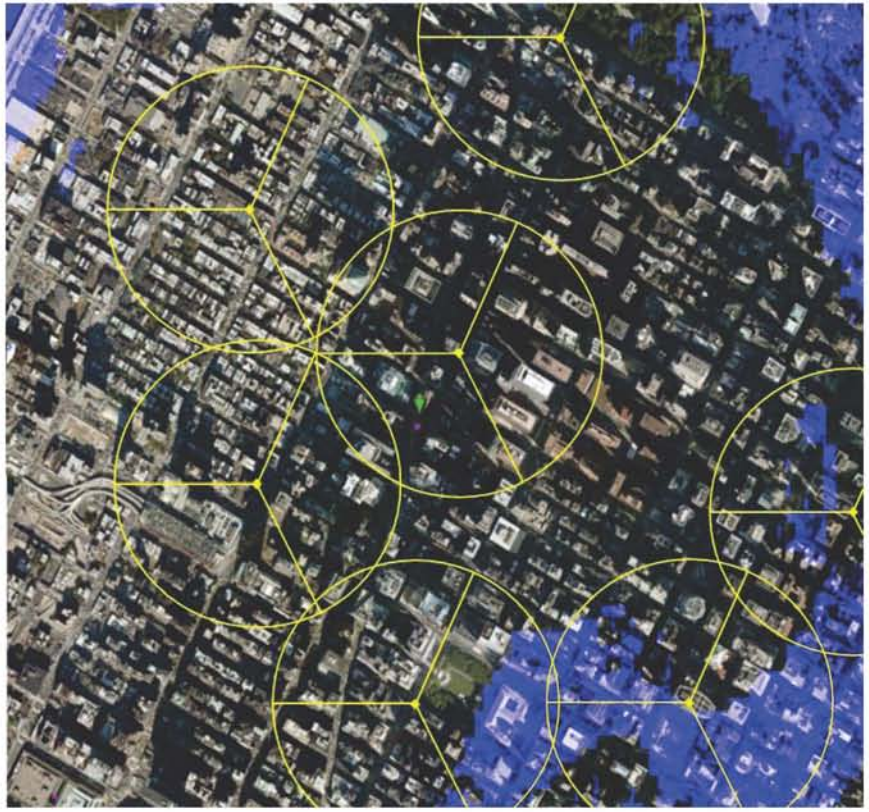
Future LTE releases will include MBMS (Multimedia Broadcast/Multicast Service)

Rel 9 (2Q10) MBMS still has gaps

- Designed to support long duration TV/video sessions, not PTT
- MBMS connectionless and service not guaranteed, access delays are unknown
- Restriction of a single service area per eNB not efficient, need dynamic Multicast services

Additional gaps with MBMS

- Need to apply a reuse plan to get sufficient SINR to handle call density on cell edges
- Continuity at jurisdictional boundaries
- High-rise building coverage with cellular
- Commercial PoC models are multi-unicast; a broadcast-aware PoC model is needed



LTE MBSFN – Broadcast coverage
Blue = very low SINR and service rates

Inbound coverage and capacity still the limiting case for performance

- There is no voting approach or soft-handoff in available in LTE

Broadcast holds promise but many questions regarding coverage remain

OMA PoC over R8 LTE expected Group PTT to Audio

- ~1 – 3 seconds unloaded and perfect RF conditions
- ~2 – 4 seconds typical loading and RF conditions
  - Not functionally equivalent to LMR/P25 feature set
  - Investigating possible OMA/LTE optimizations

LMR specifications define the following End to End PTT to audio emanating from target radio

- Trunking Monocast/Simulcast Performance Range ~ 1.1S / 1.3 S
  - Motorola P25 Systems .75 – 1.1 S
- Conventional Radio System Performance Range ~ .25 S / .65 S
  - Initial access is longer (.65 S) then when system busy and repeater in hang time (.25 S)

P25 LMR Core
Private LTE Upper Core
P25 LMR
Public/Private LTE Lower Core & RAN
User carrying both LMR and LTE devices

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Thank You