



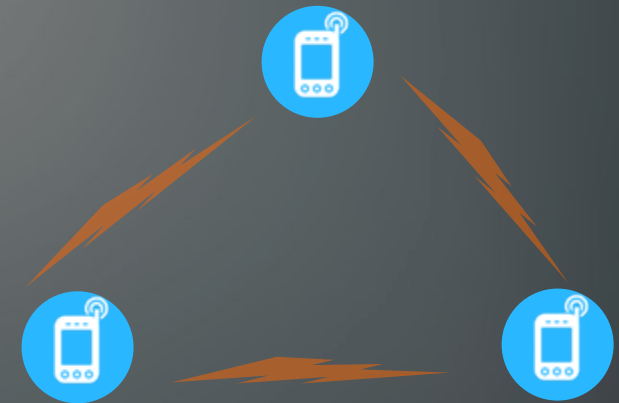
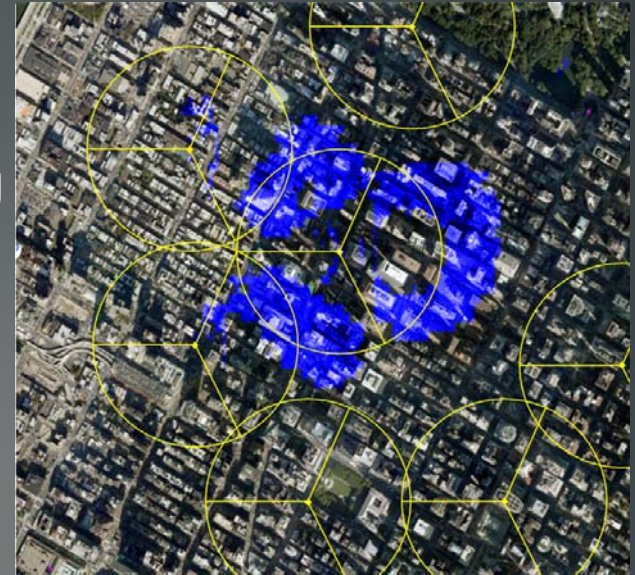
# Requirements Needed for Public Safety Mobile Wireless Network

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# Public Safety System Resilience



- Today - Multiple levels of radio system redundancy are provided
  - Backup radio equipment/sites and overlapping coverage
  - Zone trunking, site trunking; failsoft
  - Local repeater mode without Core Network
  - Talkaround mode without Site/Core Network
- Broadband doesn't work without Core Network
  - Off-network sites result in interference and provide limited services over a small area
- Broadband doesn't support Talkaround

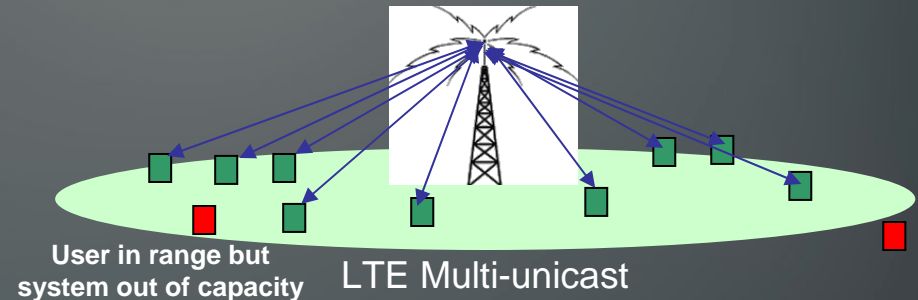
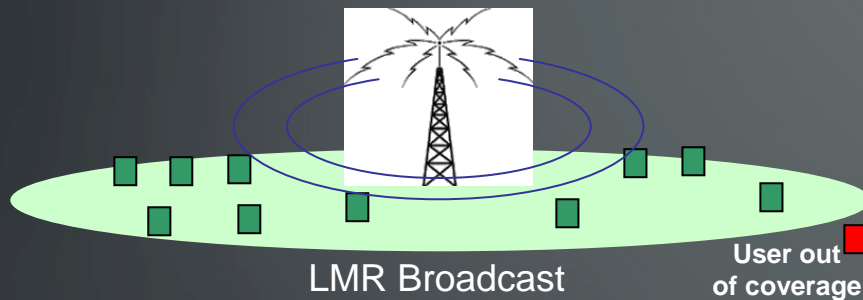


*LTE doesn't support all these modes and must be made a 3GPP Priority*

# Public Safety Coverage



- LMR
  - An LMR bearer delivers a single media stream
  - LMR coverage is based on signal strength (i.e., range)
  - All users within range of the base site can receive a transmission
- Broadband
  - Broadband is based on a bearer-per-user today
  - Capacity is based on channel bandwidth and C/I
  - The number of users that can be supported depends on their location in the cell and the interference generated in other cells
  - Multicast/Broadcast is proposed for BB systems to support IPTV
  - Broadcast is a key to supporting public safety-grade coverage and functionality



*Public Safety-grade broadcast mode must be prioritized in 3GPP*

# Public Safety Requires Local Control of Network

- Local Public Safety agencies must coordinate, maintain, administer and dynamically, in real time, arbitrate the following mission critical functions of their communications systems
  - Security Policy and associated cryptographic material
  - System access control and priority access parameters
  - QoS flow management and network admission control
  - **Subscriber provisioning and software version/configuration**

Local Agency  
Controlled  
Implementation  
Of Unique  
Operational  
Policies



# Why 10+10 MHz is better for Public Safety



- **5+5 MHz will not be enough bandwidth for all deployments**
  - Large cities and regional networks will have high user densities
  - Future loading anticipated by machine-to-machine and fixed deployment devices
- **10+10 MHz will increase coverage area 24 – 49% over 5+5 MHz**
  - Less self interference, frequency diversity gains
- **10+10 MHz has more than 2x sector capacity of 5+5 MHz**
- **Emergency incidents will happen on the cell edge**
  - Incident scene uplink streaming video is a critical broadband capability
    - 5+5 MHz uplink cell edge channel capacity ~ 500 kb/s total for cell
    - 10+10 MHz uplink cell edge channel capacity ~ 1 Mb/s total for cell

