

**GENERAL DYNAMICS**

Broadband

# Shaping LTE to address the needs of the Public Safety community

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# Why Should 3GPP Consider Public Safety?

## Global Interest

- US has committed to LTE for Public Safety broadband
- In Europe LTE is considered to be the best option by many of the relevant technical committees and fora (e.g. TCCA CCBG)
- Other national PS authorities (e.g. in Australia, S-E Asia and the Gulf States) have chosen or are considering LTE

## Network Deployment Models

- Some Public Safety authorities may contract out network provision providing an opportunity for commercial operators
- Other Public Safety authorities may choose to rely upon mixed public/private network models offering similar commercial opportunities

## Mission Critical Voice

- Voice communications is essential to Public Safety usage

# Priority = Mission Critical Voice (MCV)

## High Level features

- Device-to-Device calls
- One-to-many group calling / Talk group management
- Push-To-Talk (PTT) calling
- Full duplex / cellular voice
- Emergency alerting / pre-emptive access
- Talker ID

## Qualitative/Performance characteristics

- Audio quality
- High power in-vehicle UE option
- Secure voice and data
- Low latency
- Inter-agency interoperability

# LTE and Provision of MCV Features

## Existing features in LTE

- ✓ Full duplex / cellular voice (VoLTE profile)
- ✓ Caller ID (for FD cellular voice)
- ✓ Band 14 high power UE (RAN work item in progress)
- ✓ Ciphering of user plane by PDCP

## Missing features

- ✗ Device-to-Device calls
- ✗ One-to-many group calling / Talk group management
- ✗ Push-To-Talk calling / Talker ID
- ✗ Group call emergency alerting / pre-emptive access

## Features needing evaluation

- Audio quality of 3GPP codecs in mission critical environments
- Call-setup & media latency in mission critical situations
- Effects of E2E security upon ROHC and scheduler efficiencies

# Device-to-Device Calls

## Proximity Services

- Talk-Around / Direct Mode is an essential feature of current Narrowband PMR terminals in providing MCV
- Normative follow-on to ProSe study item is crucial
- D2D must be supported natively by LTE for full migration of PS community to LTE broadband
- Communication more important than discovery for public safety users
- Operation when no network coverage exists is essential for public safety community



# Group Calls / Push-To-Talk

## Group Communications System Enablers

- Open Channel, Group calls and PTT are essential features of current Narrowband PMR terminals in providing MCV
- Application call control in LTE is the responsibility of IMS Application Servers (external to 3GPP)
- Migration from PMR should ideally be to an Open Standards solution providing for inter-agency interoperability when supported natively on LTE
- 3GPP should provide support for Open Standards solutions defined by external organisations addressing application services (e.g. OMA PoC)
- 3GPP should consider bearer optimisations and means of enhancing access to current bearer services (e.g.):
  - Improvements to call setup and media latency
  - Enhancements to facilitate resource allocation/reservation for group calls
  - eMBMS enhancements or other means of distributing one-to-many (DL) media ?



# Summary and Recommendations

## *Ensure Mission Critical Voice Support*

### 1. Proximity Services

- **3GPP SA (and RAN) should complete specification of device-to-device communication, including off network scenarios, in Rel-12 (ProSe)**



### 2. Group Communications

- **3GPP should provide optimised support for IMS based application services providing PTT, group call and talk group management features (GCSE\_LTE)**

