Content

- **Long Term Evolution**

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Commercial Mobile Subscribers
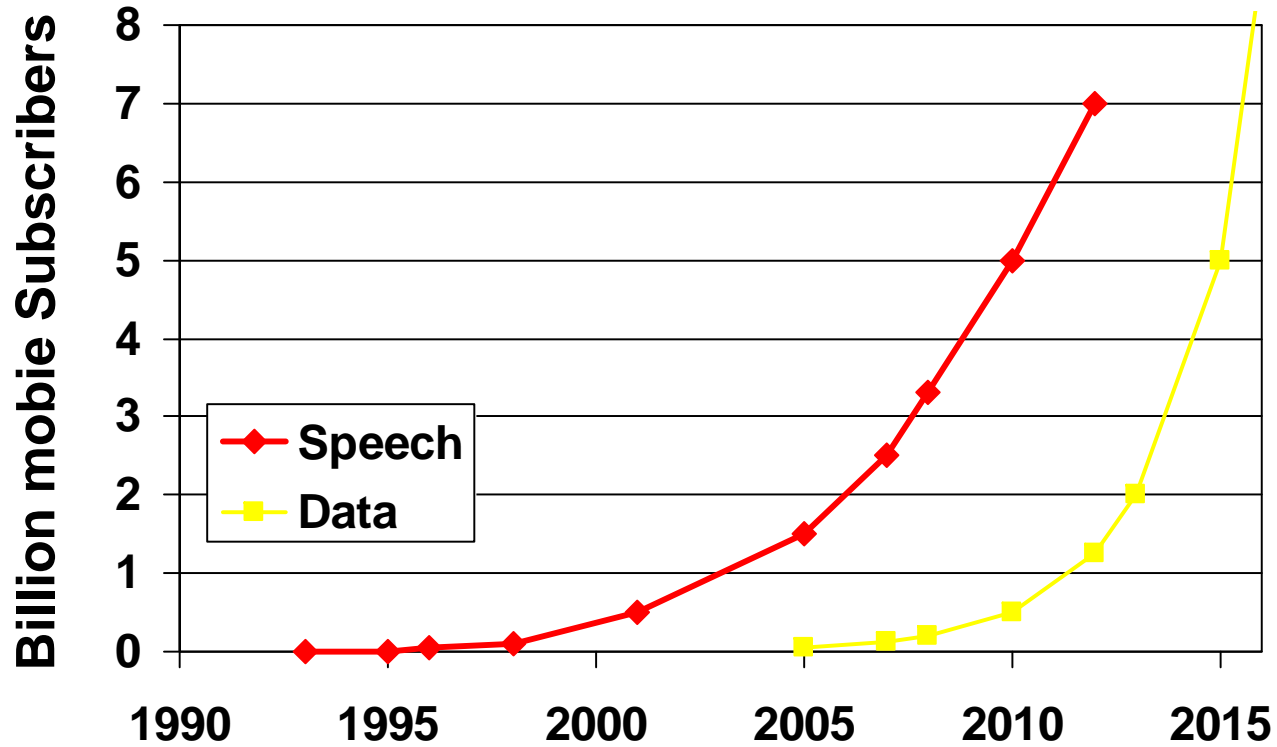
Source: GSMA

Booming Data Requirements

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Long Term Evolution as a response to Data Explosion

- Driven by mobile operators Internet Access business plans

- Increased data capabilities and spectrum efficiency:

  - 1:1 frequency re-use

  - Bandwidth is shared

    - A single user under a cell gets all capacity
    - Multiple users under the same cell share the total available capacity of the cell

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Key Requirements for Public Safety

- Coverage

- Resource availability
  - Capacity & Throughput
  - Control

- Resilient architecture

- Purpose fit devices

- Specific operational models (group communications, …)
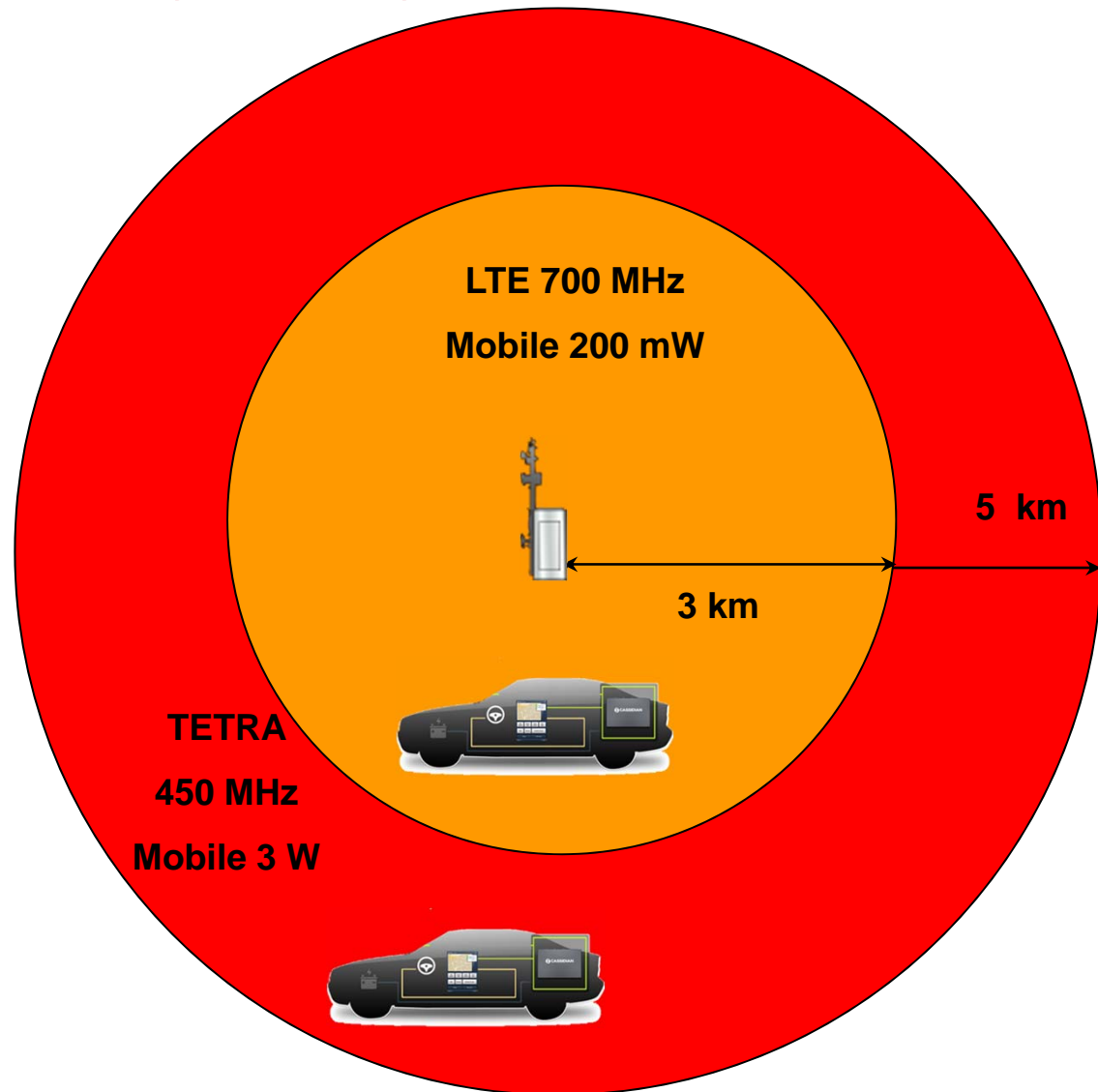
- Smooth evolution and migration plans

PLANNING FOR THE WORSE CASE

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Coverage: Impacts of cell edge throughput requirements
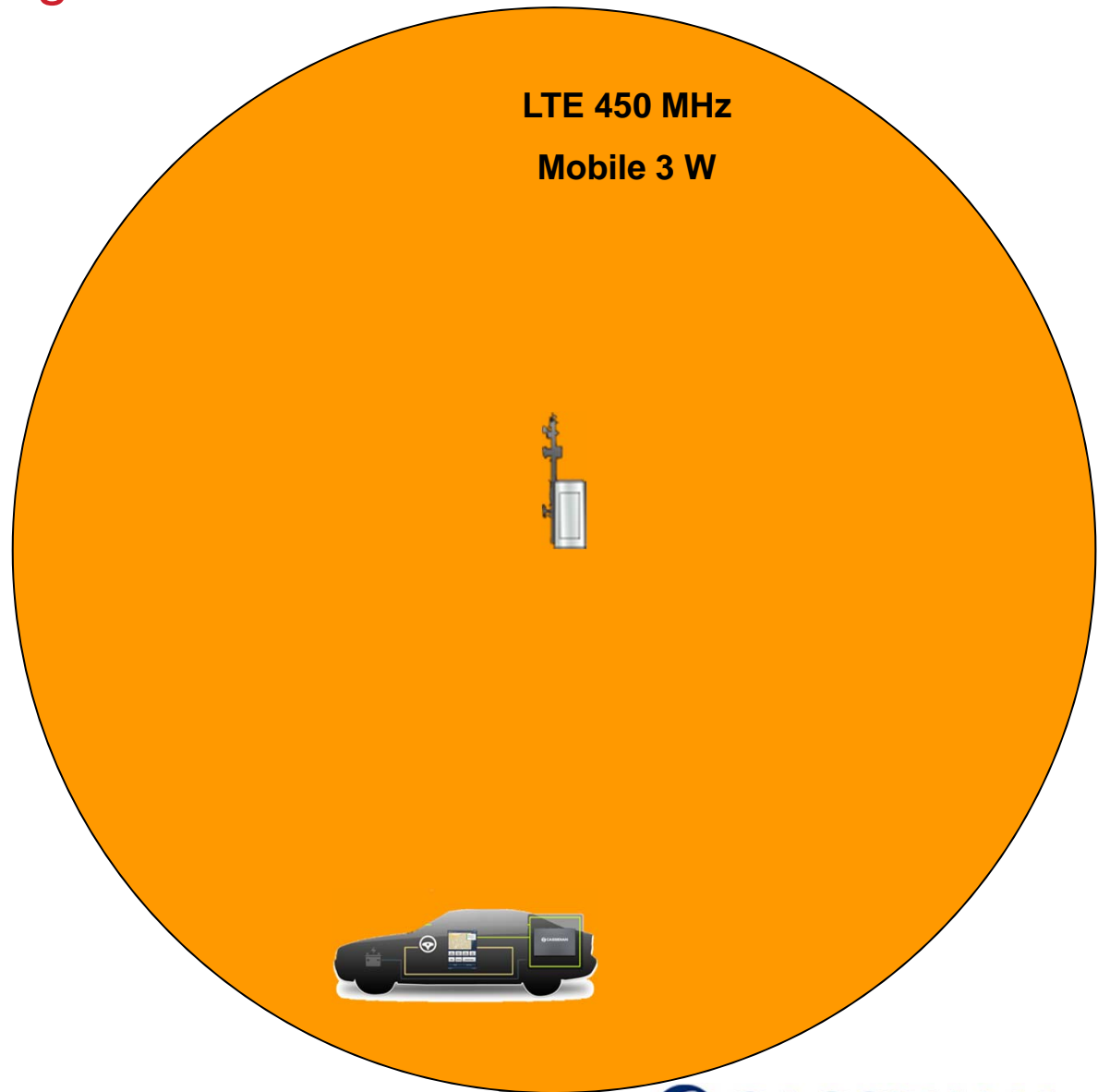
URBAN
ENVIRONMENT

400 kbps AT LTE
CELL EDGE FOR
VIDEO

X2 to X3
NUMBER OF
TETRA SITES

LTE 700 MHz

Mobile 200 mW
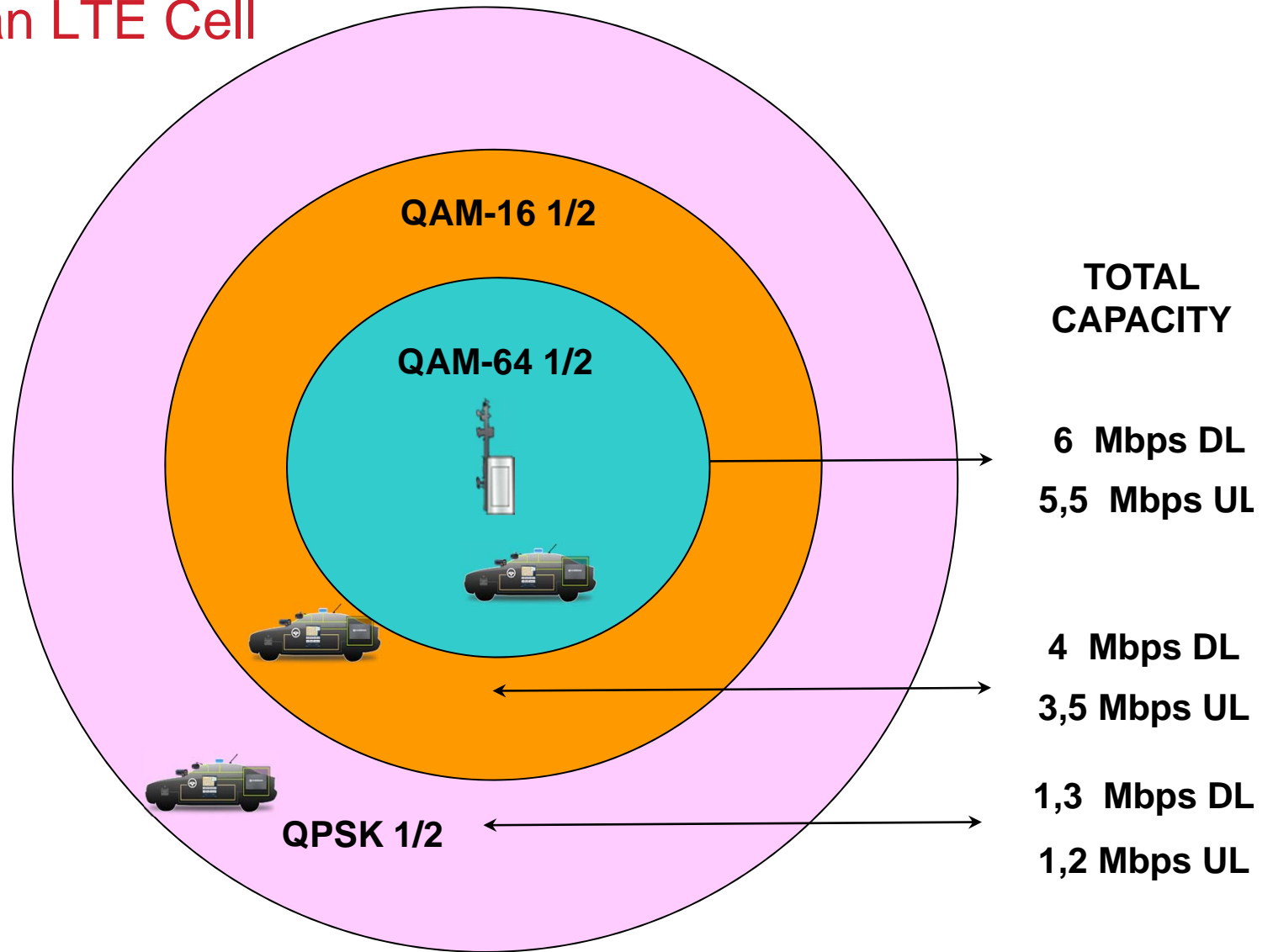
5 km

3 km

TETRA

450 MHz

Mobile 3 W

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Coverage: Impacts of High Power

URBAN ENVIRONMENT

400 kbps AT LTE CELL EDGE FOR VIDEO

LTE 450 MHz

Mobile 3 W

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Capacity in an LTE Cell

QAM-16 1/2

QAM-64 1/2

TOTAL
CAPACITY

6 Mbps DL

5,5 Mbps UL

FDD
2*5 MHZ

4 Mbps DL

3,5 Mbps UL

1,3 Mbps DL

1,2 Mbps UL

QPSK 1/2

WORSE CASE
3 simultaneous uplink video streams @ 400 kbps

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Devices

- High cost of non-ruggedization when failures occur during operations

- Device to device communication mandatory in case of network destruction

- High power transmission to keep 1:1 radio site ratio with current Professional Mobile Radio technology

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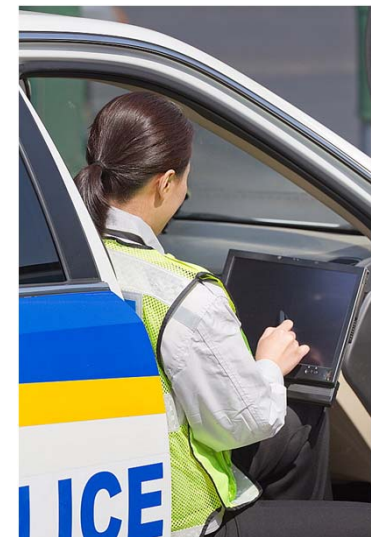
Conclusions

- LTE technology brings significant radio improvements

- Commercial LTE Technology need to be complemented and adapted to full-fill Public Safety needs

  - Frequency adaptations to fit into Public Safety spectrum

  - Special purpose devices

  - Coverage enhancement through high power transmission

  - Resiliency modes

  - Dynamic control & allocation of network resources through emergency response centers

  - Smooth integration and evolution of current solutions & applications

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Thank You