

RP-131635

# Introducing LTE in Unlicensed Spectrum

Qualcomm, Ericsson

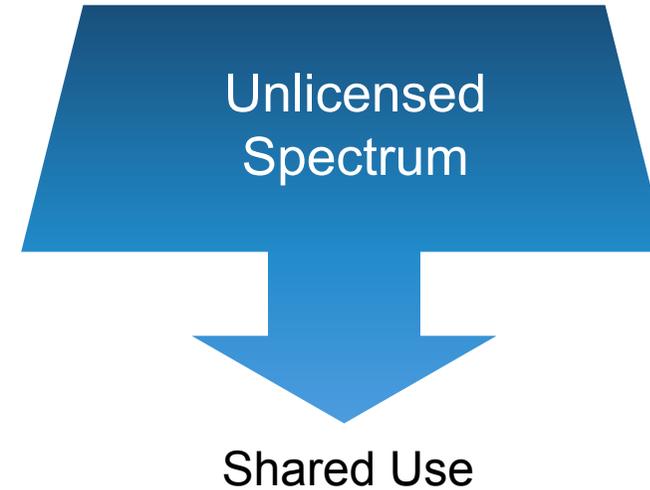
3GPP RAN #62  
Busan, South Korea  
Dec 3-7 2013





Preferred use of spectrum for mobile broadband  
Top priority for QoS, mobility and control

**3GPP technologies: 2G, 3G, LTE**



Well suited for local area access &  
opportunistic traffic offload

**Mostly WiFi**

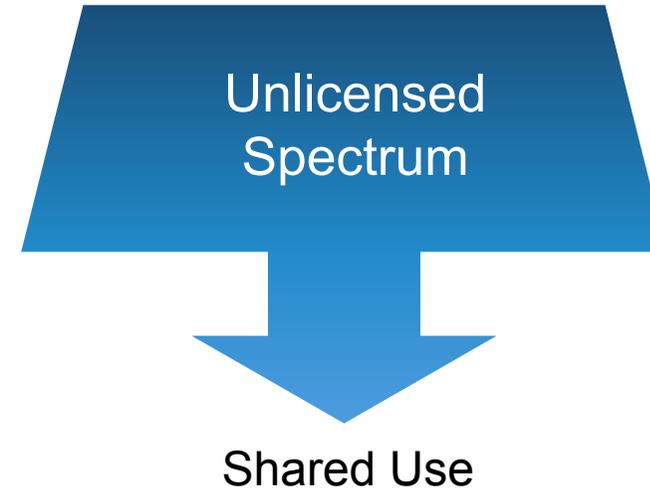
**Operators will more and more need  
to rely on unlicensed spectrum**

# Spectrum for Cellular Networks



Preferred use of spectrum for mobile broadband  
Top priority for QoS, mobility and control

**3GPP technologies: 2G, 3G, LTE**



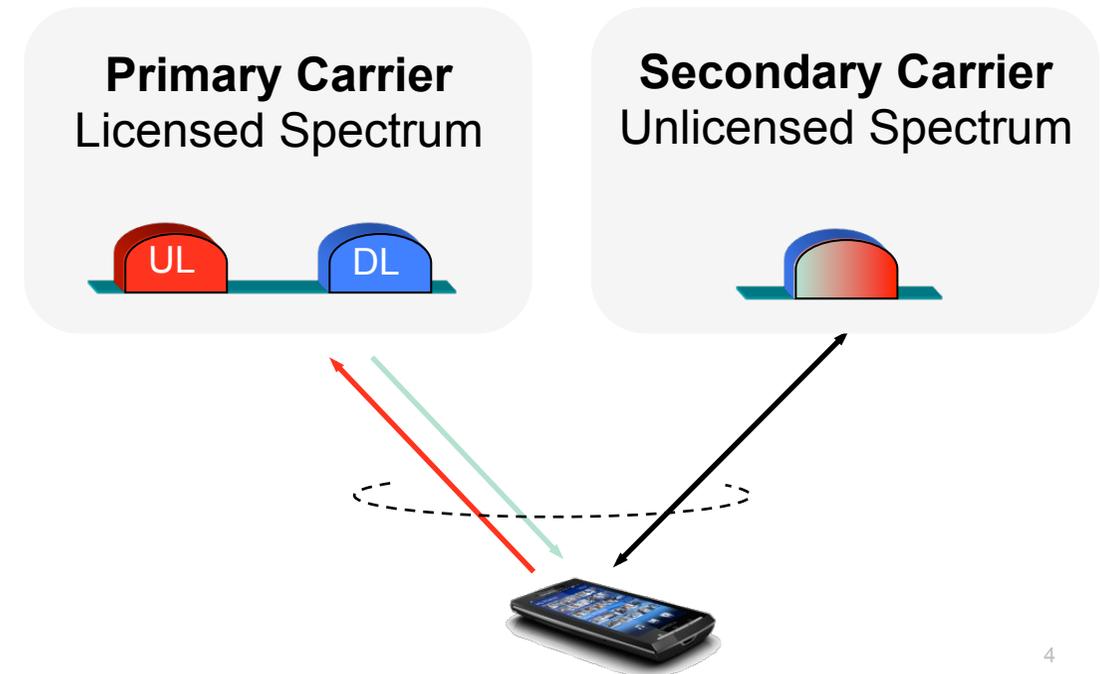
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***Proposal:***  
**Enable LTE in unlicensed**  
**in a licensed-assisted manner**

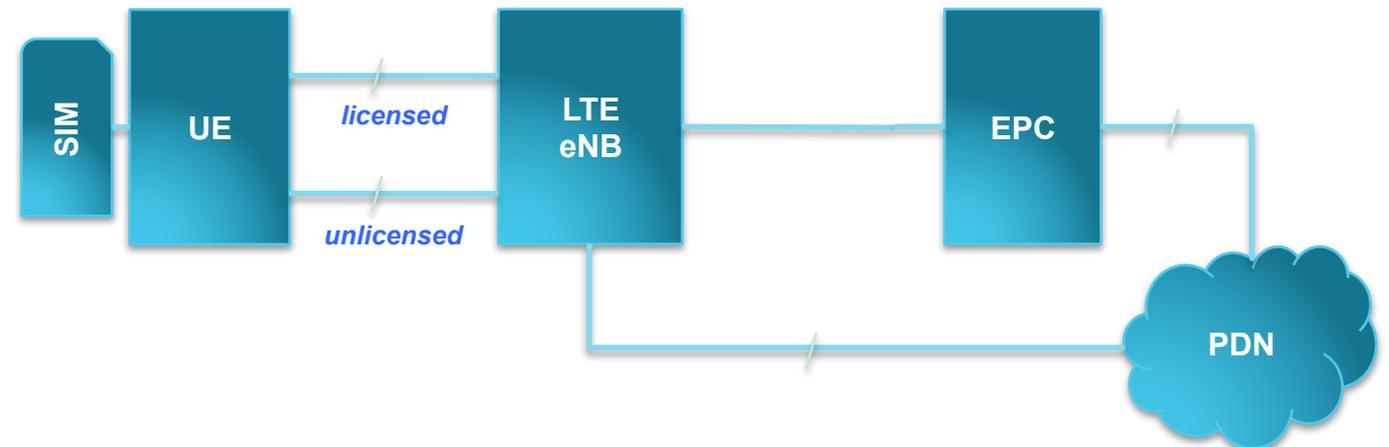
# LTE in Unlicensed Spectrum

- LTE transmitted according to unlicensed spectrum regulations in unlicensed spectrum
  - Always **accompanied** by a **licensed carrier**
  - Carrier Aggregation / Supplemental Downlink
  - Dual Connectivity in the future
- **Primary Carrier** always uses licensed spectrum
  - FDD or TDD
  - Control signalling, mobility, user data
- **Secondary Carrier(s)** use unlicensed spectrum
  - Best-effort user data in DL, and potentially UL



# LTE in Unlicensed Spectrum (cont.)

- Builds on LTE scale and ecosystem
- The **same RAN** can provide LTE data access in licensed & unlicensed
- No impacts foreseen to the core network nodes
- Management of **one network**



- Requirements for unlicensed spectrum differ across regions / bands
- In some regions / band, **LTE “as is”** can be deployed in unlicensed bands
  - E.g. 5725-5850 MHz in USA, currently unlicensed
- Instead, in other regions, there are specific requirements for unlicensed spectrum, e.g **“Listen Before Talk” (LBT)**
- Consequently, we propose the following:

- **LTE as Supplemental Downlink in 5725-5850 MHz in USA**
  - Existing LTE waveform can be deployed in the band
  - **RAN4 Work Item** to introduce the new band for SDL usage
    - I.e. always coupled with a licensed primary cell
  - RP-131680 (Verizon rapporteur)
  
- **LTE enhancements for deployment in Unlicensed Spectrum**
  - **RAN1-led Study Item** on modifications necessary to the LTE radio
    - Goal is to study & address all the specific requirements for unlicensed spectrum
    - E.g. Listen-Before-Talk
  - RP-131788 (Ericsson rapporteur)

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