

**3GPP TSG RAN Workshop on LTE in Unlicensed Spectrum
Sophia Antipolis, France, June 13, 2013**

RWS-140020

Document for: Discussion

Agenda Item: 2

Source: Verizon, CMCC, Huawei, Ericsson

Use Cases & Scenarios for Licensed Assisted Access

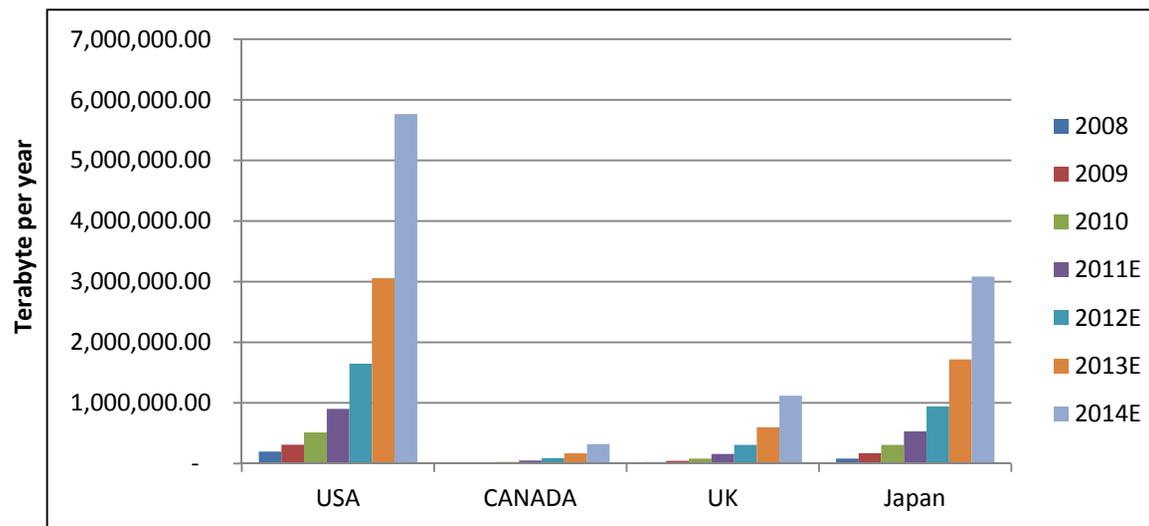
**The content of this presentation is also supported by DoCoMo, TeliaSonera,
Qualcomm, Alcatel-Lucent, NSN, Nokia, China Unicom, CHTTL**

Goal of the presentation

- This presentation is solely focused on use cases & scenarios of highest interest for Licensed Assisted Access (LAA)
- The goal is to help the industry converge on the most important & highest priority cases to cover in Rel-13 timeframe

Motivation

- Mobile Broadband traffic is predicted to be doubled every year.



Source: Huawei Wireless 2011 Q1 (Based on Informa 2010Q3)

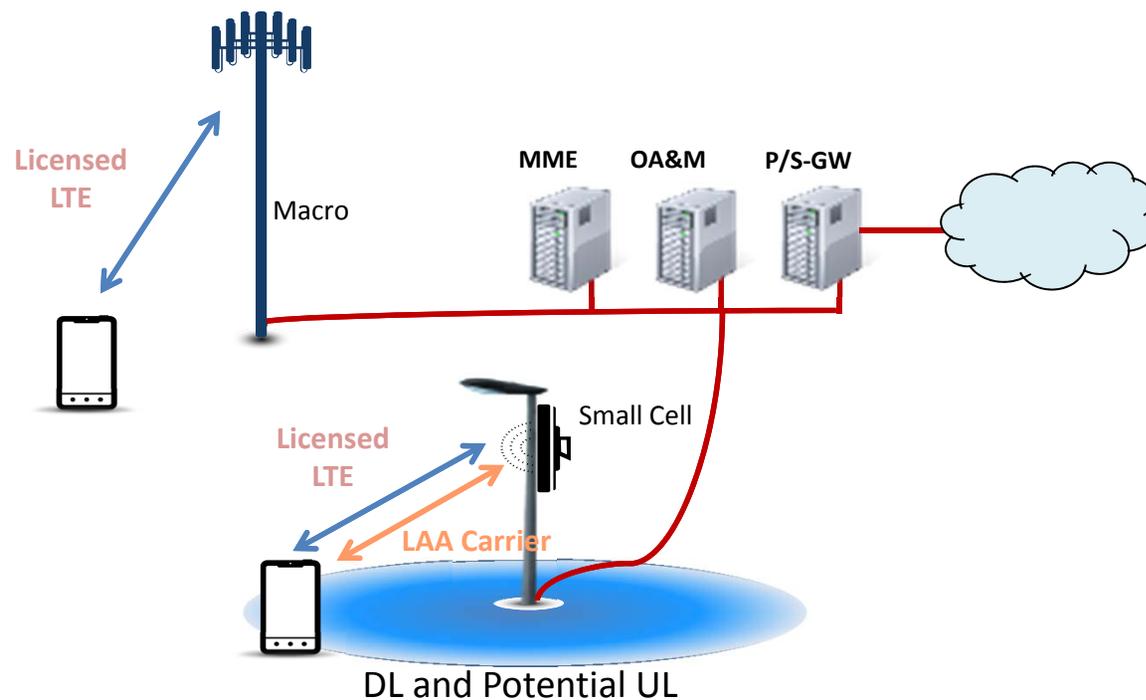
- Striving to meet the market demands, there have been increasing interests from operators in deploying some complementary accesses utilizing unlicensed spectrum
 - Some operators use WiFi offloading for capacity boosting
 - LTE-based access can provide benefits, with licensed-assisted access

Licensed Assisted Access

- Leverage existing LTE Carrier Aggregation framework
 - LTE transmissions in unlicensed spectrum according to unlicensed spectrum regulation
 - The Study should at least consider the 5GHz bands
 - Accompanied by a licensed carrier; standalone mode is not considered
- Primary Carrier always uses licensed spectrum
 - FDD or TDD
 - Control signalling, mobility, user data
- Secondary Carrier(s) use unlicensed spectrum
 - Best-effort user data

Use Case of highest priority

- The scenarios of interest are at **operator-deployed** scenarios, e.g. the **small cell** deployment where licensed and unlicensed spectrum is accessed from the same eNodeB building upon the existing carrier-aggregation framework.

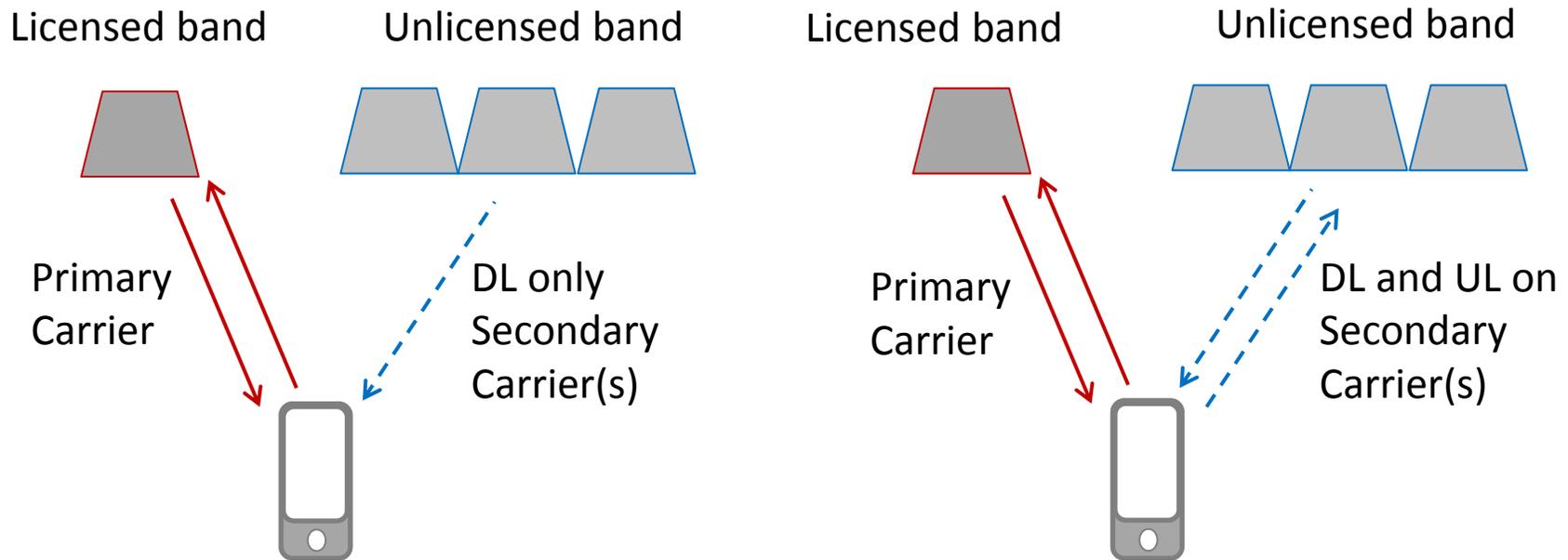


Scenarios

- Two scenarios for exploiting unlicensed spectrum can be foreseen initially:
 - (1) Unlicensed spectrum used for DL only
 - UE does not transmit, carrier aggregation in downlink only
 - (2) Unlicensed spectrum used for DL and potential UL
 - UE receives and may potentially transmit, carrier aggregation in downlink and potential uplink

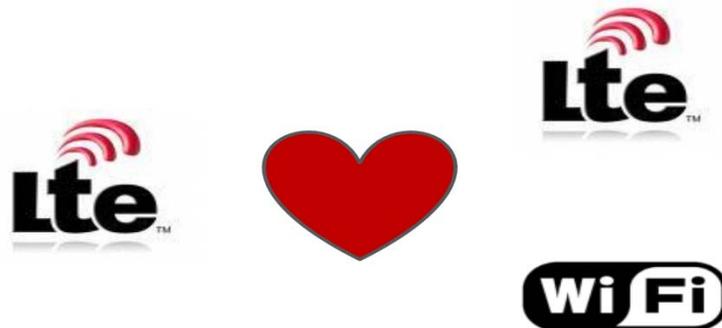
The corresponding 3GPP Study Item could start working on scenario (1) followed by scenario (2)

Scenarios (cont.)



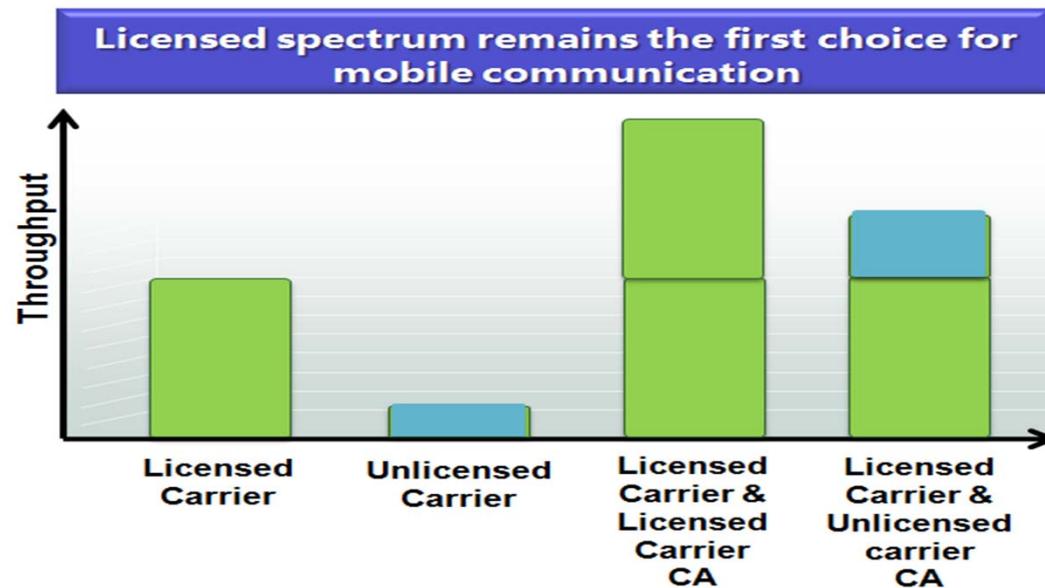
Coexistence

- Coexistence with WiFi and between Licensed Assisted Access will have to be studied as part of the RAN1-led Study Item
- Both intra-operator case as well as inter-operator case should be covered
- Both co-channel case as well as intra-band inter-frequency case should be covered



Spectrum Allocation Impact

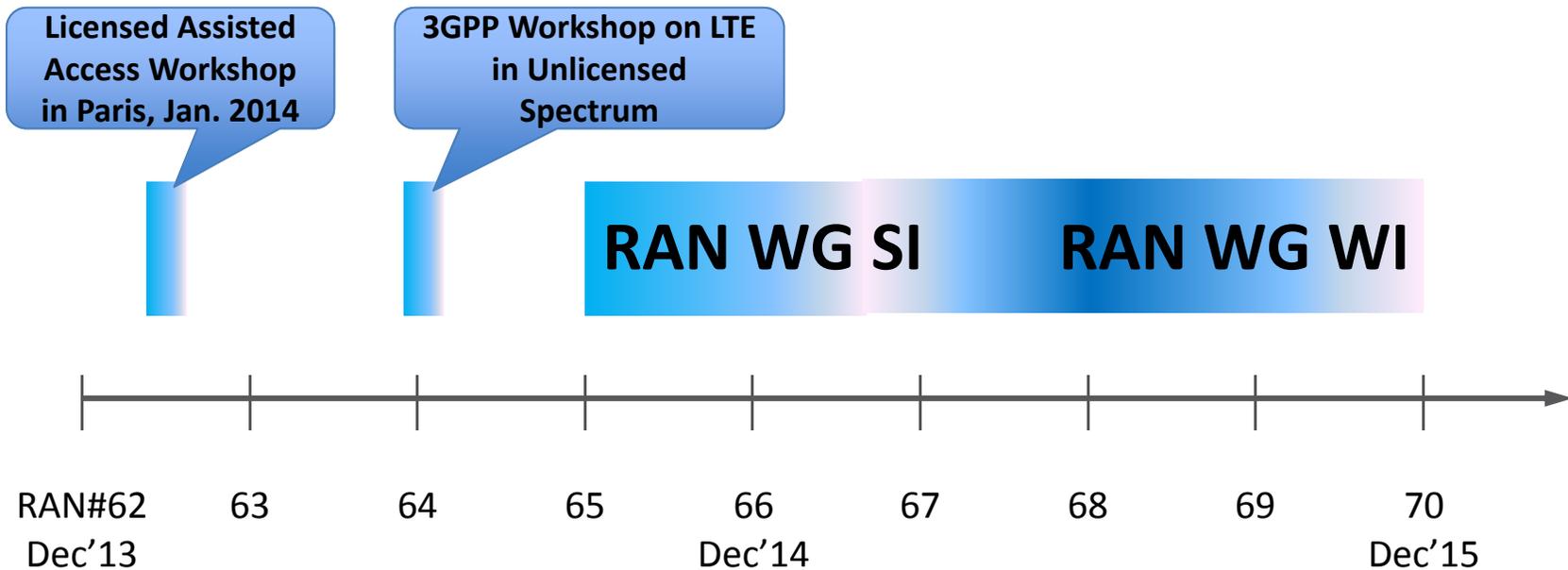
- Using licensed spectrum compared to unlicensed spectrum is always superior in terms of reliability, quality, etc.



- Using LTE for a Licensed-Assisted Access to unlicensed spectrum can only be a complement in some area where spectrum resource might be limited
 - Some operators use WiFi offloading for capacity boosting
 - LTE-based access can provide benefits, with licensed-assisted access

Tentative 3GPP plan

- **Tentative standard schedule:**
 - Start Study Item at RAN#65
 - Complete global solution in Rel-13



Conclusions

- We believe the following are the highest priority use cases & scenarios for Licensed Assisted Access SI ([RP-140770](#)) in Rel-13
 - (a) Operator Deployed Small Cells
 - (b) Carrier Aggregation Framework
 - (c) Usage of unlicensed spectrum for the Secondary Carrier, i.e., always assisted by a Primary Carrier in licensed spectrum
 - 1) DL-only in unlicensed spectrum
 - 2) Possible DL & UL in unlicensed spectrum