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Coverage extension for NR Rel-15

China Telecom

Introduction

- The coverage issue has attracted much interest in LTE phase
  - In TR 36.824, the system bottleneck in terms of LTE coverage performance was identified, and corresponding coverage enhancements were adopted in Rel-12
  - Then, the further coverage enhancements were developed during Rel-13 and Rel-14 work

- In NR, urban macro needs to provide continuous and ubiquitous coverage with higher carrier frequency than LTE [TR 38.913]

- Operators will face great challenges in ensuring sufficient coverage and cost effective deployments for NR

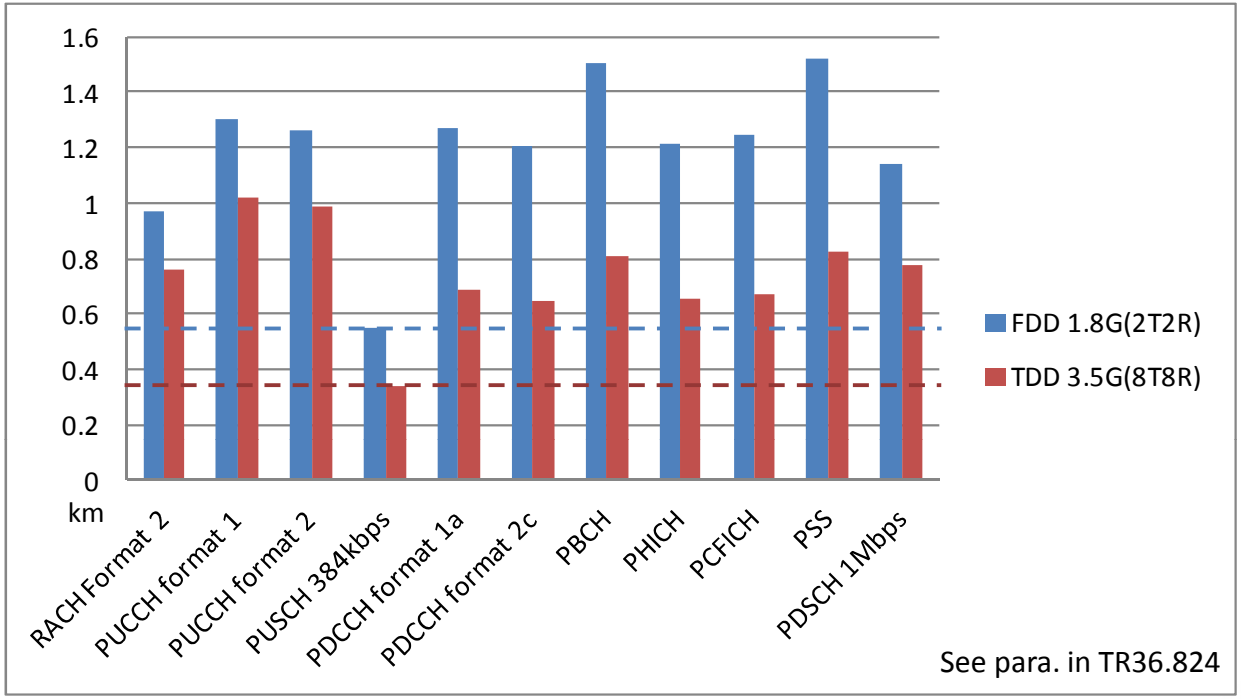
Potential sub-6G bands for NR

- RAN4 agreements [R4-1702504]
  - RAN4 recommends following guideline to RAN-Plenary#75
    - ✓At least following the frequency ranges are included in scope of NR bands in Rel-15 NR WI

Frequency range/LTE band	Operators whose request is included in the frequency range
3.3-4.2 GHz	DOCOMO, KDDI, SBM, CMCC, China Unicom, China Telecom, KT, SK Telecom, LG Uplus, Etisalat, Orange, Telecom Italia, British Telecom, Deutsche Telekom
4.4-4.99 GHz	DOCOMO, KDDI, SBM, CMCC, China Unicom, China Telecom,
…	..

Coverage analysis

Coverage distance comparing between FDD LTE 1.8G and TD-LTE 3.5G



- As previous study in TR 36.824, UL will still be the limited factor in terms of coverage in higher frequency
- Compared to FDD LTE 1.8G, even though some coverage gain can be achieved from more antennas in higher frequency (e.g., 3.5G), the overall coverage performance is much reduced due to increased pathloss and penetration loss

Proposal

- NR Rel-15 WI should include
  - Mechanisms to provide cell coverage extension

Thanks !

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