3GPP TSG-RAN WG4 Meeting # 95-e DRAFT R4-2008916

Electronic Meeting, 25 May – 5 June, 2020

**Source:** Huawei

**Title:** TP to TR 38.820: deployment scenarios cleanup

**Agenda Item:** 9.2.1

**Document for:** Approval

# Introduction

This TP to TR 38.820 [1] provides cleanup of the deployments scenarios section, introducing additional text on the inter-relations among the FWA, fixed wireless broadband, and IAB scenarios.

# References

[1] TR 38.820 v 1.3.0 Study on the 7 to 24 GHz frequency range for NR

# TP to the TR 38.820

*------------------------------ Modified section ------------------------------*

### 5.6.4 IAB

A diverse range of deployment scenarios can be envisioned for IAB, including support for outdoor small cell deployments, or indoors. For the IAB performance evaluation, scenarios addressing outdoor and outdoor-to-indoor case in dense urban, or urban micro case were considered, based on macro grid IAB-donor coverage with continuous cellular layout, extended with randomly dropped micro sites as IAB-nodes, i.e. two-layer layout (i.e. macro + micro). The IAB WID in RP-193226 [65] also includes the multi-hop IAB network case, which can be seen as interesting feature to achieve range extensions even at higher frequency bands of the 7 – 24 GHz range.

From the propagation point of view, consideration of 7 – 24 GHz range brings more challenging scenario due to higher (compared to FR1) attenuation, with decreased cell range. On the other hand, provision of the LOS backhaul link from the rooftop donor-IAB node shall alleviate propagation challenge. Similar, for the multi-hop case of cascaded IAB-nodes, with the inter-IAB backhauling links being LOS, does not seem to be a bottleneck for the IAB deployments in 7 – 24 GHz range. Similar to Dense Urban scenario, the IAB scenario is characterized by high user density of low and medium mobility, and high traffic loads. For the IAB study, the carrier frequencies of 4 GHz and 30 GHz were considered for the IAB-donor and IAB-node, respectively. The micro layer of the IAB-nodes is considered as the capacity layer, where the IAB study assumed 400 MHz channel bandwidth for IAB-nodes.

### 5.6.5 Summary

Table 5.6.5-1 below summarizes the NR deployment scenarios for the 7 – 24 GHz frequency range.

Referring to clause 4.4.2 on the WRC-19 conclusions, one can find the information on the resolution COM6/18 for the IMT for fixed wireless broadband in fixed services bands. This resolution refers the Fixed Wireless Access (FWA) scenario, which can be considered as yet another deployment scenario applicable to 7 – 24 GHz frequency range.

Studies on relations and dependencies among the FWA, fixed wireless broadband, and/or IAB scenarios are considered to be out of scope of this study item, while all those cases are seen as applicable to 7 – 24 GHz frequency range.

Other NR deployment scenarios such as high speed train, highway scenario or urban grid for connected car were also considered during the 7 – 24 GHz study item, but no further analyses were provided for those.

Table 5.6.5-1: NR deployment scenarios for 7 – 24 GHz frequency range

| NR scenario | Carrier frequency  (GHz) | Maximum aggregate system BW (DL+UL)  (MHz) |  | BS antenna array size (Tx and Rx antenna elements) | Scenario layout | User characteristic | ISD  (m) | Scenario description | BS class |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Indoor hotspot | 7÷24 | ≤ 200÷1000 |  | ≤ 256 | Single layer, indoor only | 100% Indoor, 3 km/h,  10 users/TRxP | 20 | Indoor, small coverage, high capacity, high user throughput, high user density | LA |
| Dense urban | 7÷24 | ≤ 200÷1000 |  | ≤ 256 | Two layer, macro hex grid, random drop micro | Uniform/macro TRxP, 10 users/TRxP,  Clustered/micro TRxP,  80% indoor (3 km/h), 20% outdoor (30 km/h) | 200 | Outdoor and outdoor-to-indoor, high user densities, high traffic loads, dense urban areas, continuous cellular layout, interference-limited | WA, WA+MR |
| Urban macro | 7÷24 | ≤ 200÷1000 |  | ≤ 256 | Single layer, hex grid, macro | 20% Outdoor in cars: 30km/h,  80% Indoor: 3km/h  10 users per TRxP | 500 | large cells and continuous coverage, interference-limited | WA |
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| IAB  (NOTE 3) | 7÷24 | IAB-donor: 100MHz (@4GHz) IAB-node: 400MHz (@30GHz) |  |  | two layer (macro IAB-donor + micro IAB-node(s)) for dense urban, single layer for urban micro | 80% indoor (3km/h), 20% outdoor (30km/h); DL/UL traffic = {4:1}  (NOTE 4) | 200, 500 | Outdoor and outdoor-to-indoor, dense urban, or urban micro | WA+MR(s) |

NOTE 1: Summary of all parameters is not intended for the system level simulation purposes, rather for the scenarios characteristics comparison.

NOTE 2: Values of the aggregated system BW and BS antenna array sizes, as well as user characteristics were reused from the NR deployment scenarios in TR 38.913 [2].

NOTE 3: Values of the aggregated system BW and BS antenna array sizes, as well as user characteristics were reused from the IAB system level evaluation assumptions. Values of the carrier frequencies of 4 GHz and 30 GHz are provided for reference, based on the IAB technical report.

NOTE 4: The user characteristics in the IAB scenario are related to the end user (not the IAB node).

*----------------------------- End of modified section ------------------------------*