

**Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)**

**Submission Title:** Update on Regulatory Progress above 275 GHz

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**Re:** -

**Abstract:** In the last WRC a resolution was approved to have an Agenda Item 1.15 in the upcoming WRC 2019. In these slides some information on the progress is presented.

**Purpose:** Provide Information to the Task Group

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# Update on Regulatory Progress above 275 GHz

# Outline

- The way from one WRC to the next WRC (simplified)
- AI 1.15 above 275 GHz
  - Introduction to current regulatory situation
  - What can be changed within AI 1.15 in the next WRC
  - Involved Groups in ITU-R
  - Current status and way forward

# From WRC to WRC (simplified)

- At the WRC (e.g. 2015) resolutions for future Agenda Items (AI) have been approved.
- (Also the other resolutions are incorporated to the Radio Regulations)
- In addition in these resolutions ITU-R is invited to “prepare” these topics for the next WRC
- If possible topics have already a broad support after the studies in ITU-R
- At the WRC (e.g. 2019) resolutions for the AI may be approved (leads to adjustments in the Radio Regulations)

# Current regulation above 275 GHz

- Footnote 5.565 in the Radio Regulations (RR):  
*“The following frequency bands in the range 275-1 000 GHz are identified for use by administrations for passive service applications:*
- **Radio astronomy service:** 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz, 926-945 GHz;
- **Earth exploration-satellite service (passive) and space research service (passive):** 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.
- The **use** of the range 275-1 000 GHz by the passive services **does not preclude use** of this range by **active services**. [...]” as long as the passive services are protected.

# AI 1.15 above 275 GHz

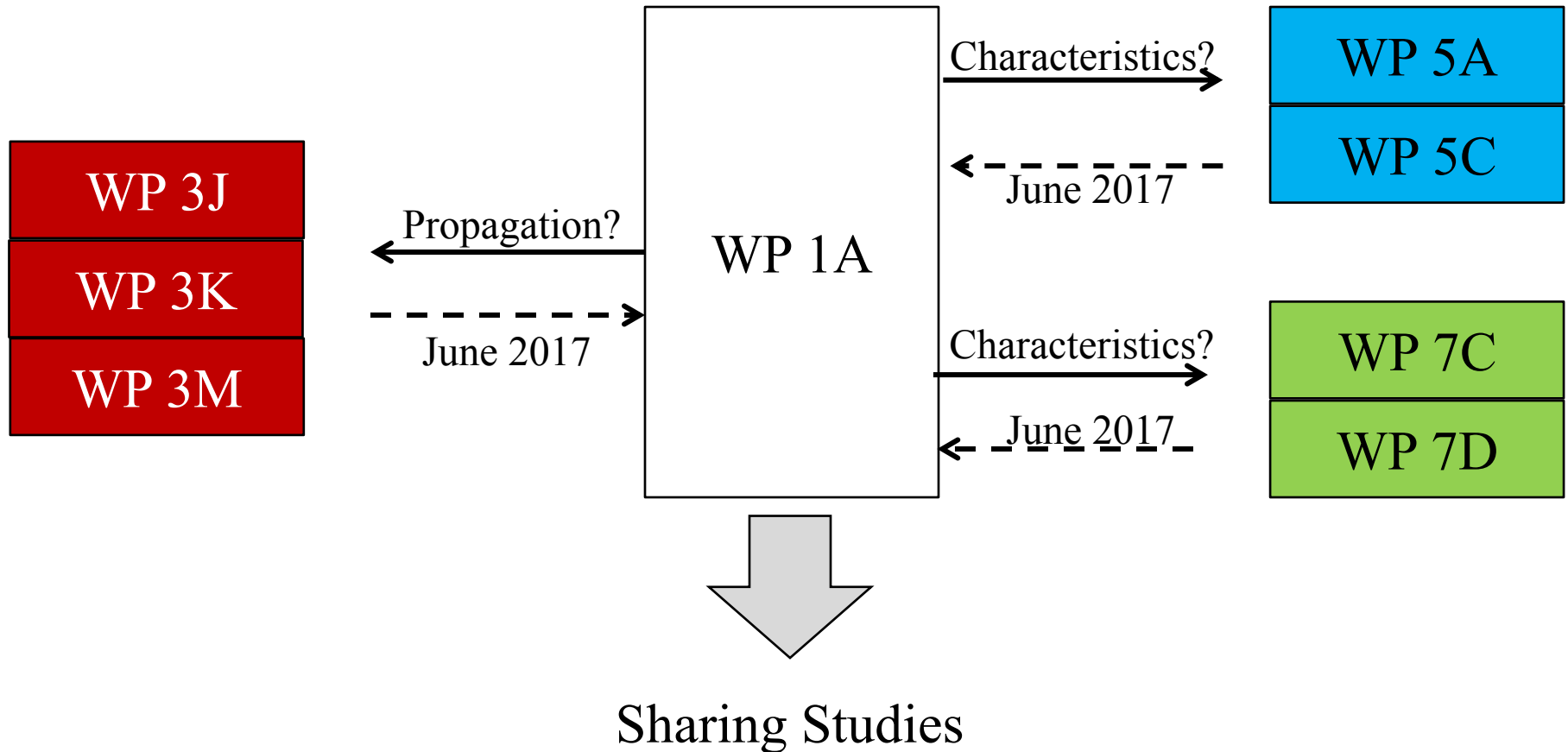
WRC 2015 agreed in resolution 767:

- to have an agenda item for WRC 2019 to consider **identification** of spectrum for **land-mobile** and **fixed active services** in the range of **275 GHz to 450 GHz** while maintaining **protection of the passive services** identified
- ITU-R is invited to
  - identify **technical and operational characteristics**
  - study spectrum needs
  - develop propagation models
  - conduct **sharing studies with the passive services**
  - identify candidate frequency bands

# ITU-R groups involved

- WP 1A “spectrum engineering techniques”
- WP 3J “propagation fundamentals”
- WP 3K “point-to-area propagation”
- WP 3M “point-to-point and earth space propagation”
- WP 5A “land mobile service”
- WP 5C “fixed services”
- WP 7C “earth exploration-satellite service, space research”
- WP 7D “radio astronomy”

# Part 1: Who does what (simplified)?





# WP 5A – Technical and Operational Characteristics

- Develops NEW REPORT ITU-R M.[300GHZ\_MS\_CHAR]
  - Current Status: PRELIMINARY DRAFT NEW REPORT
  - Currently attached to the chairmen's report 5A/469 Annex 31 (public)
  - Envisioned to be adopted as New Report in November
- Addressed Use Cases
  - Close Proximity (Intra-Device, Inter-Chip Communications, Ticket Downloading)
  - Wireless Links for Data Centers
- Information contained:
  - Frequency Range, Modulation, EIRP, ...
  - Deployment Densities
  - Antenna Patterns
  - Spectrum Need

# WP 5C – Technical and Operational Characteristics

- Develops NEW REPORT ITU-R F.[300GHZ\_FS\_CHAR]
  - Current Status: PRELIMINARY DRAFT NEW REPORT
  - Currently attached to the chairmen's report 5C/292 Annex 3 (TIES required)
  - Envisioned to be adopted as New Report in November
  
- Addressed Use Cases
  - Wireless front- and backhaul
  
- Information contained:
  - Frequency Range, Modulation, EIRP, ...
  - Deployment Densities
  - Antenna Patterns
  - Spectrum Need

# WP 5C – Technical and Operational Characteristics Excerpts

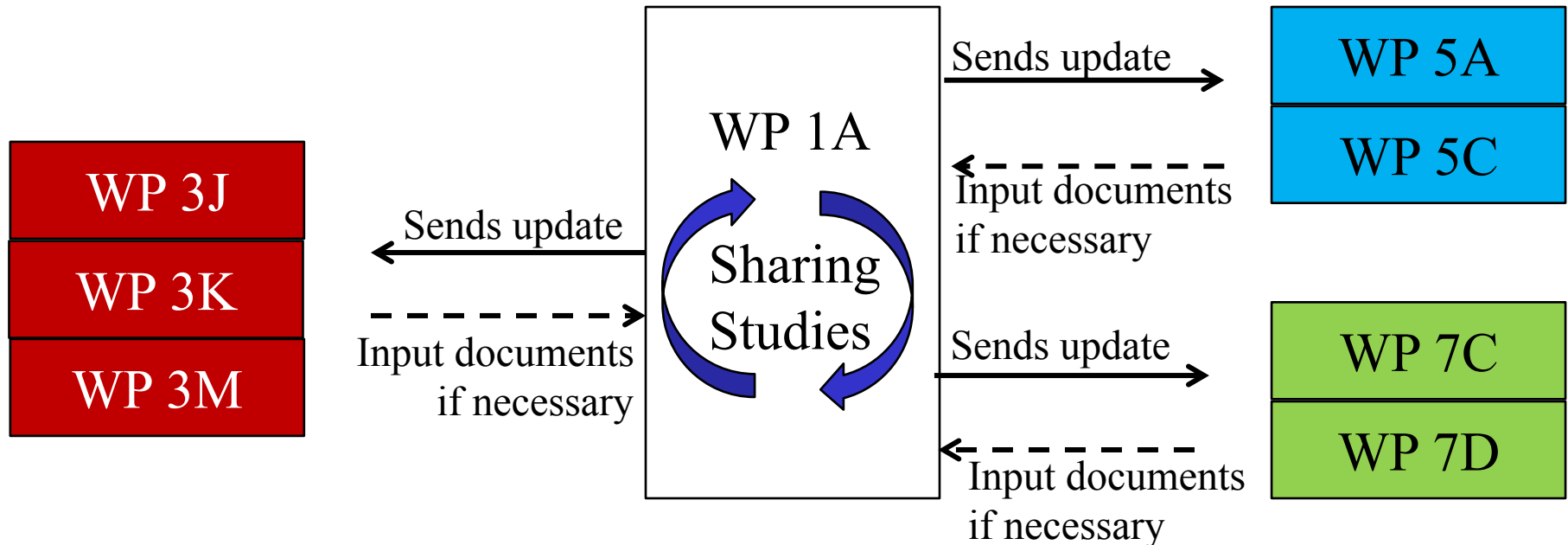
- Excerpts in the table
- Deployment in urban areas: estimated as 8.4 / km<sup>2</sup>
- Spectrum need:  
 “ [...] bandwidth of 24.5 GHz is sufficient to provide high-capacity link for fronthaul/backhaul for IMT system. If the requirements are similar, the same bandwidth of around 25 GHz may satisfy the initial typical deployment scenarios.”  
 “[...] a total long term spectrum bandwidth of about 50 GHz will sufficiently support the evolution of IMT traffic between BBU and RRH.”

Frequency band (GHz)	275–325	380–445
Channel bandwidth (GHz)	2.....25 (FDD) 2.....50 (TDD)	2.....32.5 (FDD) 2.....65 (TDD)
Tx output power range (dBm)	0....20	-10....10
Tx output power density range (dBm/GHz)	-17.....17	-28....7
Antenna gain range (dBi)	24 ... 50	24 ... 50
e.i.r.p. range (dBm)	44.....70	37.....60
e.i.r.p. density range (dBm/GHz)	30.....67	19.....57
Antenna pattern	Recommendation ITU-R F.699 (Single entry) Recommendation ITU-R F.1245 (Aggregate)	

# WP 1A – Work Program

- Leads the preparation of AI 1.15 above 275 GHz
- Develops **working document towards a PRELIMINARY DRAFT NEW REPORT ITU-R SM.[275-450GHZ\_SHARING]**
  - current Status: skeleton document with some input
  - technical Parameters from 5A, 5C, 7C, 7D are included
  - will include sharing studies between passive and active services
  - attached to the chairmen's report 1A/208 Annex 3 (TIES required)
- Develops **working document towards DRAFT CPM TEXT for WRC-19 agenda item 1.15**
  - currently attached to the chairmen's report 1A/208 Annex 1 (TIES required)
  - current status: skeleton document
  - will contains possible actions with reasoning for the agenda item in WRC19
  - represents the view of all administrations (each administration can have its own in there)

## Part 2: Who does what (simplified)?



## Part 2: Timeline for Sharing Studies

- According to work plan and milestones for ITU-R studies on WRC-19 agenda item 1.15 (chairmen's report 1A/208 Annex 2)
  - 1st meeting – June 2016
  - 2nd meeting – November 2016
  - 3rd meeting – June 2017
    - “final” technical parameters from 5A, 5C, 7C, 7D
  - 4th meeting – 23-30 November 2017
    - Introduce all sharing studies into ITU-R SM.[275-450GHZ\_SHARING
    - Further develop CPM Text
  - 5th meeting – [2018-Q2]
    - Finalize ITU-R SM.[275-450GHZ\_SHARING]
    - Further develop and finalize CPM text

**Vielen Dank für  
Ihre Aufmerksamkeit.**

Thank you for paying attention!