Update on WRC-23 Agenda Items for IMT

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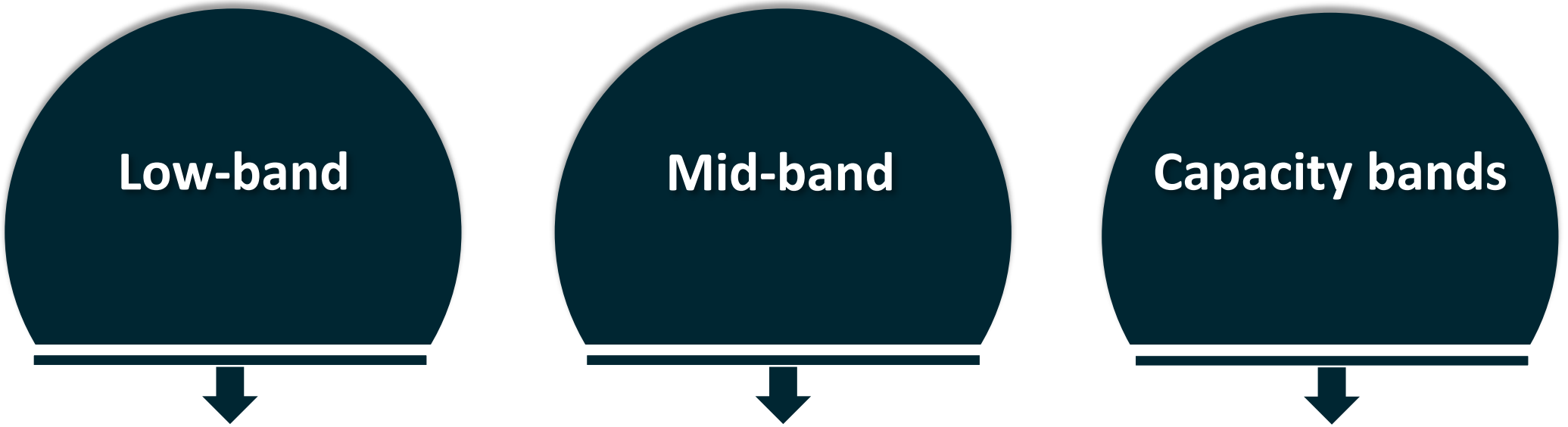
CTU meeting July 26, 2022

Contents

WRC-23: Spectrum Needs of 5G

Harmonizing for cost efficiency and coverage



IMT spectrum demand

Additional mid-band spectrum needed for mobile operators in 2025-2030 timeframe

A total of around 2-3 GHz of mid-band spectrum would enable mobile operators to deliver the ITU-R IMT- 2020 requirements in cities in an economically feasible manner

http://www.coleago.com/imt-spectrum-demand/

WRC -23 IMT Agenda Items

Bands	Region 1	Region 2	Region 3	Group
470-960 MHz	AI1.5 (IMT)	-	-	TG 6/1
3300-3400 MHz	AI1.2 (IMT)		-	WP5D
3600-3800 MHz	AI1.3 (MS)	AI1.2 (IMT)	-	WP5A / 5D
4800-4990 MHz	AI 1.1 (IMT)			WP5B / 5D
6425-7025 MHz	AI1.2 (IMT)	-	-	WP5D
7025-7125 MHz	AI1.2 (IMT)			WP5D
10-10.5 GHz	-	AI1.2 (IMT)	-	WP5D
IMT in the fixed service	Topic 9.1.c			WP5A / 5C
Article 21	21.5			WP5D

ITU-R Activities

- Finalization of Characteristics of IMT-2020 for use in sharing studies
- Sharing studies with incumbent services conducted
- Continued discussion on the results of the studies and also on some of the parameters used
- Significant progress on the develop of CPM text , in particular on the possible Methods to satisfy the agenda items

1.2 – CPM Text

- Section 3: Summary of technical studies
- Section 4: Methods to satisfy agenda item
- Section 5: Regulatory Examples for each of the Methods based on :
    - Allocation status for Mobile service in a band considered under the AI;
    - IMT identification;
    - Conditions if any necessary on IMT to protect existing Services

3300 - 3400 MHz

Region 1	Region 2	Region 3
3 300-3 400 RADIOLOCATION	3 300-3 400 RADIOLOCATION Amateur Fixed Mobile	3 300-3 400 RADIOLOCATION Amateur
5.149 5.429 5.429A 5.429B 5.430	5.149 5.429C 5.429D	5.149 5.429 5.429E 5.429F

3300-3400 MHz

5.429D In the following countries in Region 2: Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Ecuador, Guatemala, Mexico, Paraguay and Uruguay, the use of the frequency band 3 300-3 400 MHz is identified for the implementation of International Mobile Telecommunications (IMT). Such use shall be in accordance with Resolution **223 (Rev.WRC-19)**. This use in Argentina, Paraguay and Uruguay is subject to the application of No. **9.21**. The use of the frequency band 3 300-3 400 MHz by IMT stations in the mobile service shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-19)

3300-3400 MHz

5.429C *Different category of service*: in Argentina, Belize, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Ecuador, Guatemala, Mexico, Paraguay and Uruguay, the frequency band 3 300-3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. In Argentina, Brazil, the Dominican Republic, Guatemala, Mexico, Paraguay and Uruguay, the frequency band 3 300-3 400 MHz is also allocated to the fixed service on a primary basis. Stations in the fixed and mobile services operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-19)

CPM Options discussed for 3.3-3.4 GHz

Method 2A

NOC, i.e., retain secondary allocation to MS and Suppress Resolution 245 (WRC-19)

Method 2B

Upgrade MS allocation primary basis in Region 2 and identify it for IMT by modifying RR5.429D. Modify RR's 5.429C and 5.429D to not cause interference from RLS and not claim protection from RLS

Method 2C

Same as Method 2B except upgrade allocation to MS (except aeronautical mobile) to primary

3 600-4 800 MHz

<table>
<tr><th colspan="3">Allocation to services</th></tr>
<tr><th>Region 1</th><th>Region 2</th><th>Region 3</th></tr>
<tr><td rowspan="2">3 600-4 200
FIXED
FIXED-SATELLITE (space-to-Earth)
Mobile</td><td>3 600-3 700
FIXED
FIXED-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile 5.434
Radiolocation 5.433</td><td>3 600-3 700
FIXED
FIXED-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile
Radiolocation
5.435</td></tr>
<tr><td colspan="2">3 700-4 200
FIXED
FIXED-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile</td></tr>
</table>

3 600-3 800 MHz

Methods 3A, 3B, 3C and 3E proposes to identify the frequency band 3 600-3 800 MHz for IMT in Region 2 by modifying RR No. **5.434** listing one or more of the following conditions:

- RR Nos. **9.17**, **9.18**
- RR Nos. **9.21**
- RR Table **21-4**
- Revised pfd limit for the MS/IMT.

Method 3D proposes interested countries add their names to 5.434 for 3.6-3.7 GHz

Method 5F proposes to modify 5.434 to apply to R2

5 925-7 145 MHz
Allocation to services

	Region 1	Region 2	Region 3
5 925-6 700	FIXED 5.457 *FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B* ***MOBILE 5.457C*** *5.149 5.440 5.458*		
6 700-7 075	*FIXED* *FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441* ***MOBILE*** *5.458 5.458A 5.458B*		
7 075-7 145	*FIXED* ***MOBILE*** *5.458 5.459*		
7 145-7 190	*FIXED* *MOBILE SPACE RESEARCH (deep space) (Earth-to-space)* *5.458 5.459*		

CPM Options discussed for 7025-7125 MHz

Methods A to D for NOC and IMT identification with variation in the conditions associated with such identification as indicated below

Method A : NOC

Method B : IMT identification with no conditions

Method C : IMT identification with conditions in a Resolution

Method D : IMT identification with measures to protect SOS (e-S) in the band 7100-7155 MHz

CPM Options for 10-10.5 GHz

- Method A: NOC
- Methods: B and C for allocation to mobile service on primary basis in R2 with IMT identification and conditions in a Resolution and Mods to 5.480 and 5.481
- **5.480** Additional allocation*:* in Argentina, Brazil, Chile, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Paraguay, the overseas countries and territories within the Kingdom of the Netherlands in Region 2, Peru and Uruguay, the frequency band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis. In Colombia, Costa Rica, Mexico and Venezuela, the frequency band 10-10.45 GHz is also allocated to the fixed service on a primary basis. (WRC-19)
- **5.481** Additional allocation: in Algeria, Germany, Angola, Brazil, China, Côte d'Ivoire, Egypt, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Romania, Tunisia and Uruguay, the frequency band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. In Costa Rica, the frequency band 10.45-10.5 GHz is also allocated to the fixed service on a primary basis. (WRC-19)

AI 1.1 (4800-4990 MHz)- Review measures and pfd in FN 5.441B for IMT to protect AMS and MMS

5.441B In Angola, Armenia, Azerbaijan, Benin, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, China, Côte d'Ivoire, Djibouti, Eswatini, Russian Federation, Gambia, Guinea, Iran (Islamic Republic of), Kazakhstan, Kenya, Lao P.D.R., Lesotho, Liberia, Malawi, Mauritius, Mongolia, Mozambique, Nigeria, Uganda, Uzbekistan, the Dem. Rep. of the Congo, Kyrgyzstan, the Dem. People's Rep. of Korea, Sudan, South Africa, Tanzania, Togo, Viet Nam, Zambia and Zimbabwe, the frequency band 4 800-4 990 MHz, or portions thereof, is identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. The use of IMT stations is subject to agreement obtained under No. **9.21** with concerned administrations, and IMT stations shall not claim protection from stations of other applications of the mobile service. In addition, before an administration brings into use an IMT station in the mobile service, it shall ensure that the power flux-density (pfd) produced by this station does not exceed −155 dB(W/(m^2 · 1 MHz)) produced up to 19 km above sea level at 20 km from the coast, defined as the low-water mark, as officially recognized by the coastal State. This pfd criterion is subject to review at WRC-23. Resolution **223 (Rev.WRC-19)** applies. This identification shall be effective after WRC-19. (WRC-19)

CPM Options for AI 1.1

Method A : NOC, i.e., retain existing measures and apply them to same countries (29 countries out of 40 in FN 5.441B) as per Resolution 223

Method B : Apply existing measures to all countries in FN 5.441B

Method C : New pfd apply only to those countries for which existing pfd value applies

Method D : Apply new pfd to all countries

AI 1.5 : Review of 470-960 MHz for R1

The GSMA supports a primary mobile allocation in the band 470-694 MHz for R1. This will allow those countries that wish to do so to identify the band, or parts thereof, for IMT.

Opportunity for R2 countries to ADD their country names to FN's dealing with primary MS allocation in the band 470-698 MHz and for IMT identification in parts thereof to improve harmonization and enable introduction of Broadband services. These FN's are **5.292**, **5.293**, **5.295**, **5.297**, **5.308** and/or **5.308A**.

There is primary mobile allocation already in the band 470-698 MHz in R3, and some countries have IMT Identification and some considering IMT use under the MS allocation.

Citel Activities

Citel made progress in developing preliminary proposals and (PP's) and Draft Inter American Proposals (DIAP)'s.

At last meeting in Dec 2021. More progress expected at the October 2022 meeting for DIAP's and possibly IAP's.

Specifically:

AI 1.1 : PV's

AI 1.2: PP's for each of the bands for IMT identification in the bands for R2 in the bands 3.3-3.4 GHz; 3.6-3.7 GHz and 3.6-3.8 GHz ; and 10-10.5 GHz

PP also for NOC in 6425-7125 MHz

AI 1.3 : PV's

For AI 1.5 : DIAP for NOC in R2

CITEL/GT/CCITEL/GT/CMR-23/doc.022/21
MR-23/doc.022/21

MOD CAN/1.2/2

5.434 In Region 2Canada, Chile, Colombia, Costa Rica, El Salvador, the United States and Paraguay, the frequency band 3 600-3 7800 MHz, or portions thereof, is identified for use by these administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. At the stage of coordination the provisions of Nos. **9.17** and **9.18** also apply. Before an administration brings into use a base or mobile station of an IMT system, it shall seek agreement under No. **9.21** with other administrations and ensure that the power flux-density (pfd) produced at 3 m above ground does not exceed −154.5 dB(W/(m^2 · 4 kHz)) for more than 20% of time at the border of the territory of any other administration. This limit may be exceeded on the territory of any country whose administration has so agreed. In order to ensure that the pfd limit at the border of the territory of any other administration is met, the calculations and verification shall be made, taking into account all relevant information, with the mutual agreement of both administrations (the administration responsible for the terrestrial station and the administration responsible for the earth station), with the assistance of the Bureau if so requested. In case of disagreement, the calculation and verification of the pfd shall be made by the Bureau, taking into account the information referred to above. Stations of the mobile service, including IMT systems, in the frequency band 3 600-3 8700 MHz shall not claim more protection from space stations than that provided in Table **21-4** of the Radio Regulations (Edition of 2004). (WRC-19)

Summary

- 5G development and expansion needs sufficient bandwidth for lower network density/costs
- Access to core mid-band spectrum in 3.5 GHz and 6 GHz range is crucial for 5G and WRC-23 is key opportunity.
- ITU-R work has progressed for AI's dealing with primary allocation to MS and for IMT identification.
- Citel countries have submitted Preliminary proposals and Draft IAP's for these Agenda items.
- CTU members may review the work of ITU-R and of Citel with a view to develop/ support proposals for these AI's.
- Input from CTU members to Citel is key to further development and finalization of Citel common proposals.

WRC-23 | ASKS

Sub-1 GHz
Agenda Item 1.5

- Mobile allocation for Region 1 can help sub-regions make their own choice about identification and matches Region 1 up with Rest of World.

3.3-3.8 GHz
Agenda Items 1.2 & 1.3

- IMT identification in 3.3-3.4 GHz will provide broad harmonisation
- 3.6-3.8 GHz requires IMT identification in R2 and allocation and/or identification in R1

4800-4990 MHz
Agenda Item 1.1

- Restrictions need lifting to allow widespread IMT use

6 GHz
Agenda Item 1.2

- Identification of 6 425-7 125 MHz needed to allow 5G expansion