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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23)Dubai, 20 November - 15 December 2023** |  |
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| PLENARY MEETING | **Addendum 1 toDocument 44(Add.2)-E** |
|  | **26 June 2023** |
|  | **Original: English** |
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| Member States of the Inter-American Telecommunication Commission (CITEL) |
| Proposals for the work of the conference |
|  |
| Agenda item 1.2 |

1.2 to consider identification of the frequency bands 3 300-3 400 MHz, 3 600‑3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **245 (WRC‑19)**;

Part 1 – Frequency band 3 300-3 400 MHz

Background

Mobile broadband plays a crucial and fundamental role in providing access to information for businesses and consumers worldwide. Mobile broadband users are also demanding higher data rates and are increasingly using mobile devices to access audio-visual content. The mobile industry continues to drive technological innovations in order to meet these evolving user demands. In 2020, the first year of the pandemic, the number of Internet users grew by 10.2 per cent, the largest increase in a decade, driven by developing countries where Internet use went up 13.3 per cent. According to ITU estimates, the number of active mobile-cellular telephone subscriptions per 100 inhabitants continues to grow strongly, reaching 110 subscriptions per 100 inhabitants, including a record number of mobile subscriptions with broadband capacity (3G or better).[[1]](#footnote-1) Ninety-five percent of the world’s population lives within reach of a mobile broadband service, and the relatively small difference in the number of subscriptions between developed and developing countries demonstrates that connectivity is a priority among people in countries at all levels of development.1

The evolution of International Mobile Telecommunications (IMT), which provides wireless telecommunication services on a worldwide scale, has contributed to global economic and social development. IMT systems are now being evolved to provide applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications.

The demand for mobile wireless broadband applications such as IMT continues to grow dramatically as does the need for access to radio spectrum to support that growth.[[2]](#footnote-2)2 Fifth generation (5G) provides improved data rates and reduced latency. Importantly 5G has been designed to enable capabilities in a wide range of industries including healthcare, transportation, manufacturing, education, and telemedicine; 5G is expected to have a broad impact on our economies and societies. Recognizing the need to consider additional mid-band spectrum bands – with its favourable mix of coverage and capacity - in the range 3 300 MHz to 10.5 GHz to support the terrestrial component of IMT, WRC-19 approved WRC-23 agenda item 1.2. ITU-R, standards development organizations, and industry continue to progress the work on the development of IMT-2020.

WRC-23 agenda item 1.2 (Resolution **245 (WRC-19)**) calls for sharing and compatibility studies, with a view to ensuring the protection of services to which the frequency band is allocated on a primary basis, without imposing additional regulatory or technical constraints on those services, and also, as appropriate, on services in adjacent bands, for the frequency bands:

– 3 300-3 400 MHz and 3 600-3 800 MHz and (Region 2);

– 3 300-3 400 MHz (amend footnote in Region 1);

– 7 025-7 125 MHz (globally);

– 6 425-7 025 MHz (Region 1);

– 10.0-10.5 GHz (Region 2).

3 300-3 400 MHz

The frequency band 3300-3400 MHz is part of a globally-standardized band for 5G. 3GPP has specifications (n77 or 3.3-4.2 GHz band) for the operation of both Long- Term Evolution (LTE) and 5G NR in these bands and there are already significant deployments worldwide along with the required ecosystem to enable those deployments. Seventy percent or nearly 140 operators are investing their 5G deployments in this range. The band 3300-3400 MHz is also included in existing frequency arrangements harmonized in CITEL[[3]](#footnote-3)3 and the ITU-R[[4]](#footnote-4)4. In Region 2, the Radio Regulations footnotes Nos. **5.429C** and **5.429D** provide primary allocations to the mobile service and identification for IMT respectively, while in other Regions there are primary allocations to the mobile service via No. **5.429,** No. **5.429A**, andNo. **5.429C,** with identifications to IMT via No. **5.429B** andNo. **5.429E**.

Proposals

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations
(See No. 2.1)

MOD IAP/44A2A1/1#1353

2 700-3 600 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 3 300-3 400RADIOLOCATION | 3 300-3 400MOBILE except aeronautical mobile ADD 5.A12 RADIOLOCATIONAmateurFixed | 3 300-3 400RADIOLOCATIONAmateur |
| 5.149 5.429 5.429A 5.429B 5.430  | 5.149 MOD 5.429C MOD 5.429D | 5.149 5.429 5.429E 5.429F |

**Reasons:** The identification of mid-band frequency spectrum for IMT is essential to be able to address digitalization (e.g., sustainable smart cities, industries) and reduce the digital divide in the Americas.

MOD IAP/44A2A1/2#1351

5.429C *Different category of service*: 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 service 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‑23)

**Reasons:** The identification of mid-band frequency spectrum for IMT is essential to be able to address digitalization (e.g., sustainable smart cities, industries) and reduce the digital divide in the Americas.

MOD IAP/44A2A1/3

5.429D In Region 2, the use of the mobile (except aeronautical mobile) service in 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‑23)

**Reasons:** Modification to RR No. 5.429D to extend it to the entire Region 2.

ADD IAP/44A2A1/4

5.A12 Stations in the mobile (except aeronautical mobile) service operating in the frequency band 3 300-3 400 MHz in Region 2 shall not cause harmful interference to, or claim protection from, systems operating in the radiolocation service.     (WRC‑23)

**Reasons:** The identification of mid-band frequency spectrum for IMT is essential to be able to address digitalization (e.g., sustainable smart cities, industries) and reduce the digital divide in the Americas.

MOD IAP/44A2A1/5

RESOLUTION 223 (REV.WRC‑23)

Additional frequency bands identified for International
Mobile Telecommunications

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that International Mobile Telecommunications (IMT), including IMT-2000, IMT‑Advanced and IMT-2020, is the ITU vision of global mobile access;

*b)* that IMT systems provide telecommunication services on a worldwide scale regardless of location, network or terminal used;

*c)* that IMT provides access to a wide range of telecommunication services supported by fixed telecommunication networks (e.g. public switched telephone network (PSTN)/integrated services digital network (ISDN), high bit rate Internet access), and to other services which are specific to mobile users;

*d)* that the technical characteristics of IMT are specified in ITU Radiocommunication Sector (ITU‑R) and ITU Telecommunication Standardization Sector (ITU‑T) Recommendations, including Recommendations ITU‑R M.1457 and ITU‑R M.2012, which contain the detailed specifications of the terrestrial radio interfaces of IMT;

*e)* that the evolution of IMT is being studied within ITU‑R;

*f)* that the review of IMT-2000 spectrum requirements at WRC‑2000 concentrated on the frequency bands below 3 GHz;

*g)* that at WARC‑92, 230 MHz of spectrum was identified for IMT-2000 in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz, including the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz for the satellite component of IMT-2000, in No. **5.388** and under the provisions of Resolution **212 (Rev.WRC‑19)**;

*h)* that since WARC‑92 there has been a tremendous growth in mobile communications including an increasing demand for broadband multimedia capability;

*i)* that the frequency bands identified for IMT are currently used by mobile systems or applications of other radiocommunication services;

*j)* that Recommendation ITU‑R M.1308 addresses the evolution of existing mobile communication systems to IMT-2000, and that Recommendation ITU‑R M.1645 addresses the evolution of the IMT systems and maps out their future development;

*k)* that harmonized worldwide frequency bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;

*l)* that the frequency bands 1 710-1 885 MHz, 2 500-2 690 MHz and 3 300-3 400 MHz are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations;

*m)* that the frequency band 2 300-2 400 MHz is allocated to the mobile service on a co‑primary basis in the three ITU Regions;

*n)* that the frequency band 2 300-2 400 MHz, or portions thereof, is used extensively in a number of administrations by other services including the aeronautical mobile service (AMS) for telemetry in accordance with the relevant provisions in the Radio Regulations;

*o)* that IMT has already been deployed or is being considered for deployment in some countries in the frequency bands 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz and equipment is readily available;

*p)* that the frequency bands 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz, or parts thereof, are identified for use by administrations wishing to implement IMT;

*q)* that technological advancement and user needs will promote innovation and accelerate the delivery of advanced communication applications to consumers;

*r)* that changes in technology may lead to the further development of communication applications, including IMT;

*s)* that timely availability of spectrum is important to support future applications;

*t)* that IMT systems are envisaged to provide increased peak data rates and capacity that may require a larger bandwidth;

*u)* that ITU‑R studies forecasted that additional spectrum may be required to support the future services of IMT and to accommodate future user requirements and network deployments;

*v)* that the frequency band 1 427-1 429 MHz is allocated to the mobile, except aeronautical mobile, service in all three Regions on a primary basis;

*w)* that the frequency band 1 429-1 525 MHz is allocated to the mobile service in Regions 2 and 3 and to the mobile, except aeronautical mobile, service in Region 1 on a primary basis;

*x)* that the frequency band 1 518-1 559 MHz is allocated in all three Regions to the mobile-satellite service (MSS) on a primary basis[[5]](#footnote-5)1;

*y)* that WRC-15 identified the frequency band 1 427-1 518 MHz for use by administrations wishing to implement terrestrial IMT systems;

*z)* that there is a need to ensure the continued operations of the MSS in the frequency band 1 518‑1 525 MHz;

*aa)* that appropriate technical measures to facilitate adjacent frequency band compatibility between the MSS in the frequency band 1 518-1 525 MHz and IMT in the frequency band 1 492‑1 518 MHz need to be studied;

*ab)* Report ITU‑R RA.2332, on compatibility and sharing studies between the radio astronomy service and IMT systems in the frequency bands 608-614 MHz, 1 330-1 400 MHz, 1 400‑1 427 MHz, 1 610.6-1 613.8 MHz, 1 660-1 670 MHz, 2 690-2 700 MHz, 4 800-4 990 MHz and 4 990‑5 000 MHz;

*ac)* that WRC-15, WRC-19 and WRC-23 identified the frequency band 3 300-3 400 MHz for use by administrations wishing to implement terrestrial IMT systems in Nos. **5.429B**, **5.429D** and **5.429F**;

*ad)* that the frequency band 3 300-3 400 MHz is allocated worldwide on a primary basis to the radiolocation service;

*ae)* that a number of administrations use the frequency band 3 300-3 400 MHz, or portions thereof, which is allocated to the fixed and mobile services on a primary basis in No. **5.429**;

*af)* that the frequency band 4 800-4 990 MHz is allocated worldwide to the mobile and fixed services on a primary basis;

*ag)* that WRC‑15 and this conference identified the frequency band 4 800-4 990 MHz for use by administrations wishing to implement terrestrial IMT systems in countries listed in Nos. **5.441A** and **5.441B**;

*ah)* that appropriate technical measures may be considered by administrations at a national level to facilitate adjacent frequency band compatibility between radio astronomy receivers in the frequency band 4 990-5 000 MHz and IMT systems in the frequency band 4 800‑4 990 MHz;

*ai)* that Report ITU-R M.2481 addresses in-band and adjacent band coexistence and compatibility studies between IMT systems in the frequency band 3 300-3 400 MHz and radiolocation systems in the frequency band 3300-3 400 MHz, and that further studies were carried out in preparation for WRC-23;

*aibis)* that the development of new ITU-R Recommendations and/or Reports could provide guidance to support administrations planning to implement IMT with the radiolocation service operating in neighboring countries in the frequency band 3300-3400 MHz,

emphasizing

*a)* that flexibility must be afforded to administrations:

– to determine, at a national level, how much spectrum to make available for IMT from within the identified frequency bands;

– to develop their own transition plans, if necessary, tailored to meet their specific deployment of existing systems;

– to have the ability for the identified frequency bands to be used by all services having allocations in those frequency bands;

– to determine the timing of availability and use of the frequency bands identified for IMT, in order to meet particular user demand and other national considerations;

*b)* that the particular needs of developing countries must be met;

*c)* that Recommendation ITU‑R M.819 describes the objectives to be met by IMT‑2000 in order to meet the needs of developing countries,

noting

*a)* Resolutions **224 (Rev.WRC‑19)** and **225 (Rev.WRC‑12)**, which also relate to IMT;

*b)* that the sharing implications between services sharing the frequency bands identified for IMT in No. **5.384A**, as relevant, will need further study in ITU‑R;

*c)* that studies regarding the availability of the frequency band 2 300-2 400 MHz for IMT are being conducted in many countries, the results of which could have implications for the use of those frequency bands in those countries;

*d)* that, due to differing requirements, not all administrations may need all of the IMT frequency bands identified at WRC‑07, or, due to the usage by and investment in existing services, may not be able to implement IMT in all of those frequency bands;

*e)* that the spectrum for IMT identified by WRC‑07 may not completely satisfy the expected requirements of some administrations;

*f)* that currently operating mobile communication systems may evolve to IMT in their existing frequency bands;

*g)* that services such as the fixed service, the mobile service (second-generation systems), the space operation service, the space research service and the AMS are in operation or planned in the frequency band 1 710‑1 885 MHz, or portions thereof;

*h)* that in the frequency band 2 300-2 400 MHz, or portions thereof, there are services such as the fixed, mobile, amateur and radiolocation services which are currently in operation or planned to be in operation in the future;

*i)* that services such as the broadcasting-satellite service (BSS), the BSS (sound), the MSS (in Region 3) and the fixed service (including multipoint distribution/communication systems) are in operation or planned in the frequency band 2 500-2 690 MHz, or portions thereof;

*j)* that the identification of several frequency bands for IMT allows administrations to choose the best frequency band or parts thereof for their circumstances;

*k)* that further study of the technical and operational measures regarding adjacent frequency band compatibility between IMT systems operating below 3 400 MHz and fixed-satellite service earth stations operating above 3 400 MHz may be required;

*l)* that ITU‑R has identified additional work to address further developments in IMT;

*m)* that the IMT terrestrial radio interfaces as defined in Recommendations ITU‑R M.1457 and ITU‑R M.2012 are expected to evolve within the framework of ITU‑R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;

*n)* that the identification of a frequency band for IMT does not establish priority in the Radio Regulations and does not preclude the use of the frequency band for any application of the services to which it is allocated;

*o)* that the provisions of Nos. **5.317A**, **5.384A**, **5.388**, **5.429B**, **5.429D**, **5.429F**, **5.441A** and **5.441B** do not prevent administrations from having the choice to implement other technologies in the frequency bands identified for IMT, based on national requirements,

recognizing

that for some administrations the only way of implementing IMT would be spectrum refarming, requiring significant financial investment,

resolves

1 to invite administrations planning to implement IMT to make available, based on user demand and other national considerations, additional frequency bands or portions of the frequency bands above 1 GHz identified in Nos. **5.341B**, **5.384A**, **5.429B**, **5.429D**, **5.429F**, **5.441A** and **5.441B** for the terrestrial component of IMT; due consideration should be given to the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT, taking into account the services to which the frequency band is currently allocated;

2 to acknowledge that the differences in the texts of Nos. **5.341B**, **5.384A** and **5.388** do not confer differences in regulatory status;

3 that in the frequency bands 4 800-4 825 MHz and 4 835-4 950 MHz, in order to identify potentially affected administrations when applying the procedure for seeking agreement under No. **9.21** by IMT stations in relation to aircraft stations, a coordination distance from an IMT station to the border of another country equal to 300 km (for land path)/450 km (for sea path) applies;

4 that in the frequency band 4 800-4 990 MHz, in order to identify potentially affected administrations when applying the procedure for seeking agreement under No. **9.21** by IMT stations in relation to fixed-service stations or other ground-based stations of the mobile service, a coordination distance from an IMT station to the border of another country equal to 70 km applies;

5 that the power flux-density (pfd) limits in No. **5.441B**, which is subject to review at WRC‑23, shall not apply to the following countries: Armenia, Brazil, Cambodia, China, Russian Federation, Kazakhstan, Lao P.D.R., Uzbekistan, South Africa, Viet Nam and Zimbabwe,

invites the ITU Radiocommunication Sector

1 to conduct compatibility studies in order to provide technical measures to ensure coexistence between the MSS in the frequency band 1 518-1 525 MHz and IMT in the frequency band 1 492-1 518 MHz, including guidance on the implementation of frequency arrangements for IMT deployment in the frequency band 1 427-1 518 MHz, taking into account the results of these studies;

2 to study the technical and regulatory conditions for the protection of stations of the AMS and the maritime mobile service (MMS) located in international airspace or waters (i.e. outside national territories) and operated in the frequency band 4 800-4 990 MHz;

3 to continue providing guidance to ensure that IMT can meet the telecommunication needs of developing countries and rural areas;

3*bis* to continue providing guidance to administrations planning to facilitate the implementation of IMT in the frequency band 3300-3400 MHz taking into account *considering* *aibis)*;

4 to include the results of the studies mentioned in *invites the ITU Radiocommunication Sector* above in one or more ITU‑R Recommendations and Reports, as appropriate,

invites the 2023 World Radiocommunication Conference

to consider, based on the results of the studies referred to in *invites the ITU Radiocommunication Sector* above, possible measures to address, in the frequency band 4 800-4 990 MHz, protection of stations of the AMS and MMS located in international airspace and waters from other stations located within national territories and to review the pfd criteria in No. **5.441B**.

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1. https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2021.pdf [↑](#footnote-ref-1)
2. 2 Ericsson predicts that total mobile traffic is expected to increase by a factor of five over the next six years, reaching 164 exabytes per month by the end of 2025. Ericsson reports that today, smartphones generate about 95% of total mobile data traffic, and that by 2025, 5G networks will carry about half of the world’s mobile data traffic. *See* Ericsson, Mobility Report at 20 (2020), https://www.ericsson.com/49da93/assets/local/mobility-report/documents/2020/june2020-ericsson-mobility-report.pdf. Cisco estimates that, by 2022, 22% of global internet traffic will come from mobile networks, up from 12% in 2017. *See* Cisco Systems Inc., Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2017-2022 White Paper (2019), https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.html. [↑](#footnote-ref-2)
3. 3 PCC.II/REC.54 (XXIX-17) [↑](#footnote-ref-3)
4. 4 Rec. ITU-R M.1036-6 (10/2019) [↑](#footnote-ref-4)
5. 1 See Table **21‑4** for applicable pfd limits. [↑](#footnote-ref-5)