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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Document 97-E** |
|  | **10 October 2019** |
|  | **Original: English** |
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| Angola (Republic of)/Botswana (Republic of)/Burundi (Republic of)/Comoros (Union of the)/Eswatini (Kingdom of)/Kenya (Republic of)/Lesotho (Kingdom of)/Madagascar (Republic of)/Malawi/Mauritius (Republic of)/Mozambique (Republic of)/Namibia (Republic of)/Uganda (Republic of)/Democratic Republic of the Congo/Rwanda (Republic of)/Seychelles (Republic of)/South Sudan (Republic of)/South Africa (Republic of)/Tanzania (United Republic of)/Zambia (Republic of)/Zimbabwe (Republic of) | |
| Proposals for the work of the conference | |
| Studies on frequency-related matters for identification of International Mobile Telecommunications in  bands in the 4-18 GHz range | |
| Agenda item 10 | |

10 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention.

# 1 Introduction

Today’s world is powered by information. The opportunities created by Information and Communication Technology (ICT) development have been one of the main impacting factors on how society has been evolving in recent decades. The use of the emerging technologies, including IMT-2020, will increase productivity, create new opportunities, and generate new services and employment, all of which can lead to greater well-being and further inclusiveness for the society.

IMT systems support various usage scenarios and applications, which includes enhanced Mobile Broadband (eMBB), massive Machine Type Communications (mMTC) and Ultra-Reliable Low-Latency Communications (URLLC). These applications driven by IMT-2020 have been expanding into new market segments such as smart grid, e-health, intelligent transport systems (ITS), traffic control and safety. With the pace of global commercialization of IMT-2020, the market demand for IMT services and applications is increasing, and additional spectrum is required to facilitate new IMT-2020 application scenarios as well as to provide for increasing network capacities in coming years.

Global IMT spectrum harmonization is essential for economies of scale, roaming and interoperability, and also coexistence with other services, which is one of targets for ITU-R identifying IMT spectrum on top of Mobile Service Allocation.

The millimetric wave (mmW) bands in agenda item 1.13 will become the key bands for the provision of ultra-high speed and high-capacity 5G services. As expected, 5G networks in the mmW bands will be mostly deployed as hotspots in big cities and other densely populated areas.

However, in order to enable the full capabilities of 5G, including extended coverage, additional spectrum will be required. Partly, these needs could be satisfied from the existing mobile bands below 3.6 GHz. While the lower frequency bands are more efficient for coverage of larger areas and also for the provision of indoor coverage from outdoor base stations, existing 5G bands such as the C‑band will be in high demand for efficient deployment of 5G networks. It is anticipated that additional spectrum will soon be required for 5G in the mid-range frequency range, particularly between about 4 GHz and 18 GHz.

ECCAS, SADC and EACO made proposals at the 4th ATU Preparatory Meeting for WRC-19 (APM19-4) in East London to study bands in the 6-24 GHz range for possible identification for IMT. Regional organisations and countries outside Africa have also proposed to study this range. After discussion at APM19-4, ATU members agreed to consider identification for IMT in the following bands:

• 4 800-4 990 MHz

• 5 925-7 125 MHz

• 7 125-8 500 MHz

• 8.5-10 GHz

• 10-10.5 GHz

• 14.3/14.8-15.35 GHz

• 15.35-15.63 GHz

• 15.63-17.3 GHz

In order to provide flexibility for ITU Members to adopt suitable frequency band for future IMT implementation, ATU support to conduct studies on frequency related matter for IMT identification in the frequency bands listed above.

Proposal for WRC-19

1 To agree to the new WRC Resolution in Attachment 1 of this document, to request ITU‑R to study coexistence of IMT-2020 systems with existing services in the bands listed above.

2 To add to the agenda of WRC-23 an agenda item on possible identification of the bands above for IMT, taking consideration of the studies conducted by ITU-R, as per Attachment 2 of this document

ATTACHMENT 1

ADD AGL/BOT/BDI/COM/SWZ/KEN/LSO/MDG/MWI/MAU/MOZ/NMB/UGA/COD/RRW/SEY/SSD/AFS/TZA/ZMB/ZWE/97/1

Draft New Resolution (wrc-19) [AGL/BOT/BDI/COM/SWZ/KEN/LSO/MDG/MWI/MAU/MOZ/NMB/UGA/COD/RRW/SEY/SSD/AFS/TZA/ZMB/ZWE/A10]

Studies on frequency-related matters for identification of International Mobile Telecommunications in specific bands in the range 4-18 GHz

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

considering

*a)* that International Mobile Telecommunications (IMT) is key to providing broadband wireless connectivity on a worldwide scale and contributing to global economic growth and social development;

*b)* that there is continuous growth of mobile data traffic in all countries;

*c)* that the assignment of contiguous wide spectrum bandwidth reduces system complexity associated with carrier aggregation, which will improve energy efﬁciency and reduce network cost;

*d)* that adequate and timely availability of spectrum and corresponding regulatory provisions are essential to support the future development of IMT;

*e)* that protection of incumbent services from future IMT systems is to be ensured taking into account current usage and future development of the incumbent services without imposing additional constraints;

*f)* that the 6 725-7 025 MHz is covered by Appendix **30B** of the Radio Regulations,

recognizing

*a)* that to realize global roaming and obtain the benefits of cost-effective deployment of IMT system, it is necessary to achieve global/regional spectrum harmonization for IMT;

*b)* that incumbent services already use bands within the 4-18 GHz range, and these services and their future development require appropriate protection that may involve substantial infrastructure investment,

noting

that compared with the low and high frequency bands, the 4-18 GHz frequency range can provide better balance for meeting needs for both coverage and capacity,

resolves to invite the 2023 World Radiocommunication Conference

to consider, based on the results of ITU-R studies referred to in *resolves to* *invites ITU-R* below, identification for the terrestrial component of IMT in the following frequency bands taking into account *recognizing b)* above:

• 4 800-4 990 MHz

• 5 925-7 125 MHz

• 7 125-8 500 MHz

• 8.5-10 GHz

• 10-10.5 GHz

• 14.3/14.8-15.35 GHz

• 15.35-15.63 GHz

• 15.63-17.3 GHz

resolves to invite ITU‑R

1 to study additional spectrum needs associated with the capabilities required for terrestrial component of IMT, taking into account:

– evolving needs to meet emerging demands for IMT;

– technical and operational characteristics of IMT systems in the 4-18 GHz frequency range, including the evolution of IMT through advances in technology and spectrally-efficient techniques, and their deployment;

– the timeframe in which spectrum would be needed;

2 to conduct sharing and compatibility studies between IMT and incumbent services in the bands listed above, taken into account the need to ensure protection of existing services and their development without imposing additional constraint(s) which have allocations in the potential candidate bands and in adjacent bands on a primary basis,

invites administrations

to participate actively in the studies by submitting contributions to the ITU-R.

ATTACHMENT 2

PROPOSAL FOR AN ADDITIONAL AGENDA ITEM AIMING AT IDENTIFICATION OF BANDS WITHIN 4-18 GHZ FOR IMT

***Subject:*** Proposal for an agenda item for WRC‑23 aiming at identification of bands within 4‑18 GHz for IMT

***Origin****:* ATU

***Proposal:*** *To conduct sharing studies between IMT and the incumbent services in bands within 4‑18 GHz before 2023 and to consider a possible IMT identification in those bands at WRC-23*

***Background/reason:***

The millimetric wave (mmW) bands in agenda item 1.13 will become the key bands for the provision of ultra-high speed and high-capacity 5G services. As expected, 5G networks in the mmW bands will be mostly deployed as hotspots in big cities and other densely populated areas.

However, in order to enable the full capabilities of 5G, including extended coverage, additional spectrum will be required. Partly, these needs could be satisfied from the existing mobile bands below 3.6 GHz. The lower frequency bands are more efficient for coverage of larger areas and also for the provision of indoor coverage from outdoor base stations. Existing mobile bands, in first instance the C-band, will be in high demand for efficient deployment of 5G networks. It is also anticipated that additional spectrum will soon be required for 5G in the mid-range frequency range, particularly between about 4 and 18 GHz. This range is particularly interesting for the African region due to the favourable propagation conditions compared to the bands above 18 GHz.

The following bands are candidates for IMT identification:

• 4 800-4 990 MHz

• 5 925-7125 MHz

• 7 125-8 500 MHz

• 8.5-10 GHz

• 10-10.5 GHz

• 14.3/14.8-15.35 GHz

• 15.35-15.63 GHz

• 15.63-17.3 GHz

***Radiocommunication services concerned:*** FSS, FS, MS and others

***Indication of possible difficulties:*** The bands under consideration have existing uses. Coexistence of IMT with these services needs to be studied and, as a result, IMT identification in some of these bands might not be possible

***Previous/ongoing studies on the issue:***

In the frequency band of 5 925-6 425 MHz, the result of sharing and compatibility studies for IMT and other services are demonstrated in the Report ITU-R F.2326-0 (for the sharing studies with Fixed Service) and Report ITU-R S.2367 (for the sharing studies with FSS UL).

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| ***Studies to be carried out by:*** WP5D | ***with the participation of:***  Administrations and Sector members of the ITU-R |

***ITU‑R Study Groups concerned:***

SG5, SG4 and other groups

***ITU resource implications, including financial implications (refer to CV126):*** TBD

***Common regional proposal:*** Yes ***Multicountry proposal:*** No

***Number of countries:***

***Remarks***

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