**UNITED STATES OF AMERICA**

**DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**

**Agenda Item 1.13**: *to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution* ***238******(WRC-15)***

**Background Information**: Mobile broadband plays an increasingly crucial role in providing access to businesses and consumers worldwide. According to International Telecommunication Union (ITU) statistics, “Mobile-broadband subscriptions have grown more than 20% annually in the last five years and are expected to reach 4.3 billion globally by end 2017”, while “Mobile-broadband prices as a percentage of GNI per capita halved between 2013 and 2016 worldwide.[[1]](#footnote-2) The mobile industry continues to drive technological innovations for International Mobile Telecommunication (IMT) in order to meet evolving user demands, including higher data rates. In early 2012, the ITU-R embarked on a program to develop “IMT for 2020 and beyond”. In November 2015, the ITU-R approved Recommendation ITU-R M.2083 “Framework and overall objectives of the future development of IMT for 2020”, which highlights three key usage scenarios for IMT-2020: enhanced mobile broadband, massive machine type communications, and ultra-reliable and low latency communications. Work within the ITU-R as well as the mobile industry continues on the development of specifications for IMT-2020.

As part of the preparations for WRC-19 agenda item 1.13, ITU-R studies under Resolution **238 (WRC-15)** have addressed sharing and compatibility between IMT and other incumbent services operating within the 37 to 43.5 GHz frequency range. Resolution **238 (WRC-15)** considered, on the one hand, that harmonized worldwide bands and harmonized frequency arrangements for IMT are highly desirable in order to achieve global roaming and the benefits of economies of scale, along with the fact that identification of frequency bands allocated to mobile service for IMT may change the sharing situation regarding applications of services to which a frequency band is already allocated and may require additional regulatory actions. Resolution **238 (WRC-15)** also considered, on the other hand, the need to protect existing services and to allow for their continued development when considering frequency bands for possible identifications for IMT. Resolution **238 (WRC-15)** recognized both that any identification of frequency bands for IMT should take into account the use of the bands by other services and the evolving needs of these services andthat there should be no additional regulatory or technical constraints imposed on services to which a band is currently allocated on a primary basis.

ITU-R studies showed that protection for Space Research Service (SRS) operating in the band 37-38 GHz and the Radio Astronomy Service (RAS) operating in the band 42.5-43.5 GHz could be considered at the national level due to relatively small separation distances. For Fixed Service (FS) operations in the band 37-43.5 GHz, studies showed a few cases of interference in excess of protection criteria when the FS system pointed directly across the IMT deployment area, which is most likely not a realistic scenario as FS links deployed in a dense urban environment would be designed to avoid the clutter and noisy conditions. With respect to passive services in adjacent band, “we note that the -10dBW power limit was adopted to protect passive sensors in the 36-37 GHz band in accordance with ITU Resolution 752 (WRC-07). Because this limit was adopted by the ITU to protect passive sensors from harmful interference from fixed and mobile transmitters in the 36-37 GHz band, we conclude that it will provide appropriate protection to the passive sensors from transmitters in the adjacent band.”[[2]](#footnote-3)

In the 37.5-40 GHz and 42-42.5 GHz bands, which are used by the Fixed-Satellite Service (FSS) for space-to-Earth links for specifically, individually-authorized earth stations, ITU-R studies have shown that co-frequency, co-coverage operation of IMT is feasible under certain conditions of operations in both services/applications. The same is true in the 42.5-43.5 GHz band, which is used by the FSS for Earth-to-space links. In portions of the range where ubiquitously-deployed FSS user terminals would operate (e.g., the 40-42 GHz band reserved for such use by the United States Federal Communications Commission (FCC)2), ITU-R studies have not shown that co-frequency, co-coverage operation of FSS downlinks and IMT is feasible.

International spectrum harmonization is a key component to enable introduction of mobile broadband services such as IMT and satellite services including the FSS. For IMT deployment harmonization is not limited to situations in which all regions have identical spectrum identifications. Consumers and businesses today benefit from the provision of IMT services because the equipment can be reconfigured to operate over multiple bands to satisfy the differences in IMT identifications. This is also expected to be the case from IMT in the higher frequency bands under agenda item 1.13.

Some administrations have or are planning to assign spectrum licenses to IMT in parts of the 37-43.5 GHz frequency range on an unpaired basis and have assigned or are planning to assign spectrum licenses to operators in services other than IMT in other parts of the 37-43.5 GHz frequency range. For example, the United States of America made the 37-40 GHz frequency range available for mobile broadband use and took FSS use into account2. However other administrations in other regions are looking at other portions of the 37-43.5 GHz frequency range for IMT. Standards are already under development for the 37-40 GHz frequency range which can readily be extended to enable devices to operate in unpaired blocks in other portions of the 37-43.5 GHz frequency range.

In light of the ITU-R studies showing feasibility of sharing under certain conditions and the benefits of regional harmonization, the proposal of the United States of America is to make the 37-40 GHz and 42-43.5 GHz frequency ranges available for mobile broadband use. This proposal supports an identification for IMT across the 37-40 GHz and 42-43.5 GHz frequency ranges in Region 2 and an associated Resolution for the implementation of IMT as well as a new co-primary mobile service allocation by footnote in the band 42-42.5 GHz limited to IMT.

This proposal addresses only part of one frequency range that is under consideration under WRC-19 Agenda Item 1.13 and Resolution **238 (WRC-15)**. Additional proposals under Agenda Item 1.13 are under development.

This proposal does not address Regions 1 or 3 to allow for possible regional variations as explained above.

**Proposal**:

ARTICLE 5

**Frequency allocations**

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

**MOD** **USA/1.13/1**

|  |  |  |
| --- | --- | --- |
|  | | |
| 34.2-40 GHz | | |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 37-37.5 FIXED  MOBILE except aeronautical mobile ADD 5.IMT  SPACE RESEARCH (space-to-Earth)  5.547 | | |
| 37.5-38 FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE except aeronautical mobile ADD 5.IMT  SPACE RESEARCH (space-to-Earth)  Earth exploration-satellite (space-to-Earth)  5.547 | | |
| 38-39.5 FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE ADD 5.IMT  Earth exploration-satellite (space-to-Earth)  5.547 | | |
| 39.5-40 FIXED  FIXED-SATELLITE (space-to-Earth) 5.516B  MOBILE ADD 5.IMT  MOBILE-SATELLITE (space-to-Earth)  Earth exploration-satellite (space-to-Earth)  5.547 | | |

|  |  |  |
| --- | --- | --- |
| 40-47.5 GHz | | |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| \*\*\* | | |
| 42-42.5 FIXED  FIXED-SATELLITE (space-to-Earth) 5.516B  BROADCASTING  BROADCASTING-SATELLITE  Mobile ADD 5.IMT2  5.547 5.551F 5.551H 5.551I | | |
| 42.5-43.5 FIXED  FIXED-SATELLITE (Earth-to-space) 5.552  MOBILE except aeronautical mobile ADD 5.IMT  RADIO ASTRONOMY  5.149 5.547 | | |

**ADD USA/1.13/2**

5.IMT The 37-40 GHz and 42.5-43.5 GHz frequency ranges are identified in Region 2 for use by administrations wishing to implement International Mobile Telecommunications (IMT). This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Administrations should take this into account when considering regulatory provisions in relation to these bands. Resolution [IMT Implementation] (WRC-19) shall apply.

Reasons: As studies show, IMT sharing with other services operating in 37-40 GHz and 42.5-43.5 GHz is feasible under certain conditions to protect incumbent services. Considering the importance of regional harmonization for IMT and for incumbent services, these modifications provide an identification for IMT in the frequency range 37-40 GHz and 42.5-43.5 GHz in Region 2 with a Resolution providing important protections for incumbent services. This facilitates harmonized regional bands for IMT, which are highly desirable in order to achieve global roaming and the benefits of economies of scale. Resolution [IMT implementation](WRC-19) provides for the implementation of IMT considering the need to protect existing services and to allow for their continued development, in accordance with Resolution 238 (WRC-15).

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**ADD USA/1.13/3**

5.IMT2 *Different category of service*: in Region 2 the 42-42.5 GHz frequency band is allocated to the mobile service on a primary basis and identified for use by administrations wishing to implement International Mobile Telecommunications (IMT). Use of this primary mobile service allocation is limited to IMT. This identification does not preclude the use of this band by any application of the other services to which it is allocated and does not establish priority in the Radio Regulations. Administrations should take this into account when considering regulatory provisions in relation to these bands. Resolution **[IMT Implementation] (WRC-19)** shall apply.

Reasons: As studies show, IMT sharing with other services operating in 42-42.5 GHz is feasible under certain conditions to protect incumbent services. Considering the importance of regional harmonization for IMT and for incumbent services, this modification provides an upgrade of the mobile service from a secondary allocation to a co-primary allocation and an identification for IMT in the frequency range 42-42.5 GHz in Region 2 with a Resolution providing important protections for incumbent services. This facilitates harmonized regional bands for IMT, which are highly desirable in order to achieve global roaming and the benefits of economies of scale. Limiting the new upgraded allocation to the mobile service in 42-42.5 GHz to IMT use keeps the identification within the scope of AI 1.13 and Resolution 238. Resolution [IMT implementation] provides for the implementation of IMT considering the need to protect existing services and to allow for their continued development, in accordance with Resolution 238 (WRC-15).

**ADD USA/1.13/4**

RESOLUTION [IMT implementation] (WRC‑19)

Implementation of International Mobile Telecommunications  
in the 37-40 GHz and 42-43.5 GHz bands

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

considering

*a)* that International Mobile Telecommunications (IMT) is intended to provide telecommunication services on a worldwide scale, regardless of location and type of network or terminal;

*b)* that IMT systems have contributed to global economic and social development;

*c)* that IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications;

*d)* that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;

*e)* that ITU‑T has initiated the study of network standardization for IMT for 2020 and beyond;

*f)* that adequate and timely availability of spectrum and supporting regulatory provisions is essential to realize the objectives in Recommendation ITU‑R M.2083;

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

*h)* that the band or portions of the bands 37-40 GHz and 42-43.5 GHz are already allocated to the fixed, mobile, space research, fixed-satellite, mobile-satellite and earth exploration-satellite services and are already in use;

*i)* that identification of frequency bands allocated to mobile service for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require additional regulatory actions;

*j)* the need to protect existing services and to allow for their continued development when considering frequency bands for possible additional allocations to any service,

noting

*a)* that Resolution ITU‑R 65 addresses the principles for the process of development of IMT for 2020 and beyond, and that Question ITU‑R 77‑7/5 considers the needs of developing countries in the development and implementation of IMT;

*b)* that Question ITU‑R 229/5 seeks to address the further development of IMT;

*c)* that IMT encompasses both IMT-2000, IMT-Advanced, and IMT-2020 collectively, as described in Resolution ITU‑R 56‑2;

*d)* Recommendation ITU‑R M.2083, on the framework and objectives of the future development of IMT for 2020 and beyond;

*e)* that Report ITU‑R M.2320 addresses future technology trends of terrestrial IMT systems;

*f)* Report ITU‑R M.2376, on technical feasibility of IMT in the frequency bands above 6 GHz;

*g)* that Report ITU‑R M.2370 analyses trends impacting future IMT traffic growth beyond the year 2020 and estimates global traffic demands for the period 2020 to 2030;

*h)* that there are ongoing studies within ITU‑R on the propagation characteristics for mobile systems in higher frequency bands;

recognizing

*a)* the relevance of provisions in Nos. **5.516B** and **5.547**, and Resolution **143 (WRC-07)**;

*b)* that there is a lead time between the allocation of frequency bands by world radiocommunication conferences and the deployment of systems in those bands, and that timely availability of wide and contiguous blocks of spectrum is therefore important to support the development of IMT;

*c)* that any identification of frequency bands for IMT should take into account the use of the bands by other services and the evolving needs of these services;

*d)* that there should be no additional regulatory or technical constraints imposed to services to which the band is currently allocated on a primary basis;

*e)* that ITU-R studies have shown that compatible operations of IMT and receive satellite earth stations in the fixed-satellite service can be achieved through geographic separation between an IMT deployment and the receive earth station;

*f)* that the required geographic separation distance in *recognizing e)*  will vary as a function of earth station antenna diameter, elevation angle, surrounding terrain, and IMT network system design and can vary from a few hundred to a few thousand meters ;

resolves

1) that administrations which implement IMT should consider the following:

*a)* making some or all of the frequency bands identified in No.**5.IMT** and No.**5.IMT2** available for IMT;

*b)* in making frequency bands available under paragraph *a)*, take into account:

– in bands shared with satellite services, the impact that the deployment of IMT stations would have on the existing and future development of FSS earth stations, and the deployment of FSS earth stations would have on the existing and future development of IMT;

– the relevant technical characteristics applicable to IMT, as identified by ITU‑R Recommendations;

2) that administrations which implement IMT shall:

*a*) adopt geographic separations between FSS earth stations and IMT deployments, adjusted as appropriate to protect each specific FSS earth station.

*b)* ensure that IMT base stations comply with the following characteristics:  
- minimum downtilt: 10 degrees  
- maximum e.i.r.p.: 52 dBm/200 MHz

Reasons: As studies show, IMT sharing with other services operating in 37-40 GHz and 42-43.5 GHz is feasible under certain conditions to protect incumbent services. This Resolution provides for the implementation of IMT while providing important protections for incumbent services and allowing for their continued development, in accordance with Resolution 238 (WRC-15). ITU-R studies have shown that compatible operations of IMT and receive satellite earth stations in the fixed-satellite service can be achieved through geographic separation between an IMT deployment and the receive earth station, and assuming certain characteristics for IMT networks.

1. ICT Facts and Figures 2017, p 4 and 5. See: https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf [↑](#footnote-ref-2)
2. US 2nd R&O See: https://apps.fcc.gov/edocs\_public/attachmatch/FCC-16-89A1.pdf [↑](#footnote-ref-3)