**WRC-19 Agenda Item 1.13**

IWG-2 members were not able to reach consensus on a proposal for WRC-19 Agenda Item 1.13 regarding the identification of frequency bands for the future development of International Mobile Telecommunications (IMT), in accordance with Resolution 238 (WRC-15) for the frequency range 37 – 43.5 GHz. The views on the appropriate regulatory changes the FCC should support are provided.

View A is supported by: AT&T, Cisco Systems Inc., CTIA, Ericsson, GSMA, Intel Corporation, Samsung Electronics America, Sprint Corporation, T-Mobile and Verizon.

View B is supported by: The Boeing Company, EchoStar Corporation, Inmarsat, Intelsat, Jansky-Barmat Telecommunications Inc, Lockheed Martin and SES Americom.

VIEW A

**View A:**

View A proposes an identification to the terrestrial component of IMT for the 37-43.5 GHz frequency range as well as a corresponding upgrade to the Mobile service a co-primary allocation for the 40.5-42.5 GHz frequency bands.  View A is supported by AT&T, Cisco Systems Inc., CTIA, Ericsson, GSMA, Intel Corporation, Samsung Electronics America, Sprint Corporation, T-Mobile and Verizon.

Incredible technological innovation has enabled the use of higher frequency bands (e.g. mmWave) to help meet the ever-increasing demand for mobile broadband.  As a global spectrum policy leader, the FCC led the US to be the first country in the world to make mmWave spectrum available for 5G in the 27.5-28.35 GHz and 37-40 GHz frequency ranges. While the US moves forward by making additional frequency bands available for 5G use, other countries and regions are now following suit with their initial spectrum licensing decisions.

The harmonization of spectrum for mobile broadband provide benefits to consumers and businesses through economies of scale and global roaming. Yet harmonization of exact frequency bands for mobile broadband has becoming increasingly difficult over time as governments are unable to make spectrum available in the exact same frequency bands due to different existing uses and priorities. Fortunately, the benefits of harmonization can still be achieved today over “radio tuning ranges”.

The identification for IMT of the 37-43.5 GHz frequency range would provide these benefits of harmonization while allowing regulators the flexibility to assign spectrum within this range for domestic use as appropriate. Leading administrations, including some of the world’s largest markets, have or are planning to assign spectrum licenses within the 37-43.5 GHz frequency range on an unpaired basis. The equipment developed for operation in the 37-40 GHz frequency band allocated for UMFUS in the US can also support other 5G networks operating within the 37-43.5 GHz radio tuning range. For instance, in Europe, the Radio Spectrum Policy Group has announced that 40.5-43.5 GHz is the “European priority in terms of studies for second stage mm-wave 5G bands” in recognition of “a tuning range for equipment from 37-43.5 GHz. The potential of this tuning range would be for different regions to be able to identify the most appropriate frequencies to be used for 5G.” Therefore, a global identification for IMT in 37-43.5 GHz would allow each country/region to assign spectrum for 5G consistent with their domestic use and priorities, while still facilitating the benefits of economies of scale for businesses and consumers.

It is also important to note that as part of WRC-19 agenda item 1.13 preparations, ITU-R Task Group 5/1 carried out extensive sharing and compatibility studies: these studies show that sharing between the terrestrial component of IMT and other services operating in this frequency range is feasible.

Finally, there is no need for a WRC Resolution specifying operational constraints on IMT to be associated with this proposed identification for IMT. Operational characteristics that are used by cellular providers, such as base station downtilt, that change on time scales needed to minimize intra- and inter-cell interference and also guarantee quality of service should not be encoded in the Radio Regulations. It should also be noted that the US rules for Upper Microwave Flexible Use Service (UMFUS), which allows fixed or mobile service, would not comply with the e.i.r.p. limits proposed for inclusion in a Resolution in the Radio Regulations.

Based upon the reasons described above, the above-signed support View A with an identification to the terrestrial component of IMT in 37-43.5 GHz as well as a corresponding co-primary allocation to the mobile service in 40.5-42.5 GHz.

**ATTACHMENT TO VIEW A:**

**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 Telecommunications 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-1) The mobile industry continues to drive technological innovations for International Mobile Telecommunications (IMT) in order to meet evolving user demands, including higher data rates. In early 2012, ITU-R embarked on a program to develop “IMT for 2020 and beyond”. In November 2015, 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 have concluded that sharing between IMT and other incumbent services operating within the 37 to 43.5 GHz frequency range is feasible. For example, there were large interference margins for Fixed Satellite Service (FSS), Mobile Satellite Service (MSS) and Broadcasting Satellite Service (BSS) operating in the space to Earth direction in 37-42.5 GH, with smaller margins in the Earth to space direction in 42.5-43.5 GHz, Protection for Earth Exploration Satellite Service (EESS) and Space Research Service (SRS) operating in the 37-38 GHz bands as well as the Radio Astronomy Service (RAS) operating in the 42.5-43.5 GHz bands could be considered at the national level due to relatively small separation distances. For Fixed Service (FS) operations in 37-43.5 GHz, studies showed a few cases of interference 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-2)

International spectrum harmonization is a key component to enable introduction of mobile broadband services such as IMT. Spectrum harmonization facilitates global roaming, economies of scale and commonality of equipment, which is imperative given that mobile devices can be designed to operate only in a limited number of frequency bands. Harmonization is not limited to situations in which all regions have identical spectrum allocations. Consumers and businesses can also benefit from use of spectrum within harmonized “tuning range” solutions covering adjacent or nearly-adjacent bands in which equipment can be reconfigured to operate over multiple bands (i.e., they are within the same tuning range).

Leading administrations, including some of the world’s largest markets, have or are planning to assign spectrum licenses within the 37-43.5 GHz frequency range on an unpaired basis. For example, the United States of America made the 37-40 GHz frequency range available for mobile broadband use.[[3]](#footnote-3) In Europe, the Radio Spectrum Policy Group has announced that 40.5-43.5 GHz is the “European priority in terms of studies for second stage mm-wave 5G bands” in recognition of “a tuning range for equipment from 37-43.5 GHz. The potential of this tuning range would be for different regions to be able to identify the most appropriate frequencies to be used for 5G.”[[4]](#footnote-4) Consequently, 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 any portion of the entire 37-43.5 GHz frequency range.

Harmonization of spectrum within “radio tuning ranges” is a crucial consideration for WRC-19 agenda item 1.13 as differences in uses and priorities among various countries and regions may make it difficult to reach consensus on the global identification to IMT for individual bands. Availability of standardized equipment allows countries to deploy mobile/IMT in different band segments (e.g. 37-40 GHz, 40.5-43.5 GHz, 37-43.5 GHz) consistent with their domestic priorities. As there is no need for a fixed duplex gap within these unpaired blocks, the same mobile devices can support the entire 37-43.5 GHz frequency range, thereby offering significant potential for economies of scale and global roaming. In other words, with the IMT identification in 37-43.5 GHz, Administrations have the flexibility to take full advantage of the benefits of international harmonization even if they do not choose to deploy across the entire frequency range. In light of the ITU-R studies showing feasibility of sharing and the benefits of international harmonization, this proposal supports an identification for IMT across the entire 37-43.5 GHz frequency range as well as upgrading the secondary allocation for the Mobile Service to a co-primary allocation in 40.5-42.5 GHz.

**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 |
| 40-40.5 EARTH EXPLORATION-SATELLITE (Earth-to-space)  FIXED  FIXED-SATELLITE (space-to-Earth) 5.516B  MOBILE ADD 5.IMT  MOBILE-SATELLITE (space-to-Earth)  SPACE RESEARCH (Earth-to-space)  Earth exploration-satellite (space-to-Earth) | | |
| 40.5-41  FIXED  FIXED-SATELLITE  (space-to-Earth)  BROADCASTING  BROADCASTING-SATELLITE  MOBILE ADD 5.IMT  5.547 | 40.5-41  FIXED  FIXED-SATELLITE  (space-to-Earth) 5.516B  BROADCASTING  BROADCASTING-SATELLITE  MOBILE ADD 5.IMT  Mobile-satellite (space-to-Earth)  5.547 | 40.5-41  FIXED  FIXED-SATELLITE  (space-to-Earth)  BROADCASTING  BROADCASTING-SATELLITE  MOBILE ADD 5.IMT  5.547 |
| 41-42.5 FIXED  FIXED-SATELLITE (space-to-Earth) 5.516B  BROADCASTING  BROADCASTING-SATELLITE  MOBILE ADD 5.IMT  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 | | |

Reasons: As studies show sharing with other services operating in 37-43.5 GHz is feasible, these modifications provide an identification for IMT in the frequency range 37 to 43.5 GHz and the Mobile Service is upgraded from a secondary allocation to a co-primary allocation in 40.5-42.5 GHz. This facilitates harmonized worldwide bands for IMT, which are highly desirable in order to achieve global roaming and the benefits of economies of scale.

**ADD USA/1.13/2**

5.IMT The 37-43.5 GHz frequency range is identified 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.

Reasons: Harmonized worldwide bands for IMT enable global roaming and the benefits of economies of scale as the same user equipment can be used to serve the global market. Identifying the entire 37-43.5 GHz tuning range facilitates global harmonization enables Administrations to reap the benefits of internationally harmonized spectrum while preserving the ability to identify the most appropriate frequencies for use based upon their domestic priorities.

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VIEW B

**VIEW B:**

**Introduction**

WAC members supporting View B maintain that the WAC should approve Document IWG-2/071 (10.04.18) (“Document 71”) and recommend to the FCC to use Document 71 as the basis for reconciling a draft United States Proposal regarding Agenda Item 1.13 in the frequency range 37-43.5 GHz. The Boeing Company, EchoStar Corporation, Inmarsat, Intelsat, Jansky-Barmat Telecommunications Inc, Lockheed Martin and SES Americom support View B.

**View B**

The proposal supported by the proponents of View B in document Document 71 is to  
(i) include a footnote identifying mobile allocations in the frequency ranges 37-40 GHz and 42.5-43.5 GHz for IMT,  
(ii) include a second footnote upgrading the mobile service from a secondary allocation to a co-primary allocation in the frequency range 42-42.5 GHz, identifying the band for IMT and restricting the upgraded primary mobile service allocation to IMT and  
(iii) include a Resolution providing for the implementation of IMT and protection of incumbent satellite services.

**View B provides the following benefits:**

1. **It focuses on spectrum harmonization while allowing for regional flexibility.**

The United States should take the lead for harmonizing spectrum for IMT and other services in Region 2 and building on the Spectrum Frontiers second Order. No administrations have identified specific frequency ranges for IMT at CITEL. The proposal in Document 71 provides an opportunity to achieve a balance between IMT and other services in Region 2. View B proponents recognize that Region 1 and 3 are considering other spectrum bands within the range 37-43.5 GHz for IMT identification and therefore this proposal allows for possible regional variations while focusing on Region 2.

1. **It focuses on 4.5 GHz of spectrum for which studies demonstrated that sharing is feasible.**

Consistent with Spectrum Frontiers, Document 71 proposes to identify the band 37-40 GHz for IMT and does not include the band 40-42 GHz. As recognized in Spectrum Frontiers, the band 40-42 GHz is reserved for use by ubiquitously-deployed FSS user terminals and no studies have demonstrated to date that such use is compatible with an IMT deployment. There is a great prospect for harmonization of this band in Region 2 for ubiquitously-deployed FSS user terminals as it is identified for use by high-density applications in the FSS through footnote 5.516B in Article 5 of the Radio Regulations.

In order to provide flexibility for harmonization of IMT spectrum in Region 2, Document 71 also proposes to identify the band 42-43.5 GHz for IMT as this band can be shared between IMT and FSS earth stations at known locations. This would make a total of 4.5 GHz of spectrum among which countries in Region 2 can select frequencies for IMT identification based on their needs. Similar to IMT equipment today, future IMT equipment is expected to have the technical capability to adjust to different frequency ranges. This technical capability will ensure that global roaming and the benefits of economies of scale are achieved.

1. **It provides a method for upgrading the secondary mobile allocation in 42-42.5 GHz that is within the scope of Resolution 238 (WRC-15).**

Document 71 proposes to include a footnote upgrading the mobile service from a secondary allocation to a co-primary allocation in the frequency range 42-42.5 GHz, identifying the band for IMT and restricting use of the primary mobile service to IMT in accordance with Resolution 238 (WRC-15).

1. **It provides necessary protection to satellite services.**

Document 71 proposes that footnotes identifying frequencies for use by IMT refer to a Resolution providing for the implementation of IMT. This Resolution captures the key assumptions and conclusions of sharing studies conducted by ITU-R Task Group 5/1, which demonstrated that IMT and satellite services are compatible in certain frequency ranges under the studied conditions. It is essential for satellite services that technical protections and spectrum be harmonized on a regional basis through the Radio Regulations. Satellite services cannot be competitive if access to spectrum and protection are defined on a country-by-country basis, as proposed by the proponents of View A in Document IWG-2/061r3 (10.04.18).

The Resolution recognizes that geographic separations between FSS earth stations and IMT deployments should be adopted in order ensure compatibility, as demonstrated by the ITU-R studies and as recognized in the Spectrum Frontiers second Order. It leaves full flexibility to administrations regarding implementation of such geographic separations.

The Resolution also captures two key assumptions used in ITU-R studies, the minimum downtilt and maximum e.i.r.p. of base stations as provided by the expert IMT group WP 5D. The proponents of View B recognize that these assumptions may be in contradiction with national decisions providing flexibility in the design of IMT systems and that there may be other ways to ensure that IMT deployment remains compatible with satellite services as IMT technology evolves.

**ATTACHMENT TO VIEW B:**

**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.[[5]](#footnote-5) 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.”[[6]](#footnote-6)

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).

**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.

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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-1)
2. See: <https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-89A1.pdf>, p61. [↑](#footnote-ref-2)
3. See: https://apps.fcc.gov/edocs\_public/attachmatch/FCC-16-89A1.pdf [↑](#footnote-ref-3)
4. https://circabc.europa.eu/sd/a/fe1a3338-b751-43e3-9ed8-a5632f051d1f/RSPG18-005final-2nd\_opinion\_on\_5G.pdf [↑](#footnote-ref-4)
5. ICT Facts and Figures 2017, p 4 and 5. See: https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf [↑](#footnote-ref-5)
6. US 2nd R&O See: https://apps.fcc.gov/edocs\_public/attachmatch/FCC-16-89A1.pdf [↑](#footnote-ref-6)