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**INTERNATIONAL TELECOMMUNICATION UNION**

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**PLENARY MEETING**

**Document XXXX-E**  
**31 July 2015**  
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**Member States of the Inter-American Telecommunication Commission (CITEL)**

**PROPOSALS FOR THE WORK OF THE CONFERENCE**

**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,

**Background Information:** Since 2000, terrestrial IMT networks have served a crucial role in providing access to businesses and consumers worldwide. According to ITU statistics, Mobile cellular subscriptions will reach over 7 billion by the end of 2015, corresponding to a penetration rate of 97%, including a penetration rate of 92% in developing countries and 121% in developed countries.<sup>1</sup>

IMT networks contribute to global economic and social development. IMT systems provide a wide range of multimedia applications, including telemedicine, teleworking, distance learning, and public protection and disaster relief, with even more applications envisioned. IMT systems also help reduce the digital divide between urban and rural areas, including underserved communities.

The growth rate of mobile broadband has been phenomenal. According to ITU statistics, “Mobile broadband is the most dynamic market segment (of ICT growth); globally, mobile broadband penetration reaches 47% in 2015, a value that increased 12 times since 2007.” By end 2015, the number of mobile-broadband subscriptions is estimated to reach 3.5 billion globally, more than 8 times as many as just six years earlier (in 2008).”<sup>2</sup>

Mobile broadband data consumption is expected to continue to increase exponentially through the timeframe for WRC-19, which will create significant demand for additional spectrum to accommodate new mobile broadband data services. Projections for 2019 are as follows:<sup>3</sup>

- Global mobile data traffic will increase nearly tenfold between 2014 and 2019. Mobile data traffic will grow at a compound annual growth rate (CAGR) of 57 percent from 2014 to 2019, reaching 24.3 exabytes per month by 2019.
- The average smartphone will generate 4.0 GB of traffic per month by 2019, a fivefold increase over the 2014 average of 819 MB per month. By 2019, aggregate smartphone traffic will be 10.5 times greater than it is today, with a CAGR of 60 percent.
- The Middle East and Africa will have the strongest mobile data traffic growth of any region with a 72 percent CAGR. This region will be followed by Central and Eastern Europe at 71 percent and Latin America at 59 percent.

In order to meet this growing demand as well as to provide increased capabilities to users, IMT systems have continually incorporated technological improvements, from the first IMT-2000 networks to IMT-Advanced. In early 2012, ITU-R began to develop “IMT for 2020 and beyond”, setting the stage for research activities that are emerging around the world. ITU-R studies include Report ITU-R M.2320, which provides information on the technology trends of terrestrial IMT systems considering the time frame 2015-2020 and beyond, Report ITU-R M.[IMT.ABOVE 6 GHz] which studies the technical feasibility of IMT in bands above 6 GHz, and Recommendation ITU-R M.[IMT.VISION] which describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

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<sup>1</sup> [http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2015/ITU\\_Key\\_2005-2015\\_ICT\\_data.xls](http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2015/ITU_Key_2005-2015_ICT_data.xls)

<sup>2</sup> <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf>

<sup>3</sup> Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update 2014–2019 White Paper, [http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white\\_paper\\_c11-520862.html](http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html)

The year 2020 is seen as a beginning for next generation of mobile broadband communication systems beyond IMT-Advanced, which currently are known as ‘IMT 2020’ systems, sometimes also referred to as ‘5G’. Globally, mobile industries, academia, governments, ITU-R and regional groups are conducting research activities to address the growth in traffic and user demands for year 2020 and beyond. Correspondingly, frequency allocation and regulatory frameworks issues also need to be addressed in parallel so that the development of the technology can proceed.

Research efforts globally on “5G” systems are progressing.<sup>4</sup> In the United States, academic and research efforts on 5G are also underway (e.g., 5G Brooklyn and 5G Forum) at a number of academic institutions as well as industry.<sup>5</sup> In addition, manufacturers worldwide have invested resources in research and development efforts, while mobile operators have begun “lab trials.”

Within the scope of the wide-ranging development for future mobile broadband, and in addition to the work on-going for IMT in the lower frequency bands, considerable research has been carried out by various organizations on a global scale on the feasibility of terrestrial IMT in spectrum above 6 GHz. The corresponding results presented at various workshops and conferences have been positive towards the feasibility of utilizing higher frequencies for terrestrial IMT and mobile broadband usage. It is expected that usage of higher frequencies will be one of the key enabling components of future IMT as the state of the art in technological developments unlocks the spectrum above 6 GHz. In the United States, the Federal Communications Commission has initiated an examination of the possible use of higher frequency bands for mobile broadband services.<sup>6</sup>

Given the growing demand for mobile broadband and the technological advances which will be able to support IMT networks in higher frequency bands, it is essential to ensure the timely availability of additional spectrum in bands above 6 GHz to support the future growth of IMT in the years 2020 and beyond. Balanced against this effort is the essential need to ensure that the incumbent services with existing and planned uses in bands above 6 GHz are protected. Therefore, the United States proposes a WRC-19 agenda item to consider the identification of frequency bands for the terrestrial component of IMT in bands above 6 GHz.

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<sup>4</sup> More information is available at <https://gsmainelligence.com/research/?file=141208-5g.pdf&download>. Appendix A.

<sup>5</sup> For example, see <http://brooklyn5gsummit.com/> and <http://brooklyn5gsummit.com/>.

<sup>6</sup> Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al., GN Docket No. 14-177, et al., Notice of Inquiry, FCC 14-154, 29 FCC Rcd 13020 (2014), [https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-14-154A1\\_Rcd.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-14-154A1_Rcd.pdf).

**Proposal:**

**SUP USA/10(IMT)/1**

**RESOLUTION 808 (WRC-12)**

**Preliminary agenda for the 2018 World Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2012),

**Reasons:** This Resolution must be suppressed, as WRC-15 will create a new Resolution that will include the agenda for WRC-19.

**ADD USA/10(IMT)/2**

**DRAFT NEW RESOLUTION [USA-2019]**

**Agenda for the 2019 World Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2015),

*considering*

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and that a final agenda shall be established by the Council two years before the conference;
- b) Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;
- c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

*recognizing*

- a) that WRC-15 has identified a number of urgent issues requiring further examination by WRC-19;
- b) that, in preparing this agenda, some items proposed by administrations could not be included and have had to be deferred to future conference agendas,

*resolves*

to recommend to the Council that a world radiocommunication conference be held in 2019 for a maximum period of four weeks, with the following agenda:

1. on the basis of proposals from administrations, taking account of the results of WRC-15 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following items:

- 1.[IMT] to consider, in accordance with Resolution [IMT] (WRC-2015), spectrum requirements and potential identification for the terrestrial component of International Mobile

Telecommunications (IMT) to facilitate mobile broadband applications in the frequency range 27.5-71 GHz;

2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC-12)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

4 in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;

7 to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)** to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

8 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-07)**;

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-15;

9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and

9.3 on action in response to Resolution **80 (Rev.WRC-07)**;

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,

*resolves further*

to activate the Conference Preparatory Meeting,

*invites the Council*

to finalize the agenda and arrange for the convening of WRC-15, and to initiate as soon as possible the necessary consultations with Member States,

*instructs the Director of the Radiocommunication Bureau*

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-19,

*instructs the Secretary-General*

to communicate this Resolution to international and regional organizations concerned.

**Reasons:** To add an item to the agenda enabling consideration of frequency-related matters to facilitate mobile broadband applications including the terrestrial component of International Mobile Telecommunications (IMT) in the frequency range 27.5-71 GHz, while ensuring compatibility with existing services.

**ADD USA/10(IMT)/3**

**DRAFT NEW RESOLUTION [IMT] (WRC-15)**

**Consideration of spectrum requirements and potential identification for the terrestrial component of International Mobile Telecommunications (IMT) to facilitate mobile broadband applications in the frequency range 27.5-71 GHz**

The World Radiocommunication Conference (Geneva, 2015),

*considering*

- a) that International Mobile Telecommunications (IMT) systems have been the main method of delivering wide area mobile broadband applications;
- b) that IMT and other mobile broadband systems contribute to global economic and social development by providing a wide range of multimedia applications, such as mobile telemedicine, teleworking, distance learning and other applications;
- c) that in all countries where terrestrial IMT systems are deployed there is a continuing significant growth in the number of users of IMT systems and in the quantity and rate of data carried, the latter being driven to a large extent by audiovisual content;
- d) that IMT and other mobile broadband systems have helped reduce the digital divide between urban and rural areas, including underserved communities;
- e) that in many developing markets the main delivery mechanism for broadband access is expected to be through mobile devices;
- f) that adequate and timely availability of spectrum and supporting regulatory provisions is essential to support the future growth of IMT and other mobile broadband systems;
- g) 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;
- h) that IMT-2020 systems are envisaged to expand and support diverse usage scenarios that will extend beyond the current IMT systems;
- i) that harmonized worldwide bands and harmonized frequency arrangements for IMT and other mobile broadband systems are highly desirable in order to achieve global roaming and the benefits of economies of scale; and
- j) that there is a need to ensure protection of incumbent primary services,

*noting*

- a) that IMT encompasses both IMT-2000 and IMT-Advanced collectively, as described in Resolution ITU-R 56;
- b) that Resolution ITU-R 57 addresses the principles for the process of development of IMT-Advanced, and Question ITU-R 77-7/5 considers the needs of developing countries in the development and implementation of IMT;
- c) that Question ITU-R 229-3/5 seeks to address the further development of IMT;
- d) that Recommendations ITU-R M.1457 and ITU-R M.2012 contain detailed specifications of the terrestrial radio interfaces of IMT-2000 and IMT-Advanced, respectively;
- e) that there are on-going studies within ITU-R on the propagation characteristics for mobile systems in higher frequency bands,

*further noting*

that the ITU has established a program on IMT for 2020 and beyond, which provides the framework for IMT-2020 research and development worldwide and these initiatives are described in:

- Report ITU-R M.2320 provides information on the technology trends of terrestrial IMT systems considering the time frame 2015-2020 and beyond;
- Report ITU-R M.[IMT.ABOVE 6 GHz] studies the technical feasibility of IMT in bands above 6 GHz;
- Recommendation ITU-R M.[IMT.VISION] describes the framework and overall objectives of the future development of IMT for 2020 and beyond,

*recognizing*

- a) that there is a fairly long lead time between the identification of frequency bands by world radiocommunication conferences and the deployment of systems in those bands, and timely availability of spectrum is therefore important to support the development and harmonization of IMT and other terrestrial mobile broadband applications;
- b) that a large number of frequency bands in the range 27.5-71 GHz are already allocated to the mobile service on a primary basis;
- c) that IMT is an application in the mobile service;
- d) that frequency bands allocated to passive services are not suitable for an allocation to the mobile service and, therefore, should be excluded from the frequency bands to be considered,

*resolves to invite ITU-R*

1 to conduct and complete in time for WRC-19, the appropriate studies to determine the spectrum requirements for mobile broadband applications including the terrestrial component of International Mobile Telecommunications (IMT) in the frequency range 27.5-71 GHz, taking into account:

- technical and operational characteristics of IMT systems that would operate in this frequency range, including the evolution of IMT through advances in technology and spectrally-efficient techniques, and their deployment;
- the needs of developing countries;
- the time-frame in which spectrum would be needed;

2 to conduct and complete in time for WRC-19, the appropriate sharing and compatibility studies, including adjacent band studies as appropriate, within the frequency ranges 27.5 – 29.5 GHz, 37.0 – 40.5 GHz, 47.2-50.2 GHz, 50.4 – 52.6 GHz, and 59.3 – 71 GHz, which are already globally identified for mobile service use on a primary basis, taking into account the protection of existing services;

3 in conducting studies in accordance with *resolves to invite ITU-R* 2, to exclude from consideration all frequency bands listed in No. **5.340**,

*further resolves*

- 1) to invite CPM 19-1 to define the date by which technical and operational characteristics needed for sharing and compatibility studies are to be available, to ensure that studies referred to in *resolves to invite ITU-R* can be completed in time for consideration at WRC-19;
- 2) to invite WRC 19 to consider the results of the above studies and take appropriate actions, including identification of frequency bands for mobile broadband applications including the terrestrial component of International Mobile Telecommunications (IMT),

*invites administrations*

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

**Reasons:** To provide guidance for the work under the proposed WRC-19 agenda item.

## ATTACHMENT

### **PROPOSAL FOR ADDITIONAL AGENDA ITEM FOR CONSIDERATION OF IDENTIFICATION OF FREQUENCY BANDS FOR THE TERRESTRIAL COMPONENT OF INTERNATIONAL MOBILE TELECOMMUNICATIONS (IMT) IN THE FREQUENCY RANGE 27.5-71 GHZ, TAKING INTO ACCOUNT THE RESULTS OF STUDIES TO FACILITATE THE DEVELOPMENT OF MOBILE BROADBAND APPLICATIONS**

**Subject:** Proposed Future WRC Agenda Item for WRC-2019 for consideration of identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in the frequency range 27.5-71 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications

**Origin:** United States of America

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*Proposal: To consider the identification of frequency bands for the terrestrial component of international mobile telecommunications (imt) in the frequency range 27.5-71 GHz, taking into account the results of studies to facilitate the development of mobile broadband applications*

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***Background/reason:***

According to ITU statistics, “Mobile broadband is the most dynamic market segment (of ICT growth); globally, mobile broadband penetration reaches 47% in 2015, a value that increased 12 times since 2007.” By the end of 2015, the number of mobile-broadband subscriptions is estimated to reach 3.5 billion globally, more than 8 times as many as just six years earlier (in 2008).”<sup>7</sup> In order to meet this growing demand as well as support new user capabilities, terrestrial IMT networks continue to incorporate technological advances.

In early 2012, ITU-R began to develop “IMT for 2020 and beyond”, setting the stage for research activities that are emerging around the world, including support for networks in bands above 6 GHz. Technological advances described in Report [IMT.ABOVE 6 GHz] can facilitate the development and deployment of IMT networks to help meet this growing capacity demands for mobile broadband. Given the growing demand for mobile broadband and the technological advances, which will be able to support IMT networks in higher frequency bands, it is essential to ensure the timely availability of spectrum in bands above 6 GHz to support the future growth of IMT in the years 2020 and beyond. There are currently no bands above 6 GHz identified for IMT.

This Agenda Item would consider the identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in the frequency range 27.5-71 GHz

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<sup>7</sup> <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf>

to facilitate the development of mobile broadband applications in the following bands: the 27.5-29.5 GHz, 37.0-40.5 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, and 59.3-71 GHz

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***Radiocommunication services concerned:***

Fixed, Fixed Satellite, Inter-Satellite, Mobile, Mobile-Satellite, Earth Exploration Satellite, Space Research, Radio Astronomy Radiolocation, Radionavigation, Radionavigation-Satellite

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***Indication of possible difficulties:*** None foreseen.

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***Previous/ongoing studies on the issue:*** Report ITU-R M.2320 provides information on the technology trends of terrestrial IMT systems in 2015-2020 and beyond. ITU-R Working Party 5D is finalizing studies on Report ITU-R M.[IMT.ABOVE 6 GHz], which studies the technical feasibility of IMT in bands above 6 GHz and Recommendation ITU-R M.[IMT.VISION], which describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

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***Studies to be carried out by:*** SG 5      ***with the participation of:*** SG 3, SG 4 and SG 7

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***ITU-R Study Groups concerned:*** SG 4, SG 5 and SG 7

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***ITU resource implications, including financial implications (refer to CV126):*** This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. As the responsible group on IMT studies, ITU-R WP 5D usually has meetings three times a year, which last 6 days each.

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***Common regional proposal:*** Yes/No

***Multicountry proposal:*** Yes/No

*Number of countries:*

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***Remarks***