

**DRAFT PROPOSAL
FOR THE WORK OF THE CONFERENCE**

IMT for the Year 2020 and Beyond:

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;

Introduction

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 almost 7 billion by end 2014, corresponding to a penetration rate of 96%,” including a penetration rate of 90% in developing countries and 121% in developed countries.¹

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 remains the fastest growing market segment, with continuous double-digit growth rates in 2014. By end 2014, the number of mobile-broadband subscriptions will reach 2.3 billion globally, almost 5 times as many as just six years earlier (in 2008).”²

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, [PDN] Report ITU-R M.[IMT.ABOVE 6 GHz] which studies the technical feasibility of IMT in bands above 6 GHz, and [PDN] Recommendation ITU-R M.[IMT.VISION] which describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

¹ <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>, p 3.

² <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>, p1.

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 for 2020 and beyond’ 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.³ In Asia, the Chinese 5G initiative, named ‘IMT-2020’, is a combination of three government agencies and has established eight working groups with the aim of promoting the development of 5G technologies in the country, while Japan has “2020 and Beyond Ad Hoc” (20B AH) group focused on delivering commercial 5G services at the 2020 Olympic Games and in South Korea, the ‘5G Forum’ was founded by the Ministry of Science, ICT (information and communications technology) and Future Planning (MSIP) to lead the development of 5G mobile wireless communications and to commercialize 5G technology by 2020. In Europe, work includes the METIS 2020 Project as well as the 5G Infrastructure Public Private Partnership (5G PPP), a joint European Commission/industry effort which will facilitate research into solutions, architectures, technologies and standards for 5G infrastructure. In the US, academic and research efforts on 5G are also underway (e.g. 5G Brooklyn and 5G Forum). In the U.S., major research efforts are underway at a number of academic institutions as well as industry.⁴ 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 US, the FCC has already expressed interest in the use of higher frequency bands for mobile broadband services.

Regional preparatory groups have also recognized the need for additional spectrum for terrestrial IMT in higher frequency bands and are actively developing potential proposals for WRC_19. For example, in the Asia Pacific Preparatory Group, multiple administrations have proposed a WRC-19 agenda item for IMT in higher frequency bands. Within Europe, the Conference Preparatory Group PTA is also progressing a proposal for an agenda item at WRC-19 to identify spectrum for IMT applications in frequency bands above 6 GHz. In the UK, Ofcom issued a Call for Inputs on “Spectrum above 6 GHz for future mobile communications” to inform their strategy on these bands, including international discussions on bands above 6 GHz that could be considered at the World Radiocommunications Conference (WRC) in 2019.⁵

³ More information is available at <https://gsmaintelligence.com/research/?file=141208-5g.pdf&download>, Appendix A.

⁴ For example, see <http://brooklyn5gsummit.com/> and <http://brooklyn5gsummit.com/>.

⁵ http://stakeholders.ofcom.org.uk/binaries/consultations/above-6ghz/summary/spectrum_above_6_GHz_CFI.pdf

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. 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 6GHz.

Proposal:

MOD USA/10/1

RESOLUTION 806 (WRC-15)

Agenda for the 2019 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2015),

ADD USA/10/2

1.[IMT] to consider spectrum requirements and identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications, in accordance with Resolution [IMT] (WRC-2015);

Reasons: To support the requirement for additional spectrum being identified for the terrestrial component of International Mobile Telecommunications (IMT)

ADD USA/10/3

RESOLUTION [IMT] (WRC-15)

Consideration of identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications

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 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
- i) the need to protect existing services when considering changes to the table of frequency allocations;

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 of IMT and other terrestrial mobile broadband applications;
- b) that IMT systems have been in operation since the year 2000;
- c) the use of relevant parts of the spectrum by other radiocommunication services, many of which involve significant investment in infrastructure or represent significant societal benefit, and the evolving needs of these services,
- d) that IMT encompasses both IMT-2000 and IMT-Advanced collectively, as described in Resolution ITU-R 56;
- e) 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;
- f) that Question ITU-R 229-3/5 seeks to address the further development of IMT;
- g) 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,
- h) that Report ITU-R M.2320 provides information on the technology trends of terrestrial IMT systems considering the time frame 2015-2020 and beyond.
- i) that [PDN] Report ITU-R M.[IMT.ABOVE 6 GHz] studies the technical feasibility of IMT in bands above 6 GHz
- j) that [PDN] Recommendation ITU-R M.[IMT.VISION] describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

resolves

that WRC-19 consider, based on the results of ITU-R studies in *invites ITU-R 1* and 2, possible identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications.

invites ITU-R

- 1) to conduct, and complete in time for WRC-19, the appropriate studies to determine the spectrum requirements for the terrestrial component of IMT in bands above 6 GHz;
- 2) to conduct sharing and compatibility studies, based on the results of *invites ITU-R 1*, to determine appropriate frequency bands
- 3) when conducting studies in accordance with *invites ITU-R 2*, to consider
 - i) frequency bands within existing allocations to the mobile service on a primary basis in the table of frequency allocations on a regional or global basis, other than those in No. **5.340**.
 - ii) additional frequency bands if spectrum requirements cannot be met in frequency bands studied under *invites ITU-R 3 i)*

invites administrations

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

ATTACHMENT

PROPOSAL FOR ADDITIONAL AGENDA ITEM FOR CONSIDERATION OF IDENTIFICATION OF FREQUENCY BANDS FOR THE TERRESTRIAL COMPONENT OF INTERNATIONAL MOBILE TELECOMMUNICATIONS (IMT) IN BANDS ABOVE 6 GHz, INCLUDING APPROPRIATE MOBILE ALLOCATIONS IF NEEDED, 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 bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications

Origin: United States of America

Proposal: *To consider the identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications*

Background/reason:

ITU statistics show that “Mobile broadband remains the fastest growing market segment, with continuous double-digit growth rates in 2014. By end 2014, the number of mobile-broadband subscriptions will reach 2.3 billion globally, almost 5 times as many as just six years earlier (in 2008).”⁶ 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 PDN 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.

⁶ <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>

Radiocommunication services concerned: Mobile Service

Indication of possible difficulties: None foreseen.

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 [PDN] Report ITU-R M.[IMT.ABOVE 6 GHz] which studies the technical feasibility of IMT in bands above 6 GHz and [PDN] Recommendation ITU-R M.[IMT.VISION] which describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

Studies to be carried out by: ITU-R
WP5D

with the participation of: other WPs as required

ITU-R Study Groups concerned: SG 5 and others as needed

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.

Common regional proposal: Yes/No

Multicountry proposal: Yes/No

Number of countries:

Remarks