

IAFI<sup>1</sup>

## REVIEW AND UPDATING OF VARIOUS ITU-R QUESTIONS OF RELEVANCE TO WP5D

**1 Introduction**

Sub-Working Group (SWG) RA-23 has been tasked with reviewing the ITU-R Resolutions, Questions and Opinions in order to develop necessary updates to these Resolutions, Questions and Opinions. Following six questions are assigned to ITU-R WP5D :

Question Number	ITU-R Working Party	Question Title	Proposal
<a href="#">209-6/5</a>	WP5A/WP5D	Use of the mobile, amateur and the amateur-satellite services in support of disaster radiocommunications	No Comments
<a href="#">241-4/5</a>	WP5A/WP5D	Cognitive radio systems in the mobile service	No Comments
<a href="#">77-8/5</a>	WP5D	Consideration of the needs of developing countries in the development and implementation of IMT	Proposed to update this question
<a href="#">229-5/5</a>	WP5D	Further development of the terrestrial component of IMT	Proposed to update this question
<a href="#">262/5</a>	WP5D	Usage of the terrestrial component of IMT systems for specific applications	Proposed to update this question
<a href="#">242-2/5</a>	WP5A/WP5C /WP5D	Reference radiation patterns of omnidirectional and sectoral antennas for the fixed and mobile services for use in sharing studies	Proposed to update this question

<sup>1</sup> ITU-APT FOUNDATION OF INDIA (<https://itu-apt.org>)

## **2 Proposal**

In this document, IAFI is proposing some edits to the following questions as given in the attachment 1, 2, and 3

In the attachments 1, 2, 3 and 4 of this document, IAFI is proposing edits to the questions (Questions [77-8/5](#), [229-5/5](#), [262/5](#) and [242-2/5](#)) mentioned in the table above.

**Attachment:** 1-4

QUESTION ITU-R 77-8/5\*

**Consideration of the needs of developing countries and LDCs in the  
development and implementation of IMT**

(1986-1992-1993-1997-2000-2003-2007-2012-2019-2023)

The ITU Radiocommunication Assembly,

*considering*

- a) the work carried out so far by the Radiocommunication Sector on mobile radiocommunication systems, in particular of International Mobile Telecommunications (IMT);
- b) ITU-R Recommendations on IMT, in particular Recommendations ITU-R M.819 on IMT-2000 for developing countries, ITU-R M.1308 on evolution of land mobile systems towards IMT-2000, ITU-R M.1457 on specifications of the terrestrial component of IMT-2000, Recommendation ITU R M.1645 on framework and overall objectives of the future development of IMT 2000 and systems beyond IMT 2000; Recommendation ITU-R M.2012 on specifications of the terrestrial component of IMT-Advanced, and Recommendation ITU-R M.2150 on specifications of the terrestrial component of IMT-2020; c) that ITU-R Report ITU-R M.2373 provides details of interactive unicast and multicast audio-visual capabilities and applications provided over terrestrial IMT systems;
- d) that different frequency bands are identified in the ITU Radio Regulations (RR) for use, on a worldwide, regional or country basis, by administrations wishing to implement IMT systems;
- e) Resolution 43 (WTDC, Rev. Kigali, 2022), “Assistance in implementing International Mobile Telecommunications (IMT) and future networks” dealing with the assistance to developing countries in their planning and optimization of spectrum usage for the medium to long term for the implementation of IMT, taking into account national and regional specificities and needs and to continue encouraging and assisting developing countries to implement IMT systems and future networks;
- f) ITU-T Recommendations and ongoing work items that are relevant to this work;
- g) that the ITU Handbooks on “Deployment of IMT systems-2000”, “Global Trends in IMT” and “International Mobile Telecommunications (IMT)” were developed through a collaborative effort among the three ITU Sectors;
- h) the potential increase in the pace of deployment and provision of broadband communications services in the developing countries through the use of cost-effective wireless access technologies including IMT for both fixed and mobile users,

---

\* This Question should be brought to the attention of Radiocommunication Study Group 3, Telecommunication Standardization Study Group 13 and Telecommunication Development Study Group 1.

*decides* that the following Question should be studied:

1 What are the optimal technical and operational characteristics for IMT to meet the needs of developing countries including the special needs of Least Developed Countries (LDCs) for cost effective broadband access to the global telecommunication networks?

NOTE 1 – In carrying out the above study, particular attention should be given to the following items:

- a) the need to provide an economical, reliable and high-quality telecommunication infrastructure;
- b) the need for modular design (easily expandable) for both hardware and software, and simple and low-cost terminals allowing flexible growth of number of users and coverage areas;
- c) the evolution and demand for the applications including eMBB, mMTC and UrLLC provided by IMT;
- d) evolution adaptability to allow for migration based on the international standards and protocols to support inter-operability with existing networks or among IMT radio interfaces;
- e) harmonized and efficient use of frequency bands for urban, rural and remote areas to the extent possible;
- f) propagation problems in remote and hilly areas, coastal and small island areas and sandy desert areas;
- g) the possibility of using the equipment in a variety of environments including extremes of heat and cold, high humidity, dust, corrosive atmospheres and other environment hazards;
- h) the positive impact of IMT and future networks on economic development and improvement of communication as well as social inclusion;
- i) approaches and experiences of administrations while implementing terrestrial component of IMT in various frequency ranges and various terrains and environments;
- j) the need for common access to emergency services supported through IMT,

*further decides*

1 that the results of the above studies should be included in one or more Recommendations, Reports, or Handbooks<sup>1</sup>;

2 that work on the above studies be carried out in cooperation with the relevant ITU-D and ITU-T activities;

3 that the results of the above studies should be completed by 2027.

Category: S2

---

<sup>1</sup> The material developed as a result of the above may also be appropriate as an update of the relevant Handbooks on IMT.

QUESTION ITU-R 229-5/5\*

**Further development of the terrestrial component of IMT**

(2000-2003-2008-2012-2015-2019-2023)

The ITU Radiocommunication Assembly,

*considering*

- a) that more than 8.6 billion mobile subscriptions roughly corresponding to the total global population are supporting access to global telecommunication networks; however an estimated 2 billion people worldwide live in places which are still out of reach of mobile cellular services;
- b) that mobile data traffic is drastically increasing driven largely by the introduction of new types of advanced devices;
- c) that service functionalities in fixed and mobile networks are increasingly converging and IMT is an enabler for such convergence;
- d) that the cost of radio technology equipment is continually decreasing, thus making the radio approach an increasingly attractive access option for many applications including broadband communications;
- e) that ever-increasing user demand for mobile radiocommunications requires the continual evolution of systems and development of new mobile broadband systems where required, in order to accommodate higher data rates and provide larger data capacity for applications such as multimedia, video and machine-to-machine services;
- f) that for international operation, economies of scale, and interoperability it is desirable to agree on common system technical, operational, and spectrum-related parameters;
- g) that, after the initial standardization of the terrestrial component of IMT, ongoing enhancements of the IMT specifications have been and will continue to be accommodated over time;
- h) that the implementation of IMT systems is expanding and that these systems will continue to be widely deployed in the near future;
- i) that ITU-R has been endeavouring to facilitate globally harmonized use of the spectrum identified for IMT by developing relevant ITU-R Recommendations;
- j) Question ITU-R 77/5 on consideration of the needs of developing countries in the development and implementation of IMT;
- k) that the ITU Handbooks on “Deployment of IMT-2000 systems”, “Global Trends in IMT” and “International Mobile Telecommunications (IMT)” were developed through a collaborative effort among the three ITU Sectors;
- l) that the needs of extension to various industry areas utilizing IMT are increasing rapidly,

*recognizing*

- a) that IMT encompasses both a terrestrial component and a satellite component;

---

\* This Question should be brought to the attention of the relevant Telecommunication Standardization Sector Study Groups and Radiocommunication Study Group 4.

- b) the time-scales necessary to develop and agree on the technical, operational and spectrum-related issues associated with the ongoing evolution and further development of future mobile systems;
- c) the needs of the developing countries, taking account of *considering j)* and *k)* above;
- d) that the characteristics of current and future IMT systems, with significantly high data rates, large data traffic capacity and new types of applications, will necessitate the adoption of more spectrally efficient techniques;
- e) that some frequency bands are identified for the use of IMT in the ITU Radio Regulations (RR);
- f) that harmonized use of IMT spectrum is important to bridge the digital divide and bring the benefits of ICTs through IMT systems to all,

*noting*

- a) that Resolution ITU-R 50 addresses the role of the Radiocommunication Sector in the ongoing development of IMT;
- b) that Resolution ITU-R 56 specifies the naming for IMT;
- c) that Resolution ITU-R 57 specifies the principles for the process of the development of IMT-Advanced;
- d) that Resolution ITU-R 65 specifies the principles for the process of future development of IMT for 2030 and beyond,

*decides* that the following Questions should be studied:

- 1 What are the overall objectives and user needs for the further development of IMT, beyond the work carried out so far by the Radiocommunication Sector on IMT?
- 2 What are the new applications and service requirements associated with further development of IMT?
- 3 What are the technical and operational issues, and spectrum-related issues for the further development of IMT and increasingly efficient use of spectrum?
- 4 What are the technical and operational characteristics needed for the further development of IMT?
- 5 What are the optimal radio-frequency arrangements required to facilitate harmonized use of the spectrum identified for IMT?
- 6 What factors need to be considered in developing a migration strategy to facilitate transition from current IMT technologies to more advanced ones?
- 7 What are the issues concerning the facilitation of global circulation of terminals and other related aspects regarding the continued development and deployment of IMT systems?
- 8 What are the terrestrial radio interface technologies of IMT and the detailed radio interface specifications which need to be provided by the 2027 timeframe?
- 9 What should be the objectives for the long-term development of IMT?

*further decides*

- 1 that the results of the above studies should be included in one or more Report(s) and/or Recommendation(s);

2 that the IMT studies described in *decides* 1 through 7 above should be completed by  
2027;

3 that the studies described in *decides* 8 and 9 may extend beyond the 2027 time-frame.

Category: S2

QUESTION ITU-R 262/5

**Usage of the terrestrial component of IMT systems for specific applications**

(2019-2023)

The ITU Radiocommunication Assembly,

*considering*

- a) that the first IMT systems started service around the year 2000, and since then IMT systems such as IMT-Advanced and IMT-2020 have been developed and enhanced;
- b) that IMT systems have contributed to global economic and social development;
- c) that IMT-2020 systems provide further capabilities and extend to varied usage scenarios such as enhanced mobile broadband (eMBB), ultra-reliable and low latency communications (URLLC) and massive machine type communications (mMTC), described in Recommendation ITU-R M.2150;
- d) that IMT-2030 systems are expected to be developed to further enhance the capabilities of IMT-2020;
- e) that IMT systems are leading the growth and development of industries in the field of ICT;
- f) that IMT systems are providing benefits of global ecosystem and economies of scale which is helping in faster adoption of ICT; and
- g) that applicable areas of IMT are expected to be expanded further to various specific applications to facilitate the digital economy, e.g. e-manufacturing, e-agriculture, e-health, intelligent transport systems, smart city and traffic control, etc., which could bring requirements beyond current capabilities of IMT,

*recognizing*

- a) that Resolution ITU-R 50 addresses the role of the Radiocommunication sector in the ongoing development of IMT;
- b) that Question ITU-R 229/5 addresses in general terms the further development of the terrestrial component of IMT;
- c) that Question ITU-R 209/5 addresses the use of the mobile, amateur and the amateur-satellite services in support of disaster radiocommunications;
- d) that Recommendation ITU-R M.2083 defines the framework of the future development of IMT for 2020 and beyond, which includes further enhancement of existing IMT, as well as a broad variety of capabilities associated with envisaged usage scenarios;
- e) that Recommendation ITU-R M.2150 defines the specifications of the terrestrial component of IMT-2020;
- f) that Report ITU-R M.2441 addresses the emerging usage of the terrestrial component of IMT;



g) that the ITU Handbooks on “Deployment of IMT systems-2000”, “Global Trends in IMT” and "International Mobile Telecommunications (IMT)” were developed through a collaborative effort among the three ITU Sectors;

h) that Report ITU-R M.2291 contains studies related to the usage of IMT for broadband public protection and disaster relief applications,

*noting*

a) that several groups and organizations inside and outside ITU-R are studying technologies, usages and spectrum for specific applications based on IMT systems;

b) that IMT systems are now being deployed in industrial, private, local and enterprise networks,

*decides* that the following Questions should be studied

1 What are the specific industrial and enterprise applications, their emerging usages, their spectrum needs, and their functionalities, that may be supported by the terrestrial component of IMT?

2 What are the technical characteristics, operational aspects, and capabilities associated with specific industrial, private, local and enterprise applications of using the terrestrial component of IMT?

*further decides*

1 that the results of the above studies should be included in one or more Recommendations, Reports and/or Handbooks;

2 that the above studies described in *decides* should be completed by 2027.

Category: S2

## QUESTION ITU-R 242-2/5<sup>2</sup>

### **Reference radiation patterns of omnidirectional and sectoral antennas for the fixed and mobile services for use in sharing studies**

(1995-2000-2012-2015-2023)

The ITU Radiocommunication Assembly,

*considering*

- a) that determination of criteria for frequency sharing between point-to-multipoint systems in the fixed service and systems in other services or between systems in the land mobile service and systems in other services requires a knowledge of radiation patterns of omnidirectional and sectoral antennas along all possible interfering paths;
- b) that the use of reference radiation patterns for omnidirectional and sectoral antennas would facilitate interference calculations;
- c) that different reference radiation patterns may be required for the various types of antennas in use,

*decides* that the following Questions should be studied

- 1 What are the measured radiation patterns in the vertical and horizontal planes for both polarizations of typical omnidirectional and sectoral antennas used in point-to-multipoint systems in the fixed service or land mobile systems?
- 2 What reference radiation patterns can be defined for use in sharing studies for the different types of antennas?

*further decides*

- 1 that the results of the above studies should be included in one or more Recommendation(s) or Report(s);
- 2 that the above studies should be completed by 2027.

NOTE – See Recommendation ITU-R [F.1336](#).

Category: S2

---

<sup>2</sup> In the year 2019, Radiocommunication Study Group 5 extended the completion date of studies for this Question.

