



Radiocommunication Bureau (BR)

Administrative Circular
CACE/937

3 December 2019

To Administrations of Member States of the ITU, Radiocommunication Sector Members, ITU-R Associates participating in the work of the Radiocommunication Study Group 5 and ITU Academia

Subject: **Radiocommunication Study Group 5 (Terrestrial services)**

- **Approval of 2 new ITU-R Questions and 10 revised ITU-R Questions**
- **Suppression of 1 ITU-R Question**

By Administrative Circular CACE/927 of 19 September 2019, 2 draft new ITU-R Questions and 10 draft revised ITU-R Questions were submitted for approval by correspondence in accordance with Resolution ITU-R 1-8 (§ A2.5.2.3). In addition, the Study Group proposed the suppression of 1 ITU-R Question.

The conditions governing this procedure were met on 19 November 2019.

The texts of the approved Questions are attached for your reference in the Annexes 1 to 12 and will be published by the ITU. The suppressed ITU-R Question is indicated in Annex 13.

Mario Maniewicz
Director

Annexes: 13

Distribution:

- Administrations of Member States of the ITU and Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 5
- ITU-R Associates participating in the work of Radiocommunication Study Group 5
- ITU Academia
- Chairmen and Vice-Chairmen of Radiocommunication Study Groups
- Chairman and Vice-Chairmen of the Conference Preparatory Meeting
- Members of the Radio Regulations Board
- Secretary-General of the ITU, Director of the Telecommunication Standardization Bureau, Director of the Telecommunication Development Bureau

Annex 1

QUESTION ITU-R 261/5

Radiocommunication requirements for connected automated vehicles (CAV)

(2019)

The ITU Radiocommunication Assembly,

considering

- a) that, around 1.5 billion vehicles exist in the world including trucks and busses;
- b) that, after the initial standardization of intelligent transport systems (ITS), ongoing enhancements of the ITS specifications have been and will continue to be accommodated over time;
- c) that the introduction of CAVs is driven by new types of radiocommunication and sensor technologies;
- d) that, CAVs have the potential to reduce crashes, thereby reducing traffic fatalities and crash-related injuries;
- e) that CAVs provide information about congestion relief and traffic crashes for increased efficiency of traffic and comfortable driving;
- f) that CAVs encompass various stages of automation, involving different levels of human intervention;
- g) that CAVs are being planned to be or are deployed in various regions;
- h) that radiocommunications for CAVs may be implemented in frequency bands allocated to the land mobile service;
- i) that there is a need for consideration of global or regional harmonization of spectrum for CAVs;
- j) that the technologies for CAVs also address requirements for trucks and public transportation systems to make them safer and more efficient;
- k) Question ITU-R 205/5 on the development and implementation of ITS services,

recognizing

that harmonized spectrum would facilitate worldwide deployment of radiocommunications for CAVs and provide for economies of scale for CAVs,

noting

that a number of ITU-R Recommendations and Reports exist on various aspects of current ITS, for example Recommendations ITU-R M.1452, ITU-R M.1453, ITU-R M.1890, ITU-R M.2057, ITU-R M.2084, ITU-R M.2121 and Reports ITU-R M.2228, ITU-R M.2322, ITU-R M.2444, ITU-R M.2445 as well as the Handbook on Land Mobile (including ITS),

decides that the following questions should be studied

- 1 What is the definition of connected automated vehicle (CAV) in the context of ITS?
- 2 What are the radiocommunication elements for CAVs?
- 3 What are the overall objectives and requirements for CAVs, including:
 - service requirements: service type, service concept, grade of service;
 - radiocommunication requirements: sensors, radio interfaces, data rate, latency, reliability;
 - improvement factors: safety, control, energy savings, traffic management, congestion control?
- 4 Which radiocommunication systems have the capabilities to support CAV requirements?
- 5 What CAV functions might benefit from spectrum harmonization?
- 6 What are the spectrum requirements for CAV radiocommunication including:
 - suitable bands;
 - spectrum bandwidth needed?

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 should be completed by 2023.

Category: S2

Annex 2

QUESTION ITU-R 262/5

Usage of the terrestrial component of IMT systems for specific applications

(2019)

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.2083;
- d) that Recommendation of the IMT-2020 terrestrial component radio interface specifications is scheduled to be finalized by 2020 in accordance with its timeline;
- e) that IMT systems are leading the growth and development of industries in the field of ICT; and
- f) 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 and the development of IMT-2020, as well as a broad variety of capabilities associated with envisaged usage scenarios;
- e) that Report ITU-R M.2441 addresses the emerging usage of the terrestrial component of IMT;

f) 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 and enterprise networks,

decides that the following Questions should be studied

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

2 What are the technical characteristics, operational aspects, and capabilities associated with specific industrial and enterprise applications of using 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 2023.

Category: S2

Annex 3

QUESTION ITU-R 205-6/5

Intelligent Transport Systems

(1995-1996-2002-2003-2007-2012-2019)

The ITU Radiocommunication Assembly,

considering

- a) that there is a need to integrate new technologies including radiocommunications into land transportation systems;
- b) that many new land transportation systems use intelligence in the land vehicles coupled with advanced management techniques to improve traffic management;
- c) that the technologies planned for intelligent transport systems (ITS) can be applied to public transportation (transit) systems to make them more efficient and to enhance the integrated use of all forms of surface transport;
- d) that ITS are being planned and implemented in various Regions;
- e) that a wide variety of ITS applications are defined;
- f) that international standards would facilitate the world-wide applications of ITS and provide for economies of scale in bringing ITS equipment and services to the public;
- g) that early international harmonization of ITS would have several benefits;
- h) that world-wide compatibility of ITS may be dependent on common radio spectrum allocations;
- i) that radio is an essential component of ITS;
- j) that the International Organization for Standardization (ISO) is standardizing ITS (non-radio aspects) in ISO/TC204,

recognizing

- a) Recommendation ITU-R M.1453 “Intelligent transport systems – Dedicated short range communications at 5.8 GHz”;
- b) Recommendation ITU-R M.2084 “Radio interface of vehicle-to-vehicle and vehicle-to-infrastructure communications for Intelligent Transport System applications”;
- c) Recommendation ITU-R M.2121 “Harmonization of frequency bands for Intelligent Transport Systems in the mobile service”;

decides that the following Questions should be studied

- 1 What are the various elements of ITS?
- 2 What are the overall objectives for ITS with respect to:
 - radiocommunication requirements: radio interfaces, reliability, grade of service, etc.;
 - improvement factors; congestion reduction, safety, control, etc.;
 - type of services?
- 3 What radio-based ITS services and functions might benefit from international standardization?
- 4 What are the spectrum requirements for each element of ITS including:
 - suitable bands;
 - spectrum bandwidth needed?
- 5 What are the interconnect requirements of ITS with telecommunication networks?
- 6 What are the technical factors that affect sharing between ITS and other users?
- 7 To what extent can the evolving mobile telecommunications systems be used to deliver ITS services?
- 8 What are the radiocommunication requirements and technical specifications necessary for the global or regional harmonization of next generation ITS radiocommunications?
- 9 What is the definition of “telematics” in the context of ITS? In such a context, what are the systems and application requirements of telematics? What are the land mobile communications requirements of telematics?

further decides

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by 2023.

Category: S2

Annex 4

QUESTION ITU-R 101-5/5*

Quality of service requirements in the land mobile service

(1990-1993-1995-2003-2007-2019)

The ITU Radiocommunication Assembly,

considering

- a) that there is a rapid development in methods for digitization of speech and its transport over IP networks;
- b) that this development gives new possibilities to obtain higher system flexibility and improved spectrum efficiency in the transmission of speech;
- c) that digitally encoded speech enables more privacy in speech communication;
- d) that new systems supporting multimedia telecommunication services with various degrees of performance are being introduced widely;
- e) that there may be advantages in adopting for the land mobile service standards that are compatible with ITU-T Recommendations relevant to the fixed networks,

decides that the following Questions should be studied

- 1 Which measures of quality of multimedia services are relevant for different land mobile applications?
- 2 What delay with respect to delivery of service and delay variation are acceptable for different land mobile applications?
- 3 What is the proper choice of encoding bit rates for multimedia services taking into account quality requirements, channel coding techniques, efficient frequency usage, and cost?

further decides

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by 2023.

Category: S2

* This Question should be brought to the attention of the Telecommunication Standardization Sector Study Groups 2 and 12.

Annex 5

QUESTION ITU-R 209-6/5

Use of the mobile, amateur and the amateur-satellite services in support of disaster radiocommunications

(1995-1998-2006-2007-2012-2015-2019)

The ITU Radiocommunication Assembly,

considering

- a)* Resolution 136 (Rev. Dubai, 2018) of the Plenipotentiary Conference, on the use of telecommunications/information and communication technologies for humanitarian assistance and for monitoring and management in emergency and disaster situations, including health-related emergencies, for early warning, prevention, mitigation and relief;
- b)* Resolution 43 (Rev. Buenos Aires, 2017), which instructs the Director BDT, in close collaboration with the Directors of the Radiocommunication Bureau (BR) and the Telecommunication Standardization Bureau (TSB), as well as the relevant regional telecommunication organizations, to continue encouraging and assisting developing countries to implement IMT systems and future networks, to provide assistance to administrations on the use and interpretation of ITU Recommendations relating to IMT, and future networks adopted by both ITU-R and ITU-T, etc.;
- c)* Resolution **647 (Rev.WRC-15)** on Radiocommunication aspects, including spectrum management guidelines, for early warning, disaster prediction, detection, mitigation and relief operations relating to emergencies and disasters;
- d)* that the Tampere Convention on the provision of telecommunication resources for disaster mitigation and relief operations by the Intergovernmental Conference on Emergency Telecommunications (ICET-98) came into force on 8 January 2005;
- e)* that in accordance with No. **25.3** of the Radio Regulations amateur stations may be used for transmitting international communications on behalf of third parties in case of emergencies or disaster relief. An administration may determine the applicability of this provision to amateur stations under its jurisdiction (**WRC-03**);
- f)* that in No. **25.9A** of the Radio Regulations administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief (**WRC-03**),

recognizing

- a) that when a disaster occurs, the disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases, other agencies and organizations may also be involved;
- b) that in times of disasters, if most terrestrial-based networks are destroyed or impaired, other networks in the amateur and amateur-satellite services may be available to provide basic, on-site communications capability;
- c) that important attributes of the amateur services include stations distributed throughout the world which have trained radio operators capable of reconfiguring networks to meet the specific needs of an emergency,

decides that the following Question should be studied

What are the technical, operational and related procedural aspects of mobile, amateur and amateur-satellite services in support and improvements of disaster warning, mitigation and relief operations?

further decides

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by 2023;
- 3 that the above studies should be coordinated with the other two Sectors.

Category: S2

Annex 6

QUESTION ITU-R 238-3/5^{*,**}

Mobile broadband wireless access systems

(2006-2007-2012-2019)

The ITU Radiocommunication Assembly,

considering

- a) that there is a need to provide broadband wireless access (BWA) in a variety of environments;
- b) that it is desirable to recommend radio interface standards for mobile broadband wireless access systems;
- c) that it is desirable to identify the technical and operational requirements for mobile broadband wireless access systems;
- d) that in today's terrestrial radiocommunications, mobile "broadband" services provide similar capabilities and experience, with the added benefit of mobility, as is available from widely-deployed wireline networks;
- e) that there are mobile and fixed systems currently in operation and also in development that provide broadband wireless access in various frequency bands;
- f) that information transfer methods based on internet protocol (IP) are being used in broadband infrastructure;
- g) that standardization bodies are addressing the architecture and technical features of broadband wireless access systems,

noting

- a) that studies on BWA are also performed in the context of IMT systems (see Question ITU-R 229/5);
- b) that studies on fixed BWA and nomadic BWA are performed under the scope of Questions ITU-R 215/5 and ITU-R 212/5, respectively,

* Broadband wireless access is defined in Recommendation [ITU-R F.1399](#).

** This Question should be brought to the attention of ITU-D Study Group 2.

decides that the following Questions should be studied

- 1 What are the technical and operational requirements for mobile broadband wireless access systems in the mobile service?
- 2 What are the applicable radio interface standards for mobile broadband wireless access systems in the mobile service?
- 3 What are the applicable antenna systems suitable for mobile broadband wireless access systems in the mobile service?
- 4 What are the frequency sharing and/or compatibility criteria associated with BWA systems operating in the mobile service?

further decides

- 1 that the results of the above studies should be included in one or more Recommendations, Reports, or Handbooks;
- 2 the above studies should be completed by 2023.

Category: S2

Annex 7

QUESTION ITU-R 256-1/5

Technical and operational characteristics of the land mobile service in the frequency range 275-1 000 GHz

(2015-2019)

The ITU Radiocommunication Assembly,

considering

- a) that there is a growing demand for high speed and large capacity radiocommunications having data rates of several tens of Gbit/s to over 100 Gbit/s for land mobile service applications;
- b) that due to progress in the recent terahertz technologies, the integrated devices and circuits operating above 275 GHz can achieve various sophisticated applications;
- c) that the above devices and circuits could provide such high speed and large capacity radiocommunications for land mobile service systems;
- d) that standard development organizations such as IEEE are developing standards for terahertz wireless systems which utilize the broadband contiguous bandwidth larger than 50 GHz using the frequency range above 275 GHz;
- e) that broadband contiguous bandwidths larger than 50 GHz for the land mobile service are not available in the frequency range below 275 GHz;
- f) that certain parts of the frequency range 275-1 000 GHz are identified in Radio Regulations No. **5.565** for use by administrations for passive service applications;
- g) that the use of the frequency range 275-1 000 GHz by the passive services does not preclude the use of this range by active services;
- h) that the technical and operational characteristics of the land mobile service need to be specified for sharing and compatibility studies with the passive service applications indicated in *considering f*);
- i) that the frequency range 275-450 GHz has been studied under WRC-19 for use by the land-mobile and fixed services applications,

recognizing

- a) that Report ITU-R RS.2431 “Technical and operational characteristics of EESS (passive) systems in the frequency range 275-450 GHz” provides the technical and operational characteristics of Earth Observation (passive) sensors in the frequency range 275-450 GHz;
- b) that Report ITU-R SM.2352 provides the technology trends of active services in the frequency range 275-3 000 GHz;
- c) that Report ITU-R RA.2189 initiated sharing studies between the radio astronomy service and active services in the frequency range 275-3 000 GHz,

decides that the following Question should be studied

What are the technical and operational characteristics of the land mobile service in the frequency range 275-1 000 GHz?

further decides

- 1 that sharing studies between the land mobile and passive services, as well as the land mobile and other active services should be carried out, taking into account the characteristics mentioned in *decides* as well as the relevant results of the studies under WRC-19;
- 2 that the results of studies in the frequency range 275-1 000 GHz should be brought to the attention of the other Study Groups, in particular, Study Group 7;
- 3 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 4 that the above studies should be completed by 2023.

Category: S2

Annex 8

QUESTION ITU-R 241-4/5

Cognitive radio systems in the mobile service

(2007-2007-2012-2015-2019)

The ITU Radiocommunication Assembly,

considering

- a) that the use of mobile radio systems is growing at a rapid rate globally;
- b) that more efficient use of spectrum is essential to the continued growth of such systems;
- c) that cognitive radio systems (CRSs) may facilitate the more efficient use of spectrum in mobile radio systems;
- d) that cognitive radio systems may offer functional and operational versatility and flexibility in mobile radio systems;
- e) that considerable research and development is being carried out on cognitive radio systems and related radio technologies;
- f) that it is beneficial to identify the technical and operational characteristics of a CRS;
- g) that Report ITU-R SM.2152 contains the ITU-R definition for a CRS;
- h) that ITU-R Reports and/or Recommendations on cognitive radio systems would be complementary to other ITU-R Recommendations on mobile radio systems;
- i) that Reports ITU-R M.2225, ITU-R M.2242 and ITU-R M.2330 contain studies related to CRS,

noting

that there are network aspects related to the control of cognitive radio systems,

recognizing

- a) that CRSs are a collection of technologies, not a radiocommunication service;
- b) that any radio system implementing CRS technology within any radiocommunication service shall operate in accordance with the provisions of the Radio Regulations applicable for that specific service in the related frequency band,

decides that the following Questions should be studied

- 1 What are the closely related radio technologies and their functionalities that may be a part of cognitive radio systems?
- 2 What key technical characteristics, requirements, performance improvements and/or other benefits are associated with the implementation of cognitive radio systems?
- 3 What are the potential applications of cognitive radio systems and their impact on spectrum management?
- 4 How can cognitive radio systems facilitate the efficient use of radio resources in the mobile service?
- 5 What are the operational implications (including privacy and authentication) of cognitive radio systems?
- 6 What are the cognitive capabilities and CRS technologies that could facilitate sharing and compatibility between the mobile service and other services, such as broadcasting, mobile-satellite or fixed, as well as passive services, space services (space-to-Earth) and safety services, taking into account the specificity of all these services?
- 7 What are the cognitive capabilities and CRS technologies that could facilitate coexistence of the systems in the mobile service?
- 8 What factors need to be considered for the introduction of CRS technologies in the land mobile service?

further decides

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by the year 2023.

Category: S2

Annex 9

QUESTION ITU-R 257-1/5

Technical and operational characteristics of stations in the fixed service in the frequency range 275-1 000 GHz

(2015-2019)

The ITU Radiocommunication Assembly,

considering

- a)* that there is a growing demand for high speed and large capacity radiocommunications having data rates of several tens of Gbit/s to sometime over 100 Gbit/s for fixed service systems;
- b)* that due to progress in the recent terahertz technologies, the integrated devices and circuits operating above 275 GHz can achieve various sophisticated applications;
- c)* that the above devices and circuits will be able to provide such high speed and large capacity radiocommunications for fixed service systems;
- d)* that the traffic demands for backhaul and fronthaul for mobile systems are increasing due to mobile broadband communications such as IMT-Advanced, IMT-2020 and future IMT;
- e)* that certain parts of the spectrum in the frequency range 275-1 000 GHz are identified in No. **5.565** for passive services in the Radio Regulations;
- f)* that the use of the frequency range 275-1 000 GHz by the passive services does not preclude use of this range by active services;
- g)* that the technical and operational characteristics of the fixed service need to be specified for sharing and compatibility studies with the passive service applications indicated in *considering f)*;
- h)* that the frequency range 275-450 GHz has been studied for use by the land-mobile and fixed services applications,

noting

- a)* that Report ITU-R SM.2352 provides the technology trends of active services in the frequency range 275-3 000 GHz;
- b)* that Report ITU-R F.2323 provides guidance on the future development of the fixed service operating in the millimetric-wave band;
- c)* that Report ITU-R RA.2189 initiated sharing studies between radio astronomy service and active services in the frequency range 275-3 000 GHz;
- d)* that Report ITU-R F.2416 provides technical and operational characteristics and applications of the point-to-point fixed service operating in the frequency band 275-450 GHz;

e) that Report ITU-R M.2417 provides technical and operational characteristics of land-mobile service applications in the frequency range 275-450 GHz;

f) that Report ITU-R RS.2431 provides the technical and operational characteristics of Earth Observation (passive) sensors in the frequency range 275-450 GHz,

decides that the following Question should be studied

What are the technical and operational characteristics of the fixed service in the frequency range 275-1 000 GHz?

further decides

1 that sharing studies between the fixed and passive services, as well as the fixed and other active services should be carried out taking into account the characteristics mentioned in *decides*;

2 that the results of studies in the frequency range 275-1 000 GHz should be brought to the attention of the other Study Groups;

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

4 that the above studies should be completed by 2023.

Category: S2

Annex 10

QUESTION ITU-R 246-1/5

Technical characteristics and channelling requirements for adaptive HF systems

(2007-2019)

The ITU Radiocommunication Assembly,

considering

- a)* that adaptive HF systems which can automatically select a channel from an assigned group and control modulation mode, transmission speed and transmission power continue to be developed;
- b)* that use of adaptive HF systems, which release the channel when they have no traffic, allows frequencies to be shared between several systems or users;
- c)* that adaptive systems should achieve optimum operational performance and compatibility,

decides that the following Question should be studied

What are the appropriate technical characteristics and channelling requirements to implement adaptive HF systems, taking into account efficient use of spectrum and minimization of interference?

further decides

- 1 that the results of the above study should be included in one or more Recommendation(s) and/or Report(s);
- 2 that studies should be completed by 2023.

NOTE – See Recommendation [ITU-R F.1778](#)

Category: S2

Annex 11

QUESTION ITU-R 229-5/5*

Further development of the terrestrial component of IMT

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

The ITU Radiocommunication Assembly,

considering

- a)* that more than 7 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;
- 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;

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

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” and “Global Trends in 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;

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 2020 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 2023 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 2023;

3 that the studies described in *decides* 8 and 9 may extend beyond the 2023 time-frame.

Category: S2

Annex 12

QUESTION ITU-R 77-8/5*

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

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

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.2012 on specifications of the terrestrial component of IMT-Advanced, and Recommendation ITU-R M.2083 on IMT Vision – “Framework and overall objectives of the future development of IMT-2020 and beyond”;
- c) 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;
- d) Resolution 43 (WTDC, Rev. Buenos Aires, 2017), “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;
- e) ITU-T Recommendations and ongoing work items that are relevant to this work;
- f) that the ITU Handbooks on “Deployment of IMT systems-2000” and “Global Trends in IMT” were developed through a collaborative effort among the three ITU Sectors;
- g) 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 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 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 building complexes, and mountainous, coastal 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 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 Handbooks¹;

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 2023.

Category: S2

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

Annex 13

Suppression of ITU-R Question

Question ITU-R	Title	Document
255-0/5	Performance and availability objectives and requirements for fixed wireless systems, including packet-based systems	5/159
