

Recommendation ITU-R M.2160-0

(11/2023)

M Series: Mobile, radiodetermination, amateur
and related satellite services

Framework and overall objectives of the future development of IMT for 2030 and beyond

Foreword

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SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R M.2160-0

**Framework and overall objectives of the future development
of IMT for 2030 and beyond¹**

(2023)

Scope

This Recommendation describes a framework and overall objectives for the development of the terrestrial component of International Mobile Telecommunications (IMT) for 2030 and beyond (IMT-2030). IMT is expected to continue to better serve the needs of the networked society, for both developed and developing countries in the future.

In this Recommendation, the framework of the development of IMT-2030, including a broad variety of capabilities associated with envisaged usage scenarios, is described. Furthermore, this Recommendation addresses the objectives for the development of IMT-2030, which includes further enhancement and evolution of existing IMT. Aspects of interworking with other networks are also addressed.

Keywords

IMT, IMT-2030

Abbreviations/Glossary

AI	Artificial intelligence
CA	Carrier aggregation
CPP	Carrier phase positioning
DOICT	Date, operation, information and communication technology
DTN	Digital twin network
E-MIMO	Extreme MIMO
eMBB	Enhanced mobile broadband
HIBS	High altitude platform stations as IMT base station
HR	Holographic radio
IBFD	In-band full duplex
IMT	International Mobile Telecommunications
LDPC	Low density parity check code
ML	Machine learning
mMTC	Massive machine type communication
NOMA	Non-orthogonal multiple access
NTN	Non-terrestrial network
OAM	Orbital angular momentum
RIS	Reconfigurable intelligent surface
SDGs	Sustainable development goals

¹ This Recommendation focuses on the terrestrial component of IMT-2030.

SIC	Self-interference cancellation
TRxP	Transmission reception point
UAS	Unmanned aircraft system
UCN	User-centric network
UDN	Ultra-dense network
URLLC	Ultra-reliable and low-latency communication
XR	Extended reality

Related documents: ITU Recommendations, Reports, Documents and Handbook

- Recommendation ITU-R M.687 – International Mobile Telecommunications-2000 (IMT-2000)
- Recommendation ITU-R M.816 – Framework for services supported on International Mobile Telecommunications-2000 (IMT-2000)
- Recommendation ITU-R M.1457 – Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)
- Recommendation ITU-R M.1645 – Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000
- Recommendation ITU-R M.2012 – Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications Advanced (IMT-Advanced)
- Recommendation ITU-R M.2083 – IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond
- Recommendation ITU-R M.2150 – Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2020 (IMT-2020)
- Report ITU-R M.2134 – Requirements related to technical performance for IMT-Advanced radio interface(s)
- Report ITU-R M.2243 – Assessment of the global mobile broadband deployments and forecasts for International Mobile Telecommunications
- Report ITU-R M.2291 – The use of International Mobile Telecommunications for broadband public protection and disaster relief applications
- Report ITU-R M.2320 – Future technology trends of terrestrial IMT systems
- Report ITU-R M.2370 – IMT Traffic estimates for the years 2020 to 2030
- Report ITU-R M.2376 – Technical feasibility of IMT in bands above 6 GHz
- Report ITU-R M.2410 – Minimum requirements related to technical performance for IMT-2020 radio interface(s)
- Report ITU-R M.2441 – Emerging usage of the terrestrial component of International Mobile Telecommunication (IMT)
- Report ITU-R M.2516 – Future technology trends of terrestrial IMT systems towards 2030 and beyond

The ITU Radiocommunication Assembly,

considering

- a) that ITU has provided the standardization and harmonized use of IMT, which has contributed to the enhancement of telecommunication services on a global scale;
- b) that technological advancement and the corresponding user needs would promote innovation and accelerate the delivery of advanced communication applications to consumers;

- c) that the development of IMT-2030 is to continue supporting an inclusive information society and expanding its goals towards societal considerations including environmental aspects, which would be an important enabler for the achievement of sustainable development goals;
- d) that Question ITU-R 229/5 addresses further development of the terrestrial component of IMT, the study of which is in progress;
- e) that Question ITU-R 262/5 addresses usage of the terrestrial component of IMT systems for specific applications, the study of which is in progress;
- f) that for the global operation and economies of scale, which are key requirements for the success of mobile telecommunication systems, a harmonized appropriate timeframe for future development of IMT considering technical, operational and careful deliberation of spectrum related aspects is important,

considering further

- a) that development of radio interface(s) that support the new capabilities of IMT-2030 is expected along with the enhancement of IMT-2000, IMT Advanced and IMT-2020 systems;
- b) that IMT interoperability and/or interworking with other access systems is important,

recognizing

- a) that Recommendation ITU-R M.1645 addresses the framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000;
- b) that Recommendation ITU-R M.2083 addresses the framework and overall objectives of the future development of IMT for 2020 and beyond,

recommends

that the Annex should be considered as the framework and the overall objectives to guide the future development of IMT-2030.

Annex

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1 Introduction

With the evolution of information and communications technologies, IMT-2030 is expected to support enriched and potential immersive experience, enhanced ubiquitous coverage, and enable new forms of collaboration. Furthermore, IMT-2030 is envisaged to support expanded and new usage scenarios compared to those of IMT-2020, while providing enhanced and new capabilities.

The objective of this Recommendation is to provide guidelines on the framework and overall objectives of the future development of IMT-2030, and is organized as follows:

- Trends of IMT-2030 are presented in § 2.
NOTE – Reference to spectrum contained in this Recommendation should in no way be seen as demanding of spectrum needs for IMT-2030.
- Usage scenarios and capabilities of IMT-2030 are derived in §§ 3 and 4, respectively.
- Considerations of ongoing development are described in § 5.

2 Trends of IMT-2030

2.1 Motivation and societal considerations

The motivation for the development of IMT-2030 is to continue to build an inclusive information society towards contributing to support the United Nations Sustainable Development Goals (SDGs). To this end, IMT-2030 is expected to be an important enabler for achieving the following goals, among others:

- **Inclusivity:** Contributing towards further bridging of digital divides, to the maximum extent feasible, by ensuring affordable access to meaningful connectivity to everyone.
- **Ubiquitous connectivity:** Towards connecting unconnected, IMT-2030 is expected to include affordable connectivity and, at minimum, basic broadband services with extended coverage, including sparsely populated areas.
- **Sustainability:** Sustainability refers to the principle of ensuring that today's actions do not limit the range of economic, social and environmental options to future generations. IMT-2030 is envisaged to be built on energy efficiency, low power consumption technologies, reducing greenhouse gas emissions and appropriate use of resources under the applicable model of circular economy, in order to address climate change and contribute towards the achievement of current and future sustainable development goals.
- **Innovation:** Fostering innovation with technologies that facilitate connectivity, productivity and the efficient management of resources. These technological advances will improve user experience with a view to positively transform economies and lives everywhere.
- **Enhanced security and resilience:** IMT-2030 system is expected to be secure by design. It is expected to have the ability to continue operating during and quickly recover from a disruptive event, whether natural or man-made. Making security and resilience as the key considerations in the design, deployment and operation of IMT-2030 systems is fundamental to achieving broader societal and economic goals.
- **Standardization and interoperability:** IMT-2030 systems are expected to be designed from the start to use transparently and member-inclusively standardized and interoperable interfaces, ensuring that different parts of the network, whether from the same or different vendors, work together as a fully functional and interoperable system.
- **Interworking:** IMT-2030 is expected to support service continuity and provide flexibility to users via close interworking with non-terrestrial network implementations, existing IMT systems and other non-IMT access systems. IMT-2030 is also expected to support smooth