Update from ITU-R WP5D

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ITU-R WP5D tasks

IMT technology framework (now IMT-2030)	Radio system aspects of the terrestrial component of International Mobile Telecommunications (IMT) systems, comprising IMT-2000, IMT-Advanced and IMT-2020 as well as IMT-2030
IMT spectrum matters and preparation for WRC-27	• Follow up from WRC-23 • Responsible for one and a half Agenda Items (AI) for WRC-27 - AI 1.7 on spectrum for IMT-2030/6G - Protection of terrestrial networks on AI 1.13: direct to device (D2D) to complement terrestrial coverage

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IMT technology update

- The work on TPR (Technical Performance Requirements) for IMT-2030 was kicked off in Feb24
- The discussions have mostly focused on the definition of TPRs for especially the new capabilities (Positioning, Sensing, AI, etc.) – see more from the background slide
- Decisions on how each TPR is evaluated (simulation/analysis/inspection/no requirements) are expected in Feb26 – see IMT-2030 timeline from the background slide.
- Based on the discussions so far, the decisions related to the new capabilities will not be straight forward
- Numerical values for identified subset of TPRs will be discussed June25 onwards

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IMT spectrum update on AI 1.7

IMT parameters and characteristics for WRC-27 studies

- All the bands considered in the background slides
- "Old" IMT parameters referred and "new" almost ready
  - 15GHz parameters to be done in the next WP5D in Feb25; work ongoing in 3GPP and in GSMA
- Hot topics in last week:
  - Population-based method to calculate BS density (area-based method used in previous 2 WRC cycles)
  - IMT protection criteria – time or exceedance % needed or not? and if yes: how to define and what it should be?
  - AAS ZF BF issue assessed -> no need for new AAS modelling for sharing and compatibility studies

The work on AI 1.7 has started

- No studies yet, but structure and listing of all needed studies (per 3 bands)
- "Reverse studies" – to be or not to be?

Generic point:

IMT attracts lot of attention whenever it has a WRC AI:

- IMT has specific identification status in ITU RR
- IMT has been and is ITU's success story positively impacting billions of people and societies globally

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IMT spectrum update on AI 1.13

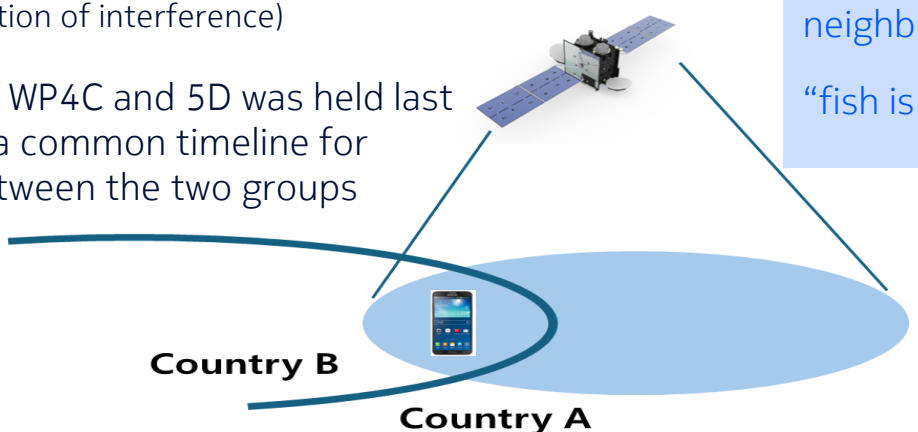
- Various views on terminology: D2D, D2C or DC-MSS, “unmodified UEs”….
- Still not any specific focus on which IMT band(s) for D2D
- FDD is technically and operationally proven for MSS, however, still no scope to exclude TDD
  - Some new ideas to pair 2 TDD bands creating FDD operation
- Extensive debate on terrestrial IMT protection (pfd, epfd, aggregation of interference)
- Joint meeting of WP4C and 5D was held last week and made a common timeline for collaboration between the two groups

Generic point:

AI 1.13 work is split between WP4C (studies) and WP5D (regulatory considerations for IMT protection).

Different views, objectives, ideas, bands, use cases, etc related to D2D + regulatory aspects of neighbouring countries.

“fish is big” ☺



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Other spectrum work ongoing in WP5D

- Coordination of FS stations with IMT in the frequency band 6 425-7 125 MHz
- Coordination of SRS (deep space) stations with IMT in upper 6 GHz
- Coordination of FSS non-GSO earth stations with IMT
- National approaches of RLAN-IMT in the frequency band 6 425-7 125 MHz
- Protection of terrestrial services in 40 GHz from non-GSO satellite systems

- Note:
  Recommendation ITU-R M.1036-7 (IMT band plans) was done deal in the previous WP 5D meeting.

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Background Slides

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New use case expected for 6G have demanding performance requirements

e.g.

Immersive Communications

Mobile hologram

Integrated Communication & Sensing

Spectrum requirements need to be met from existing and new allocations

SPECTRUM

- All frequency bands currently identified for IMT in the Radio Regulations are relevant for IMT-2030 (6G) as well
- In addition, **WRC-27 (agenda item 1.7)** will consider identification of frequency bands 4400-4800 MHz, 7125-8400 MHz and 14.8-15.35 GHz (or parts thereof) for the terrestrial component of IMT, based on sharing and compatibility studies with other services in these bands and adjacent bands
- **WRC-27 (agenda item 1.13)** will also consider appropriate regulatory actions for direct connectivity between space stations and IMT user equipment to complement terrestrial IMT network coverage in the frequency range between 694/698 MHz and 2.7 GHz, based on sharing and compatibility studies with other services in these bands and adjacent bands (incl. protection of the terrestrial component of IMT)

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Bands considered under different WRC-27 agenda items

List of frequency bands to be considered under WRC-27 agenda items

Frequency bands	WRC-27 agenda items
608-614 MHz	1.17
694/698-960 MHz	1.13
1 427-1 518 MHz	1.11 (1 518-1 544 MHz) 1.12 (1 427-1 432 MHz), 1.13
1 710-1 785 MHz	1.13
1 805-2 025 MHz	1.12 (1 880-1 920 MHz, 2 010-2 025 MHz), 1.13, 1.14 (2 010-2 025 MHz)
2 110-2 200 MHz	1.13, 1.14(2 120-2 170 MHz)
2 300-2 400 MHz	1.13
2 500-2 690 MHz	1.11 (2 483.5-2 500 MHz) 1.13 1.15
3 500-3 600 MHz	1.15
3 600-3 800 MHz	1.15
4 400-4 800 MHz	1.7 1.19 (4 200-4 400 MHz)
7 125-8 400 MHz	1.7 1.15 (7 190-7 235 MHz) 1.19(8 400-8 500 MHz)
14.8 – 15.35 GHz	1.7
25.25-28.35 GHz	1.15
37-43.5 GHz	1.6
47.2-48.2 GHz	1.1, 1.6

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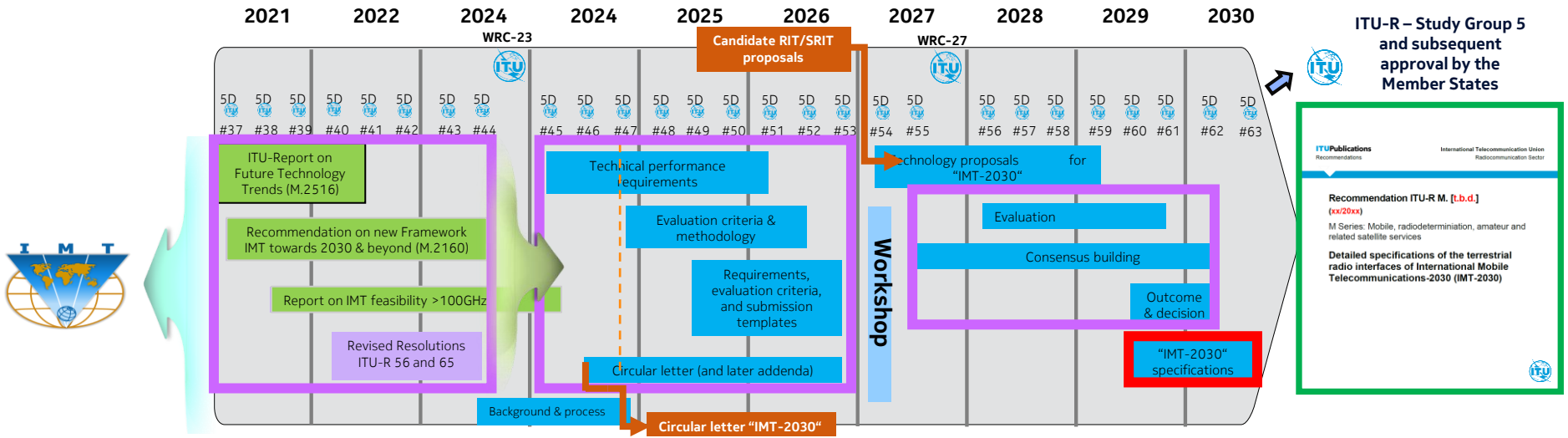
ITU-R Timeline and Process for IMT-2030



Note 1: WP 5D #59 will additionally organize a workshop involving the Proponents and registered Independent Evaluation Groups (IEGs) to support the evaluation process
Note 2: While not expected to change, details may be adjusted if warranted. Content of deliverables to be defined by responsible WP 5D groups

Framework ⇨ **Requirements and Evaluation criteria** ⇨ **Evaluation and Consensus building** ⇨ **Specification** ⇨ **Approval**

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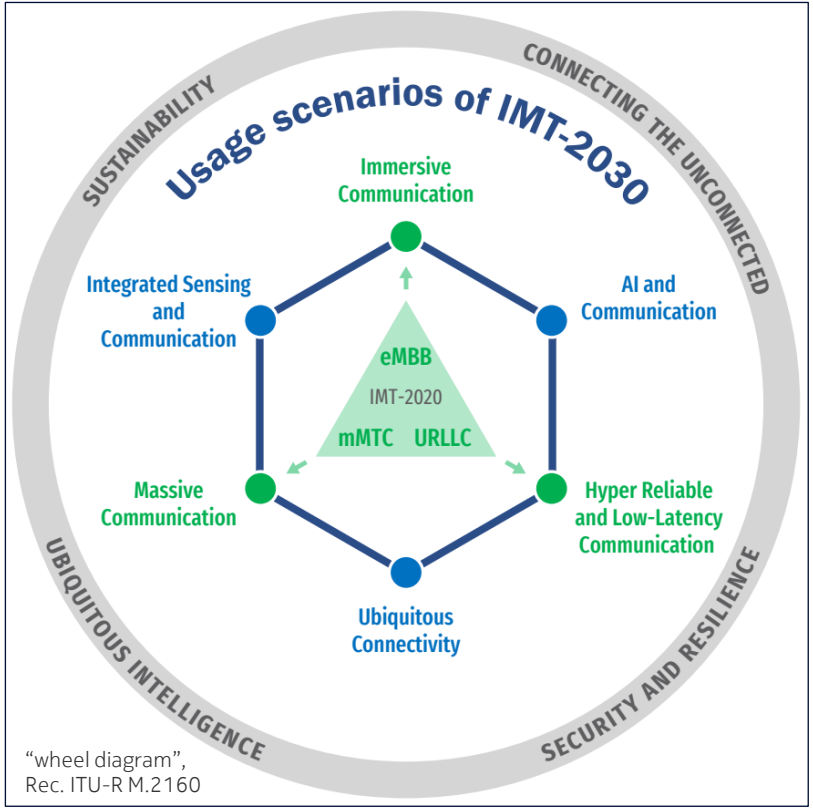
Rec. ITU-R M.2160 (§3) - Usage scenarios IMT-2030



"wheel diagram", Rec. ITU-R M.2160

6 Usage scenarios

Extension from IMT-2020 (5G)

- eMBB ➡ Immersive Communication
- mMTC ➡ Massive Communication
- URLLC ➡ HRLLC (Hyper Reliable & Low-Latency Communication)

New

- Ubiquitous Connectivity
- AI and Communication
- Integrated Sensing and Communication

4 Overarching aspects

act as design principles commonly applicable to all usage scenarios

- Sustainability
- Connecting the unconnected
- Ubiquitous intelligence
- Security / resilience

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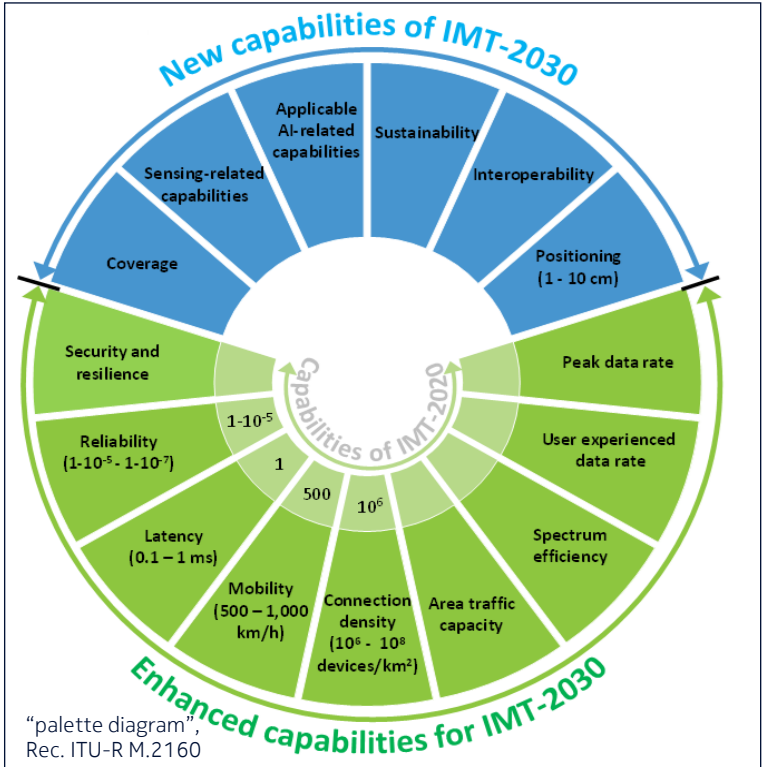
Rec. ITU-R M.2160 (§4) - Capabilities of IMT-2030



"palette diagram", Rec. ITU-R M.2160

Note: The range of values given for capabilities are estimated targets for research and investigation of IMT-2030

- IMT-2030 Framework Recommendation identifies 15 capabilities for IMT-2030 technology
- Nine of those capabilities are derived from existing IMT-2020 systems
- The range of values given for capabilities are estimated targets for research and investigation of IMT-2030
- All values in the range have equal priority in research and investigation
- For each usage scenario, a single or multiple values within the range would be developed in future in other ITU-R Recommendations/Reports
- IMT-2030 is also expected to help address the need for increased environmental, social and economic sustainability, and also support the goals of the Paris Agreement of the United Nations Framework Convention on Climate Change

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