



Standards development for broadband wireless access

Colin Langtry

Chief, Study Groups Department

ITU Radiocommunication Bureau

ITU Overview

Committed to connecting the world

193 Member States
673 Sector Members
168 Associates
108 Academia

ITU-T

Telecommunication
standardization
- network and service
aspects



ITU-D

Promote and assist the
extension of ICTs to all the
world's inhabitants - narrowing
the digital divide

ITU-R

Global radio spectrum
management and
radiocommunication
standardization

IMT-2000, IMT-Advanced, IMT-2020

- All of today's 3G and 4G mobile broadband systems are based on the ITU's IMT standards.
- ITU established the detailed specifications for **IMT-2000** and the first "3G" deployments commenced around the year 2000.
- In January 2012, ITU defined the next big leap forward in wireless cellular technology – **IMT-Advanced** – and this is now being progressively deployed worldwide.
- The detailed investigation of the key elements of **IMT-2020** is already well underway, once again using the highly successful partnership ITU-R has with the mobile broadband industry and the wide range of stakeholders in the 5G community.

Organizations involved in the development of IMT in ITU-R WP 5D

- 3GPP,
- 3GPP2,
- 4G Americas,
- 5G Infrastructure Public Private Partnership,
- 5G Innovation Centre,
- APT Wireless Group,
- Fifth Generation Mobile Communications Promotion Forum,
- ARIB,
- ATIS,
- CCSA,
- CDG,
- ETSI,
- EU METIS Project,
- GSMA,
- IEEE,
- IMT-2020 Promotion Group,
- ITRI,
- NGMN,
- NYU Wireless,
- TSDSI,
- TIA,
- TTA,
- TTC,
- UMTS Forum,
- WiMax Forum
- Wireless World Research Forum
- *We welcome any other interested partners*

IMT-2020 studies

- ITU-R WP 5D is working together with these partners in the same open process to establish the criteria for IMT-2020
- Recommendation ITU-R M.2083-0, approved in September 2015, defines the framework and overall objectives of the future development of IMT for 2020 and beyond.
- The ITU Radiocommunication Assembly held in Geneva, 26-30 October 2015, approved Resolutions ITU-R 65 and 56-2 that establish the roadmap for the development of 5G mobile and the term that will apply to it: “IMT-2020”.

Next steps

- Work on the next phases of IMT-2020 will ramp up in 2016, with the expected adoption in 2016/17 of the following deliverables:
 - The Report on the **Technical Performance Requirements** that a technology would need to meet to satisfy “IMT-2020”
 - The Report on **Evaluation Criteria and Evaluation Methods** for “IMT-2020” technologies
 - The **Report on Specific Submission Requirements** of the candidate technology under assessment related to submissions, the evaluation criteria and submission templates
 - **Communication via Circular Letters and Liaisons** will be a key element of the work.

Development of the requirements

- 5G requirements will be different because of the wide range of use cases creating distinctly different “wants” and potentially separate sets of requirement values
 - IoT, “Typical” Wireless Broadband, Video and other higher bandwidth applications (e.g, above 6 GHz)
- The ITU Circular Letter [5/LCCE/59](#) was issued on 22 March 2016:
 - invitation for submission of proposals for candidate radio interface technologies for the terrestrial components of the radio interface(s) for IMT-2020
 - invitation to participate in their subsequent evaluation
- Liaisons from WP 5D to External Organizations will solicit information seeking:
 - Understanding of the key characteristics to define the overall detailed requirement universe and subsequently the detailed information necessary to establish the actual parameter values

Proposal Submission and Evaluation



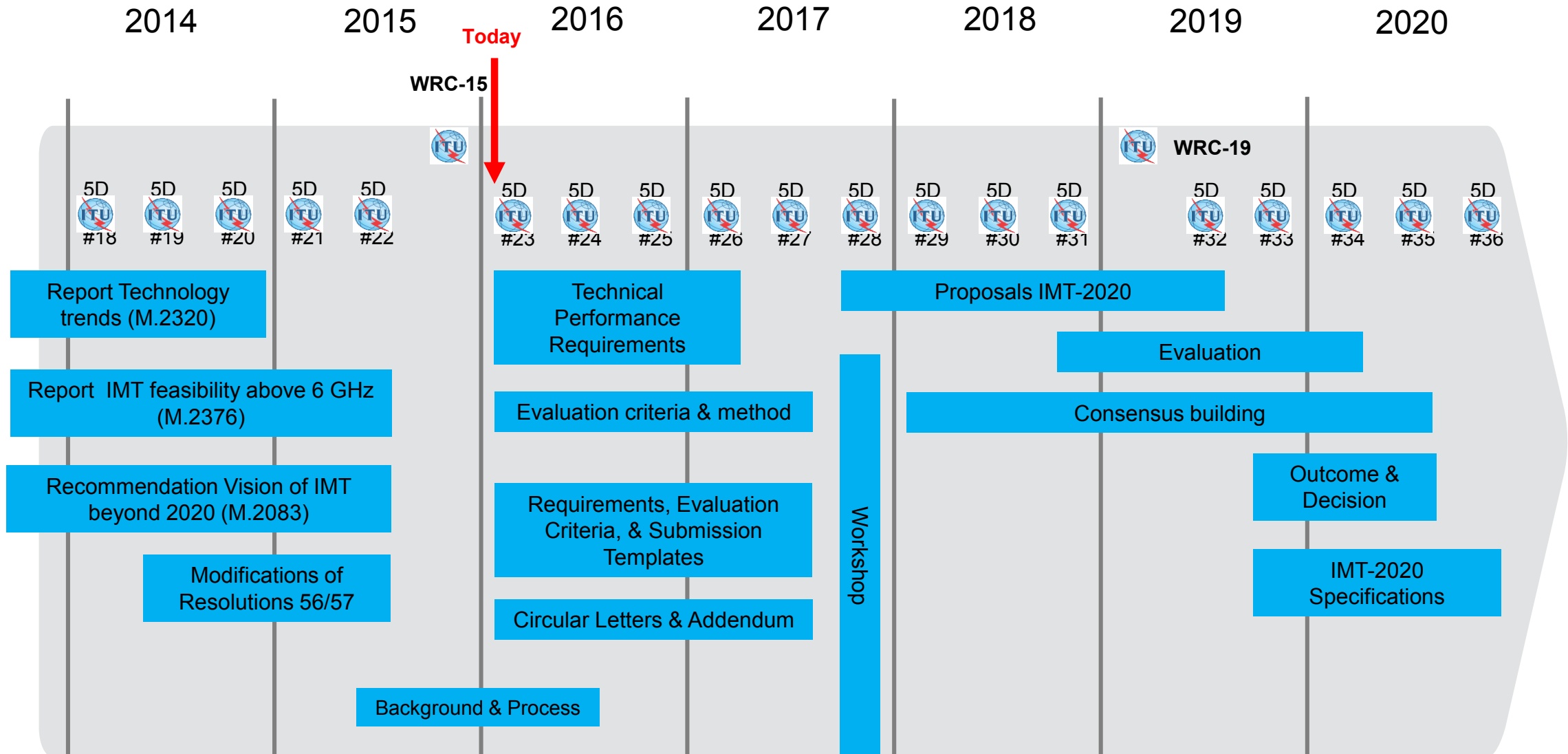
- It is anticipated that the timeframe for proposals will be focused on 2018 (window spans late 2017 to mid-2019).
- The evaluation by independent external evaluation groups and definition of the new radio interfaces to be included in “IMT-2020” will take place from 2018-2020.
- Coordination with entities external to ITU-R will continue to be a cornerstone in the work.

Final specifications



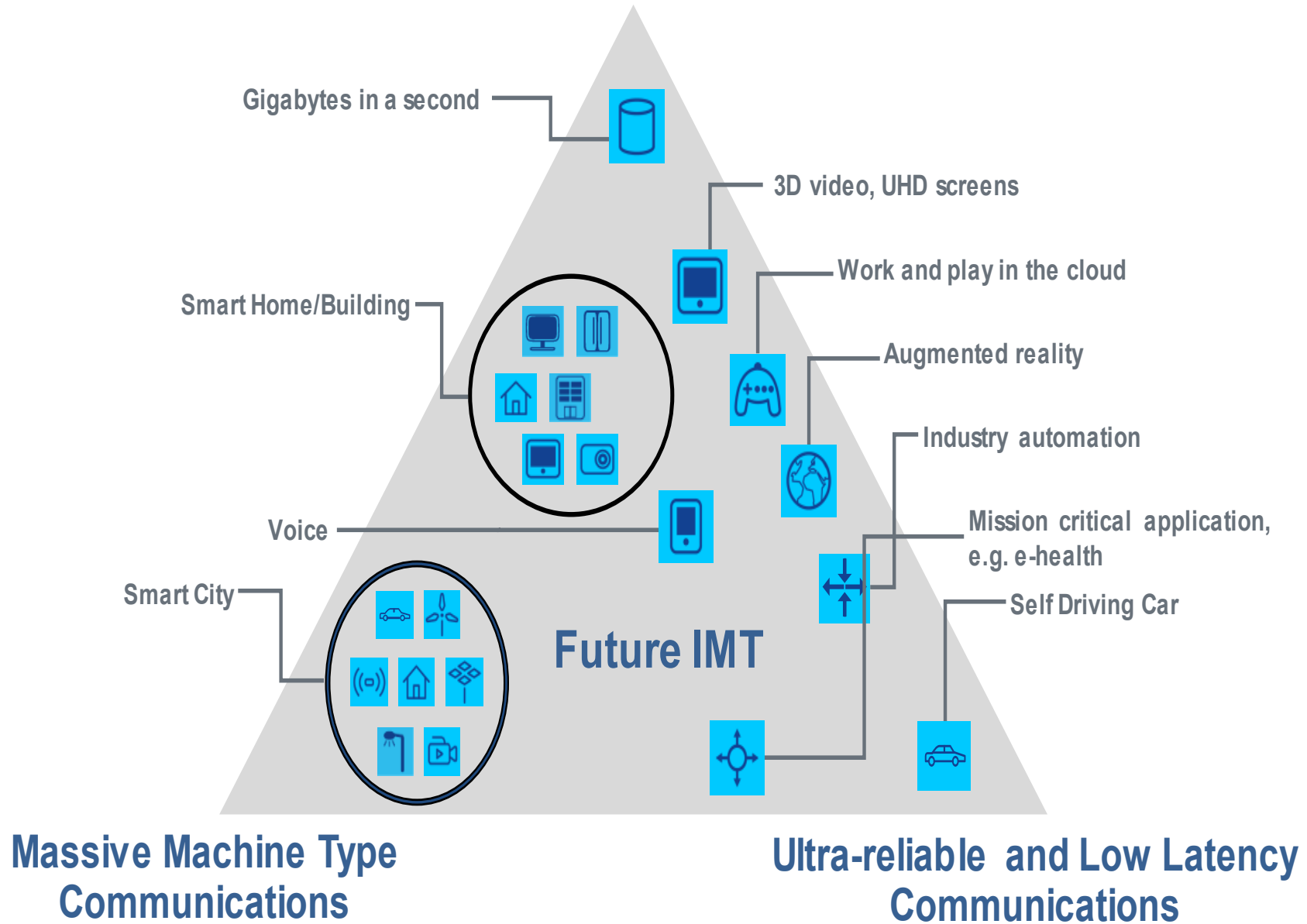
- It is expected that **the final specifications** for the “global core specification (GCS)” from the external organizations (the technology proponents) towards the work on Draft new Recommendation ITU-R M.[IMT-2020.SPECS] *“Detailed specifications of the terrestrial radio interfaces of IMT-2020”* would be received into WP 5D Meeting #34 (February 2020) at the latest.
- **Transposed specifications** (from the individual regional or national transposing organizations) would be received by June 2020 at the latest.
- The new Recommendation ITU-R M.[IMT-2020.SPECS] for the initial release of “IMT-2020” is expected to be approved by October 2020.

Detailed Timeline & Process For IMT-2020 in ITU-R



Note: While not expected to change, details may be adjusted if warranted.

Enhanced Mobile Broadband



5G Capability Perspectives from the ITU-R IMT-2020 Vision Recommendation

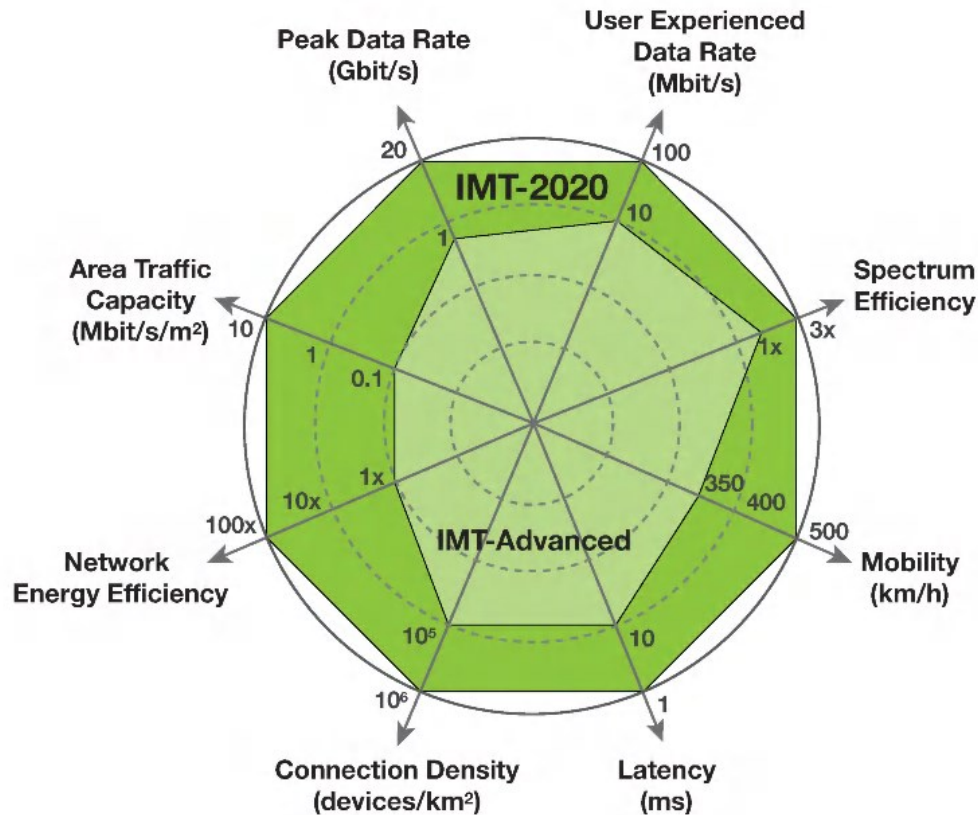


Fig 3. Enhancement of key capabilities from IMT-Advanced to IMT-2020

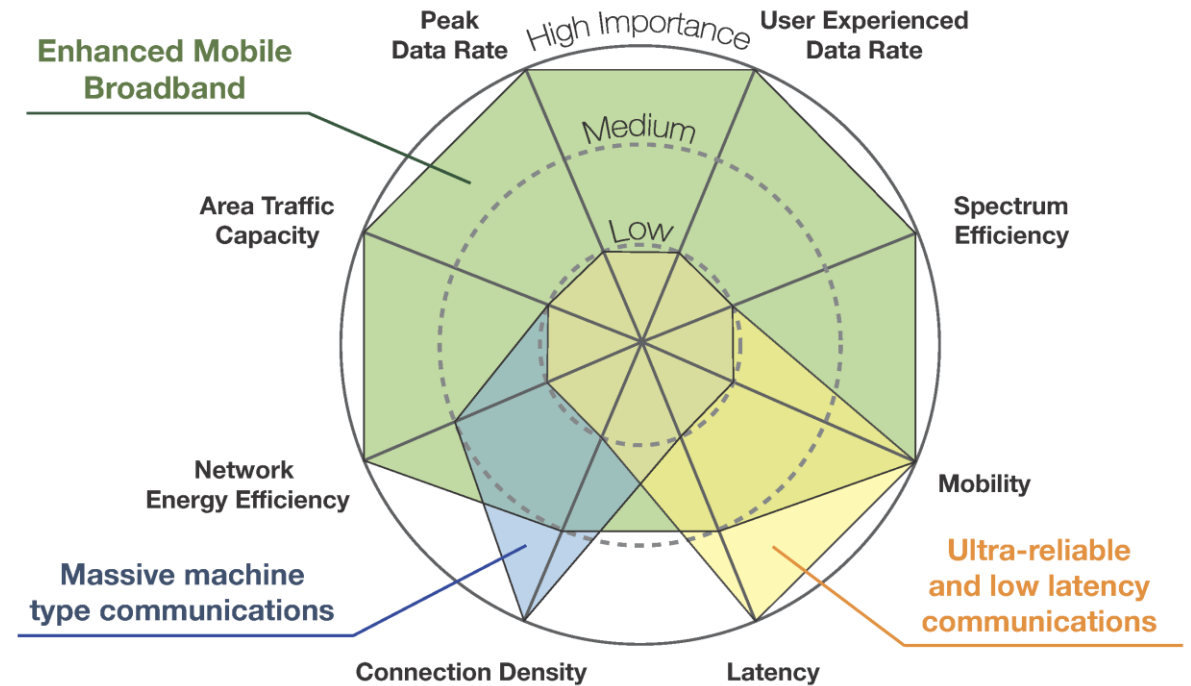


Fig 4. The importance of key capabilities in different usage scenarios

The values in the Figure 3 above are targets for research and investigation for IMT-2020 and may be further developed in other ITU-R Recommendations, and may be revised in the light of future studies. Additional descriptions and further details for both Figures are in the IMT-2020 Vision Recommendation - [Recommendation ITU-R M.2083](#)

New spectrum: Bands under study for WRC-19

| Existing mobile allocation | No global mobile allocation |
|----------------------------|-----------------------------|
| 24.25 GHz – 27.5 GHz | 31.8 – 33.4 GHz |
| 37 – 40.5 GHz | 40.5 – 42.5 GHz |
| 42.5 – 43.5 GHz | |
| 45.5 – 47 GHz | 47 - 47.2 GHz |
| 47.2 -50.2 GHz | |
| 50.4 – 52.6 GHz | |
| 66 – 76 GHz | |
| 81 – 86 GHz | |

Related ITU-R studies

ITU-R – radio standards and spectrum

- **SG1** - spectrum management, licensing, short range devices, cognitive radio
- **SG3** – propagation studies – incl. studies > 6 GHz
- **SG4** – satellite systems
- **SG5** – machine-type comms, intelligent transport systems, sensor networks, **IMT**

ITU-T – fixed network aspects

- **SG13** - Future networks (& cloud)
- **SG20** - IoT and applications, smart cities
- Focus Group on IMT-2020 (FG IMT-2020)

Thank you!