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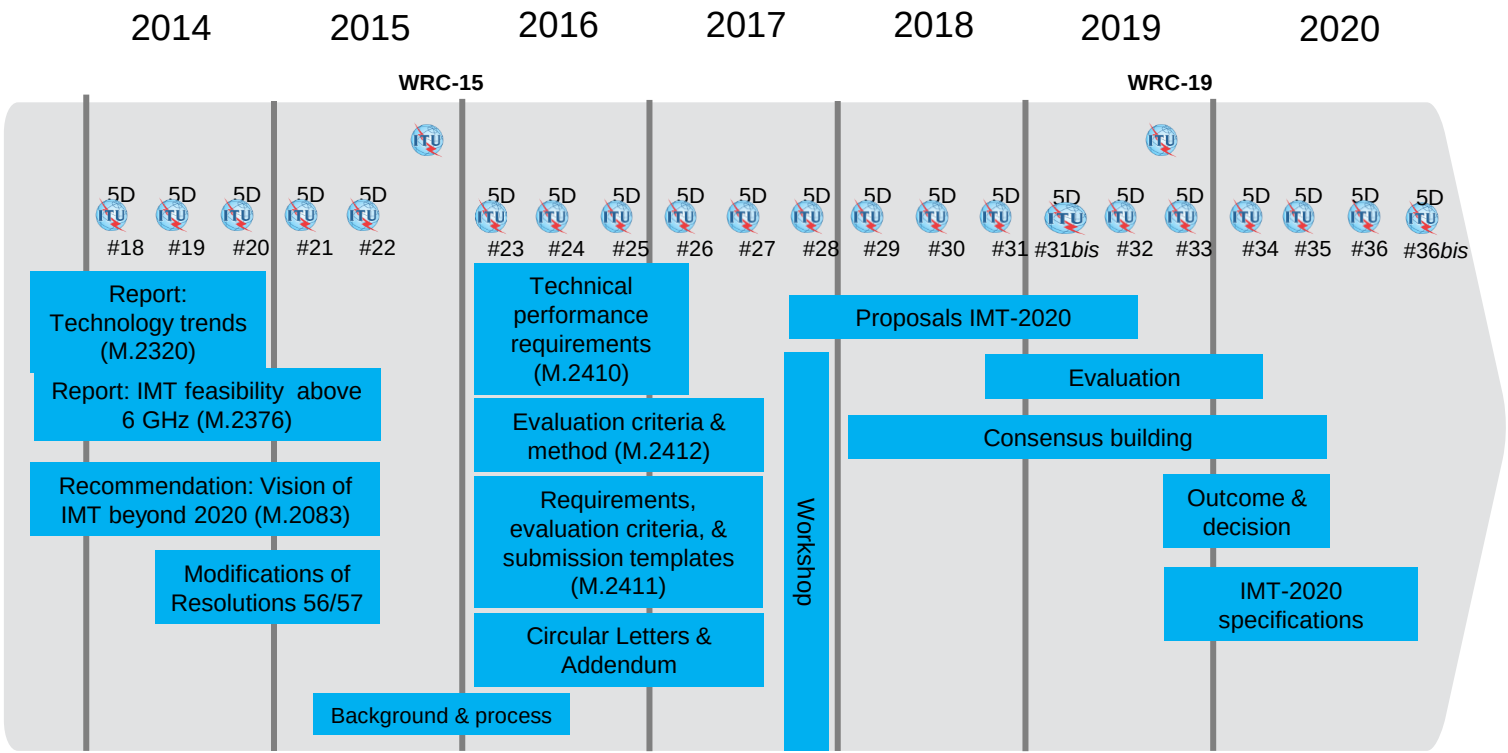
# IMT-2020 (5G) Radio Interface Technologies in WP 5D

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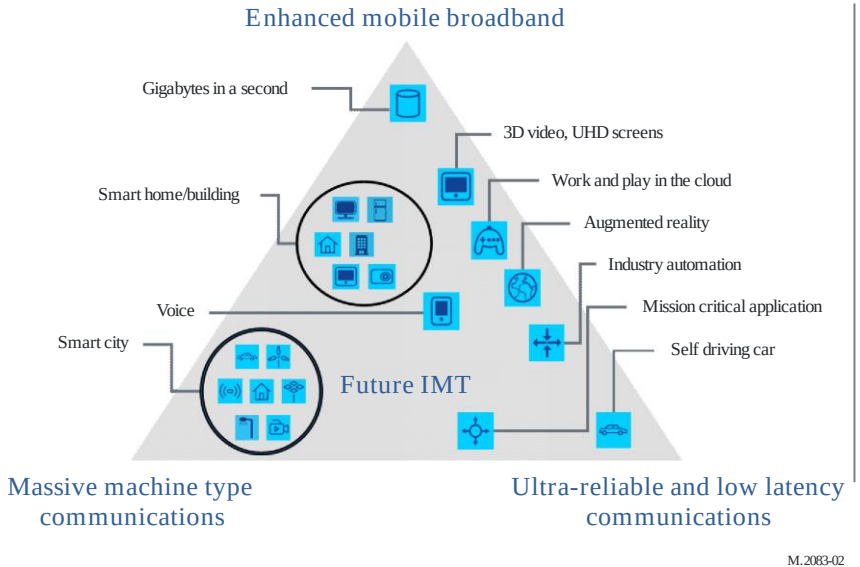
# WP 5D timeline for IMT-2020
# Detailed specifications for the terrestrial radio interfaces



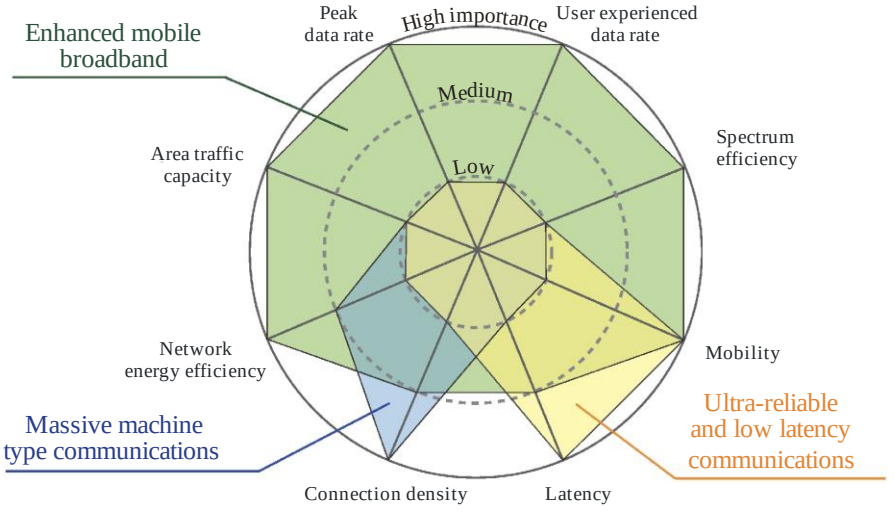

Note: Meeting #36bis is a focused meeting (technology) for finalization of Step 8 of the IMT-2020 process and completing draft new Recommendation ITU-R M.[IMT-2020.SPECS]

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# IMT-2020 Vision Rec. ITU-R M.2083

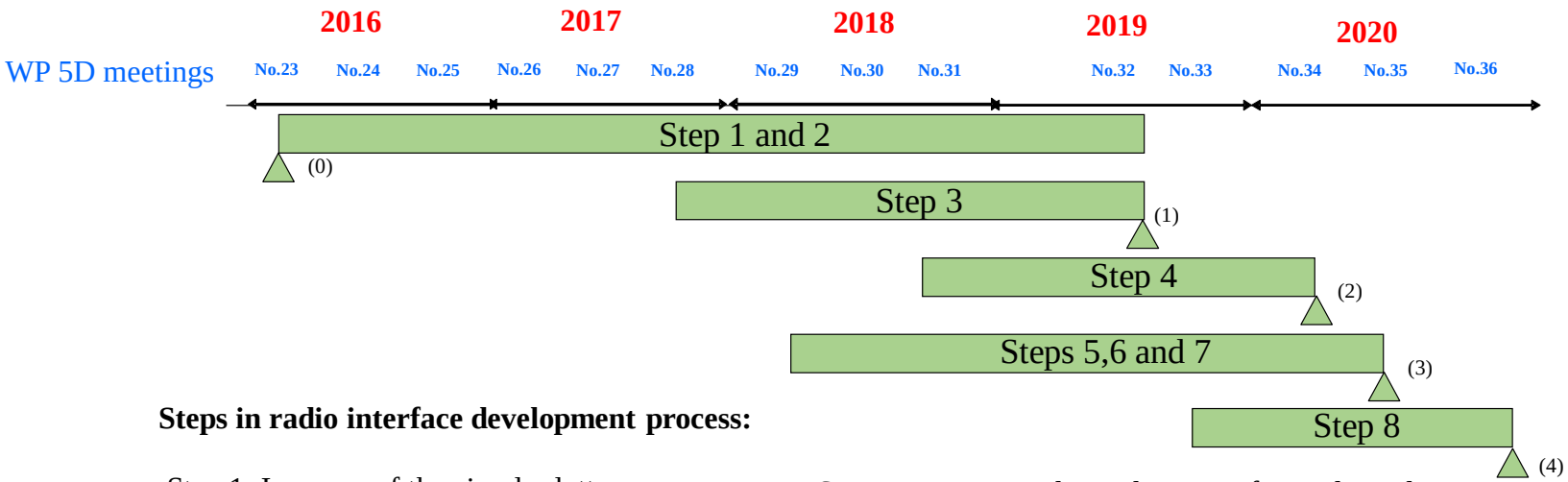



IMT-2020 usage scenario




IMT-2020 Key capabilities

# Schedule to develop IMT-2020 RIT




**Steps in radio interface development process:**

Step 1: Issuance of the circular letter

Step 2: Development of candidate RITs and SRITs

Step 3: Submission/Reception of the RIT and SRIT proposals and acknowledgement of receipt

Step 4: Evaluation of candidate RITs and SRITs by Independent Evaluation Groups

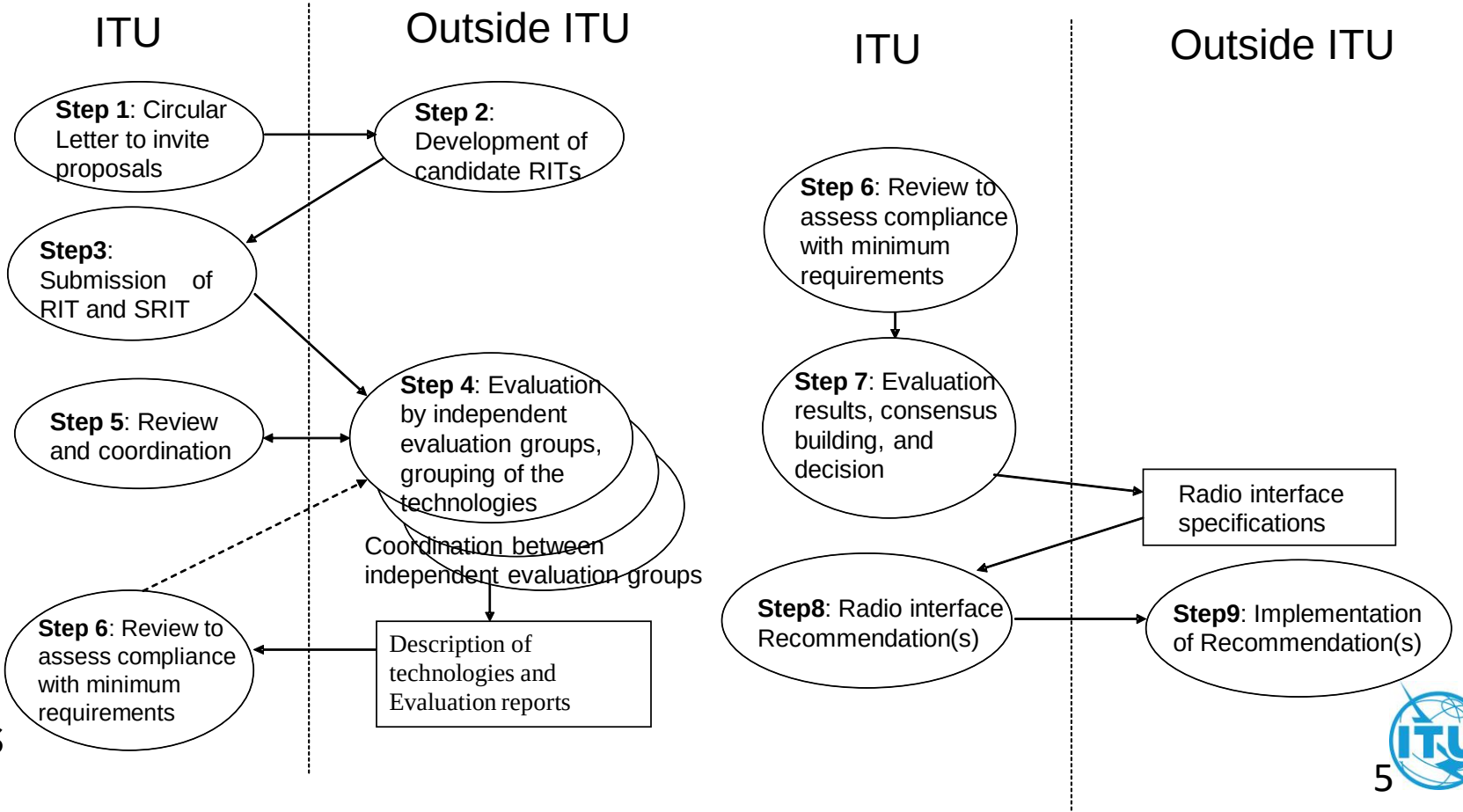
Step 5: Review and coordination of outside evaluation activities

Step 6: Review to assess compliance with minimum requirements

Step 7: Consideration of evaluation results, consensus building and decision

Step 8: Development of radio interface Recommendation(s)

# Steps in the IMT-2020 process



# Services and spectrum requirements (Rep. M.2411)

- Support for wide range of services
  - ✓ support a range of services across different usage scenarios of eMBB, URLLC, and mMTC

- Frequency bands identified for IMT
  - ✓ utilize at least one frequency band identified for IMT in the Radio Regulations
- Higher Frequency range/band(s)
  - ✓ utilize the higher frequency range/band(s) above 24.25 GHz

# Technical performance requirements (Rep. M.2410)

| KPI | eMBB | mMTC | URLLC | Requirements |
|---|---|---|---|---|
| Peak date rate | ✓ | | | DL: 20Gbps, UL: 10Gbps |
| Peak spectral efficiency | ✓ | | | DL: 30bps/Hz, UL: 15bps/Hz |
| User experienced data rate | ✓ | | | DL: 100Mbps, UL: 50Mbps |
| 5th percentile user spectral efficiency | ✓ | | | DL: 0.12-0.3bps/Hz, UL: 0.045-0.21bps/Hz |
| Average spectral efficiency | ✓ | | | DL: 3.3-9bps/Hz, UL: 1.6-6.75bps/Hz |
| Area traffic capacity | ✓ | | | 10Mbps/$m^2$ |
| User plane/control plane latency | ✓ | | ✓ | User plane - eMBB: 4msec, URLLC: 1msec<br>Control plane – 20msec |
| Connection density | | ✓ | | 1M devices/$km^2$ |
| Energy efficiency | ✓ | | | Support a high sleep ratio and long sleep |
| Reliability | | | ✓ | 99.999% |
| Mobility | ✓ | | | 0.45 – 1.5 bps/Hz |
| Mobility interruption time | ✓ | | ✓ | 0msec |
| Bandwidth | | | | At least 100 MHz Yes No Up to 1 GHz |

# Candidate proposals for IMT-2020 Radio Interface

- ITU WP 5D received 7 candidate technology proposals in 2019.

| Proponent | SRIT/RIT | note |
|---|---|---|
| 3GPP | SRIT | 3GPP LTE and NR |
| 3GPP | RIT | 3GPP NR |
| China | RIT | 3GPP NR with NB-IoT |
| Korea | RIT | 3GPP NR |
| ETSI TC DECT and DECT Forum | SRIT | DECT-2020 NR and 3GPP NR |
| Nufornt | RIT | EUHT |
| TSDSI | RIT | 5Gi |

SRIT: Set of Radio Interface Technology, RIT: Radio Interface Technology

# Recommendation ITU-R M.2150

- Recommendation ITU-R M.2150 - Detailed specifications of IMT-2020 Radio Interface Technologies
- After evaluation of the proposals by the external groups, 3 Radio interface technologies were recommended in 2021 in the initial version.
- An additional radio interface technology is to be recommend in the first revision, expected in 2022.

| Technology | 3GPP 5G-SRIT (NR + LTE) | 3GPP 5G-RIT (NR) | TSDSI 5Gi | ETSI DECT and DECT Forum DECT 5G-SRIT |
|---|---|---|---|---|
| Recommendation | M.2150 (Feb. 2021) | | | M.2150-1 (2022) |
| Service supported | eMBB, URLLC, MTC | eMBB, URLLC, mMTC | eMBB, URLLC, mMTC | - eMBB (3GPP NR)<br>- URLLC and mMTC (DECT-2020 NR) |

# Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int

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