

# Spectrum challenges for Broadcasting

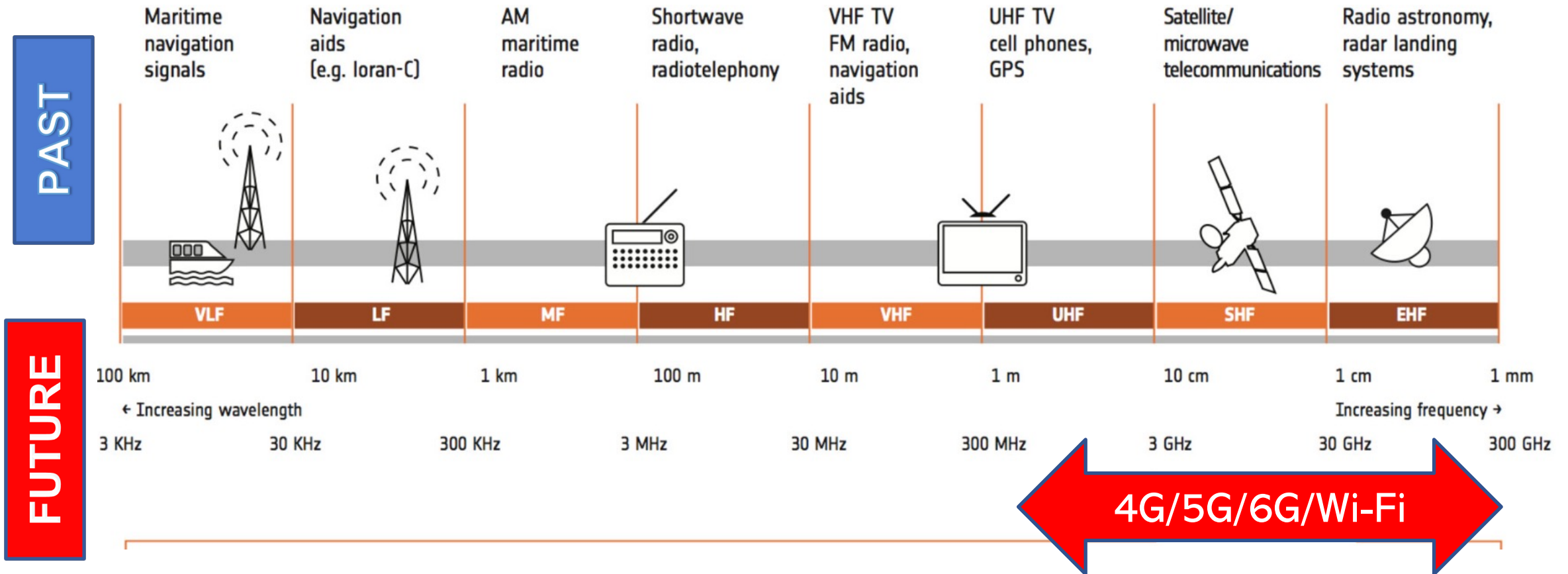


# About IAFI

- ITU-APT Foundation of India (IAFI) is a non-profit, non-political registered society in India.
- IAFI is a non-partisan Foundation and does not identify with any Industry sector or group. We support all telecom and IT sectors: 4G, 5G, GSO –NGSO Satellites, Wi-Fi, Broadcasting, Aviation, etc.
- IAFI is recognized by the ITU as an international/regional Telecommunications organization and granted complimentary sector membership of all the three ITU Sectors - ITU-R, ITU-T and ITU-D, IAFI increased its participation and contributions in ITU and APT:
- IAFI is an affiliate member of the Asia Pacific Telecommunity (APT)
- Despite Covid, IAFI continued and expanded its activities with almost one event every month
- IAFI activities continued to be well covered by the Media with 30 stories during the year
- IAFI submitted more than 20 responses to TRAI, DOT and other consultations
- IAFI moved into a new and larger office in the World Trade Center in New Delhi in response to our increased activities.

# Spectrum around the World is evolving towards Cellular Technologies

Challenging all other services including broadcasting



# Factors Influencing Broadcast Spectrum

- There are typically four technology platforms used to deliver broadcasting to users:
  1. Internet
  2. DTH Satellite
  3. Cable
  4. Terrestrial Broadcast Networks
- In India, there was a high levels of penetration of cable and DTH satellite for providing TV broadcast services.
- In the recent years, there is major shift to Internet based delivery of broadcast services, both to homes and mobile devices.
- Therefore, the need for terrestrial broadcast spectrum is diminishing – and same is expected to be the fate of satellite DTH spectrum in near future.

# Internet is slowly taking over broadcast delivery

## Thus doing away the need for DTH or terrestrial spectrum

### Terrestrial

- HF/VHF Sound
- VHF/UHF  
Analogue TV
- DTV

### Satellite

- DTH (Ku Band)
- C Band (+Cable  
local distribution)

### Internet

- Mobile 4G/5G
- Wi-Fi
- Fixed broadband

# Challenges to Terrestrial UHF Broadcast Spectrum

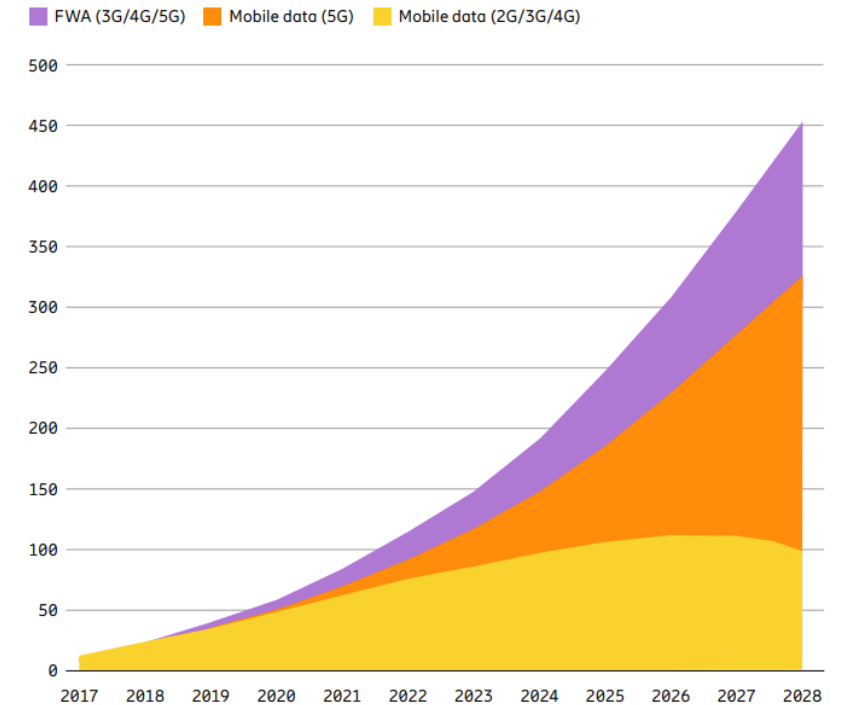
- One of the primary influences on the demand for terrestrial spectrum has been digitization of TV broadcast and Digital Switchover around the World – India never had that issue because there was no significant analogue UHF TV
- DSO has significant implications on the global demand for spectrum in the broadcast services.
- In India, 700 MHz (703-803 MHz) band was already converted to mobile, in line with other Asian countries.
- India is now implementing the new APT 600 MHz band from 612 to 703 MHz which provides 40+40 MHz 5G spectrum– this band plan was originally designed by the IAFI
- Still the band 470-612 MHz will be available to be decided in future

# 10 billion Mobile connections surpassed in 2022\*

Number of Mobile based connections per head of the population in 2Q22



Global mobile data traffic (EB per month)

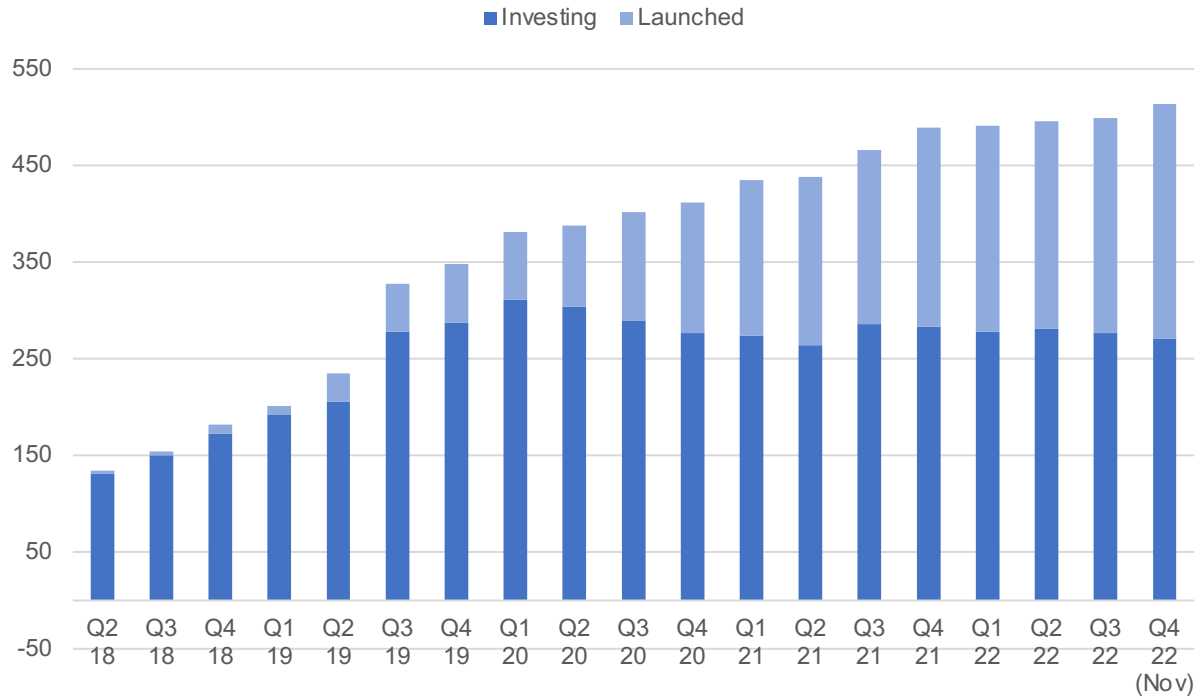


Source: Ericsson Mobility Report, November 2022

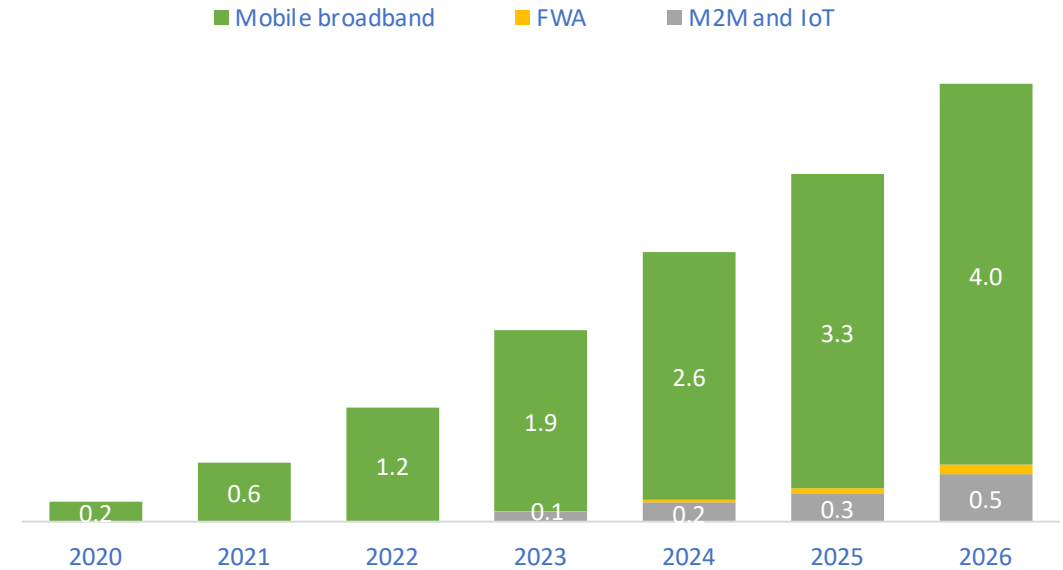
Note: Data traffic forecast, both global and regional, represents the estimated traffic volume in all networks over the duration of a month. Traffic, in terms of throughput, in high-traffic areas will be much higher than the average traffic.

# 5G roll-out and uptake continues to grow

Growth of 5G: number of operators investing in and operating commercial networks



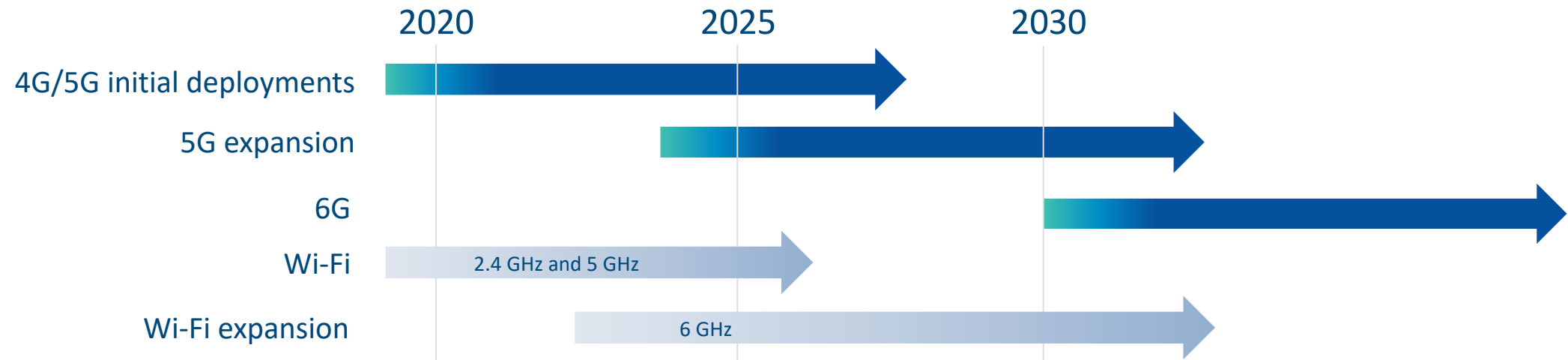
5G connections by type, worldwide (billions)



- By end-November 2022, 514 operators are investing in 5G, 47% of which have launched commercial services
- 5G connections are set to double in 2022 to reach 1.2 billion

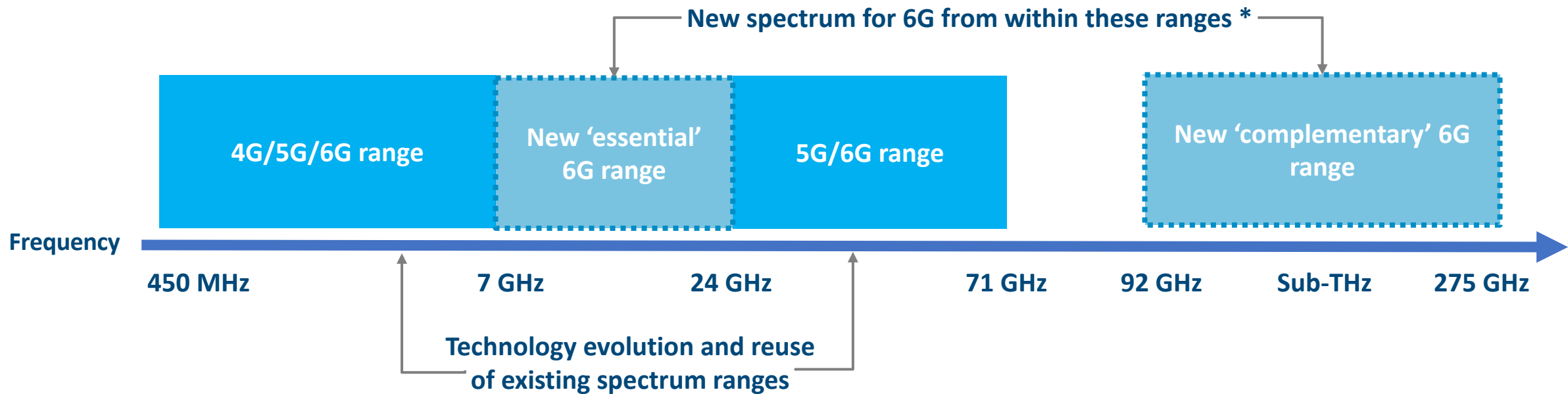


# 5G will continue to need more spectrum from 2023 to 2030



Band (MHz)	600-960 MHz	1.4 GHz, 2GHz, 2.5 GHz	3.6 GHz	4.4 - 6 GHz	6-24 GHz	26 GHz	40,50, 60 GHz	80-400 GHz
5G Initial	700 MHz	1700-2300 MHz	3300-3670 MHz			26 GHz		
5G Expansion	600 MHz	1.4 GHz	3800-4200 MHz	4.4 - 4.95 GHz		26 GHz	40 GHz	
6G	600-960 MHz	2.5 GHz		4.4- 4.95 GHz	Parts of 7-24 GHz		40. 50, 60 GHz	80-400 GHz
Wi-Fi		2.4 GHz		5 GHz	6 GHz		60-70 GHz (V band)	
CNPN	700 MHz		3700-3800	4.95-4.99 GHz		28 GHz		

# New Spectrum is needed for 6G



- \* Frequency bands from within these ranges will need to be selected for further study, taking into account sharing possibilities of IMT with other Radiocommunication Services allocated on a primary basis.
- \* Existing users of mobile applications such as those supported by UWB should also be considered for relevant bands where applicable.
- \* The lower the frequency the better from within the 'essential range' in terms of propagation, cell size and economic network deployments.
- \* IMT Agenda Item for WRC-27 is a key step towards a successful device ecosystem and economies of scale

# Many countries have already adopted 6GHz WiFi

■ Adopted 5925-6425 MHz

■ Adopted 5925-7125 MHz

■ Considering 5925-6425 MHz

■ Considering 5925-7125 MHz

Americas	Asia Pacific	Europe	Middle East -Africa
<ul style="list-style-type: none"> <li>• <a href="#"><u>Argentina</u></a></li> <li>• <a href="#"><u>Brazil</u></a></li> <li>• <a href="#"><u>Canada</u></a></li> <li>• <a href="#"><u>Chile</u></a></li> <li>• <a href="#"><u>Colombia</u></a></li> <li>• <a href="#"><u>Costa Rica</u></a></li> <li>• <a href="#"><u>Dominican Republic</u></a></li> <li>• <a href="#"><u>Guatemala</u></a></li> <li>• <a href="#"><u>Honduras</u></a></li> <li>• <a href="#"><u>Mexico</u></a></li> <li>• <a href="#"><u>Peru</u></a></li> <li>• <a href="#"><u>United States</u></a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Australia</u></a> *</li> <li>• <a href="#"><u>Hong Kong</u></a></li> <li>• <a href="#"><u>Japan</u></a> *</li> <li>• <a href="#"><u>Malaysia</u></a></li> <li>• <a href="#"><u>New Zealand</u></a></li> <li>• <a href="#"><u>South Korea</u></a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#"><u>European Union</u></a></li> <li>• <a href="#"><u>Norway</u></a></li> <li>• <a href="#"><u>Switzerland</u></a></li> <li>• <a href="#"><u>Turkey</u></a></li> <li>• <a href="#"><u>United Kingdom</u></a> *</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Egypt</u></a></li> <li>• <a href="#"><u>Jordan</u></a></li> <li>• <a href="#"><u>Kenya</u></a></li> <li>• <a href="#"><u>Morocco</u></a></li> <li>• <a href="#"><u>Oman</u></a></li> <li>• <a href="#"><u>Qatar</u></a></li> <li>• <a href="#"><u>Saudi Arabia</u></a></li> <li>• <a href="#"><u>Tunisia</u></a></li> <li>• <a href="#"><u>UAE</u></a></li> </ul>

\* considering 6425-7125 MHz

# Summary

---

- Spectrum around the World is evolving towards Cellular Technologies and therefore challenging all other services including broadcasting
- Internet is slowly taking over broadcast delivery and thus doing away with the need for terrestrial broadcast spectrum or satellite spectrum for DTH
- For increased data demand on 5G to meet the needs of broadcast and other video services, demand for additional cellular spectrum will continue to explode
- A number of new bands will open to meet the needs of broadband access:
  - UHF band: 600 MHz
  - L band: 1427-1512 MHz
  - C band: 3700-4200 MHz, 4400-4900 MHz, 6GHz for WiFi
  - MM wave – 7-24 GHz



# THANK YOU

[Bharat.Bhatia@itu-apt.org](mailto:Bharat.Bhatia@itu-apt.org)

