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5TH INDIA SPECTRUM MANAGEMENT CONFERENCE

DR. MARTHA SUAREZ, PRESIDENT
DYNAMIC SPECTRUM ALLIANCE,
DSA

SESSION 1: LONG TERM PLAN FOR UTILISATION OF THE LOWER 6 GHZ BAND – FOCUS ON INNOVATION, RESEARCH AND INDUSTRIALIZATION

15-16 DECEMBER, NEW DELHI, INDIA

WHO WE ARE

The Dynamic Spectrum Alliance (DSA) is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all.

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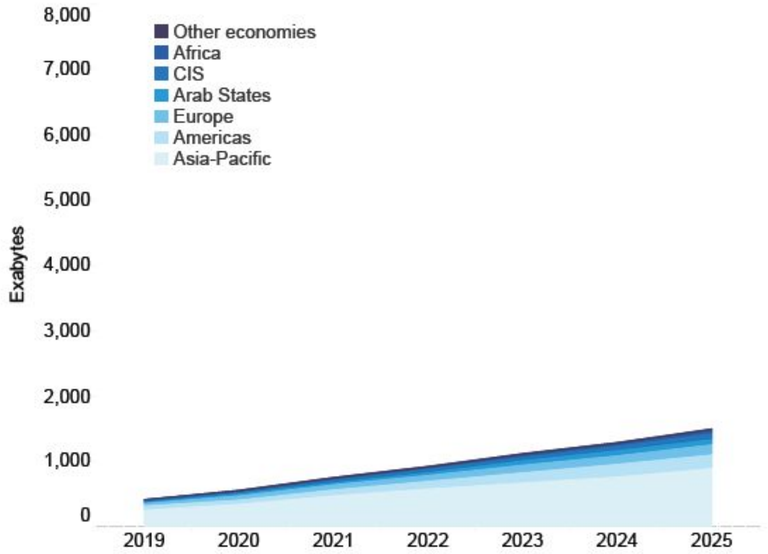
1. Fixed broadband remains the primary channel for global internet traffic, especially for high-volume data usage

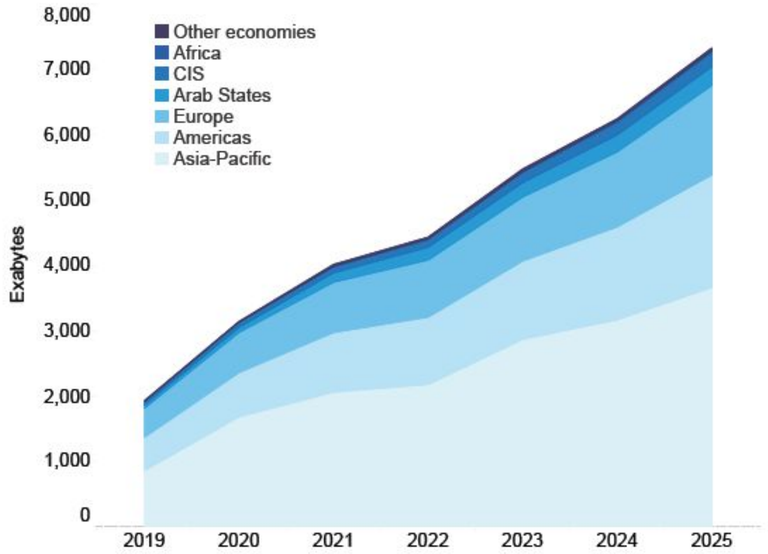
Year-over-Year Growth of Broadband Traffic – 2025 Figures

Mobile broadband traffic, EB



Note: 1 exabyte (EB) = 10^{12} megabytes. Refers to traffic within the country. Interactive chart.
Source: ITU

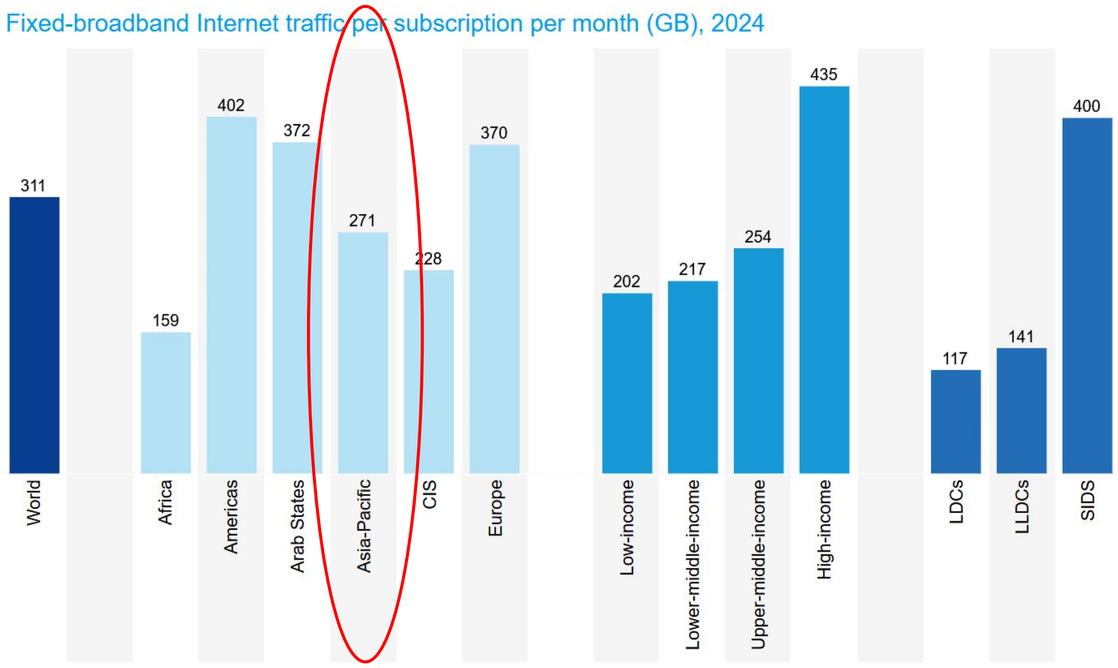
Fixed broadband traffic, EB

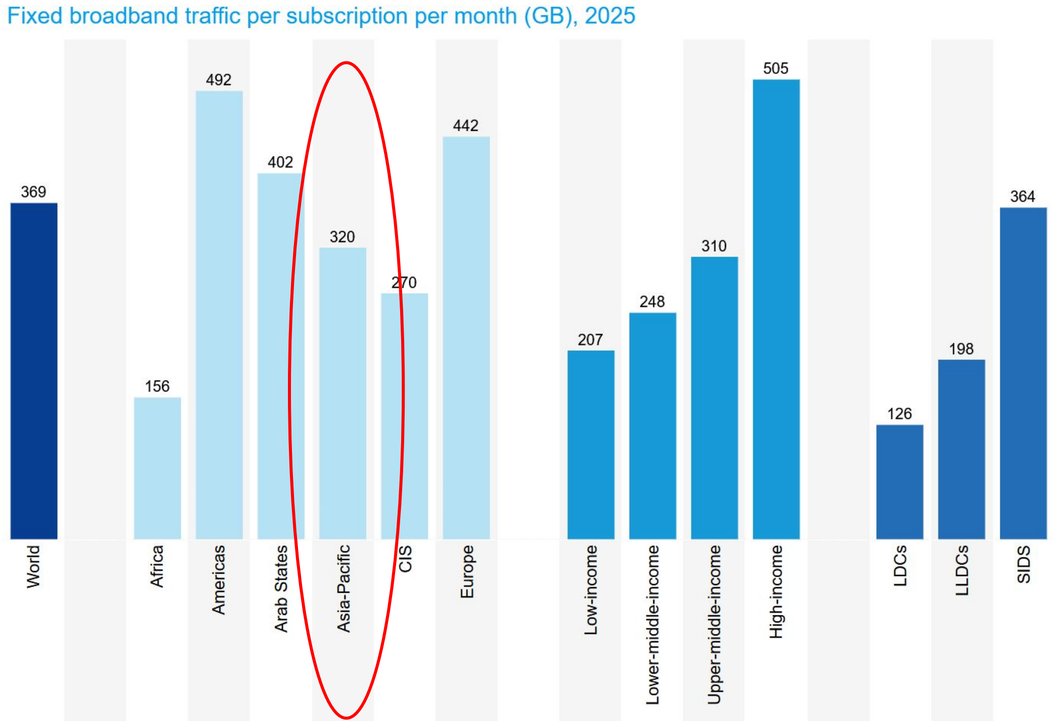


Note: 1 exabyte (EB) = 10^{12} megabytes. Interactive chart.
Source: ITU

SOURCE: HTTPS://WWW.ITU.INT/ITU-D/REPORTS/STATISTICS/2025/10/15/FF25-INTERNET-TRAFFIC/

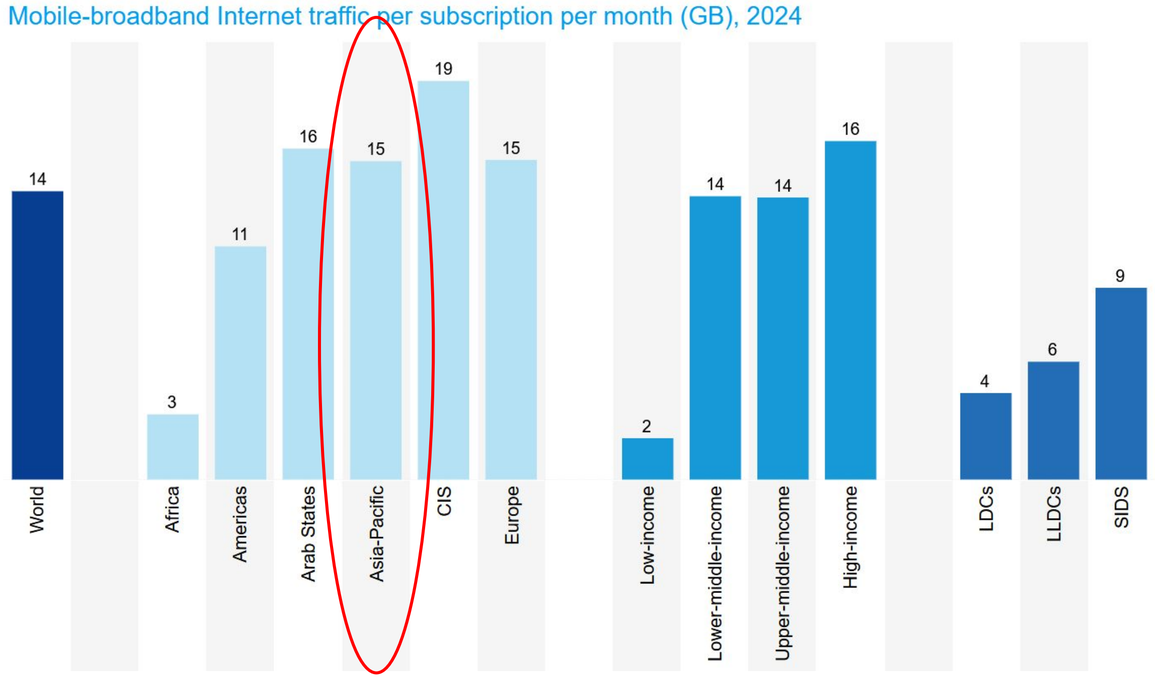
Internet traffic per subscription per month (GB) – 2024 vs 2025

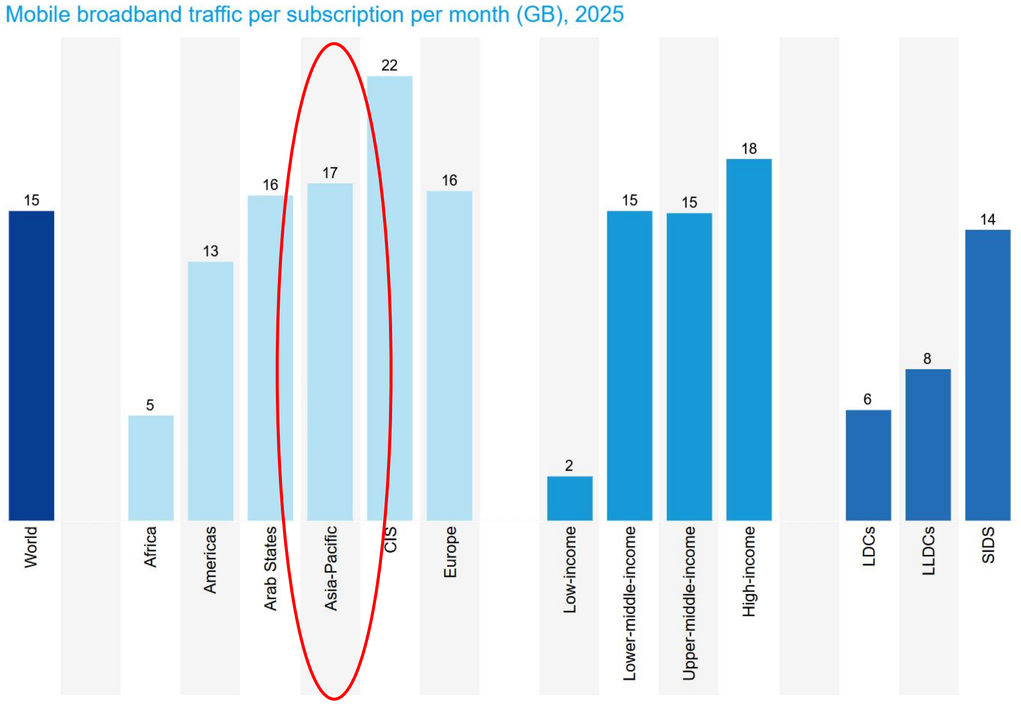




SOURCE: HTTPS://WWW.ITU.INT/ITU-D/REPORTS/STATISTICS/2024/11/10/FF24-INTERNET-TRAFFIC/

Internet traffic per subscription per month (GB) – 2024 vs 2025





SOURCE: HTTPS://WWW.ITU.INT/ITU-D/REPORTS/STATISTICS/2024/11/10/FF24-INTERNET-TRAFFIC/

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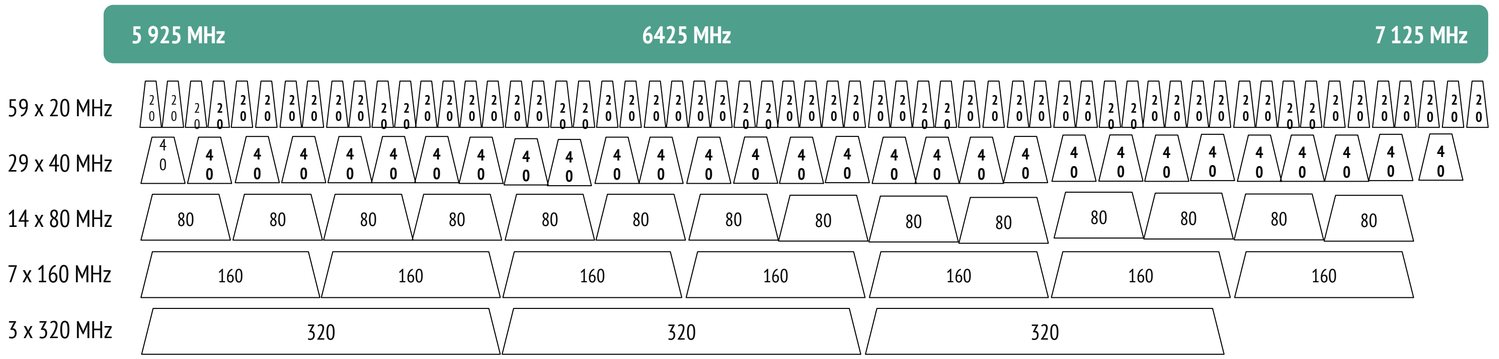
2. Larger bandwidth channels enable innovative applications and use cases

320 MHz Channels

BW

Wi-Fi @ 2.4 GHz and @ 5 GHz
20 MHz, 40 MHz, 80 MHz, 160 MHz

Wi-Fi @ 6 GHz
320 MHz



Applications and Use Cases

- Fixed Wireless Broadband
  - Enterprise Wi-Fi
  - Connected Homes (Fiber + Wi-Fi)
  - High-speed broadband satellite Wi-Fi networking
- Industrial IoT including autonomous systems
- AR/VR/XR applications
  - Digital twin rendering
  - Product/building design
  - Medical procedure simulation
- Ultra high-definition streaming / Growing video

Applications and Use Cases

- High-speed gigabit connectivity in dense multi-dwelling unit residential buildings
- Artificial Intelligence (AI)-based virtual assistants
- Sports stadiums
- University and research campus broadband, Medicine Centers, Retail Facilities
- 6 GHz is about innovation… Not only Wi-Fi, also UWB, Bluetooth and IoT in other industries

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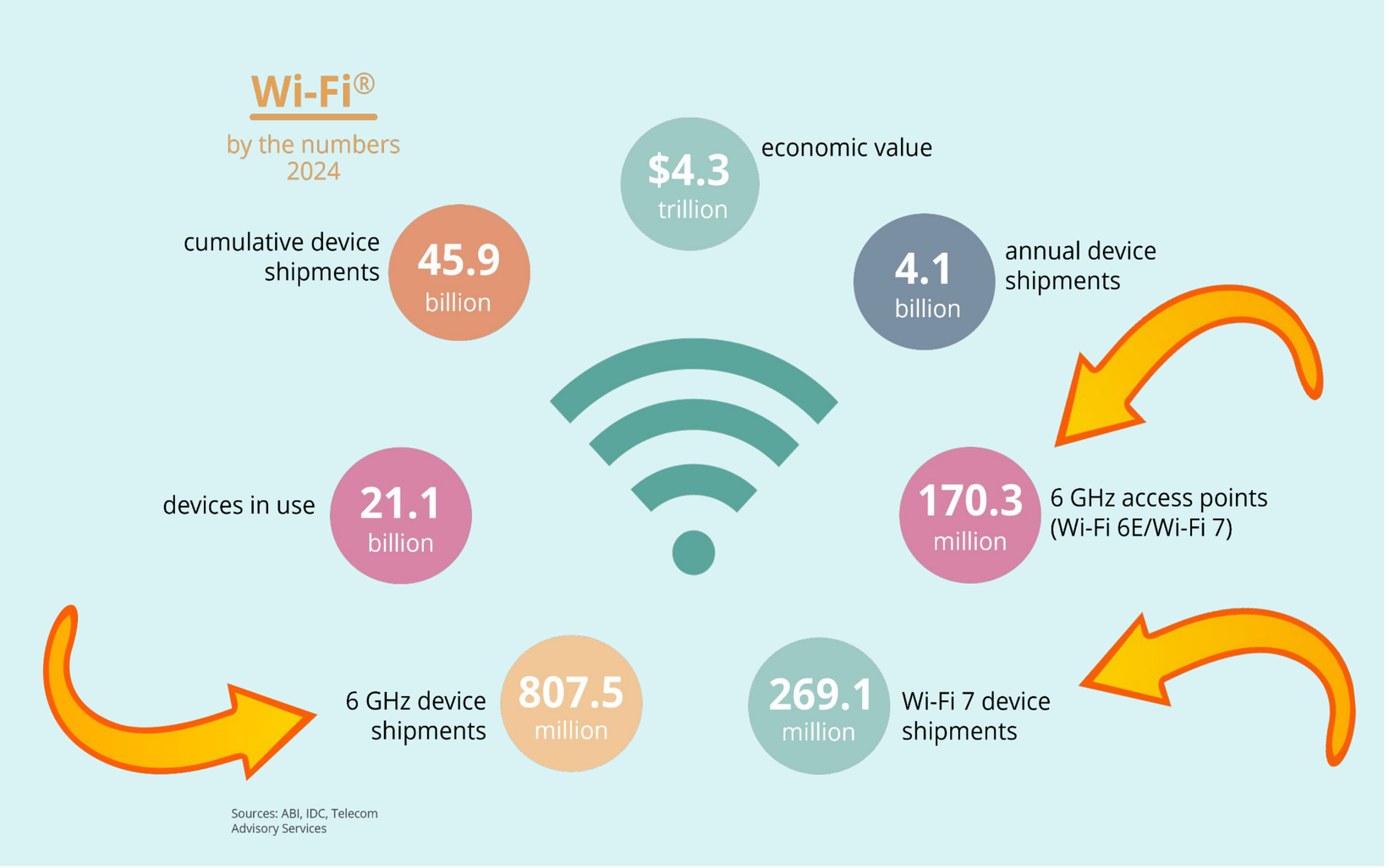
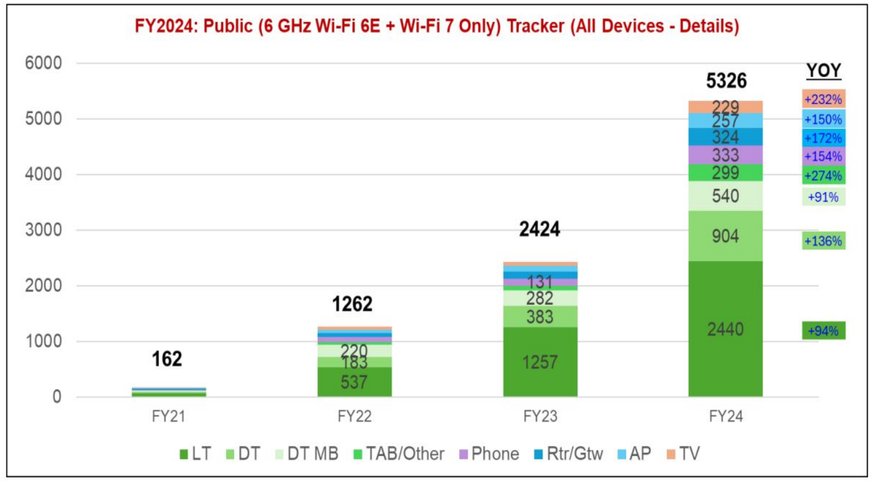
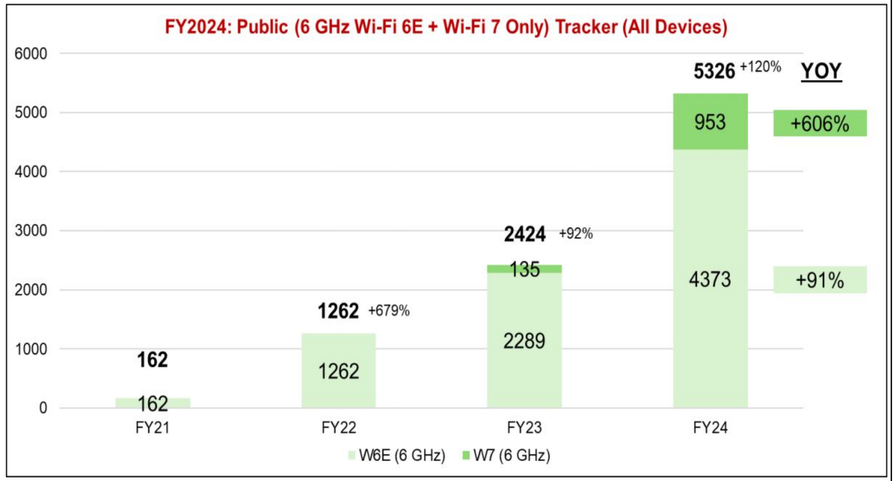
3. Wi-Fi in the 6 GHz Band: A Mature and Standardized Ecosystem

6 GHz Wi-Fi 6E and Wi-Fi 7 already supported by a large ecosystem



Unprecedented momentum in 6 GHz Wi-Fi adoption





>5000 (Wi-Fi 6E + Wi-Fi 7) device models supported 6 GHz in 2024
The total number of 6 GHz device models nearly doubled in both 2023 and 2024

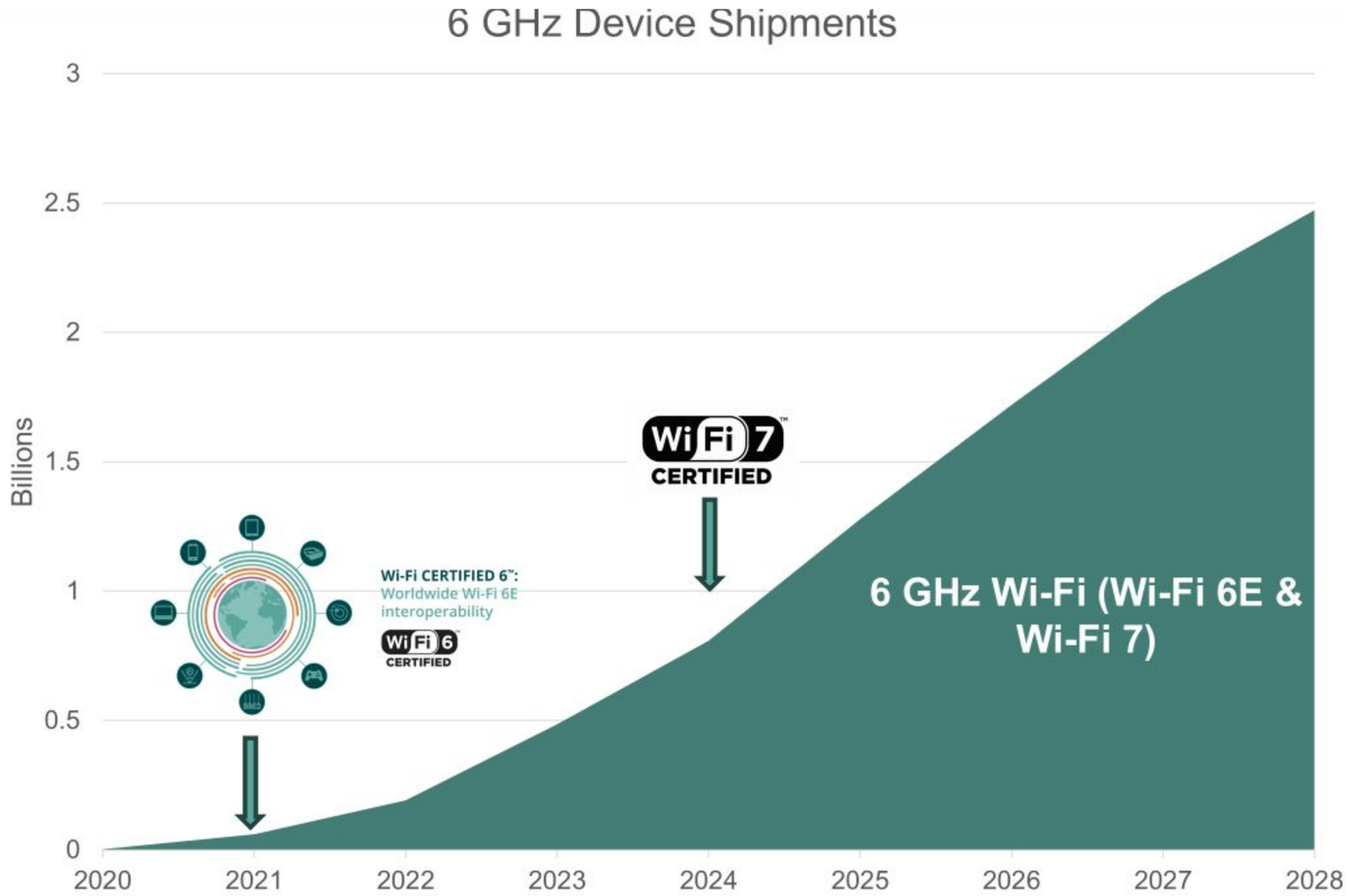
Intel Wi-Fi 6E/7 device model tracking is based on public information compiled from vendor/retailer websites, press releases, and third-party reviews.
Intel provides this assessment for informational purposes only. Intel cannot guarantee its accuracy, and it is subject to change without notice.

In 1Q25:

- Wi-Fi 6E accounted for 31.9% of enterprise access point revenues (up from 27.7% a year earlier).
- Wi-Fi 7 adoption also rose, accounting for 11.8% of dependent AP revenues, up from 10.2% in 4Q24.
- The U.S., where the entire 6 GHz band is available, recorded 21% year-on-year growth, significantly above the Europe, Middle East & Africa region of 10.6%.

Source: IDC Worldwide Quarterly WLAN Tracker (June 2025)

6 GHz Wi-Fi adoption reaches 2.5 billion in 2028



Courtesy of Wi-Fi Alliance

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… All While Ensuring Protection for Incumbent Users

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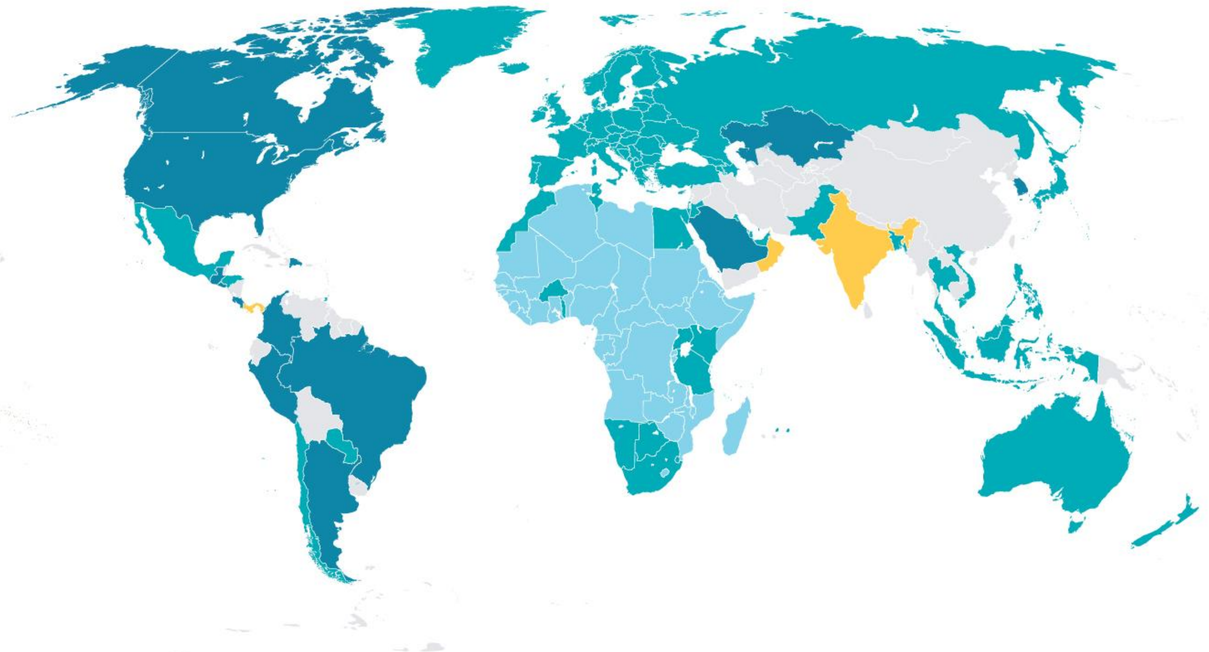
International Situation

License-Exempt in the 6 GHz band

GLOBAL PROGRESS TOWARDS LICENCE-EXEMPT ACCESS TO THE 6 GHz BAND



ADOPTED 5925-7125 MHz

- Argentina
- Brazil
- Canada
- Colombia
- Costa Rica
- Dominican Republic
- El Salvador
- Guatemala
- Kazakhstan
- Peru
- Saudi Arabia
- South Korea
- USA

ADOPTED 5925/45-6425 MHz *

- Australia
- Bahrain
- Bangladesh
- Botswana
- Burkina Faso
- Chile
- CEPT Area
- Egypt
- Eswatini
- European Union (480 MHz)
- Honduras
- Hong Kong
- Indonesia
- Israel
- Jordan
- Kenya
- Kuwait
- Macau
- Malaysia
- Mauritius (480 MHz)
- Mexico
- Morocco
- Namibia
- New Zealand
- Pakistan
- Paraguay
- Philippines
- Oman
- Qatar
- Russia
- Singapore
- South Africa
- Taiwan
- Tanzania
- Thailand
- Togo
- Trinidad and Tobago
- Tunisia
- UAE
- Uganda
- United Kingdom
- Vietnam

RECOMMENDED 5925-6425 MHz *

- Africa / ATU

UNDER CONSULTATION

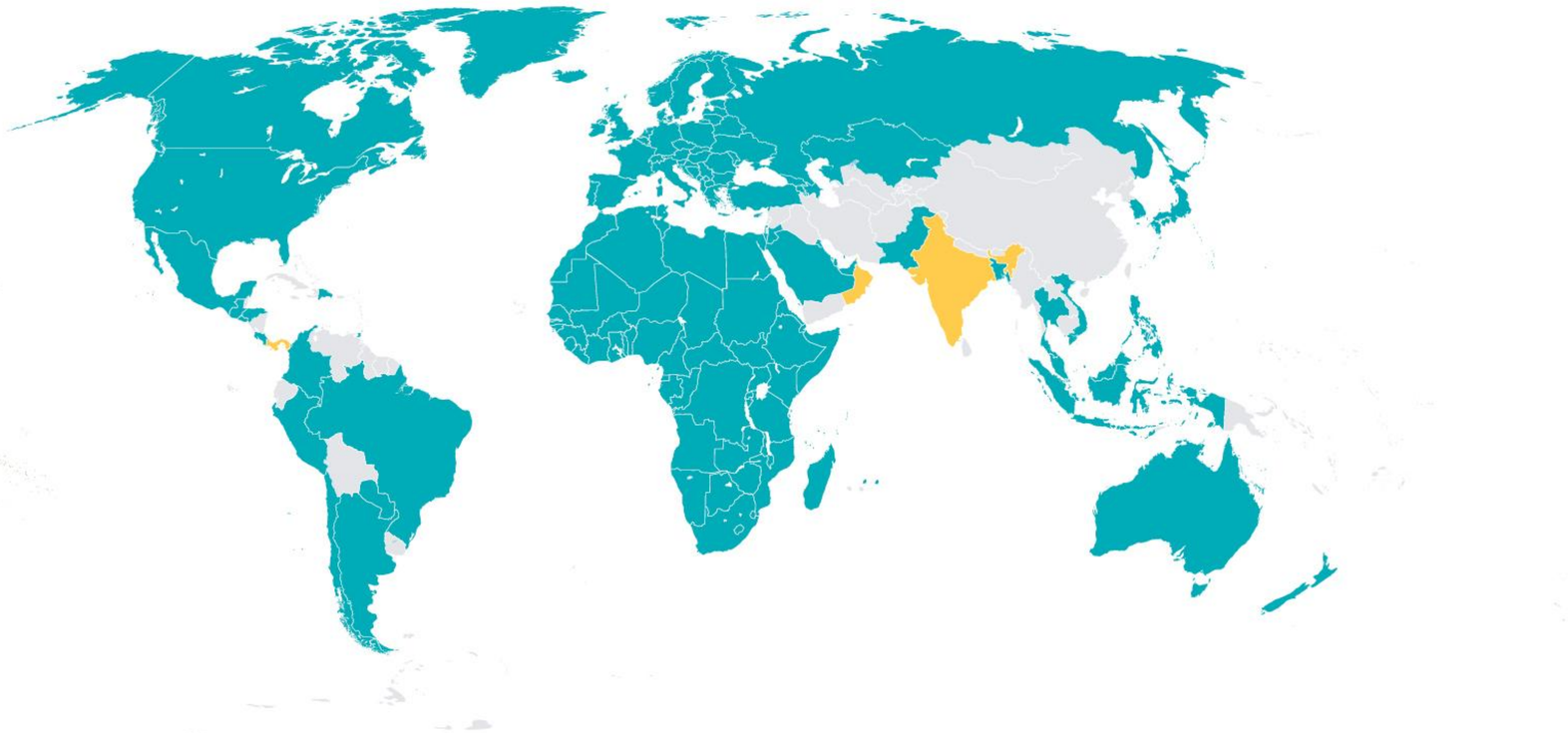
- India
- Oman
- Panama

* Position on 6425-7125 MHz varies by country

Data correct as of July 2025

6GHz.info

GLOBAL STATUS OF THE LOWER 6 GHz BAND



ADOPTED 5925/45-6425 MHz *

Argentina
ATU Region
Australia
Bahrain
Bangladesh
Botswana
Brazil
Burkina Faso
Canada
CEPT Area
Chile
Colombia
Costa Rica
Dominican Republic
El Salvador
Egypt
Eswatini
European Union (480 MHz)
Guatemala
Honduras
Hong Kong
Indonesia
Israel
Jordan
Kazakhstan
Kenya
Kuwait
Macau
Malaysia
Mauritius (480 MHz)
Mexico
Morocco
Namibia
New Zealand
Pakistan
Paraguay
Peru
Philippines
Oman
Qatar
Russia
Saudi Arabia
Singapore
South Africa
South Korea
Taiwan
Tanzania
Thailand
Togo
Trinidad and Tobago
Tunisia
UAE
USA
Uganda
United Kingdom
Vietnam

UNDER CONSULTATION

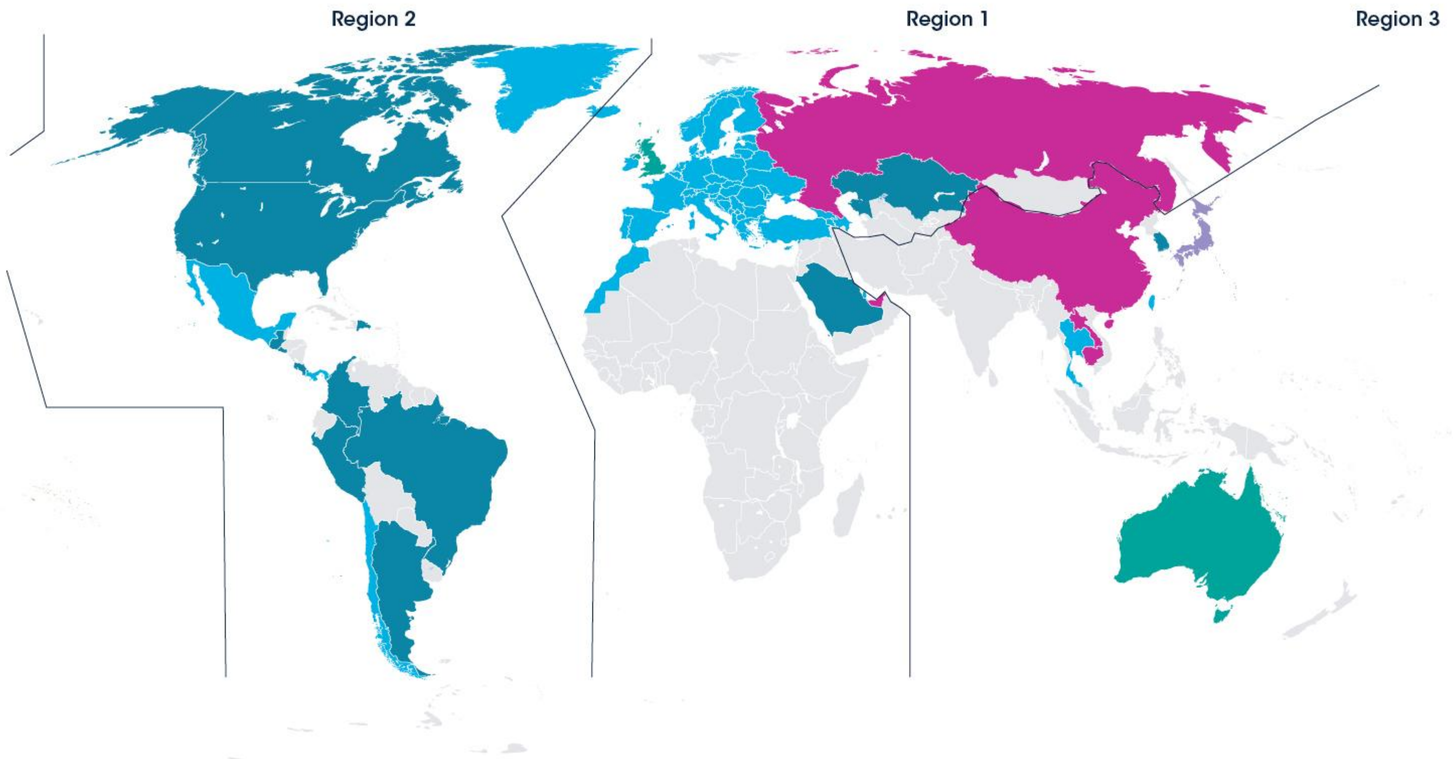
India
Oman
Panama

* Position on 6425-7125 MHz varies by country

Data correct as of July 2025

6GHz.info

GLOBAL STATUS OF THE UPPER 6 GHz BAND

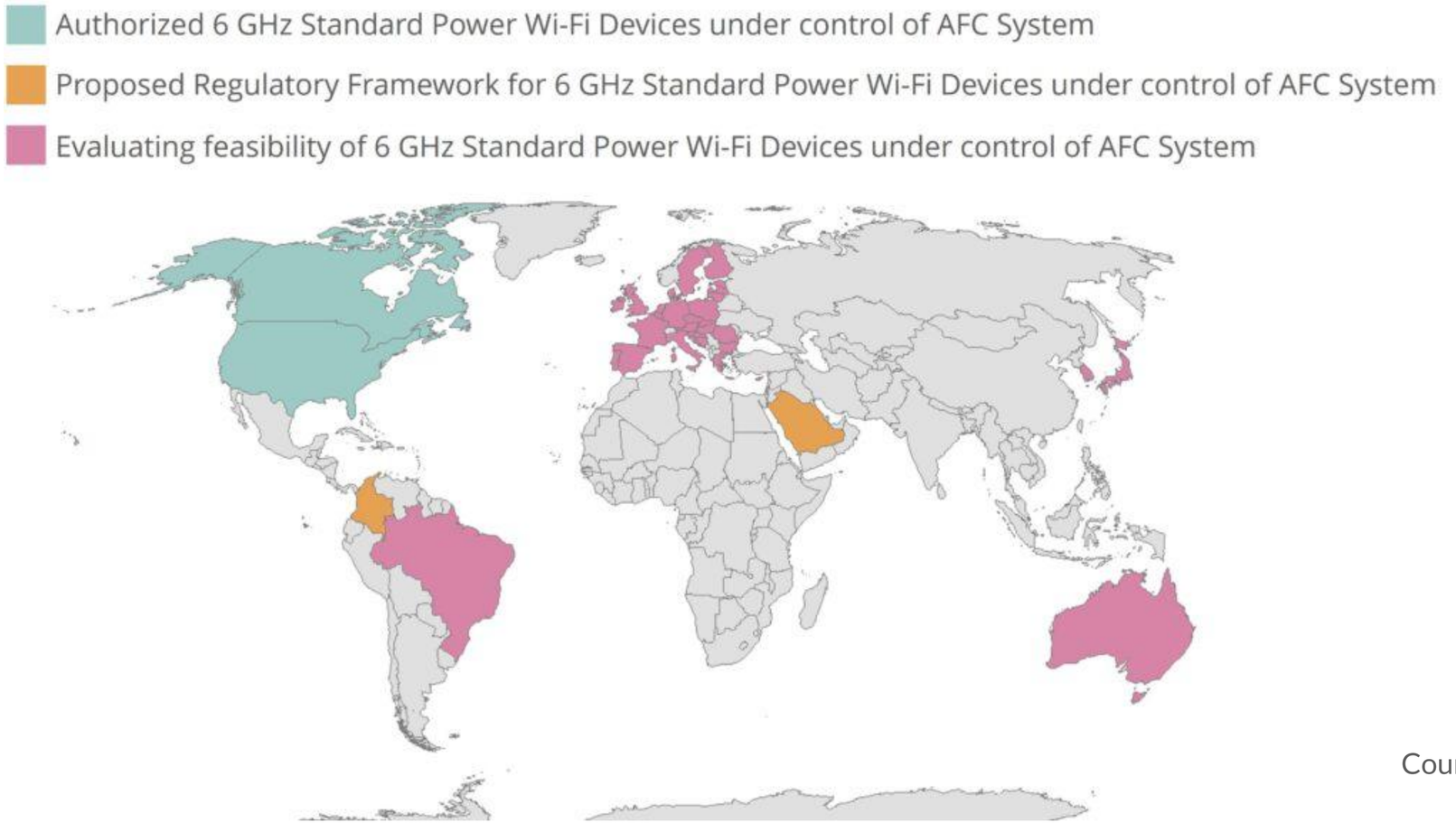


OPEN FOR LICENCE-EXEMPT USE		PROGRESSING LICENCE-EXEMPT USE	EVALUATING LICENCE-EXEMPT USE	EVALUATING SELECTIVE USE OF LICENCE-EXEMPT AND LICENSED USE	EVALUATING LICENSED USE
Argentina	Kazakhstan	Japan	Chile	Australia	Cambodia
Brazil (under review)	Peru		Europe (CEPT countries)	UK	China
Canada	Saudi Arabia		Mexico		Hong Kong
Colombia	South Korea		Panama		Lao P.D.R
Costa Rica	USA		Qatar		Maldives
Dominican Republic			Taiwan		Russia
El Salvador			Thailand		United Arab Emirates
Guatemala					

Data correct as of July 2025

6GHz.info

License-Exempt in the 6 GHz band is about innovation: AFC



Courtesy of Wi-Fi Alliance

Closing remarks:

- The 6 GHz band is a prime example of success, timely regulations have fostered innovation and driven significant private-sector investment, resulting in gigabit connectivity for users and promoting digital inclusion.
- Wi-Fi stands as a market leading technology.
- Fiber, Wi-Fi and NTN will support next-generation use cases and shape future spectrum requirements.

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ENABLING LICENSE-EXEMPT ACCESS TO THE ENTIRE 6 GHZ BAND ENSURES BROADER SOCIETAL BENEFITS, LEVERAGES EXISTING INFRASTRUCTURE, AND ADDRESSES REAL CONNECTIVITY NEEDS—WITHOUT COMPROMISING THE PROTECTION OF INCUMBENT USERS.

THANK YOU

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U.S. Spectrum Update: One Big Beautiful Bill Act (OB3A)

What does the OB3A do?

1. **Restores the FCC's auction authority for 10 years.**

2. **Directs the FCC to auction 300 MHz of spectrum for high powered terrestrial flexible use licenses (e.g., 3GPP technology; at least 100 MHz of that total must come from the C-Band (3.98-4.2 GHz) and be auctioned by July 2027.**

3. **Directs the NTIA to identify 500 MHz of federal spectrum to turn over to the FCC for auction within the 1.3-10.5 GHz range; at least 200 MHz must be identified for repurposing by July 2027.**

4. **Provides specific direction for three bands:**
   - **FCC shall auction at least 100 MHz of 3.98 – 4.2 GHz ("Upper C band");**
   - **NTIA may not identify, and the FCC shall not auction, 3.1-3.45 GHz which is used for Department of War systems; and**
   - **NTIA may not identify, and the FCC shall not auction, 7.4-8.4 GHz, which is used by a mix of federal agencies for terrestrial, satellite and other purposes.**

5. **Funds spectrum studies:**
   - **Allocates $50 million for NTIA to conduct studies for identification of bands to meet the 500 MHz target and perform a spectrum inventory.**
   - **Eligible bands include: 2.7–2.9 GHz, 4.4–4.9 GHz, and 7.25–7.4 GHz.**
   - **The law does not direct that any of these bands be converted to commercial use, but there is a tacit suggestion that the 500 MHz goal assigned to NTIA could come from some combination of these three bands.**

U.S. Spectrum Update: One Big Beautiful Bill Act (OB3A)

What does the OB3A *not* do?

- It does not tell the FCC where to find spectrum to auction to the mobile carriers.
- It does not say that spectrum for auction should be sourced from the 6 GHz band that is now heavily used by Wi-Fi.
- It does not direct the NTIA to take any particular action on the 7150-7250 MHz band, which could otherwise be made available for Wi-Fi to complete another 320-MHz wide channel.

What is the Trump Administration saying?

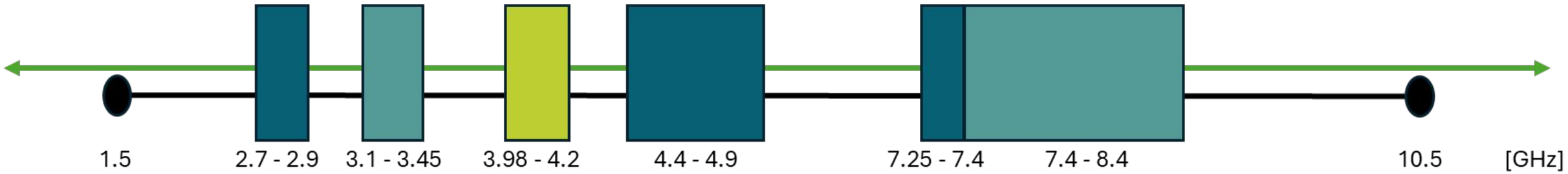
- "We fought tooth and nail to get that [6 GHz Wi-Fi] spectrum. I don't understand why anyone would think we're trying to go back on that now. It worked — we were right."
  Robin Colwell, Deputy Director, White House National Economic Council, Sept 29, 2025

Spectrum Provisions (2025-2034)

The FCC together with the NTIA have to find 800 MHz of spectrum for use by terrestrial cellular networks: 300 MHz from commercial spectrum (FCC) and 500 MHz from federal spectrum (NTIA)

FCC must auction at least 100 MHz by 2027; current estimate is as much as 150 MHz is available

FCC must auction by 2034 other commercial spectrum for a total of 300 MHz from any low, medium, or high bands



NTIA must study federal bands 2.7-2.9, 4.4-4.9 and 7.25-7.4 GHz for possible auction

Federal bands exempt from reallocation to exclusively licensed cellular use

Between 1.3 and 10.5 GHz, NTIA must find 500 MHz of federal spectrum to refer to the FCC for auction and identify 200 MHz of the total by 2027

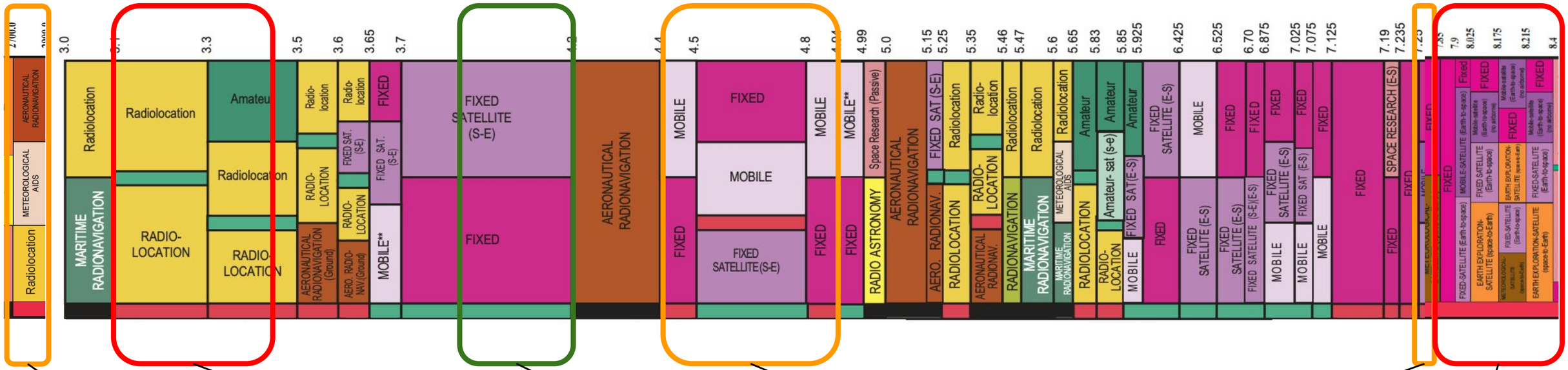
United States' One Big Beautiful Bill Act - Spectrum Provisions

Protected

Non-Federal – 300 MHz

Federal – 500 MHz

THE FCC TOGETHER WITH THE NTIA HAVE TO FIND 800 MHZ OF SPECTRUM FOR USE BY TERRESTRIAL CELLULAR NETWORKS: 300 MHZ FROM COMMERCIAL SPECTRUM (FCC) AND 500 MHZ FROM FEDERAL SPECTRUM (NTIA)



2700-2900 MHZ
NTIA STUDY

3100-3450 MHZ
DOD PROTECTED

3980-4200 MHZ
ADJACENT TO
RADAR ALTIMETER

4400-4940 MHZ
NTIA STUDY

7250-7400 MHZ
NTIA STUDY

7400-8400 MHZ
DOD PROTECTED

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Europe’s Upper 6 GHz Process: Mandate, Stakeholders Input, and Next Steps

Pasquale Cataldi · Policy Impact Partners

DSA Regulators Workshop · Dubai · 2025

The EC Mandate: “Find Options for Sharing”

RSC

RSPG
RADIO SPECTRUM POLICY GROUP

Mandate to CEPT

Task 1

- Study coexistence between IMT & WAS/RLAN vs incumbents

Task 2

- Identify scenarios for a shared use of the band

Task 3

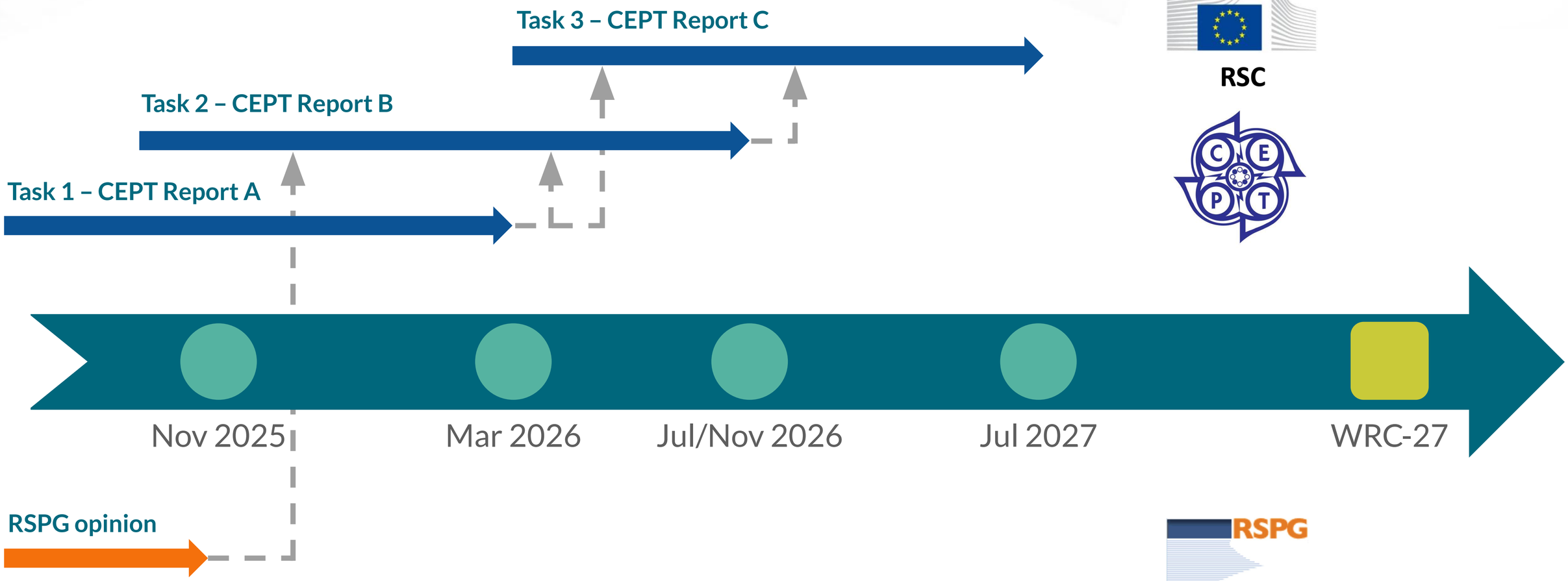
- Define harmonised technical conditions

Long term vision for the U6 GHz band sub-working group

Scope

- Opinion with political recommendations on the best use of the band to achieve the EU digital connectivity objectives

Timeline of European process



CEPT status of activities

Task 1 – Coexistence with incumbents

- ECC Report 364 (coexistence of WAS/RLAN with incumbents) finalised
- ECC Report 375 (coexistence of IMT with incumbents) under public consultation
- Work on CEPT Report A ongoing

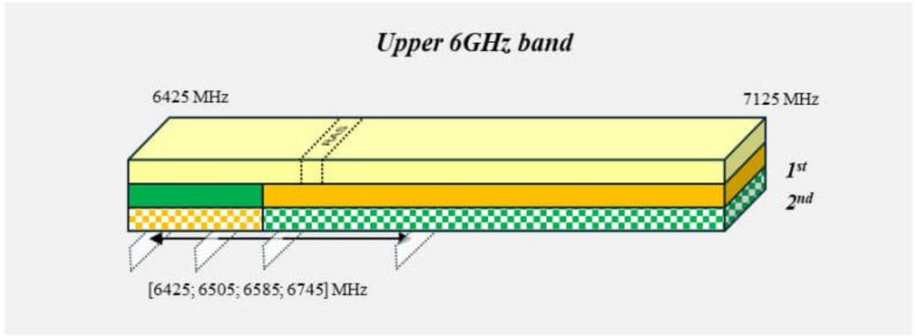
Task 2 – Shared use of the band

- ECC Report 365 finalised
- Work on CEPT Report B ongoing

Task 3 – Harmonised conditions

- Drafts for the necessary work items under discussion

RSPG draft opinion on U6 – June 2025



Prioritised band split

*"Each application would have **non-prioritised access** to the portion of the band assigned **to the other application**, if it does not cause harmful interference to the other application."*

Slight **preference** expressed in the draft opinion

Split point options	Prioritised for WAS/RLAN	Prioritised for IMT
6 425 MHz	0	700
6 505 MHz	80	620
6 585 MHz	160	540
6 745 MHz	320	380

*"The **public consultation** will be an **opportunity** for RSPG **to review the option** and to decide on the most appropriate one. The RSPG intends to present **one single option in the final opinion**"*

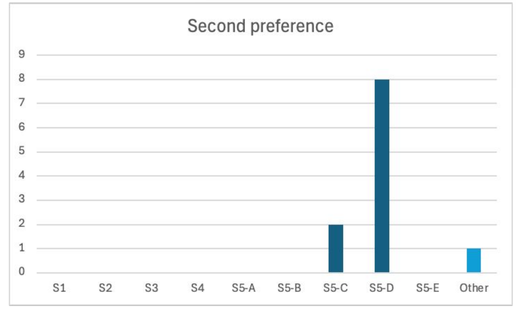
DSA Position & Stakeholder Input

DSA Response:

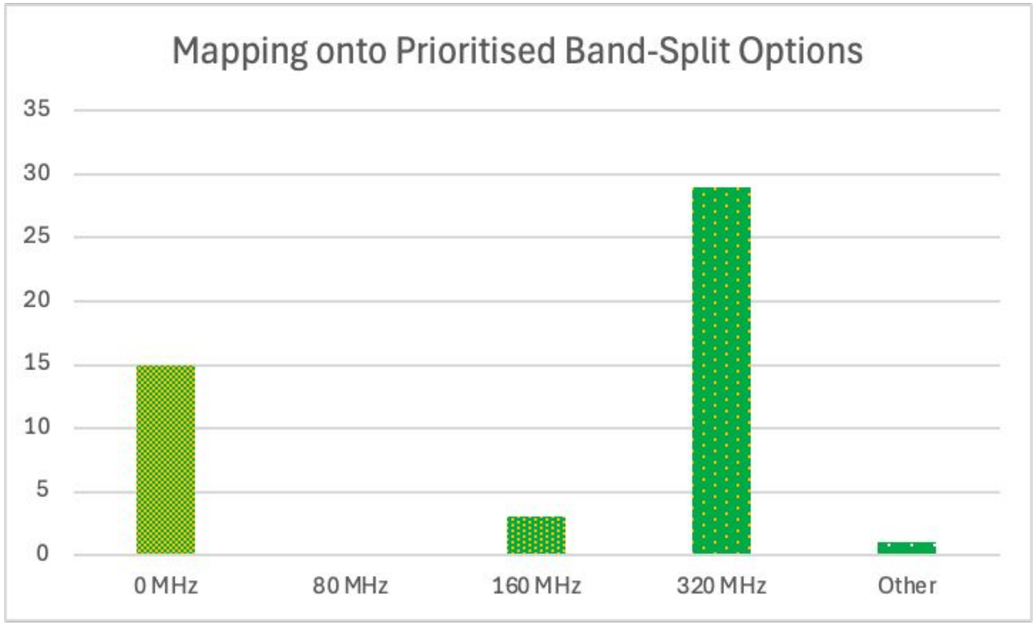
- Requested **at least 320 MHz** under lower 6 GHz conditions
- Called for **flexibility** for Member States to open more spectrum
- Recommended giving due consideration to **enterprise applications**
- Asked for **clear rules** on non-prioritised access to ensure coexistence

Stakeholder feedback – **50 responses**:

- Strong **cross-sector support for licence-exempt** access
  - Technology companies, fibre operators, academia, retailers, incumbents, etc.
- Clear need for wide contiguous channels for Wi-Fi 7
- Most respondents backed ≥160 MHz for WAS/RLAN



If only the prioritised approach is considered



RSPG final opinion on U6 –November 2025

RSPG recommends a prioritised band split

5.3 ¶5	Having considered the responses to the public consultation and the preferences expressed by Member states, the RSPG has agreed a **prioritised use of the band 6585-7125 MHz for MFCN**.
5.3 ¶6	**For the 6425-6585 MHz** the RSPG has agreed to use this as a guard band (together with a BEM applicable to MFCN in the 6585-7125 MHz) to protect WAS/RLAN in the lower 6 GHz band (5945-6425 MHz) **until the WRC-27** which may identify the additional band 7125-7250 MHz for IMT. Member States will **not release the band** neither for MFCN nor for WAS/RLAN.
5.3 ¶7	**Following the WRC-27**, RSPG intends to **decide on the exact use of the 160 MHz** (6425-6585 MHz).
5.3 ¶8	If WRC-27 identifies the 7125–7250 MHz band for IMT and no significant new developments or insights suggest otherwise, there is a strong case for designating the 6425–6585 MHz band for primary WAS/RLAN use.
5.3 ¶9	If WRC27 does not identify the 7125–7250 MHz band for IMT and no significant new developments or insights suggest otherwise, there is a strong case for designating the 6425–6585 MHz band for primary MFCN use.
6585-7125 MHz	RSPG recommends that **CEPT investigates the non-prioritised WAS/RLAN usage within this full power MFCN segment**, ensuring that such operation does not cause harmful interference to MFCN.

RSPG final opinion on U6 –November 2025

RSPG recommends a flexible approach and the protection of incumbents

5.1 ¶4	RSPG recommends a flexible use of the band in terms of allowing countries to **maintain existing fixed service** usage while supporting additional mobile applications (MFCN and WAS/RLAN) as needed.
5.2 ¶4	RSPG recommends that future **EU regulatory actions should facilitate**, to the greatest and most expedient extent feasible, **the envisaged shared usage of the upper 6 GHz band** in providing maximum long-term societal benefits.
5.2 ¶5	RSPG recommends that Member States be afforded **flexibility not to award spectrum** where no demand arises for MFCN in the band.
5.5 ¶2	Member States should maintain the **authority to determine whether WAS/RLAN, non-prioritised usage is allowed**.
6585-7125 MHz	CEPT should, within the scope of the EC Mandate (Task 1 and Task 2), study **protection of WAS/RLAN in** the frequency band **5945-6425 MHz**.

Next steps of the European process

1. ~~RSPG will publish the **opinion** and **stakeholders' responses** to consultation~~

2. CEPT will refine the technical conditions and **develop harmonised conditions**

3. The EU will decide on the **harmonised approach**

4. **National administrations** will use this to define their policies

THANK YOU

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IMT in U6 vs Incumbents – Draft ECC Report 375

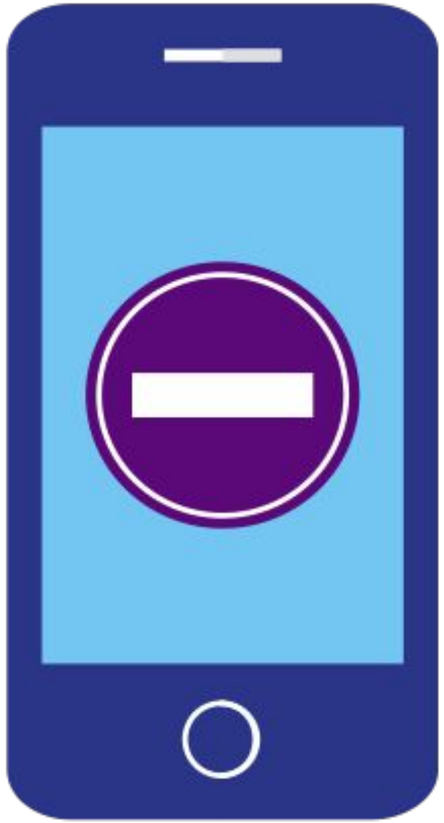
- FS: Separation distances ranging from 42 to 321 km in the main beam of the FS, and from 2 to 56 km outside of the main beam
- RAS: Separation distances ranging from 60 km to 380 km
- FSS non-GSO downlink: Separation distances ranging from 12 km to 30 km
- UWB (Ch5): 75% of events exceeded the threshold
- WAS/RLAN in L6: Assuming IMT operating on a 100 MHz, significant interference on RLAN LPI APs is expected on the adjacent 80 MHz of spectrum operated by RLAN – Impact on enterprise WAS/RLAN likely greater, but was not studied

In-building IMT using mid-band spectrum is impractical

The signals from mobile base stations struggle to penetrate building walls, particularly when using relatively high frequencies, such as the upper 6 GHz band.

"As buildings become more energy efficient, it will become harder for mobile signals to penetrate into them, especially at higher frequencies like 6 GHz. Even today, in-building coverage from outdoor macro sites using the 3.5 GHz band can be patchy, with the band only able to provide “shallow” indoor coverage in many cases. At 6 GHz it may be even harder to provide reasonable indoor coverage.”

Source: Ofcom consultation on the 6 GHz band, February 2025



Putting it all together - Importance of Accurate Data

- In the U.S., an AFC System will calculate the protection area around every incumbent receiver using licensee data in the FCC's ULS and input 6 GHz standard power access point operating data, including its 3D position and effective EIRP

- The AFC accounts for device uncertainty by calculating a service area with radius equal to uncertainty

- Permissible operating frequencies are those where the standard power service area does not collide with any fixed service link protected contour