GSMA

6 GHz in APAC
Mobile evolution in 6.425–7.125 GHz



The Asia-Pacific region is home to some of the most advanced 5G markets in the world. By the end of 2026, 5G is projected to account for more than two-thirds of total mobile connections in leading countries such as Australia, China, Japan, Singapore and South Korea. Meanwhile, other major economies such as India, Thailand, Malaysia and Vietnam are growing rapidly.

As mobile traffic grows, demand for spectrum increases. 2 GHz of mid-band spectrum will be required by around 2030 - cities with over 50% of the world's urban population will be capacity-constrained by then if mid-band spectrum remains at today's levels. The full availability of the upper 6 GHz band (6.425–7.125 GHz) for mobile networks is the first step towards spectrum for next-generation 5G-Advanced and 6G services. Beyond 2030, more spectrum will be needed which will see governments making use of the 4.5 GHz and 7 GHz frequencies being discussed at the upcoming World Radiocommunication Conference (WRC-27). The upper 3.5 GHz range (3.8-4.2 GHz) will also come into play while 600 MHz will provide a coverage layer.

IN CITIES STUDIED IN THIS REPORT:

The average economic benefit of **FULL-POWER LICENSED MOBILE IN UPPER 6 GHz** is

30×

GREATER THAN UNLICENSED

67%

of mobile data use is indoors and

33%

is outdoors

85% of indoor connectivity is provided by mid-bands with

15%

coming from low bands

73%

of urban indoor 5G use is provided by 3.5 GHz

3%

of Wi-Fi 6 and Wi-Fi 7 use is provided by 6 GHz

Wi-Fi use:

WI-FI 4	WI-FI 5	WI-FI 6	WI-FI 7
28%	35%	34%	3%

Technology migration will enhance efficiency

Indoor mid-band 4G download speeds are

2.5×

higher than on low bands

Indoor 3.5 GHz 5G download speeds are more than

2×

higher than lower mid-bands and low bands

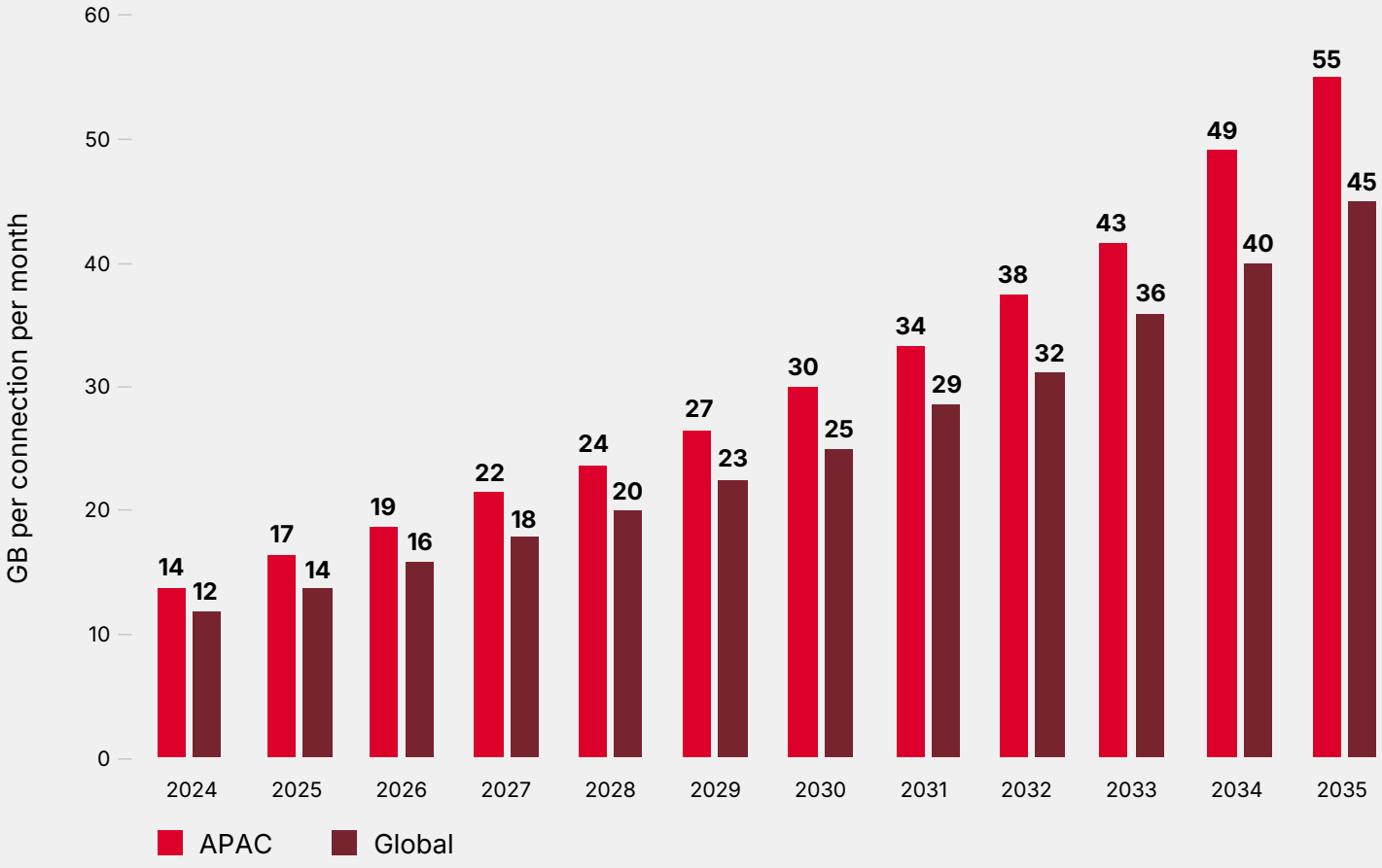
Data growth

Mobile and fixed operators will need to manage significant traffic growth over the next decade. Average data use is expected to be almost 2x higher in 2030 than in 2025 in APAC, and 3x higher by 2035.

Globally, an average of 2–2.5 GHz of mid-band spectrum (frequency bands between 1 GHz and 10 GHz) will be required in 2035–2040 to meet demand in high-population density locations around the world. In higher-demand countries (representing the top 50% of countries globally) spectrum needs will be 2.4–3.3 GHz.[1] However, APAC data consumption is expected to be higher than the global average meaning that countries will require more spectrum to meet demand.

Today, most countries have allocated around 1-1.5 GHz of mid-band spectrum for mobile, meaning around 1-2 GHz of additional spectrum will be required for the future evolution of mobile. The 700 MHz of mobile spectrum in the upper 6 GHz band can support this growth in APAC, while subsequently the upper 3.5 GHz (3.8-4.2 GHz), 4.5 GHz and 7 GHz bands should also be considered to meet demand in the 2030s.

Figure 1
APAC mobile data usage (GB per connection per month)



Source: GSMAi

1 GSMA. Vision 2040: Spectrum for the future of mobile connectivity. https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2026/07/GSMA_Vision-2040.pdf

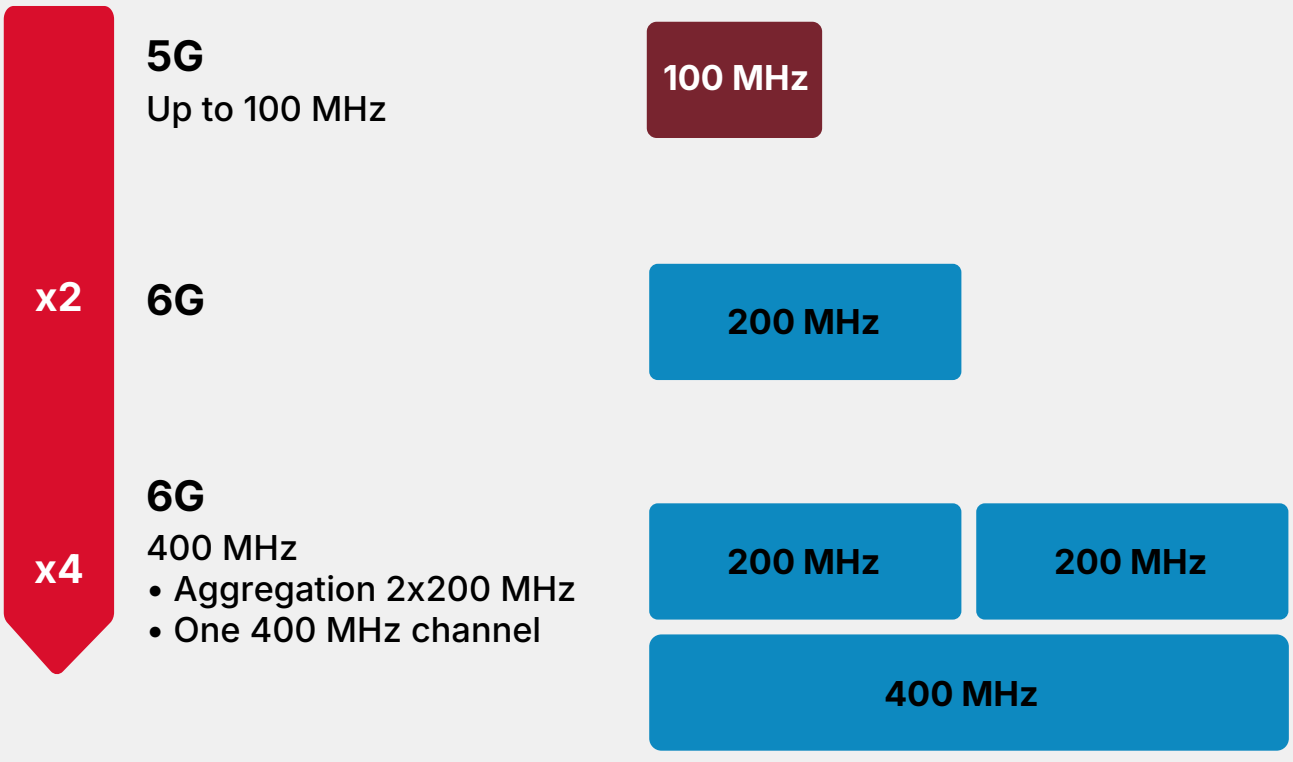
Planning 6 GHz for the future

Each mobile generation has used wider channel sizes than the one before, from 1.25 MHz 2G channels to the 100 MHz channels used for 5G. The 6G era in the 2030s will use 200–400 MHz channels in mid-bands per network to cater for capacity and speeds required to deliver services and applications.

6 GHz will be able to provide some of this capacity. The World Radiocommunication Conference in 2023 (WRC-23) harmonised the upper 6 GHz band for mobile services and it has subsequently been included in national spectrum roadmaps. Countries accounting for more than 80% of the world's population now support mobile use of upper 6 GHz, providing the scale and certainty needed for a strong global ecosystem. The first upper 6 GHz assignment processes have been finalised, and further awards are expected in the coming years across APAC, EMEA and the Americas.

The 700 MHz available in the upper 6 GHz band can only provide the lower end of the 200–400 MHz requirements per network in a typical three-operator market. However, it is still the most likely way to support sufficient channel sizes in APAC.

Figure 2
New channel sizes for new generations



Socio-economic benefits

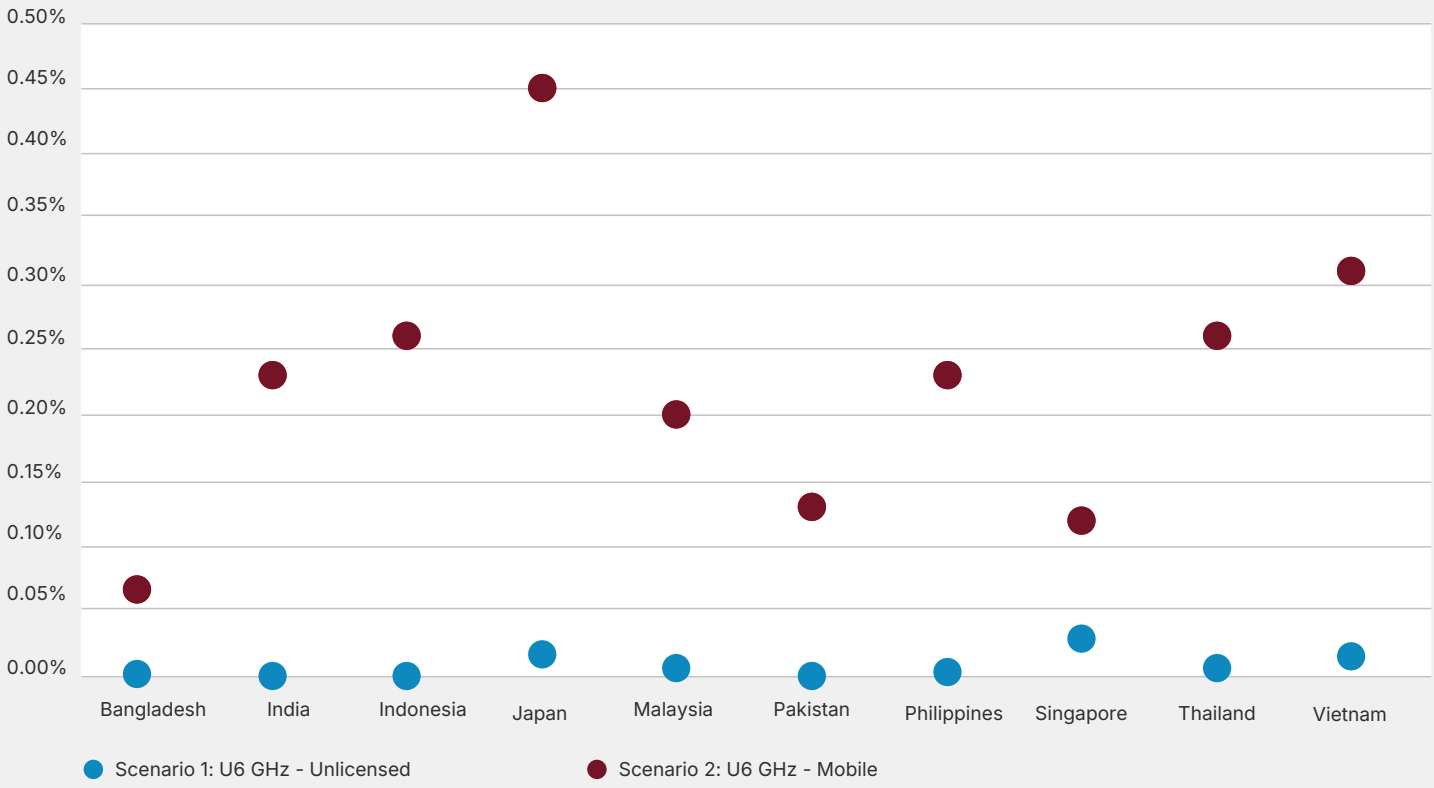
GSMA Intelligence has analysed the potential economic benefits of two different policy options for the upper 6 GHz band in 10 APAC countries.

— unlicensed RLAN use (Scenario 1)
— licensed mobile use (Scenario 2)

The greatest economic benefit is always achieved with Scenario 2, where the upper 6 GHz band is fully assigned to licensed, macro-cell mobile use. This is because mobile networks are much more likely than Wi-Fi to face capacity constraints through to 2035, making additional spectrum critical for enhancing network performance and broader economic value. This means that a decision to assign any spectrum in the upper 6 GHz band for unlicensed use will drive a lower benefit than assigning it fully for mobile use.

The results for Scenario 2 assume that all existing IMT bands will be assigned to mobile, including the 3.5 GHz range. This band has not yet been assigned in Bangladesh, Indonesia or Thailand. If this remains the case by 2035, the benefits of Scenario 2 would increase by a 4-6x in these three countries, as there would be significantly less capacity without the upper 6 GHz band.

Figure 3
Economic benefits of unlicensed and licensed mobile use of the Upper 6 GHz band
Proportion of expected GDP in 2035



Source: GSMA Intelligence

Economic analysis methodology

To estimate the economic impact of different policy options for the upper 6 GHz band, a traffic demand and supply model has been developed for the period between 2025 and 2035. This is applied to the most populous cities in each of the 10 countries. The analysis focuses on cities and urban areas as this is where capacity is most needed and where 6 GHz is most likely to be used for wide-area cellular networks and Wi-Fi.

For both mobile and Wi-Fi, the methodology is based on the following approach[2]:

- To estimate demand, mid-band traffic forecasts are developed in each city to 2035. This is converted to a throughput requirement, based on the proportion of traffic delivered in the peak hour.
- To estimate supply, capacity is modelled based on the amount of spectrum available in each scenario, spectral efficiencies, a network loading factor and the number of sites or access points deployed.
- Demand and capacity are then compared in each scenario. Where demand exceeds supply for mobile or Wi-Fi, a proportionate reduction is applied to 5G or FTTH/B adoption respectively. The impact of additional spectrum on user experience is also modelled, proxied by increased download speeds. The model assumes that the increase in spectrum drives a proportionate increase in speeds, which is then scaled based on the difference between capacity and demand. This is because if there is a lot of excess capacity, the impact on consumer experience will be less than if the network is capacity constrained.
- Lastly, the economic benefits of each policy are estimated using the existing empirical evidence that quantifies the incremental impact of 5G and FTTH/B on GDP, along with the impact of improved network quality. The analysis is carried out in each year for the 2025-2035 period and is then aggregated by taking the net present value of economic benefits. The results in Figure 3 express the benefits as a proportion of expected GDP in 2035.

It is important to note this analysis does not consider the total economic impact of mobile or Wi-Fi technologies, which would both be much larger, but rather the incremental economic impact from assigning the upper 6 GHz band.

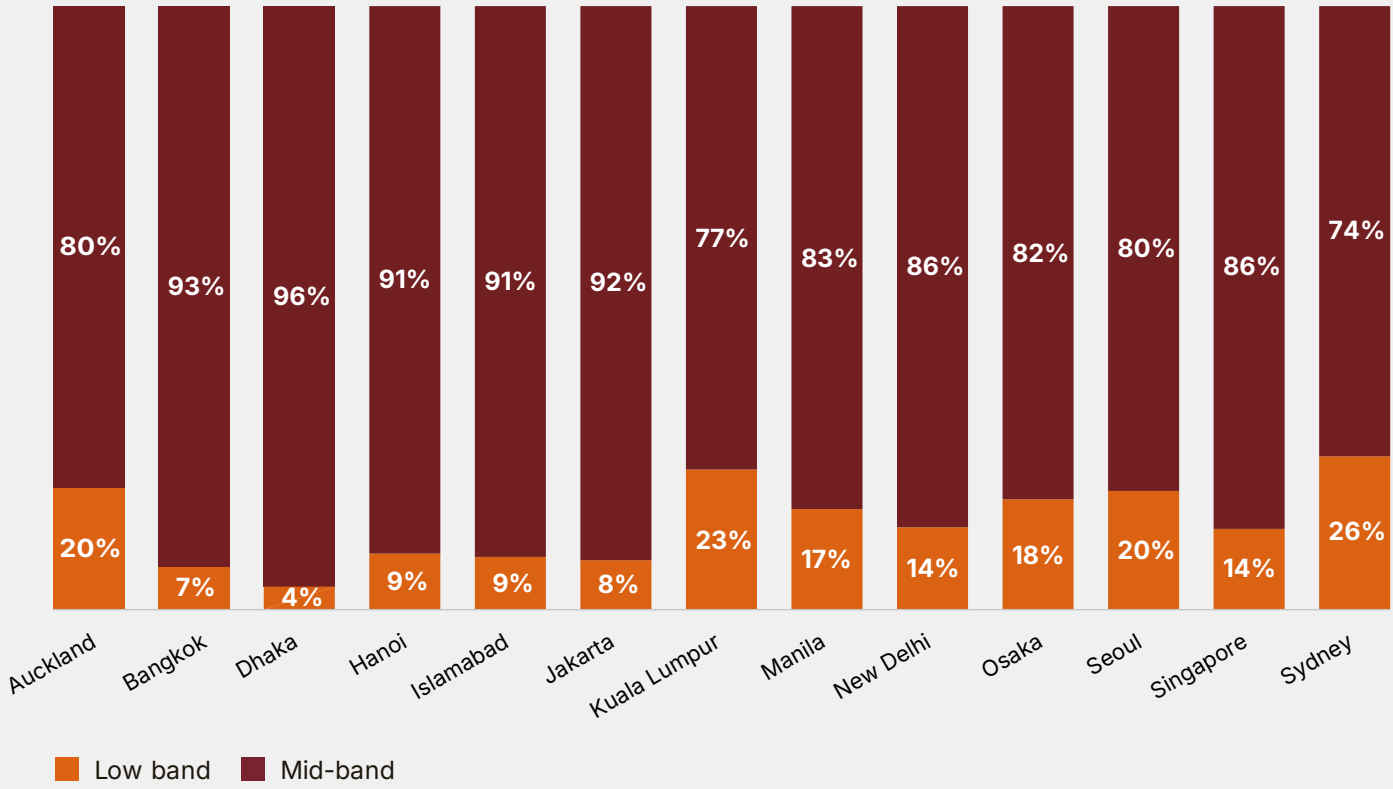
As demonstrated in this study, there is scope for more efficient use of Wi-Fi spectrum by deploying newer Wi-Fi technologies. With more efficient spectrum use, existing unlicensed bands (2.4 GHz, 5 GHz, and lower 6 GHz) are sufficient to handle future Wi-Fi demand, as they could support throughputs between 2.5 to 4 Gbps per fixed broadband subscription in dense urban apartments and multi-dwelling units (the throughput would be even higher in house dwellings). This means the incremental economic impact of assigning the upper 6 GHz for unlicensed use is lower compared to mobile.

2. For further details on the methodology used for the economic analysis, including relevant technical assumptions, see GSMA (2024), Mobile Evolution in 6 GHz: The impact of spectrum assignment options in 6.425–7.125 GHz

Mobile usage in APAC

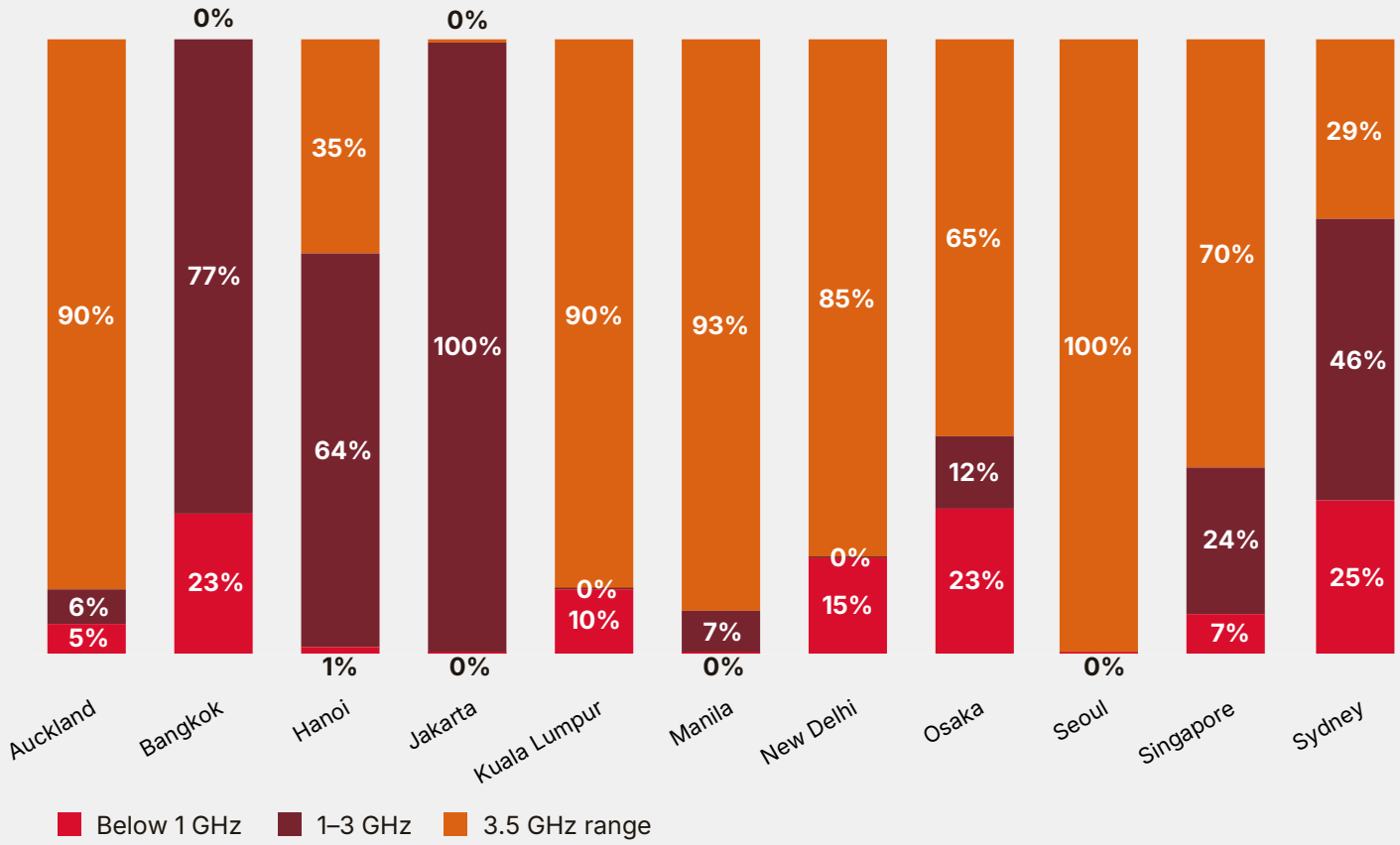
GSMA Intelligence analysis of Ookla® data shows that in 13 of APAC's most populated cities, the majority of most mobile use (around two-thirds) is indoors. The majority of this is delivered over mid-band spectrum, and for 5G usage the majority is delivered over the 3.5 GHz range.

Figure 4
Distribution of 4G and 5G indoor scans by spectrum band



Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.
Note: Low bands refer to frequencies below 1 GHz, while mid-bands refer to frequencies above 1 GHz excluding mmWave bands.

Figure 5
Distribution of 5G indoor scans by spectrum band



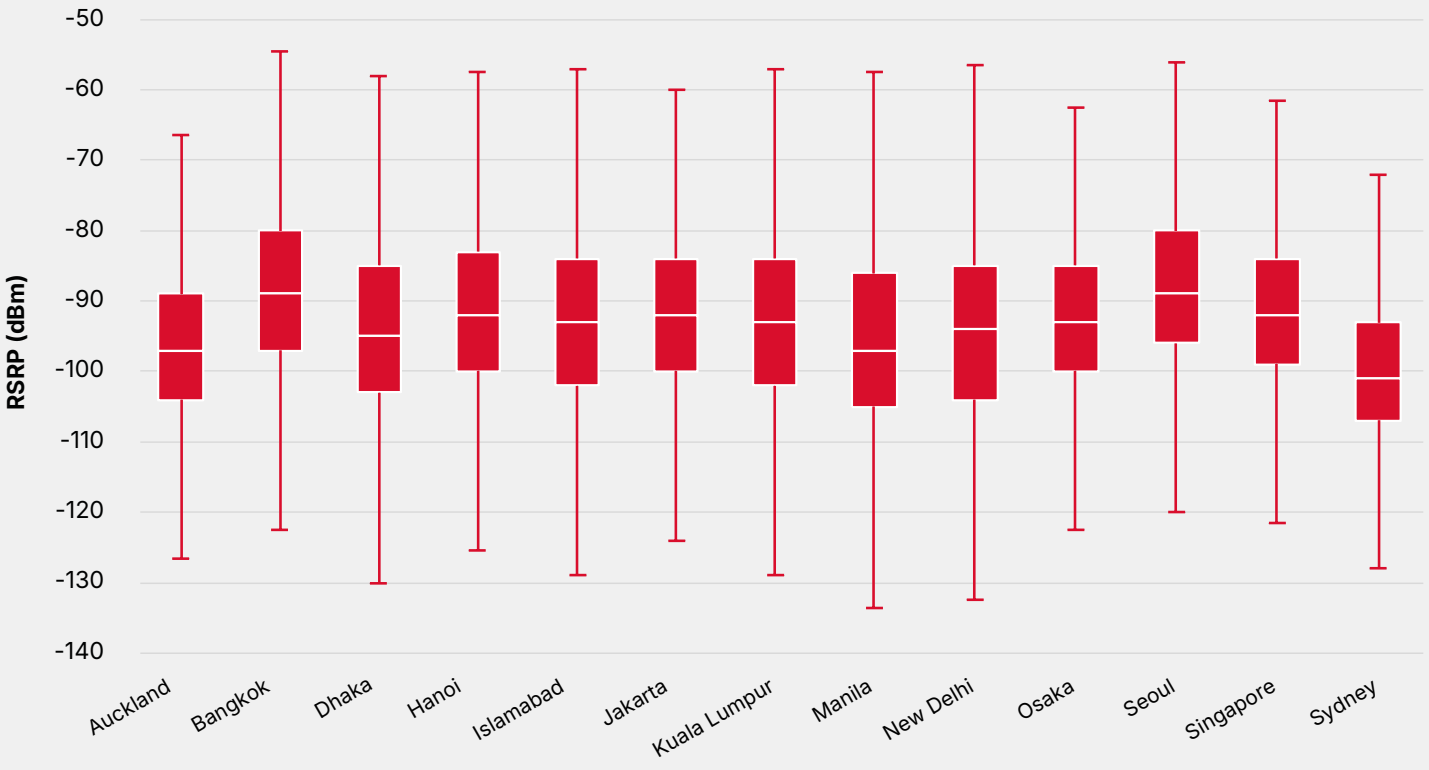
Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.
Note: Data for Dhaka and Islamabad is not shown, due to an insufficient number of 5G scans.

While mid-bands provide most indoor mobile traffic, it is important to consider whether they provide sufficient quality of service and experience for consumers. The figures below show the distribution of signal strength, measured by the Reference Signal Received Power (RSRP) for indoor scans, first on mid-bands for both 4G and 5G (Figure 6) and second on 3.5 GHz for 5G (Figure 7). Consumers had a good quality indoor signal from mid-bands in all cities. The majority of scans have an RSRP above the thresholds typically considered for effective coverage (-115 to -105 dBm). Furthermore, across all cities, mid-bands provide faster speeds than low bands for 4G, including indoors. For 5G, upper-mid bands provide faster speeds than both low bands and lower-mid bands.

Trials have shown that 6 GHz can deliver comparable indoor coverage to the 3.5 GHz range.[3] Evidence also suggests the upper 6 GHz band can effectively provide an additional capacity layer in urban areas and meet the majority of indoor and outdoor requirements.

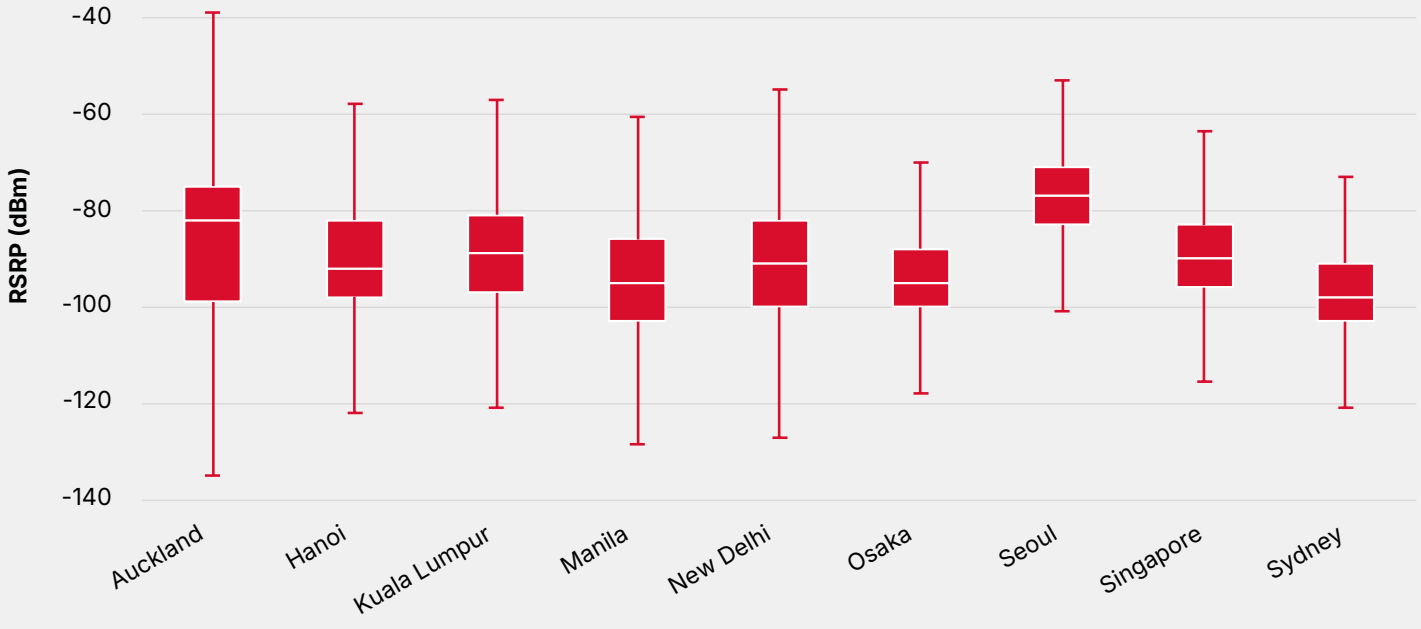
3. APT/AWG/REP-161. APT Report on the technical characteristics relevant to the implementation of IMT systems in the frequency band 6 425-7 125 MHz, September 2026.

Figure 6
Indoor mid-band signal strength (4G/5G)



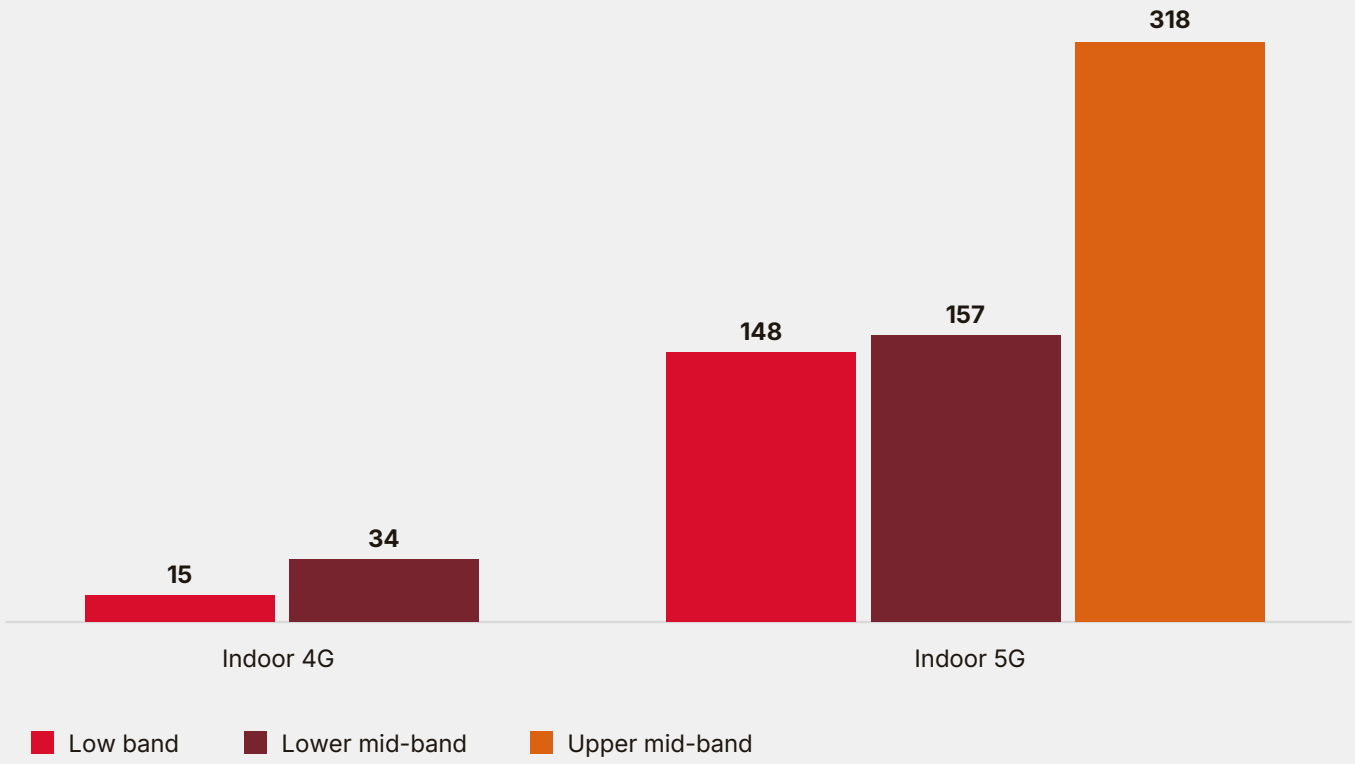
Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.
Note: The boxes show the 25th percentile, median and 75th percentile RSRPs in each city. The whiskers show the inner and outer fences.

Figure 7
Indoor 3.5 GHz signal strength (5G)



Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.
Note: The boxes show the 25th percentile, median and 75th percentile RSRPs in each city. The whiskers show the inner and outer fences.

Figure 8
Median Indoor Download Speeds by technology and spectrum band across all cities (Mbps)



Source:GSMA Intelligence analysis of Ookla® data from Q2 2026.

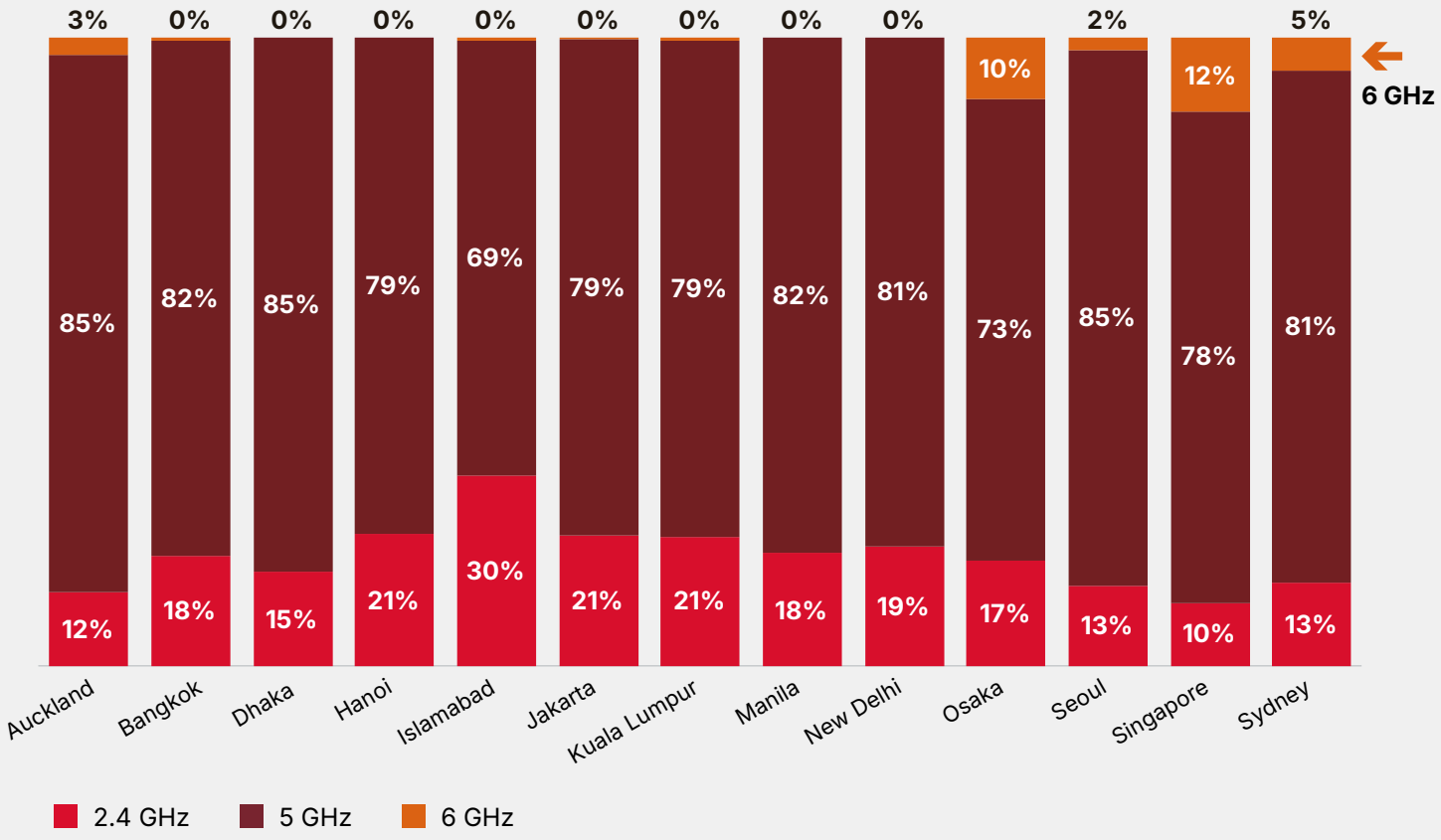


A clear pathway for Wi-Fi evolution in lower 6 GHz

GSMA Intelligence analysis of data gathered by Ookla across APAC during Q2 2026 in 13 cities shows that some countries had almost no scans using Wi-Fi 6E or Wi-Fi 7 across the 6 GHz band.[4] Most others only have single-digit percentages of total Wi-Fi scans in the 6 GHz. Even in South Korea, the only APAC country to have opened up the entire 6 GHz band (5.925-7.125 GHz) for Wi-Fi, just 2% of Wi-Fi 6 and 7 scans in Seoul were using this band.

Spectrum in the 2.4 GHz and 5 GHz Wi-Fi ranges is carrying the majority of today's APAC Wi-Fi traffic, leaving the band 5.925-6.425 GHz open to the future evolution of Wi-Fi technology.

Figure 9
Distribution of Wi-Fi 6 / 6E and Wi-Fi 7 scans by band

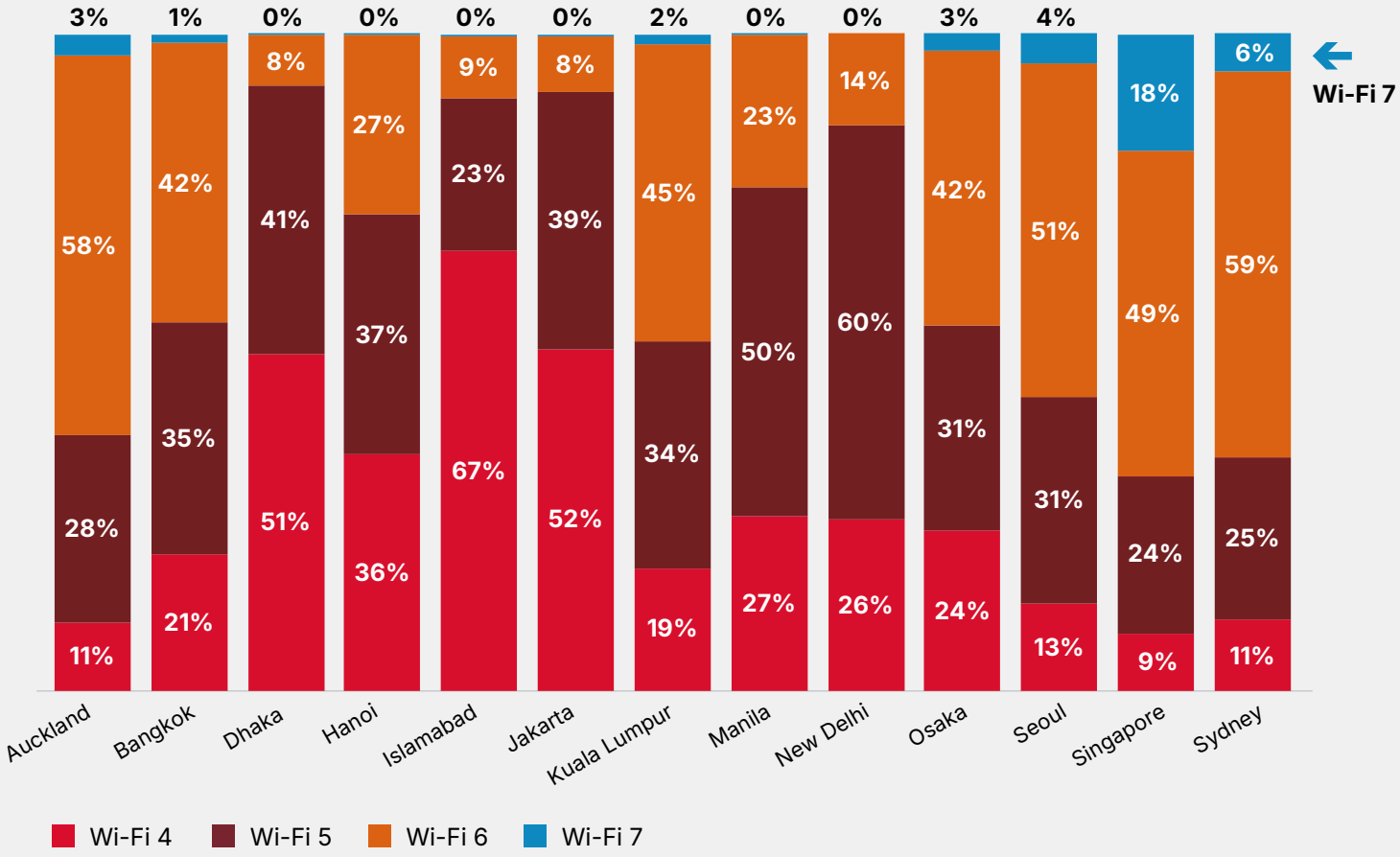


Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.

4. Across the 12 markets, the majority have made available the lower 6 GHz (5.925-6.425 GHz) available for unlicensed use, including Wi-Fi, as of Q2 2026. In South Korea, the entire 6 GHz (5.925-7.125 GHz) was made available for Wi-Fi in 2020.

Today, much of APAC still relies heavily on older Wi-Fi technologies, especially in developing markets where around a third of scans remain on Wi-Fi 4, reaching as high as 67% in Islamabad. Wi-Fi 5 usage is also extensive, ranging from 20-60%. The usage of the more spectrally efficient Wi-Fi 6 and Wi-Fi 7 varies, with higher usage among more advanced APAC markets.

Figure 10
Distribution of Wi-Fi scans by technology



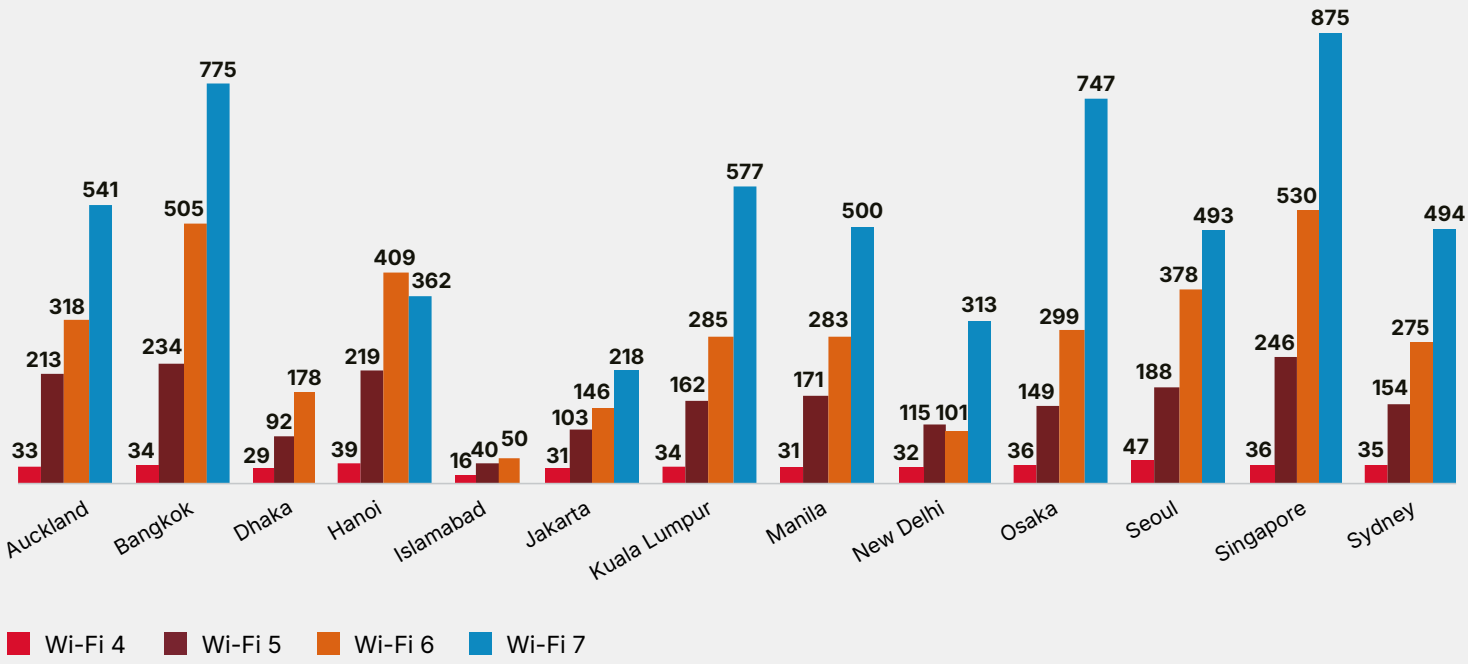
Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.

Upgrading to the latest Wi-Fi 6 and 7 technologies allows for greater efficiency, while optimising indoor deployments (for example, with additional access points, mesh network solutions and using Wi-Fi boosters) can also improve Wi-Fi quality.

Recent data also demonstrates the impact newer Wi-Fi technologies can have on delivering faster speeds using existing spectrum bands. While the lower 6 GHz band (5.925-6.425 GHz) is a new expansion band for Wi-Fi to evolve into, Wi-Fi 6 and 7 today are already providing fast user experiences using largely 2.4 GHz and 5 GHz spectrum.

It is also worth noting that even in leading markets like Singapore, the Wi-Fi 7 speed is significantly lower than the theoretical speed achievable over existing unlicensed bands (between 2.5 to 4 Gbps). Moreover, South Korea's opening of more 6 GHz spectrum to Wi-Fi has not resulted in a noticeable speed advantage. This clearly demonstrates that the amount of unlicensed spectrum is not a capacity bottleneck for Wi-Fi. Instead, Wi-Fi speeds are constrained by the maximum speed of the underlying copper, fibre or cable connection, or by the broadband package the consumer or enterprise has purchased.

Figure 11
Median Wi-Fi download speeds by technology (Mbps)



Source: GSMA Intelligence analysis of Ookla® data from Q2 2026.



Conclusion

Licensed 6 GHz spectrum can ensure that mobile connectivity will support APAC's digital goals going into the 2030s. The spectrum capacity in the lower 6 GHz band is available for Wi-Fi evolution in APAC. It is now time to ensure that mobile is given the same potential with fair and balanced regulation that allows licensed mobile access to the full upper 6 GHz band at 6.425–7.125 GHz.

6 GHz highlights

- Licensed 6 GHz capacity is required to support increasing customer demand at speeds outlined in the International Telecommunication Union's vision for 5G. It will also be required for 6G.
- Spectrum capacity needs for future deployments should consider channel sizes of 200-400 MHz.
- Mobile networks are already densified, but 6 GHz can enable the growth of sustainable mobile capacity on existing macro-cell sites.
- Timely availability of 6 GHz, at reasonable conditions and price, will drive cost-efficient network deployment, help lower the broadband usage gap and support digital inclusion.
- There is scope to improve the efficiency of unlicensed Wi-Fi spectrum use, with upgrades from Wi-Fi 4 and Wi-Fi 5 to the latest technologies and the lower 6 GHz band is an almost entirely unused space in which Wi-Fi can evolve.
- The full upper 6 GHz (6.425–7.125 GHz) should be made available to full-power macrocell IMT, without any restrictions or sharing mechanisms. Regulators should include this band in their national spectrum roadmaps for mobile and update their national frequency allocation tables accordingly.
- To enable wider harmonisation, countries are encouraged to identify the full upper 6 GHz band for IMT at WRC-27 by joining the Region 3 country footnote.



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