

INSIGHT SPOTLIGHT

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Asia Pacific is seeing a second wave of 5G rollouts, which started in the middle of 2021 with the launch of commercial 5G services in Indonesia. Several other countries, including India, Malaysia and Vietnam, are soon to follow. This comes after a first wave of 5G rollouts in the region between 2018 and 2020, which resulted in 23 commercial networks, including four fixed wireless access (FWA) networks, in 12 countries.

This activity is sparking renewed interest in mobile backhaul upgrades across the region to meet rising traffic demands. Although there is growing interest in fibre and satellite backhaul, wireless backhaul will likely remain the dominant technology in Asia Pacific. This will be underpinned by the growing role of E-band (71–86 GHz) solutions and new technical innovations to improve wireless backhaul performance.

Analysis

5G puts backhaul upgrades front and centre

As 5G users currently consume around twice as much mobile data as 4G users, the transition to 5G accelerates the need for mobile backhaul upgrades to accommodate for rising data traffic. This is particularly the case in Asia Pacific, which is already home to some of the world’s biggest users of mobile data. In India, for example, the average smartphone user consumes over 14 GB of data per month, which is 30% more than smartphone users in North America and western Europe.¹

Wireless backhaul already plays a significant role in today’s mobile infrastructure landscape, accounting for 90% of macro cell backhaul links in South and Southeast Asia. Despite growing interest in fibre and satellite backhaul, wireless backhaul is expected to remain the dominant technology in the region, accounting for more than two thirds of mobile backhaul infrastructure, on average, by 2027.²

In practical terms, operators see significant opportunities for wireless backhaul solutions to facilitate cost-effective and timely 5G deployments. As wireless backhaul requires less civil work and fewer format permits for rights of way than fibre backhaul, it can be deployed quickly to match the pace of demand for high-speed connectivity. This will help operators to commercialise 5G more quickly. Wireless backhaul also has a low capex requirement for initial deployment, making it ideal for extending 5G coverage to areas where the economics of fibre deployment can be challenging.

New solutions hold promise to meet capacity requirements

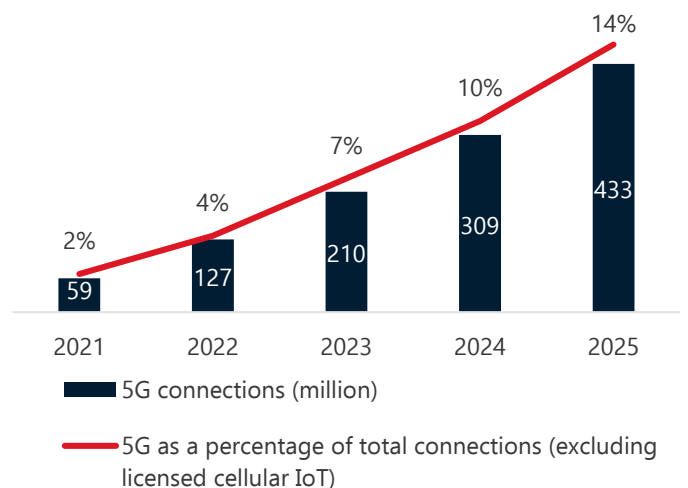
The evolution towards higher-frequency bands, with wider bandwidth and the capacity to support higher data throughput in the 5G era, such as the E-band, further underlines the value of wireless backhaul. There is growing support for the E-band from a wide range of network vendors, with many solutions integrating the latest technologies to boost the performance of wireless solutions. For example, Huawei’s 5G microwave long-reach E-band solution uses intelligent beam tracking to maintain beam stability. This enables Huawei to deploy 0.6 and 0.9 metre E-band antennas, instead of the more commonly used 0.3 metre antennas that have a more limited transmission. Other vendors, such as Siae Microelettronica, have also announced similar antenna technology for bigger E-band antennas.

Other technical solutions can also be used to improve wireless backhaul performance. For instance, cross polarisation interference cancellation (XPIC) assigns the same frequency to both the vertical and horizontal polarisation, eliminating interference from the second polarisation and potentially doubling the capacity of a microwave link. In addition, band and carrier aggregation (BCA) makes it possible to use E-band spectrum in conjunction with traditional lower-frequency bands to provide higher capacity and longer links. Further, BCA solutions evade atmospheric effects and rain fade, which helps to deliver higher-capacity coverage over a longer distance. This type of solution has been widely deployed in Europe and the Middle East and can bring significant benefits in Asia Pacific, particularly in areas prone to heavy rain.

There is also likely to be a change in backhaul network topology in the 5G era. As operators deploy additional macro cells and small cells to meet traffic demands, predominantly in urban areas, backhaul networks are expected to move from a daisy-chain topology to a star-based configuration. This allows cells to serve multiple directions, creating a more tightly knit and resilient network. While fibre will play an important role in connecting new cells, wireless backhaul will be used instead in many cases.

Source: GSMA Intelligence

5G adoption is gaining momentum in Asia Pacific* as a second wave of rollouts gets underway



* Does not include Greater China

¹ Ericsson Mobility Report June 2021

² Wireless Backhaul Evolution: Delivering next-generation connectivity, GSMA and ABI Research, 2021

Implications

Mobile operators

- **Do not underestimate transport network spend** – It is well understood that the RAN represents mobile operators' greatest network spend. Nevertheless, the level of investment required to upgrade the transport network is still significant. According to the GSMA Intelligence Operators in Focus Survey 2021, mobile operators in Asia Pacific expected to spend 19% of their overall network spend on the transport network in the next 12 months. This is only two percentage points lower than predicted spend on the service core.
- **Align RAN and backhaul upgrades** – To avoid network bottlenecks, moves to boost capacity in the access network need to be matched with an equivalent increase in transport capacity. It is therefore important that operators involve planning teams from different network segments when formulating their 5G strategies.

Network vendors

- **Maintain a broad portfolio of backhaul solutions** – Asia Pacific is a diverse geography comprised of large developing countries as well as some of the world's most advanced mobile markets (e.g. South Korea and Japan). As a result, network vendors need to tailor their solutions accordingly. Solutions based on traditional microwave spectrum and the E-band are likely to be key in markets transitioning from 3G, while the E-band and, eventually, the D-band and W-band are likely to be the most important frequency bands in advanced markets.
- **Lead with network capacity benefits** – According to GSMA Intelligence [research](#) of mobile operators in MENA, meeting the capacity requirements of 5G is the primary consideration in mobile backhaul planning. Each region is of course different, but capacity concerns being front of mind is likely to be universal. Therefore, network vendors should highlight the capacity benefits of wireless backhaul when selling to operators in Asia Pacific and elsewhere.
- **Highlight backhaul innovations** – A range of technical solutions are available to optimise the use of spectrum and enable operators to meet the capacity requirements of 5G through wireless backhaul. Examples include XPIC, BCA and integrated access backhaul (IAB). Network vendors can integrate these innovations into their latest solutions to differentiate them from competitors' products.

Regulators

- **Encourage spectrum efficiency and facilitate rapid deployments** – There are a variety of approaches for licensing backhaul bands, especially with the emergence of higher-frequency bands and dense small cell networks. Making sure the process can be efficiently managed by all parties is also crucial. Supporting longer licence durations and encouraging spectrum trading can also encourage more extensive network investment and more efficient spectrum use.
- **Spectrum licensing and regulation should promote, not discourage, innovation** – Licence fee calculations vary significantly across Asia Pacific, with formulas taking into account bandwidth, power, geographical coverage and many other factors. While some factors are appropriate to promote efficient spectrum management, they can also disincentivise investments and the adoption of new technologies. For instance, the use of bandwidth as a factor in calculating licence fees results in linear growth with channel width, which effectively punishes operators that are deploying new technologies.
- **Encourage long-term investment through predictable and timely spectrum licensing** – To support predictability, governments should publish national broadband plans, setting out targets and proposed methods for such plans to be achieved, and spectrum roadmaps that provide a schedule for forthcoming spectrum releases to meet government plans and other demands on spectrum.

Related reading

[Network Transformation 2021](#)

[The Mobile Economy Asia Pacific 2021](#)

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