

Exploring RLAN use in the 5 and 6 GHz bands

Discussion and Options Paper

Australian Communications and Media Authority (ACMA)

May 2021



Introduction

Ericsson welcomes the opportunity to respond to the Australian Communications and Media Authority's (ACMA's) 'Exploring R-LAN use in the 5 GHz and 6 GHz bands – Discussion and Options Paper' (Discussion Paper).

In summary:

- Ericsson is actively monitoring global developments in the 6GHz band.
- The 6GHz band is a strong candidate to meet the forecast additional spectrum needs in the 2025 - 2030 timeframe.
- Multiple 100MHz wide channels in mid bands will be required per operator in the 2025-2030 timeframe.
- Ericsson considers mid-band spectrum, and in particular 6GHz, as essential to realise the 5G vision.
- With limited prospect of new 100MHz allocations of contiguous channels below 4.2 GHz in Australia, Ericsson believes the 6GHz band will be critical to provide additional spectrum for operators to meet projected forecast growth on mobile data demand.
- Ericsson recommends that the ACMA:
 - consider IMT use in the 6425-7125 MHz band.
 - wait on progressing with any allocation until the conclusion of the WRC-23 process.

Spectrum demand

Ericsson recognises the need for new spectrum allocations by many and varied interested parties.

To meet forecast demand, we understand mobile network operators (MNOs) have a requirement for additional mid-band spectrum in the medium term for 5G.

We also acknowledge requests for new spectrum allocations to support radio local area networks (R-LAN).

Ericsson considers that both of these objectives can be achieved as part of an allocation process for the 6GHz band.

Ericsson does not support the comment in the **Discussion Paper** that:

"..... a clear case for wide-area International Mobile Telecommunications (IMT) in either band is yet to develop." ¹

By 2026 Ericsson forecasts² that 5G networks will carry 54% of total data traffic, with 3.5 billion 5G subscriptions. This will in turn create demand for hundreds of MHz of additional IMT spectrum for future 5G use.

¹ Exploring R-LAN use in the 5 GHz and 6 GHz bands – Discussion and Options Paper', page 10

² [Ericsson Mobility Report November 2020](#)



The ACMA have agreed with AMTA members on the need for additional mid-band spectrum to support future demand for 5G.

However, to date, no allocations of large, contiguous, wide area spectrum blocks below 4.2 GHz have been proposed. Ericsson considers the 6 GHz band may fill that void.

Market Update

The November 2020 Ericsson Mobility Report found that despite COVID-19 related uncertainties, the pace of introducing new 5G functionality increased in 2020 in both network and device domains.

For example, mobile network data traffic globally grew 50 percent between Q3 2019 and Q3 2020.

The GSMA reported 220 million 5G subscriptions at the end of 2020.²

As of April 2021, there were 140 live 5G networks globally, 703 5G devices, 25% of the population covered, and 751,000 new 5G connections each day.³

In terms of forecast growth, by 2026:

- 5G networks will carry more than half of the world's mobile data traffic.
- In South East Asia and Oceania, 5G subscriptions will account for more than 30 percent of all mobile subscriptions, compared with 40 percent of all mobile subscriptions worldwide.
- FWA connections will reach more than 180 million and account for a quarter of all mobile network data traffic globally. *(Out of these, 5G FWA connections are expected to grow to more than 70 million by 2026, representing around 40 per cent of total FWA connections.)*
- Over the long term, traffic growth will be driven by both the rising number of smartphone subscriptions and an increasing average data volume per subscription, fueled primarily by more viewing of video content, with higher resolution and the adoption of immersive consumer services e.g. VR and AR.
- Video traffic currently accounts for 66 per cent of all mobile data traffic and is forecast to account for 77 percent of all mobile data traffic by 2026.⁷

Role of 6GHz to meet forecast demand for IMT

In December 2020, Coleago released a report entitled "**IMT spectrum demand – Estimating the mid-bands spectrum needs 2025-2030 timeframe**"⁴ which was endorsed by the GSMA (GSMA Report).

The **GSMA Report** concluded that:

- An additional 1000 to 2000 MHz of spectrum in the upper mid-bands would enable operators to deliver ITU-R, IMT-2020 user experience city-wide and also deliver smart cities in an economically feasible manner.

³ Ericsson Mobility Report, GSMA

⁴ [GSMA | IMT Spectrum Demand: Estimating the mid-bands spectrum needs in the 2025-2030 timeframe - GSMA Europe](#)



- In rural areas, upper mid-band spectrum can provide the high capacity needed, for fixed wireless access broadband, where mmWave can't reach or where there is restricted output power.
- Multiple 100MHz wide channels in mid bands will be required per operator, in the 2025-2030 timeframe.
- Deploying 5G in wide channels (e.g. 100MHz and greater) drives down the cost / bit and lowers total cost of ownership.

Issues for Comment

Ericsson's response to selected issues for comment are provided below.

1. What is the demand for spectrum for R-LAN use in the 6 GHz band (5925–7125 MHz)?

Please refer to response under 'Demand for Spectrum' above.

2. Should the ACMA proceed, as proposed, to consult on a formal variation to the LIPD class licence that adds the frequency range 5925–6425 MHz for RLAN use, bounded by the parameters described in the ACMA's preliminary view section of this paper?

Ericsson recognises the need for new spectrum allocations by many and varied interested parties.

To meet forecast demand, we understand mobile network operators (**MNOs**) have a requirement for additional mid-band spectrum in the medium term for 5G.

We also acknowledge new spectrum allocations for radio local area networks (**R-LAN**).

Ericsson considers that both of these objectives can be achieved as part of an allocation process for the 6GHz band by allocating part of the band for RLAN and reserving other part for 5G.

3. If class licensing arrangements are to be made in the lower 6 GHz band (by variation to the LIPD class licence), should alternative/additional power limits and/or other conditions be considered?

While Ericsson is not opposed to additional power limits, we believe Automatic Frequency Coordination (**AFC**) efficiency is yet to be proven. In particular, we request the ACMA undertake a study of the protection criteria and methodology for protection of fixed services.



4. **Is it appropriate to consider inclusion of the upper 6 GHz band (6425–7125 MHz) in the LIPD class licence or should this be deferred to monitor future developments (for example, in the wide-area International Mobile Telecommunications (IMT) space) as outlined in the ACMA’s preliminary view? We invite comments from submitters on the utility of the band for IMT use. We recommend following developments in the IMT space.**

As noted in response to Question 2, Ericsson considers that an allocation of 5925-6425 MHz for R-LAN and 6425-7125 MHz for IMT would result in a balanced approach.

Indeed, additional spectrum is required in the timeframe 2025-2030 as per Coleago study.⁵

Additional spectrum in the mid-bands range is necessary to deliver the 5G ITU vision as well as to deliver smart cities and support a reduction in global carbon emissions.

This report estimates a need of 1-2 GHz of additional spectrum. Potential spectrum in the mid-band range, for this time frame, is very limited, and an allocation in the 6 GHz band is critical.

Should standard power (that is, higher power devices, including for outdoor use) operating under a dynamic spectrum access system such as the automatic frequency coordination (AFC) system adopted in the USA, be adopted in Australia for some or all of the 6 GHz band? Is there an appetite and capability for industry to provide the necessary systems to enable such use? We welcome views and evidence on the commercial and technical feasibility of introducing AFC systems in the band.

Where unlicensed devices are being deployed, our first priority is the protection of existing and future fixed links.

For considerations of RLAN power, in the lower 500MHz, that may interfere with fixed services, we recommend defining exclusion zones based on a protection criteria of $I/N = -X$ dB (eg. -10dB) and the usage of “free space loss” propagation models.

We recommend a requirement for registration for any outdoors power higher than 14 dBm and indoors power above 23dBm.

Note that the efficiency of AFC to protect fixed services as proposed by the Federal Communications Commission (FCC) is still to be proven.

⁵ [GSMA | IMT Spectrum Demand: Estimating the mid-bands spectrum needs in the 2025-2030 timeframe - GSMA Europe](#)



Summary

Ericsson recognises the need for additional spectrum for both licensed and unlicensed users.

Ericsson recommends that the ACMA wait for decisions in the 6425-7125 MHz band, follow the WRC-23 process and consider IMT use in this band.

Ericsson bases its position on projected mid-band spectrum needs by operators both mobile broadband (including FWA) and other use cases, e.g. Smart cities.