



# **Ericsson Submission to the ACMA's consultation on local area networks (RLANs) in the 6 GHz band - 37/2021**

**December 2021**



## Introduction

Ericsson welcomes the opportunity to respond to the Australian Communications and Media Authority's (ACMA's) '**Radio local area networks (RLANs) in the 6 GHz band - consultation 37/2021**' (Consultation Paper).

In summary:

- Ericsson considers mid-band spectrum and in particular 6GHz as essential to realise the 5G vision.
- We are actively monitoring global developments in the 6GHz band.
- The 6GHz band is a strong candidate to provide the additional spectrum needs to meet strong forecast demand in mobile broadband in the 2025 - 2030 timeframe.
- Multiple 100MHz wide channels will be required per operator, in the mid-bands, for the 2025-2030 timeframe.
- We continue to recommend the ACMA follow developments towards WRC-23 before allocating any spectrum in 6425-7125 MHz and consider potential IMT use in this band.
- If there is a strong demand for additional RLAN usage, we recommend the ACMA consider the lower part of the band and take into consideration protection of incumbents and in particular Fixed Services (FS).
- Ericsson notes the GSMAi will host a seminar on the socioeconomic benefits of both radio local area networks (**RLAN**) and International Mobile Telecommunications (**IMT**) different allocations in the 6 GHz by **RLAN** and/or IMT on 22 January 2022.<sup>1</sup>
- Ericsson supports the submission made in response to the Consultation Paper made by the Australian Mobile Telecommunications Association (**AMTA**).

## The need for spectrum

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

To meet forecast demand for mobile data, 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 (**RLAN**).

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

By 2027, 5G is expected to cover 75% of the world's population and carry 62% of global mobile traffic.<sup>2</sup> This will in turn create demand for hundreds of MHz per operator of additional IMT spectrum for future 5G use.

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<sup>1</sup> <https://www.linkedin.com/video/event/urn:li:ugcPost:6869568552186191872/>

<sup>2</sup> [Ericsson Mobility Report November 2021](#)



## **Market Update**

The November 2021 Ericsson Mobility Report<sup>3</sup> found that:

- 5G has cemented its position as the fastest deployed mobile technology generation to date, with an updated estimate of 660 million 5G subscriptions by the end of 2021.
- By the end of 2027, 4.4 billion 5G subscriptions are now forecast to represent roughly half of all mobile subscriptions at that time.
- Mobile data traffic in Q3 2021 alone was more than all mobile traffic ever generated up until the end of 2016.
- Broadband IoT has now surpassed 2G/3G as the segment with the largest share of IoT applications.
- Currently, video traffic is estimated to account for 69 percent of all mobile data traffic, a share that is forecast to increase to 79 percent in 2027.

## **Role of 6GHz to meet forecast demand for IMT**

In July 2021, GSMA released a report “Estimating the mid-band spectrum needs in the 2025-2030 time frame”<sup>4</sup> that concluded:

- An average of 2 GHz of mid-band spectrum would enable operators to deliver ITU-R, IMT-2020 user experience in urban areas to deliver eMBB and also address smart sustainable cities.
- IMT-2020 requirements will be at risk with less spectrum. That it, insufficient spectrum for IMT-2020 means:
  - significantly more base stations
  - increase the total cost of networks by 3-5x, where densification is possible
  - additional carbon footprint 1.8-2.9x higher than without sufficient spectrum.
- The additional spectrum in mid-bands will allow each cell site to support 3.5-6x more homes with 5G FWA.
- This would create significant cost-savings in network roll-out and drive affordable connectivity in areas where other broadband solutions are not economically viable.

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<sup>3</sup> [Ericsson Mobility Report November 2021](#)

<sup>4</sup> [GSMA | 5G Mid-Band Spectrum Needs - Vision 2030 - Spectrum](#)



## Issues for Comment

Ericsson's response to selected issues raised in the Consultation Paper are provided below.

### General comments

***"We are proposing to update the Radiocommunications (Low Interference Potential Devices) Class Licence 2015 (LIPD Class Licence) to authorise use of RLANs in the range 5925–6425 MHz (the lower 6 GHz band). These proposed new LIPD Class Licence arrangements for low power indoor and very low power devices were set out in the April 2021 consultation paper, with industry responses either supporting or not opposing them."***<sup>5</sup>

- Ericsson understands the need for additional RLAN spectrum due to existing WiFi bands being congested. This occurs partly due to the unlicensed / adhoc nature of cell deployment, combined with the inefficient spectrum use of the technology deployed.
- Ericsson proposes a balanced approach to the 6GHz band where the lower 6GHz is allocated to RLAN and the upper 6GHz is allocated to IMT in areas where FS and FSS is not in use.

***"If implemented, these changes to the LIPD Class Licence will make the 500 MHz of the lower 6 GHz band available for RLANs in the near term for low power indoors and very low power devices."***<sup>6</sup>

- The AMTA Policy Position Paper – "Spectrum for 5G and Beyond"<sup>7</sup> states:  
*"Importantly, the total allocation of mid-band spectrum to LIPD/Wi-Fi services was comparable to the entire allocation of IMT spectrum to mobile operators (i.e., 630 MHz versus 668 MHz) prior to the assignment of the 3.6 GHz and mmWave band. Following the allocation of an additional 500 MHz in the lower 6 GHz band to LIPD/Wi-Fi uses, the total amount of spectrum of allocated to such services (a total of up to 1,130 MHz) will greater exceed the total amount of IMT spectrum allocated to all Australian mobile operators including the 3.6 GHz band licences."*
- With Wi-Fi offload decreasing as 4G and 5G technologies providing a superior experience in addition to reduced eMBB data costs, the case for RLAN in the upper 6GHz to be used for additional capacity is not apparent. In contrast multiple studies (GSMA<sup>8</sup>, Windsor Place Consulting<sup>9</sup>, AMTA Policy Position Paper<sup>10</sup>, Coleago Report Demand for Mid Band

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<sup>5</sup> [Proposed updates to the LIPD Class Licence for 6 GHz RLANs, Consultation paper](#), page 1

<sup>6</sup> [Proposed updates to the LIPD Class Licence for 6 GHz RLANs, Consultation paper](#), page 1

<sup>7</sup> <https://amta.org.au/wp-content/uploads/2021/12/AMTA-Policy-Position-Paper-Spectrum-for-5G-and-Beyond-Nov-2021.pdf>

<sup>8</sup> <https://www.gsma.com/spectrum/wp-content/uploads/2021/07/Estimating-Mid-Band-Spectrum-Needs.pdf>

<sup>9</sup> [https://www.mcmc.gov.my/skmmgovmy/media/Spectrum-File/23b\\_WPC.pdf](https://www.mcmc.gov.my/skmmgovmy/media/Spectrum-File/23b_WPC.pdf)

<sup>10</sup> <https://amta.org.au/wp-content/uploads/2021/12/AMTA-Policy-Position-Paper-Spectrum-for-5G-and-Beyond-Nov-2021.pdf>



Spectrum in Australia<sup>11</sup>) have shown a need for additional mid-band spectrum for 5G of 2GHz.

***“These technologies will represent a step up in local wireless delivery through significant latency reduction, increased speed and greater capacity, which will partially or fully address the ‘weakest link’ problem of terminal-end wi-fi choking the significant capacity that can be delivered by modern wired (for example, fibre) broadband networks.<sup>12</sup>”***

- If all these improvements stated come to fruition, Ericsson believes this supports the case for the upper 6GHz to be assigned for IMT use. There will not be a need for more RLAN spectrum. If the “step up” is not achieved, then allocating spectrum in the upper 6GHz for RLAN would result inefficient use of valuable spectrum.
- Ericsson rejects the argument that the upper 6GHz is needed for RLAN when it hasn’t yet been used in lower 6GHz. With Wi-Fi 6 supporting 1Gbps in an 80 MHz channel, there has not been a use case put forward that supports more than the proposed 500MHz lower 6GHz band being allocated to RLAN when cell sizes are so small compared to IMT. The main reasons given for RLAN requiring more spectrum than IMT in mid-bands are:

- **Public WiFi**

Considering the low power of RLAN, and therefore the small radius of a cell, only high-density hotspots would be likely to take advantage of the capacity of the lower 6GHz band plus existing Wi-Fi bands. Ericsson believes that outside central business districts, stadiums and convention centres, this spectrum would be wasted by not being deployed or being significantly under-utilised.

Unlike the 3G era where Wi-Fi could offer a better user experience, 5G now offers superior performance to Wi-Fi and users no longer need to connect to Public WiFi networks. This is also due to the additional steps that may be required to switch from IMT and security concerns around Wi-Fi networks in general.

The Ericsson Consumer Lab<sup>13</sup> found 20% of users that have upgraded to 5G have reduced WiFi usage, while 10% of users stopped using WiFi all together.

An example of this is from the Republic of South Korea.

The Ministry of Science and ICT report shows decreased use of WiFi offload. South Korea was one of the first markets to launch

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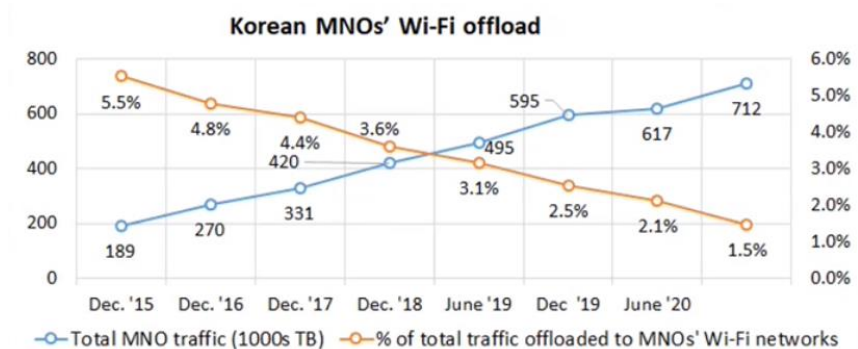
<sup>11</sup> <https://amta.org.au/wp-content/uploads/2021/12/Coleago-Report-Demand-for-mid-bands-spectrum-in-Australia.pdf>

<sup>12</sup> [Proposed updates to the LTPD Class Licence for 6 GHz RLANs, Consultation paper](#), page 1

<sup>13</sup> <https://www.ericsson.com/49944f/assets/local/reports-papers/consumerlab/reports/2021/five-ways-to-a-better-5g-report.pdf>



5G and has achieved significant 5G growth. There is now more than 90% population coverage of 5G, used data traffic use is 27GB/month (Aug 21) and 57% of all mobile broadband traffic is on 5G. There has been a steady downward trend of WiFi offload traffic in South Korea.



#### - VR headsets and alike

Ericsson believes that mmWave is more appropriate for short range communications requiring large channels for these use cases. The 6GHz band, should be used for wider areas cells and longer distance Fixed Services which in many cases are not possible with mmWave.

The mobile industry uses mmWave (above 24 GHz) spectrum for high-capacity use cases in smaller areas and we expect the same by other industries for efficient use of spectrum.

Mid-bands are vital for wide-area coverage and there is no alternate.

#### - Enterprise

It is Ericsson's view that the enterprise market will mainly require IMT and in some specific cases may be complemented by RLAN where best effort is good enough.

Both technologies are expected to be low risk to FS and FSS existing services under this indoor scenario.

- The use of unlicensed / LIPD devices that can reduce interference potential by using a *listen before talk* system, do not provide for low latency communication. Ericsson argues that only Ultra-Reliable Low-Latency Communications (URLLC) provided by 5G can deliver for Time Critical Communications (TTC) in a licensed band.
- Ericsson supports the decision not to propose changes to the LIPD Class License to support RLAN in the Upper 6 GHz.



- In relation to the LIPD rules in the lower part, if the ACMA takes a decision to proceed with RLAN, we would suggest consideration of ECC DEC (20)01 in Europe and the limitation of low power indoors to 23dBm instead of 24dBm. Any power above 23dBm indoors and 14 dBm outdoors will increase the interference to FS.

### Lower 6GHz

#### **Q3. Are there any broader comments on the proposed update to the LIPD Class Licence?**

Ericsson strongly recommends consideration of LIPD devices in the lower 6 GHz band, should have an appropriate specified RF performance which allows them to co-exist with transmitters and receivers in the Upper 6GHz band.

As the AFC system is not yet main-stream, Ericsson has reservations about this technique providing protection to FS . As a vendor of fixed link equipment, we recommend an interface protection threshold.

### Upper 6GHz

- The 6GHz Consultation Paper states that the ACMA:  
*"do not currently intend to wait for WRC-23 outcomes and any subsequent global adoption."<sup>14</sup>*
- Although Ericsson opposes this position, there is still an opportunity for the ACMA to follow the studies that will be input to WRC-23 decisions and ensure existing services are protected.
- The work that ITU-R is doing to protect FS and FSS is vital. The Consultation Paper provides *some* reasons why WRC-23 agenda item 1.2 outcomes may not impact the potential decision on use of 6GHz upper band. However, this should not be used as a justification for why the ACMA should proceed to a decision before WRC-23.
- The Consultation Paper also states that:  
*"indeed, how other major international jurisdictions choose to use the band will provide a better gauge than studies under/outcomes of that agenda item."<sup>15</sup>*
- Ericsson understands that the ACMA would prefer to align with the decision of other jurisdictions on the upper 6GHz band. However, Ericsson's understanding is that the vast majority of countries are adopting to wait for WRC-23 outcomes before proceeding to make a decision. Ericsson recommends the ACMA align with the majority view and await WRC-23 outcomes.
- A further point to consider is that it is not practically possible to remove all LIPD devices if unlicensed RLAN was allowed in the upper 6 GHz band

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<sup>14</sup> [Proposed updates to the LIPD Class Licence for 6 GHz RLANs, Consultation paper](#), page 18

<sup>15</sup> [Proposed updates to the LIPD Class Licence for 6 GHz RLANs, Consultation paper](#), page 18



and the ACMA subsequently found that 1200MHz of RLAN spectrum in 6GHz was underutilised.

- Fundamentally, unlicensed / LIPD (RLAN) and licensed spectrum do not work together because they work on different network design principles. Licensed spectrum users provide a quality of service which is compromised when unlicensed devices share the same spectrum.
- Allowing indoor only use does not work as protection to licensed users as there is no mechanism to stop a LIPD device being taken outdoors.
- Ericsson suggests that if the ACMA wish to proceed with investigating the Upper 6 GHz band for this IMT use, then this could start prior to WRC-23 using the studies that will support WRC-23.
- In regard to studies being completed, we recommend the ACMA follow these studies to ensure Australia is aligned to the global conclusion on FSS UL protection - this a global not a domestic issue. We can see support to release the band to 5G NR across all sub-regions in Region 1 (R1) and also outside R1 and this will create and drive the ecosystem.
- From Ericsson's experience, when a FS band is made unlicensed, investment can be expected to decline. This is due to a lack of certainty regarding the availability of spectrum and secured quality of service. Even with AFC implemented, Ericsson is not convinced that co-existence will work. The industry is still waiting to understand how AFC will perform in reality and there are concerns about fixed links and co-existence that are still unresolved.
- Ericsson would keenly await the technical requirements from ACMA, for this band, so ACMA compliant equipment can be investigated.
- Globally, the 6GHz band is one of Ericson highest priorities. We note a recommendation<sup>16</sup> for IMT use to be considered in Dec 2021.
- Ericsson supports the use of appropriate licensing (such as apparatus, AWL, etc) to provide protection of existing and future services in this band.
- When looking at the greater Melbourne area for example, the licence register shows six links in the upper 6GHz. If this spectrum was used for IMT, the same area would have hundreds of sites registered. The utilisation of the upper 6 GHz with IMT would be much greater than today for frequency reuse and would have greater geographic coverage than existing services or potential RLAN. Note that this is not a proposal but rather an example of the benefits of IMT.

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## **Conclusion**

Ericsson recognises the need for additional spectrum for both licensed and unlicensed users. While the US is allocating all 1200MHz of the 6GHz band to RLAN, in contrast, China plan to use the whole band for IMT. Ericsson, however, consider a balanced approach of spectrum for both technologies is the most appropriate approach and in line with Europe.

We support ACMA progressing with 6GHz spectrum allocation for both RLAN and IMT uses, with a balanced approach where the lower band is used for RLAN and the upper band for IMT. This approach should utilise studies that will support WRC-23 decisions for protection of existing services.

A wait and see approach, in regard to WRC-23 outcomes, is also supported by Ericsson and in-line with the approach of the majority of other jurisdictions. This would also allow time to see if the purported demand for RLAN spectrum needs - beyond the proposed 500 MHz in lower 6GHz band - by the Wi-Fi community materialise.

Ericsson bases its position on projected mid-band spectrum demand by operators and protection needs of existing services currently occupying the 6 GHz band.