



Allocation limits advice for the 3.8 GHz to 3.95 GHz area-wide apparatus licences allocation

Public version

September 2023

Acknowledgement of country

The ACCC acknowledges the traditional owners and custodians of Country throughout Australia and recognises their continuing connection to the land, sea and community. We pay our respects to them and their cultures; and to their Elders past, present and future.

Australian Competition and Consumer Commission

Land of the Ngunnawal people

23 Marcus Clarke Street, Canberra, Australian Capital Territory, 2601

© Commonwealth of Australia 2023

This work is copyright. In addition to any use permitted under the Copyright Act 1968, all material contained within this work is provided under a Creative Commons Attribution 3.0 Australia licence, with the exception of:

- the Commonwealth Coat of Arms
- the ACCC and AER logos
- any illustration, diagram, photograph or graphic over which the Australian Competition and Consumer Commission does not hold copyright, but which may be part of or contained within this publication.

The details of the relevant licence conditions are available on the Creative Commons website, as is the full legal code for the CC BY 3.0 AU licence.

Requests and inquiries concerning reproduction and rights should be addressed to the Director, Content and Digital Services, ACCC, GPO Box 3131, Canberra ACT 2601.

Important notice

The information in this publication is for general guidance only. It does not constitute legal or other professional advice, and should not be relied on as a statement of the law in any jurisdiction. Because it is intended only as a general guide, it may contain generalisations. You should obtain professional advice if you have any specific concern.

The ACCC has made every reasonable effort to provide current and accurate information, but it does not make any guarantees regarding the accuracy, currency or completeness of that information.

Parties who wish to re-publish or otherwise use the information in this publication must check this information for currency and accuracy prior to publication. This should be done prior to each publication edition, as ACCC guidance and relevant transitional legislation frequently change. Any queries parties have should be addressed to the Director, Content and Digital Services, ACCC, GPO Box 3131, Canberra ACT 2601.

ACCC 09/23

www.accc.gov.au

Contents

Executive summary	3
1. Background.....	6
1.1. Request for allocation limits advice.....	6
1.2. Allocation limits are usually necessary to promote competition	8
1.3. The ACCC’s advice looks to promote competition, investment and innovation.....	8
2. The 3.8 GHz band allocation	10
2.1. The ACMA has proposed two allocation options	11
3. Competition assessment.....	14
3.1. Relevant markets.....	14
3.2. State of competition in relevant markets	16
3.3. Relevant existing holdings	20
4. Allocation limits are necessary to promote competition	23
4.1. The ACCC supports the proposed zero MHz limit on the MNOs and NBN Co	23
4.2. The ACCC supports the zero MHz limit be imposed for at least 12 months	25
4.3. The ACCC supports the ACMA’s proposed associates policy.....	26
4.4. The ACCC supports cross-band limits of 140 MHz in metropolitan areas and 160 MHz in regional areas	27
4.5. The ACCC supports the cross-band limits be imposed for the duration of the allocation process	29
4.6. The ACCC does not have views on the proposed allocation quantum policy	30
Glossary of Terms	32

Executive summary

The Australian Communications and Media Authority (ACMA) has requested the ACCC's advice on whether allocation limits should be imposed on the administrative issue of area-wide apparatus licences (AWLs) in the 3.8 GHz band in metropolitan and regional areas, and if so, the nature of those limits. The ACMA has requested this advice by 30 September 2023.

Radiofrequency spectrum is a scarce and finite resource that is an essential input for the provision of wireless services, such as mobile services and satellite communications, in downstream markets. The 3.8 GHz band is suitable for the provision of a range of services including 4G and 5G mobile services on public or private networks, fixed wireless services, point-to-point services, and fixed satellite services.

There is a limited amount of available spectrum and supply may not accommodate all potential demand for the spectrum. Given this, the ACMA has sought the ACCC's views on the proposed use of allocation limits in the following manner:

- a zero MHz limit on wide area wireless broadband (WA WBB) service providers, i.e. the national mobile networks operators (MNOs) and NBN Co, for a defined period, which enables other users such as local area wireless broadband (LA WBB) service providers to have priority access to the spectrum;
- after the cessation of the zero MHz limit, a cross-band limit that applies across the 3.4–3.95 GHz band, with such a limit intended to align with those imposed for the related 3.4 GHz and 3.7 GHz bands auction scheduled for October 2023;
- an allocation quantum policy (of 50MHz, 60 MHz, or 70 MHz) that applies to all applicants, which sets the maximum aggregate amount of spectrum that could be used under the AWLs.

ACCC assessment

We have conducted our assessment of whether allocation limits are required having regard to whether they are likely to achieve the following objectives:

- promoting competition in downstream markets for the long-term interests of end-users which facilitates efficient use of spectrum, and encouraging investment in infrastructure including in regional Australia;
- supporting the deployment of new and innovative technology, including 5G.

We have identified the following relevant markets for the purpose of our assessment:

- the mobile services market;
- the fixed broadband market; and
- the private wireless enterprise market.

State of competition in the relevant markets

We consider this allocation will have the most impact on the private wireless enterprise market where the MNOs compete with non-MNO providers of private wireless networks. Currently, there are limited or no suitable spectrum that can be accessed by non-MNO users to deploy private wireless networks in metropolitan and regional areas. This means that the MNOs have a significant competitive advantage due to their substantial spectrum-licensed holdings in these areas as well as opportunities to acquire additional spectrum in the 3.4

GHz and 3.7 GHz bands auction. The MNOs' ability to compete in this market would not be constrained even if they do not acquire spectrum in this allocation.

On the other hand, this allocation could potentially remove a key barrier to entry for non-MNO providers of private wireless networks in metropolitan areas and enhances their ability to deploy networks in regional areas, thus enabling them to more effectively compete with the MNOs in these areas. Conversely, if they are unable to acquire the spectrum they need in this allocation, their ability to compete with the MNOs in these areas will continue to be constrained. Providing non-MNO users with sufficient opportunities to acquire the spectrum they need will therefore likely promote competition and infrastructure investment, as well as incentivise all providers in the market to deploy new and emerging technologies such as 5G.

The national MNOs have substantial holdings, mostly via spectrum licences, which they use to provide public mobile services. While this allocation provides opportunities for them to acquire additional spectrum which can be used to improve their networks, it is unlikely that their ability to compete in the mobile services market would be constrained if they do not acquire spectrum in this allocation. Similarly, the MNOs will have opportunities to acquire additional spectrum in the upcoming 3.4 GHz and 3.7 GHz bands auction scheduled for October 2023.

In the fixed broadband market, NBN Co and MNOs are increasingly competing with each other (albeit indirectly as NBN Co does not directly operate in the retail market). Due to NBN Co and the MNOs' substantial existing holdings and the opportunities to acquire more spectrum in the 3.4 GHz and 3.7 GHz bands auction, [c-i-c] [REDACTED] [c-i-c], we do not consider that their ability to compete in this market would be constrained if they do not acquire spectrum in this allocation. On the other hand, this allocation provides opportunities for smaller fixed wireless operators to acquire spectrum for the purpose of providing localised fixed wireless services which will likely enhance their ability to compete in the market.

The ACCC supports the ACMA's proposed allocation limits

As noted above, the MNOs are able to deploy private wireless networks using their substantial existing holdings of spectrum, unlike non-MNO private network providers. Given this material competitive advantage in spectrum, we consider that allocation limits are required to provide sufficient opportunities for non-MNO providers to acquire the spectrum they need to better compete in this market in metropolitan and regional areas.

Therefore, the ACCC supports the ACMA's proposed zero MHz limit to apply to the MNOs and NBN Co for a defined period from the commencement of the allocation process, to give other providers a priority access period. The ACCC recommends that the ACMA considers a defined period of at least 12 months to maximise opportunities for non-MNO providers to acquire spectrum, as spectrum needs for these use cases are likely to arise over time rather than at a single point in time.

The ACCC does not consider that the use of allocation principles in a general allocation window to prioritise local area wireless broadband service providers would promote competition, investment and innovation to the same extent as the zero MHz limit. This is because this option would not provide the same levels of transparency, certainty and time necessary for these providers to be able to take advantage of the priority afforded to them.

The ACCC also supports the ACMA's proposed cross-band limits to apply after the cessation of the zero MHz limit and that this limit aligns with the cross-band limits applied for the 3.4 GHz and 3.7 GHz bands auction, i.e. 140 MHz in metropolitan areas and 160 MHz in regional areas, across the 3.4–3.95 GHz band. A consistent set of cross-band limits across the two

allocations precludes bidders who have acquired up to the limits in the auction from acquiring the 3.8 GHz AWLs and allows less successful bidders to 'top up' their spectrum using AWLs. The ACCC recommends that the ACMA imposes the cross-band limits for the duration of the allocation process, with a review after a period of 3–5 years if there remains spectrum available for allocation by that time.

We have not provided views on the quantum of the ACMA's proposed allocation quantum policy. As the quantum is usually based on the spectrum requirements of likely use cases, the ACCC considers that ACMA is best placed to assess this issue.

1. Background

1.1. Request for allocation limits advice

The Australian Communications and Media Authority (ACMA) wrote to the Australian Competition and Consumer Commission (ACCC) in February 2023 requesting advice on whether allocation limits (allocation limits) should be imposed on area-wide apparatus licences (AWLs) to be issued in the 3.8–3.95 GHz band (3.8 GHz band) in metropolitan and regional areas, and if so, the nature of those limits.¹

The ACMA is planning to allocate parts of the 3.4–4.0 GHz band through a mixture of spectrum and apparatus licensing arrangements in 2022 and 2023. The issuing of apparatus licenses in the 3.8 GHz band is the third of a suite of four allocations as part of this broader process. The ACCC has previously provided allocation limits advice for the issuing of apparatus licences in the 3.4–4.0 GHz band in remote areas and the allocation of spectrum licences in the 3.4 GHz and 3.7 GHz bands in metropolitan and regional areas.²

In its request, the ACMA noted that the 3.8 GHz band allocation is likely to be of interest to a mix of existing and new use cases, including local area wireless broadband services (LA WBB), point to point (PTP) services, fixed satellite services (FSS) and wide area wireless broadband services (WA WBB). Noting the limited quantum of spectrum available, the ACMA considered that the available spectrum is unlikely to be sufficient in all areas to support expected demand from all of these services. Given that the WA WBB service operators (the mobile network operators (MNOs) and NBN Co) have been given the opportunity to acquire spectrum at the 3.4 GHz and 3.7 GHz bands auction scheduled for late 2023, the ACMA considered that allocation limits and policy settings are likely appropriate to prioritise LA WBB, PTP and FSS use cases in the 3.8 GHz band. As such, the ACMA considered that the primary objective of allocation limits for the 3.8 GHz band allocation is to support a range of users and use cases in particular localised contexts.

The ACMA requested the ACCC's views on its proposed use of allocation limits under section 102G of the *Radiocommunications Act 1992* as follows:

- an allocation limit of zero MHz to be imposed on NBN Co and the MNOs for a specified period of time (for example, 6 months) from the commencement of the allocation process, to provide the LA WBB providers with a priority access period (priority access period); and
- following the cessation of the proposed zero MHz limit, cross-band limits in the 3.4–3.95 GHz band to be imposed that align with the limits imposed for the 3.4 GHz and 3.7 GHz band auction, for a period of greater than 12 months commencing the first time NBN Co and the MNOs are able to apply for spectrum in these bands.

In addition to these allocation limits, the ACMA also sought the ACCC's views on the proposed application of an allocation quantum policy to in-band spectrum for a period of 12 months from the commencement of the initial application window on all applicants. This allocation quantum policy would indicate a maximum aggregate of spectrum that could be

¹ ACMA, [Letter to the ACCC on allocation limits for 3.8–3.98 GHz band apparatus licences](#), February 2023.

² See ACCC [Spectrum Competition Limits](#).

used by a licensee under an AWL, noting that the ACMA would have the flexibility to issue a licence of greater than this quantum if the situation justifies doing so.³

The ACMA indicated its intention to consult on these proposals as part of a draft Application Information Pack in May 2023. The ACMA requested that the ACCC provide its preliminary views on these proposals by 27 March 2023 and substantive advice by 30 September 2023.

On 23 March 2023, the ACCC wrote to the ACMA providing its preliminary views on the ACMA's proposed use of allocation limits for the issuing of AWLs in the 3.8 GHz band.⁴ The ACCC acknowledged the ACMA's intention to use allocation limits to achieve a wider suite of policy objectives, including to support a range of users and use cases in particular localised contexts. The ACCC also noted that the use of cross-band limits following the cessation of the zero MHz limit may also promote competition and encourage investment, including in discrete areas of regional Australia.

In addition, the ACCC indicated that it intends to rely on submissions to the ACMA's consultation process to inform its views on the allocation limits advice and to undertake further targeted consultation where necessary.

On 20 June 2023, the ACMA released a consultation paper (ACMA Consultation Paper) seeking views on a range of matters relating to the issuing of AWLs in the 3.8 GHz band, including proposed use of allocation limits.⁵ As part of this consultation, the ACCC provided a number of questions for stakeholders that were included in the ACMA's consultation paper. Submissions closed on 1 August 2023. The ACCC was provided with public submissions from the following parties:

- Australian Mobile Telecommunications Association (AMTA)
- Australian Radio Communications Industry Association (ARCIA)
- Communications Alliance Satellite Services Working Group (CA SSWG)
- DB Telecommunications
- Dynamic Spectrum Alliance
- NBN Co
- NTT
- Optus
- Pivotel
- Speedcast
- Telstra
- TPG.

The ACCC was also provided with two confidential submissions where consent had been given to the ACMA to share these submissions with the ACCC.

³ We note that some aspect of the ACMA's proposal had changed in the ACMA's subsequent consultation paper on allocation settings for the 3.8 GHz AWLs. See **Chapter 2**.

⁴ ACCC, [Letter to the ACMA on allocation limits for the 3.8–3.98 GHz band apparatus licences](#), March 2023.

⁵ ACMA, [Consultation paper: Area-Wide Apparatus licences in the 3.8 GHz band in metropolitan and regional Australia – licensing, allocation process, technical framework and pricing arrangements](#), June 2023.

1.2. Allocation limits are usually necessary to promote competition

Radiofrequency spectrum is a scarce and finite resource that is an essential input in the provision of wireless services. It is the means by which all wireless communications devices operate and is essential for the provision of services such as mobile telephony, wireless broadband and satellite communications.

Where demand for spectrum is likely to be greater than available supply, the traditional approach is to allow the market to determine the allocation through price-based methods, such as auctions. In auction settings, spectrum is allocated to the bidder with the highest valuation. The highest bidder's use of the spectrum is expected to be the spectrum's highest value use and thus promotes allocative efficiency. However, a bidder's valuation of spectrum could include both the value of the spectrum to itself in providing cost-effective services to its customers, and the value of keeping the spectrum from its competitors. As such, unrestricted spectrum auctions can potentially weaken competition in downstream markets, undermine economic efficiency and reduce the public benefit derived from the use of spectrum.

For these reasons, allocation limits are usually necessary in spectrum auctions to ensure that all competitors in a relevant downstream market have an opportunity to acquire sufficient spectrum to compete effectively. This use of limits promotes competition in downstream markets and delivers better outcomes for end-users of telecommunications services such as lower prices, more or better quality services and more innovative products.

In an administrative allocation setting, it remains possible that demand for spectrum exceeds supply in certain instances, such that competing demand will need to be resolved. The incentives of an applicant to deny spectrum from its competitors may likewise exist such that certain allocation settings are needed to prevent spectrum hoarding and promote competition. A complicating factor in administrative allocation is that as demand for spectrum in such a context typically arises over time, there could be significant uncertainty regarding expected demand.

The ACCC has previously found there was insufficient basis to recommend allocation limits in the context of the administrative issue of apparatus licences in the 3.4–4.0 GHz band in remote areas.⁶ The ACCC reached this conclusion on the basis that there was, at the time, uncertainty in demand and in the geographic boundaries of relevant markets, and whether competing applicants would likely compete in the same downstream markets. Relevant markets for the purpose of the 3.8 GHz band AWLs allocation and the state of competition in those markets will be discussed in Chapter 3.

1.3. The ACCC's advice looks to promote competition, investment and innovation

Under the *Radiocommunications Act 1992*, the ACMA can impose statutory limits on the aggregate amount of spectrum that may be used by any party as a result of a specific allocation. Before doing so, the ACMA must consult with the ACCC on the need for allocation limits, and the nature of any such limits.⁷

⁶ ACCC, [Allocation limits advice for the 3.4–4.0 GHz Remote spectrum allocation](#), November 2021.

⁷ See subsections 60(5), 60(13A), 102G(1) and 102G(6) of the *Radiocommunications Act 1992*.

In its request, the ACMA noted that its decisions for the allocation processes for the 3.4–4.0 GHz band are guided by the object of the *Radiocommunications Act 1992*, which is to promote the long-term public interest derived from the use of the spectrum by providing for the management of the spectrum in a manner that:

- (a) facilitates the efficient planning, allocation and use of the spectrum; and
- (b) facilitates the use of the spectrum for:
 - (i) commercial purposes; and
 - (ii) defence purposes, national security purposes and other non-commercial purposes (including public safety and community purposes); and
- (c) supports the communications policy objectives of the Commonwealth Government.

Drawing on the Ministerial Policy Statement for the allocation of spectrum in the 3.4–4.0 GHz band, the ACCC has conducted its assessment of whether allocation limits are required, and if so, what those limits should be, having regard to the following matters:

- promoting competition in downstream markets for the long-term interests of end-users which facilitates efficient use of spectrum,⁸ and encouraging investment in infrastructure including in regional Australia; and
- supporting the deployment of new and innovative technology, including 5G.⁹

The ACCC considers that the benefit derived from the use of the spectrum stems from the services that are provided to end-users. Promoting competition in downstream markets that utilise spectrum as an input would create the best incentives for market participants to utilise scarce spectrum in a manner that promotes economic efficiency.

The ACCC has considered the allocation limits proposed by the ACMA as well as the two broad allocation options in the ACMA Consultation Paper (discussed in Chapter 2) in assessing the appropriate allocation limits to apply for this allocation.

⁸ See [Explanatory Memorandum for the Radiocommunications Legislation Amendment \(Reform and Modernisation\) Bill 2020](#), p. 20.

⁹ [Radiocommunications \(Ministerial Policy Statement – 3.4-4.0 GHz\) Instrument 2022](#) .

2. The 3.8 GHz band allocation

The ACMA is planning the allocation of spectrum in the 3.8 GHz band in metropolitan and regional areas via AWLs, commencing in the first quarter of 2024. This is part of the ACMA’s broader allocation activities in the 3.4–4.0 GHz band.

The 3.8 GHz band is currently used by incumbent licensees for PTP and FSS services. The intention of the allocation is to support the introduction of LA WBB services in the band. LA WBB services are deployed by operators servicing limited geographic areas, including wireless internet service providers (WISPs), fixed wireless access providers, as well as campus-style and private network deployments by industry vertical and enterprise users. The spectrum and licence type are also suitable for the deployment of WA WBB services, such as those deployed by the MNOs and NBN Co.

As part of the 3.8 GHz band AWLs allocation, the ACMA is planning to make available 150 MHz in metropolitan and immediate surrounding areas, and 200 MHz in regional areas. The figure below shows the overall planning arrangements for the broader 3.4–4.2 GHz band, with the red highlight depicting the area and bandwidth to be allocated through this process.

Figure 1 Proposed overall planning arrangements for the 3.4–4.2 GHz band

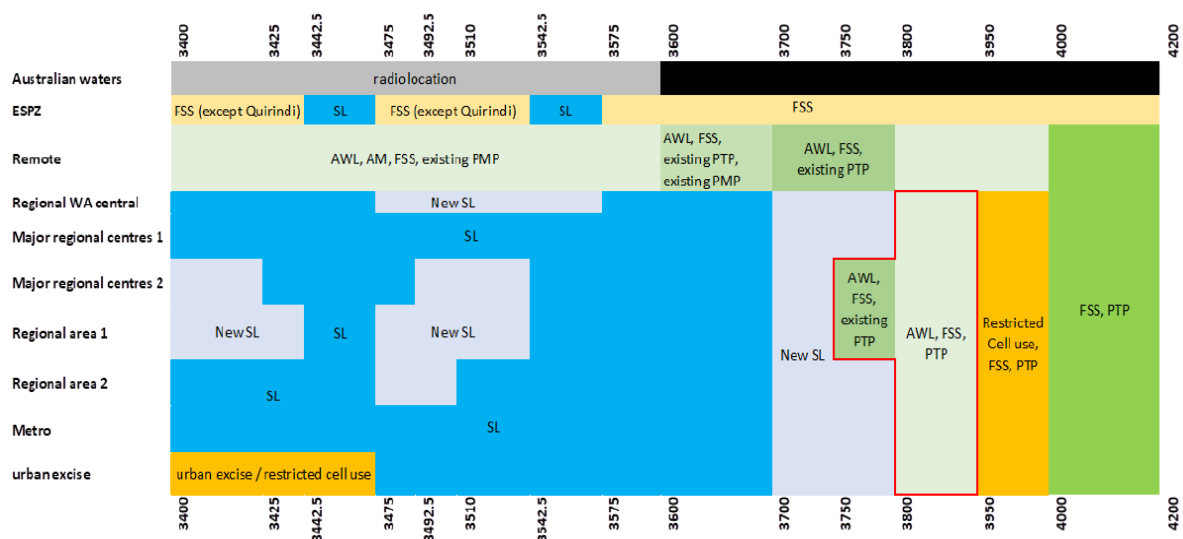
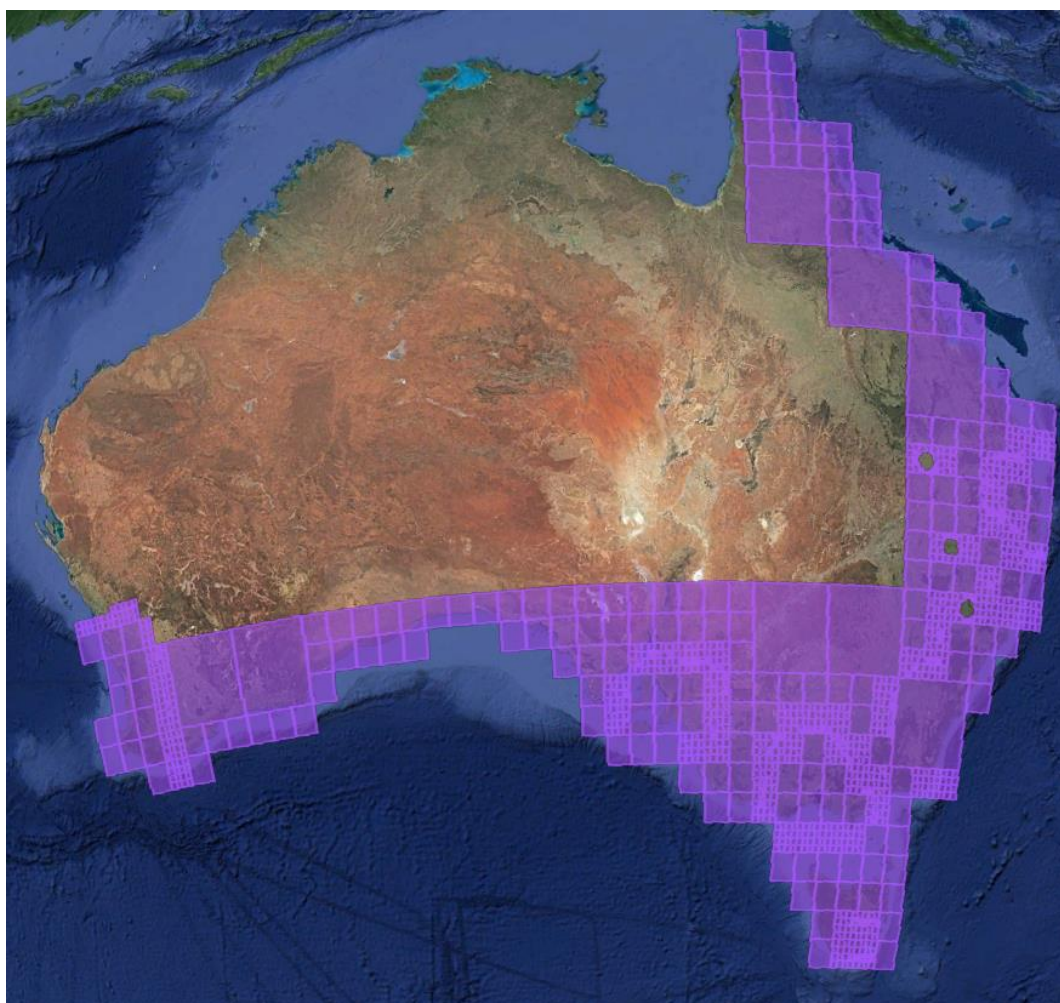


Figure 2 below shows the proposed geographic areas where the 3.8 GHz AWLs will be available.

Figure 2 Proposed areas where 3.8 GHz AWLs will be available¹⁰



2.1. The ACMA has proposed two allocation options

The ACMA is proposing to use allocation windows rather than a 'first in time' approach in issuing the 3.8 GHz band AWLs. The ACMA has noted that the allocation window approach potentially coupled with targeted allocation limits and policies, ultimately provides for a staged or managed approach to considering applications, where there are competing applications and/or insufficient spectrum to issue all licences applied for.¹¹

In this context, the ACMA proposed two broad options for allocating AWLs in the 3.8 GHz band that involves the use of allocation limits and other policy settings for the purpose of resolving competing demand and achieving outcomes consistent with the policy objectives of this allocation.

Option 1 involves a two-stage administrative allocation process where the first stage is a priority access period for LA WBB, PTP and FSS users. This is achieved using a zero MHz

¹⁰ Visual representation of licensed areas constructed using HCIS data from the ACMA's proposed [Draft Radiocommunications \(Area-Wide Licence Allocation Limits\) Determination 2023](#).

¹¹ [ACMA Consultation Paper](#), p. 17.

limit that will apply to WA WBB users, i.e. the MNOs and NBN Co, during and for a period after the initial allocation window. The ACMA expressed the preliminary view that a period of 6 months is likely appropriate for the application of the zero MHz limit. The ACMA also proposed to impose a licence transfer and authorisation limit to restrict the MNOs and NBN Co from obtaining access to the spectrum through the secondary market during the priority access period.

At the end of the priority access period, the second stage commences. This may use an allocation window or first-in-time approach, at which point all potential users including WA WBB users can apply for the AWLs. A cross-band limit will be imposed from the start of the second stage. The ACMA raised 3 possible options for cross-band limits in the 3.4–3.95 GHz band, which were consulted with stakeholders in the context of the 3.4 GHz and 3.7 GHz bands allocation:¹²

- A limit of 140 MHz in metropolitan and regional areas;
- A limit of 140 MHz in metropolitan areas and a limit of 160 MHz in regional areas;
- No limits.

The ACMA expressed the preliminary view that the cross-band limits, if adopted, should apply for 12 months.¹³ The cross-band limits are intended to apply to any applicant that has relevant holdings in the band, including those that have acquired AWLs in the initial allocation window.

Option 2 involves a general allocation window where all applicants can apply for AWLs from the commencement of the allocation process. For this option, the ACMA proposed that the cross-band limits, if adopted, will apply from the start of the process. As with the case in Option 1, the ACMA's preliminary view is that a reasonable period for the application of any cross-band limits is 12 months. Under Option 2, the ACMA has proposed to use allocation principles to prioritise LA WBB, PTP and FSS users over WA WBB users.¹⁴

Under both options, the ACMA has also proposed to impose an allocation quantum policy that will apply to all applicants, which provides guidance regarding the maximum aggregate of spectrum that may be used by a licensee.¹⁵

In addition, to support the efficacy of the proposed allocation limits under each option, the ACMA has developed an associates policy (associates policy) which has the effect of applying the limits to each applicant and their associates collectively. The policy is intended to mitigate the risk of applicants using related entities to circumvent any allocation limit.¹⁶

¹² On 22 June 2023, the ACMA made the [Radiocommunications \(Spectrum Licence Allocation – 3.4/3.7 GHz Bands\) Determination 2023](#), which specifies that cross-band limits of 140 MHz for metropolitan areas and 160 MHz for regional areas be imposed within the 3400–3800 MHz frequency range be applied to the 3.4/3.7 GHz bands auction.

¹³ [ACMA Consultation Paper](#), pp. 25–28.

¹⁴ [ACMA Consultation Paper](#), pp. 28–29.

¹⁵ [ACMA Consultation Paper](#), pp. 23, 29.

¹⁶ [ACMA Consultation Paper](#), pp. 27–28.

Table 1 below provides an overview of the allocation options proposed by the ACMA.

Table 1 Overview of ACMA’s proposed allocation options¹⁷

	Option 1: LA WBB priority period	Option 2: General allocation window approach
Process	Two stage administrative allocation approach	General allocation window approach
Initial allocation window	Allocation principles	Allocation principles
Limits	Zero MHz limit Allocation quantum policy Third party authorisation and licence trading restrictions Cross-band limits	Allocation quantum policy Cross-band limits
Quantum policy options	50 MHz 60 MHz 70 MHz	50 MHz 60 MHz 70 MHz
Zero MHz limit time period	3 months 6 months 12 months	N/A
Cross-band limits options	140 MHz in metropolitan/regional areas in 3.4–3.95 GHz band 140 MHz in metropolitan areas and 160 MHz in regional areas in the 3.4–3.95 GHz band No limits Time period options 3 months 6 months 12 months	140 MHz in metropolitan/regional areas in 3.4–3.95 GHz band 140 MHz in metropolitan areas and 160 MHz in regional areas in the 3.4–3.95 GHz band No limits Time period options 6 months 12 months 18 months
Second allocation process	Allocation principles or First-in-time approach	N/A

We have focused our competition assessment on the proposed allocation limits under the two broad options discussed above, as well as other settings relevant to the application of the allocation limits, such as time period during which any limit will be in force and the associated policy.

¹⁷ [ACMA Consultation Paper](#), p. 20.

3. Competition assessment

Our competition assessment involves the following steps:

- identifying the relevant downstream markets having regard to the intended use of and demand for the spectrum;
- assessing the state of competition in the relevant downstream markets; and
- analysing any relevant existing holdings that should be considered and how the allocation would likely impact the ability of the operators to compete in the relevant market.

Our competition assessment focuses on the impact that the allocation could have on competition in relevant downstream markets. Spectrum is an intermediate input into the provision of wireless services in the downstream markets. As such, its value comes from its use in the provision of services to consumers and businesses. The ACCC generally asks whether an operator would be constrained from competing in the relevant downstream markets if it failed to acquire spectrum at an allocation.

3.1. Relevant downstream markets

There are multiple markets relevant to this allocation

In considering its advice, the ACCC examines the impact that the allocation would have on competition in the relevant downstream markets.

Based on the potential use cases of the spectrum, the ACCC considers that the relevant markets for this allocation to be the following:

- the (public) mobile services market;
- the private wireless enterprise market; and
- the fixed broadband market;

Consistent with our previous advice to the ACMA, the ACCC considers that the broader 3.4–4.0 GHz band provides a more balanced mix of coverage and capacity benefits compared to low band and high band spectrum. As a result, the spectrum on offer could technically be used by MNOs to increase their network capacity for 4G and 5G services in metropolitan and regional areas.

Submissions to the consultation paper supported the view that the mobile services market is a relevant market in this allocation.¹⁸

The ACCC considers that the private wireless enterprise market is also a relevant market in this allocation.¹⁹ Submissions supported this view and noted that the spectrum could be used to provide private, secure, high-speed, and low latency network services with enhanced machine-to-machine and human-to-machine functionality previously only available from wired connectivity services.²⁰ In particular, the spectrum may be used in the following private

¹⁸ TPG Telecom submission to ACMA Consultation Paper, p. 2; Optus submission to ACMA Consultation Paper, p. 13.

¹⁹ The deployment of private wireless enterprise networks is a type of local area wireless broadband use case.

²⁰ NTT submission to ACMA Consultation Paper, p. 5; Optus submission to ACMA Consultation Paper, p.13; Telstra submission to ACMA Consultation Paper, p. 20; Pivotal submission to ACMA Consultation Paper, p. 3.

wireless use cases: manufacturing, transport, health, container stevedoring, education, and mining.^{21 22 23} The ACCC notes submission by the Australian Radio Communications Industry Association (ARCI) that the use cases of the spectrum will only become evident once it is made available and market participants can more properly assess the benefits of the new opportunities.²⁴ Significantly, information provided in the submissions as well as in the public domain indicate that the MNOs now actively compete in this market.²⁵ A recent ACMA market study on 4G and 5G private wireless networks in Australia notes that the MNOs could face future competition from players such as mobile infrastructure vendors, enterprise network equipment vendors and dedicated wireless network specialists.²⁶

We also consider that the spectrum could be used by the MNOs and NBN Co to improve capacity and overall quality of their fixed wireless services in areas where these services are deployed. TPG [c-i-c] [REDACTED] [c-i-c] have specifically noted the opportunity to use spectrum acquired in this allocation to provide capacity in fixed wireless services in various areas.²⁷ Other smaller fixed wireless operators may also be able to use the spectrum to provide localised fixed wireless services.²⁸

While several relevant markets have been identified, we consider that the private wireless enterprise market is most likely to be significantly impacted by the allocation. This is because this allocation can potentially remove a key barrier to entry, i.e. access to suitable spectrum, for many non-MNOs operators in deploying private wireless networks in metropolitan area and enhance their ability to deploy networks in regional areas. We discuss this further below.

While various geographic locations will be affected by the allocation, the precise areas where it will be used are uncertain

The ACMA has indicated that it will issue licences for this spectrum as AWLs. The AWLs grant the licensee the right to operate multiple devices at a given frequency within a defined area, specified at time of application. As such, applicants are able to define the exact geographic boundaries of the licence they are applying for and create bespoke geographic areas of operation.

In contrast to the allocation of spectrum licenses in national or large sub-national lots with clearly defined boundaries, AWLs may be as large as the entire area being allocated, or as small as a single HCIS cell.

The ACMA will be allocating 3.8 GHz band AWLs in both metropolitan and regional areas. Submissions recognise that the potential areas of use are anywhere in metropolitan and regional areas as noted in Chapter 2.

If the MNOs acquire AWLs to increase their network capacity in discrete local areas, the service improvements may primarily be felt in the areas in which the spectrum is deployed. However, given the national nature of the mobile services market, network improvements in

²¹ Telstra submission to ACMA Consultation Paper, p. 20.

²² NTT submission to ACMA Consultation Paper, p. 5.

²³ ARCI submission to ACMA Consultation Paper, p. 2.

²⁴ ARCI, submission to ACMA Consultation Paper, p. 2.

²⁵ See [Telstra Purple acquires Alliance Automation and Aqura Technologies, Yancoal extracts connectivity boost with TPG Telecom's Mobile Private Network, 5G Optus Campus Network](#), accessed on 8 September 2023.

²⁶ ACMA, [Private wireless networks using 4G or 5G in Australia: Market study](#), September 2023, p. 21.

²⁷ TPG submission to ACMA Consultation Paper, p. 2; [c-i-c] [REDACTED] [c-i-c]

²⁸ The deployment of fixed wireless services in localised context is also a type of local area wireless broadband use case.

discrete local areas may be felt by other subscribers to the network that live elsewhere that value coverage in those discrete local areas or otherwise travel to these areas.

For enterprise applications, submissions stated that the spectrum use cases will be in the areas that their end-users operate in.²⁹ The spectrum can be used in regional areas such as mine sites, oil and gas production, rail corridors, airports and ports.³⁰ It is presently unclear to the ACCC where the precise geographic locations of enterprise use-cases are. The ACCC considers that given the potential wide application of private wireless networks across various industries, demand could arise across metropolitan and regional areas over time.

NBN Co stated that [c-i-c] [redacted]
[redacted]
[redacted] [c-i-c]

3.2. State of competition in relevant markets

The ACCC considered the current state of competition in a relevant market and how the allocation might affect the ability of operators to compete effectively in that market. This analysis assists the ACCC in determining whether allocation limits are required to promote competition in a relevant market.

The national MNOs already have significant spectrum holdings to compete in mobile services market and private wireless enterprise market

In the national public mobile services market, Telstra, Optus, and TPG Telecom currently dominate, with Telstra the leader in terms of market share and non-price competition parameters such as overall geographic coverage and 5G deployment. The 3 national MNOs already have significant spectrum holdings in the 3.4–4.0 GHz bands in both metro and regional areas, and will have opportunities to acquire additional spectrum in this band in the upcoming 3.4 GHz and 3.7 GHz bands auction scheduled for October 2023. In addition, the MNOs also have substantial holdings in low-bands (<1 GHz), other mid-bands (1–6 GHz) and high-bands (>6 GHz). We do not consider that, at this point in time, any of Telstra, Optus, or TPG would be inhibited from competing effectively in the national public mobile services market, including in the rollout of 5G mobile technology, if they were unable to acquire spectrum in this allocation.

In the private wireless enterprise market, the MNOs, including their subsidiaries, have a significant competitive advantage over smaller and new entrant providers due to their substantial existing spectrum holdings. It is possible for the MNOs to use their spectrum-licensed holdings, or to give their subsidiaries access to these holdings, for the purpose of private network deployment across metro and regional areas. The MNOs also have the flexibility of planning their spectrum requirements and acquisitions across different use cases, which the smaller providers do not have. Similarly, the MNOs will have the opportunities to acquire additional spectrum in the 3.4 GHz and 3.7 GHz bands auction.

²⁹ Telstra submission to ACMA Consultation Paper, p. 20; NTT submission to ACMA Consultation Paper, p. 5

³⁰ Telstra submission to ACMA Consultation Paper, p. 20.

³¹ [c-i-c] [redacted] [c-i-c]

In addition, with the development of 5G standalone networks, MNOs can potentially use ‘5G network slicing’ using their existing spectrum holdings to ringfence part of their public network to provide differentiated mobile services for private enterprise use. The ACCC understands that MNOs have recently begun trialling network slicing for enterprise use.³² The ACCC considers that the extent to which 5G network slicing is a substitute for private wireless networks is likely to depend on the service requirements of the end-users and various other factors such as the geographic location that the end-user operates in.

Spectrum access represents a key barrier to entry for smaller and new entrant providers of private wireless networks

As with other wireless services, spectrum access is a key barrier to entry for the provision of private wireless networks. Smaller and new entrant providers of private wireless networks do not currently have access to suitable spectrum in metropolitan areas and have limited options in regional areas as spectrum suitable for 4G and 5G deployments are spectrum-licensed and mostly allocated to the MNOs. This means smaller and new entrant providers are at a significant disadvantage, compared to the MNOs, in seeking to deploy private wireless networks in these areas. If these providers are unable to acquire spectrum in this allocation, their ability to compete effectively in the private wireless enterprise market in metropolitan and regional areas will continue to be inhibited.

Table 2 below shows a comparison of the spectrum bands that are available to the MNOs and non-MNO users for the purpose of private wireless network deployment, including spectrum available in the upcoming 3.4 GHz and 3.7 GHz bands auction and the 3.8 GHz AWLs allocation.

Table 2 Comparison of available spectrum bands for deploying private wireless networks³³

Frequency range	Areas	MNOs	Non-MNOs
Low-band (<1 GHz)	Metro	700 MHz (90 MHz)	None
	Regional	850 MHz (60 MHz)	
	Remote	900 MHz (50 MHz)	
Mid-band (1–6 GHz)	Metro	1800 MHz (120–130 MHz)	1800 MHz (20–30 MHz held by state rail authorities) 3.8 GHz AWLs (150 MHz)
		2100 MHz (120 MHz)	
		2.3 GHz (98 MHz)	
		2.5 GHz (140 MHz)	
		3.4–3.7 GHz (325 MHz)	
		3.8 GHz AWLs (150 MHz)	

³² Ericsson, [Telstra in partnership with Ericsson announce suite of upcoming 5G Standalone automated and orchestrated services for enterprises](#), 1 September 2022, accessed 12 September 2023; FutureIoT, [Optus trials network slicing on 5G production network](#), 12 March 2023, accessed 12 September 2023.

³³ Based on information available on the ACMA’s [Register of Radiocommunications Licences](#) and [Spectrum options optimised for local area wireless broadband services: Information paper August 2023](#). We note that the geographic boundaries for metro, regional and remote licensed areas may differ across bands. Most of the bands listed are held by MNOs via spectrum licences. Where the spectrum is available through administrative issue of apparatus license (including AWLs), this is clearly indicated. For spectrum-licensed bands, relevant bandwidth figures refer to bandwidth held by the MNOs in each band, rather than total available bandwidth within the band.

	Regional	1800 MHz (150 MHz) 1900 MHz apparatus licenses (20 MHz) 2100 MHz (40 MHz) 2100 MHz apparatus licences (80 MHz) 2.3 GHz (up to 98 MHz) 2.5 GHz (140 MHz) 3.4–3.7 GHz (275–325 MHz) 3.8 GHz AWLs (200 MHz) 5.6 GHz apparatus licences (40 MHz)	1900 MHz apparatus licences (20 MHz) 2100 MHz apparatus licences (80 MHz) 3.8 GHz AWLs (200 MHz) 5.6 GHz apparatus licences (40 MHz)
	Remote	1800 MHz apparatus licences (150 MHz) 1900 MHz apparatus licences (20 MHz) 2100 MHz apparatus licences (120 MHz) 2.3 GHz (up to 98 MHz) 2.5 GHz (140 MHz) 3.4–4.0 GHz AWLs (600 MHz)	1800 MHz apparatus licences (150 MHz) 1900 MHz apparatus licences (20 MHz) 2100 MHz apparatus licences (120 MHz) 3.4–4.0 GHz AWLs (600 MHz)
High-band (> 6 GHz)	Metro	26 GHz (2200–2400 MHz)	26 GHz AWLs (400–2800 MHz) 28 GHz AWLs (2000 MHz)
	Regional	26 GHz AWLs (400–2800 MHz) 28 GHz AWLs (2000 MHz)	
	Remote	26 GHz AWLs (2800 MHz) 28 GHz AWLs (2000 MHz)	

As shown in the table above, the only spectrum available to non-MNOs for the purpose of deploying private wireless networks in metropolitan areas are parts of the 1800 MHz band in major capital cities that are already held by state rail authorities via spectrum licences, the 26 GHz and 28 GHz bands AWLs, and the current 3.8 GHz band AWLs. The 1800 MHz band held by state rail authorities are already being used to deploy railway mobile communications systems. mmWave spectrum has inferior propagation characteristics and may not be suitable for a wide range of use cases. In addition, the equipment ecosystem for mmWave spectrum is less mature compared to mid-bands such as the 3.4–4.0 GHz band.³⁴ Non-MNOs have a few more options in mid-bands in regional areas compared to metropolitan areas. For these reasons, the 3.8 GHz AWLs are likely the only short-term option for many non-MNO users wishing to deploy private wireless networks in metropolitan areas, and will expand the spectrum bands available to them in regional areas.

Providing operators other than the national MNOs the opportunity to acquire 3.8 GHz band spectrum is critical to enabling them to deploy private wireless enterprise network services

³⁴ See ACMA, [Private wireless networks using 4G or 5G in Australia: Market study](#), September 2023, p. 20.

and potentially compete with the national MNOs in metropolitan and regional areas. Increasing the number of potential suppliers of private wireless enterprise network services would likely increase competitive tension in that market and result in better network services or lower service prices being made available to end-users. Increased competition will incentivise all providers to invest in the deployment of new and innovative technology, including 5G.

NBN Co and MNOs will continue to compete in the fixed broadband market and other operators may benefit from access to spectrum

NBN Co is the dominant provider of wholesale fixed broadband services which retailers resell in the downstream retail market.³⁵ While MNOs compete in the fixed retail broadband market, they prioritise the supply of mobile services. However, MNOs have been increasingly using their mobile networks to supply fixed wireless services in competition with services offered on the NBN in the retail fixed broadband market. To this end, while NBN Co does not operate in the retail market, it indirectly competes with the MNOs in the supply of fixed broadband services.

Competition between NBN Co and MNOs in the fixed broadband market is increasing and the ACCC expects this will continue even if neither NBN Co nor the MNOs acquire additional spectrum in this allocation.

NBN Co noted that MNOs are increasingly advertising 5G home broadband products as alternatives to NBN services and pricing them below comparable NBN-powered retail services.³⁶ NBN further added that it expects investments by MNOs on their mobile networks to continue and that these investments will intensify competition between MNOs and NBN Co in the fixed broadband market.³⁷ TPG Telecom in particular has reported strong growth in the number of its fixed wireless customers.³⁸

[c-i-c]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

³⁵ ACCC, [Inquiries into NBN access pricing and wholesale service standards – Final Report](#), November 2020, at p. 5
³⁶ NBN Co, [SAU Supporting Submission](#), December 2022, p. 30.
³⁷ NBN Co, [SAU Supporting Submission](#), December 2022, p. 32.
³⁸ L Baird, [TPG doubles fixed wireless customers in NBN assault](#), *Australian Financial Review*, 27 February 2023.

[REDACTED]

Other operators may benefit from additional spectrum

Other operators may also be looking to build infrastructure to compete in the fixed broadband market and may benefit from the opportunity to acquire AWLs in the 3.8 GHz band. This includes operators that may use the spectrum to provide localised fixed wireless services. Increasing the number of potential suppliers of fixed wireless services would increase competitive tension in the broader fixed broadband market. This is likely to result in better network services or lower service prices being made available to end-users in those areas.

3.3. Relevant existing holdings

The ACCC considers that 3.4–4.0 GHz band spectrum is substitutable to the 3.8 GHz band

Identifying which spectrum is substitutable to that which will be available in the allocation is relevant in assessing how the allocation may impact an operator’s ability to compete in a relevant market, and in the case where allocation limits are warranted, whether existing holdings should be taken into account.

Submissions to the consultation paper generally agreed that spectrum in the broader 3.4–4.0 GHz band is substitutable to the 3.8 GHz band available in the allocation.

Telstra and Aqura Technologies stated that the 3.4–4.0 GHz band is one of the main worldwide 5G bands, and is often used for enterprise solutions. Telstra added that the global harmonisation of the broader band provides economies of scale and wide ecosystems of network and device equipment. Other mid and low bands can be used for 5G, but may not offer as such a good combination of coverage, data capacity, and spectrum availability in many parts of Australia.⁴⁰

Pivotel submitted that there are substitutable spectrum bands generally available such as the 3.4–3.8 GHz band. Pivotel added that other spectrum bands, such as 1.8 GHz, 2.1 GHz to 2.6 GHz etc., offered via apparatus licensing do not have sufficient bandwidth compared to the 3.8 GHz band which it considers essential to driving 5G innovation and thus are not substitutes.⁴¹

³⁹ [c-i-c] [REDACTED] [c-i-c]

⁴⁰ Telstra submission to ACMA Consultation Paper, p. 21.

⁴¹ Pivotel submission to ACMA Consultation Paper, p. 4.

Optus submitted that the development of 5G technical standards have focused on the 3.4–3.7 GHz frequency range and on time division duplex (TDD) technical specifications. Optus noted that current spectrum holdings in the 1.8 GHz, 2 GHz, 2.3 GHz, and 2.5 GHz bands are in a frequency division duplex (FDD) configuration, which are not compatible with a TDD configuration. Further, spectrum holdings below 2.5 GHz are thought to be less feasible for certain technical benefits that 5G is expected to enable (such as ‘multiple input multiple output’ applications).⁴²

NBN Co submitted that [c-i-c]

[c-i-c]
[c-i-c]
[c-i-c]
[c-i-c]

The ACCC considers that other bands within the broader 3.4–4.0 GHz band are substitutable to 3.8 GHz band. Similar to the views expressed by the ACCC in assessing allocation limits for the 3.4 GHz and 3.7 GHz bands auction, the ACCC does not consider the low-bands as well as 1.8 GHz, 2.1 GHz, and 2.6 GHz bands to be substitutable to the 3.4–4.0 GHz band because they do not offer the same large bandwidths available in the 3.4–4.0 GHz band.⁴⁴

Whether 2.3 GHz band should be considered substitutable with 3.4–4.0 GHz band for this allocation is a matter for the ACMA

TPG submitted that the ACCC must consider the 2.3 GHz band to be directly substitutable with the 3.4–4.0 GHz band, noting comments from the ACMA in the Outcomes Paper for the 3.4 GHz and 3.7 GHz bands auction settings.⁴⁵

In the ACMA’s Outcomes Paper for the 3.4 GHz and 3.7 GHz bands auction, the ACMA expressed the view that 2.3 GHz band spectrum is more directly substitutable for the 3.4–4.0 GHz band than other mid-band spectrum due to the similarity in frequency range, large bandwidths held by licensees, and time division duplex (TDD) operation. However, the ACMA noted that other mid-band spectrum can be used to varying degrees to provide similar services and are also, to differing extents, substitutable with the 3.4–4.0 GHz band.⁴⁶

On equipment availability, the ACMA noted that while the 5G equipment ecosystem is currently more mature in the 3300 MHz to 3800 MHz frequency range, equipment availability for other mid-band spectrum is rapidly increasing and is expected to continue to do so. The ACMA therefore considers that any near-term differences in equipment availability across these bands are of limited relevance, and that in the medium to longer term, these bands will become more substitutable from an equipment ecosystem perspective.⁴⁷

Despite these comments by the ACMA, it did not include the 2.3 GHz band for the purpose of applying cross-band limits in the 3.4 GHz and 3.7 GHz bands allocation due to other considerations. The ACMA noted that the inclusion of the 2.3 GHz band (and potentially

⁴² Optus submission to ACMA Consultation Paper, p. 15.

⁴³ [c-i-c] [c-i-c]

⁴⁴ See [ACCC Allocation limits advice for the 3.4 GHz and 3.7 GHz spectrum allocation](#), August 2022, p. 15.

⁴⁵ TPG submission to ACMA Consultation Paper, p. 4.

⁴⁶ See [ACMA, Allocation and technical instruments for the 3.4/3.7 GHz bands allocation process – Outcomes paper](#), July 2023, pp. 23–25.

⁴⁷ See [ACMA, Allocation and technical instruments for the 3.4/3.7 GHz bands allocation process – Outcomes paper](#), July 2023, pp. 23–25.

some other mid-bands) in the cross-band limits would substantially increase the complexity of allocation limits due to the misaligned geographic areas of existing licences, requiring reconsideration and potential redesign of allocation limits and other auction settings. The ACMA considers these additional considerations would likely result in the delay of the allocation of the spectrum.⁴⁸

TPG argued that the policy reasons provided by the ACMA to exclude the 2.3 GHz band from allocation limits in the context of the 3.4 GHz and 3.7 GHz bands auction do not apply to the AWLs allocation process, given the ACMA is undertaking an administrative allocation process, rather than an auction process. TPG also considers that there is ample time for the ACMA to undertake further consultation in relation to cross-band limits.⁴⁹

The ACCC acknowledges views expressed by the ACMA on the technical substitutability of the 2.3 GHz band with the 3.4–4.0 GHz band in the Outcomes Paper for the 3.4 GHz and 3.7 GHz bands auction settings. The ACCC considers that whether the 2.3 GHz band should be considered substitutable with the 3.4–4.0 GHz band for the purpose of this allocation likely depends on practicalities in including this band for the purpose of applying any cross-band limits in light of the allocation method, i.e. administrative issue of AWLs. The ACCC considers that the ACMA is best placed to assess these matters.

⁴⁸ [ACMA, Allocation and technical instruments for the 3.4/3.7 GHz bands allocation process – Outcomes paper](#), July 2023, pp. 24–25.

⁴⁹ TPG submission to ACMA Consultation Paper, p. 4.

4. Allocation limits are necessary to promote competition

In light of the competition assessment in Chapter 3, the ACCC considers that allocation limits are necessary to promote competition, encourage investment in infrastructure and support the deployment of new and innovative technology in relevant markets.

As the ACMA sought the ACCC's views on a number of proposed allocation limits, the ACCC has focused on these proposals for the purpose of this advice.

4.1. The ACCC supports the proposed zero MHz limit on the MNOs and NBN Co

The ACMA's proposed allocation options were discussed in Chapter 2. Under the ACMA's preferred option, the MNOs and NBN Co, along with any associates of the four entities, are excluded from being able to acquire 3.8 GHz band AWLs for a 6 month period under a zero MHz allocation limit (the **zero MHz limit**). This zero MHz limit would provide LA WBB users (such as localised fixed wireless providers or private wireless enterprise network providers), PTP and FSS users initial priority to access spectrum in the band during the defined period.

Submissions are mixed on the proposed zero MHz limit:

- DB Telecommunications (ACMA Accredited Frequency Assignment service provider to commercial and government clients), NTT (system integrator), Pivotel, and ARCIA (wireless communications industry body) supported the ACMA's proposed Option 1 on the basis that it would best facilitate LA WBB access to the band.⁵⁰
- CA SSWG appears indifferent regarding the proposed zero MHz limit but noted that MNOs and NBN Co should not be introduced into the band and doing so would make the continued use of the band for FSS users impossible.⁵¹ CA SSWG submitted that FSS users should be given initial priority over LA WBB users.⁵²
- Telstra and TPG raised concerns that the proposed zero MHz limit would not support competition and is contrary to the public interest. Telstra and TPG argued that the zero MHz limit would not facilitate the efficient allocation and use of the spectrum in circumstances where 5G mobile services are demonstrably the most efficient use of the spectrum.
- NBN Co also did not support the proposed zero MHz limit.⁵³ [c-i-c] [REDACTED]

⁵⁰ DB Telecommunications submission to ACMA Consultation Paper, p. 1; NTT submission to ACMA Consultation Paper, p. 4; Pivotel submission to ACMA Consultation Paper, p. 2; ARCIA submission to ACMA Consultation Paper, p. 2.

⁵¹ CA SSWG submission to ACMA Consultation Paper, p. 11.

⁵² CA SSWG submission to ACMA Consultation Paper, p. 11.

⁵³ NBN Co submission to ACMA Consultation Paper, p. 6

[c-i-c]

Optus also does not support the proposed zero MHz limit, although it appears to support the ACMA's overall objective of prioritising LA WBB users in the allocation of AWLs in 3.8 GHz. Optus noted the likelihood of additional band fragmentation, misaligned geographical boundaries and increased coordination will be greater under the proposed initial zero MHz limit imposed on MNOs and NBN Co given that the ACMA will have no information on potential AWL applications from MNOs and NBN Co at the same time as from other potential spectrum users. Without the opportunity to fully consider all applications at the same time, Optus stated that there is a risk that AWL allocation decisions will result in poorer spectrum efficiency and an increased risk of unallocated spectrum across a wider range of geographic areas.

AMTA also does not support the proposed zero MHz limit but did not provide further detail on its rationale for doing so.⁵⁵

The ACCC supports the ACMA's proposed zero MHz limit on the basis that it would be more likely to promote competition, investment and support innovation compared to the option where this limit is not imposed.

If all users are given equal opportunity to apply for the AWLs from the start of the allocation process, given the limited quantum available, it is likely that some users would not be able to acquire the spectrum or the quantity of spectrum they require. This risk is likely to disproportionately affect smaller and new entrant providers (mainly LA WBB users) who do not otherwise have spectrum holdings, compared to WA WBB users (i.e. the MNOs and NBN Co) who already have substantial holdings to provide services in various markets.

Of particular relevance to the proposed zero MHz limit is the private wireless enterprise market. As concluded in Chapter 3, the need for, and nature of, any allocation limits for the 3.8 GHz band AWL allocation should be assessed in light of the objective of ensuring that smaller and new entrant providers of private wireless networks have sufficient opportunities to acquire the spectrum they need in order to compete with the MNOs in this market.

As such, the ACCC supports the proposed zero MHz limit as it will likely promote competition and infrastructure investments in the private wireless enterprise market where non-MNO users may potentially compete with the MNOs. Prioritising access to the AWLs by non-MNO users ensures that the MNOs face greater competition in the supply of private wireless network services from potential new entrants since a critical barrier to entry in the market will be removed. This would further enhance incentives of all participants in the market to deploy new and innovative technologies in competition with each other.

As discussed in Chapter 3, other LA WBB users may also be able to use the spectrum for the purpose of providing fixed wireless services in localised areas. While submissions focus on the use of the spectrum for private wireless network deployment, to the extent that there is demand for the spectrum to provide fixed wireless services from smaller and new entrant providers, the zero MHz limit will also likely promote competition and infrastructure investment in the fixed broadband market by allowing these operators to compete more effectively with NBN Co and the MNOs in localised areas.

⁵⁴ [c-i-c] [c-i-c]

⁵⁵ AMTA submission to ACMA Consultation Paper, p. 13.

As described in Chapter 3, notwithstanding a potential inability for MNOs and NBN Co to acquire spectrum for a defined period in this allocation, MNOs and NBN Co will continue to be effective competitors in their respective markets.

The ACCC also considers that MNOs and NBN Co will have other opportunities to acquire substitutable mid-band spectrum (i.e. at the 3.4 GHz and 3.7 GHz bands auction) and/or that they have other means, in lieu of being able to acquire spectrum in the 3.8 GHz allocation, to improve their network quality.

[c-i-c] [REDACTED]
[REDACTED]
[REDACTED] [REDACTED]
[REDACTED]
[REDACTED] ⁵⁷ [c-i-c]. The ACCC's view is that it is ultimately a matter for the ACMA in considering whether facilitating NBN-based fixed wireless services is consistent with the ministerial policy objectives set out for the 3.4–4.0 GHz band allocation.

In any case, the ACMA is proposing to enable MNOs and NBN Co to acquire AWLs in the 3.8 GHz band to supplement spectrum holdings in the event that the proposed priority access for other users does not exhaust the available AWLs. The ACCC understands that compared to the alternative approach of barring WA WBB use cases in this band altogether, this will likely support the efficient use of scarce spectrum by putting spectrum to use in instances where it may have otherwise been unused or under-utilised.

In reaching this conclusion, the ACCC has also considered the extent to which Option 2 of the allocation options in the ACMA Consultation Paper would likely achieve the same competition objective. The ACCC considers that Option 2, which proposes to have a general allocation window and allocation principles to give priority access to LA WBB users will also facilitate a degree of increased access by LA WBB users to the band. However, in our view, merely using allocation principles as opposed to a clear statutory limit is unlikely to provide LA WBB users sufficient transparency and certainty regarding their ability to access spectrum with priority over WA WBB users, and this would likely impact their ability to secure finance and/or to develop a business case.

Further, a general allocation window requires the applicants to be ready for application during the allocation window in order to gain priority which may not happen for many non-MNO providers of private wireless networks. The appropriate period for providing priority access to these providers will be discussed further in Section 4.2 below.

Overall, we consider that Option 2 is unlikely to achieve the objectives of promoting competition, investment and innovation to the same extent as Option 1.

4.2. The ACCC supports the zero MHz limit be imposed for at least 12 months

The ACMA expressed the preliminary view that a reasonable period for the imposition of the proposed zero MHz limit is 6 months. The ACCC recommends the ACMA consider imposing a zero MHz limit period longer than, but at least, 12 months to better promote competition in the private wireless enterprise market.

⁵⁶ [c-i-c] [REDACTED] [c-i-c]

⁵⁷ [c-i-c] [REDACTED] [c-i-c]

The ACCC's view is that 6 months is likely to be an insufficient period for some potential new entrants (or end-users in the case of enterprises acquiring AWLs directly) to fully consider and develop their respective use cases and therefore may deter their engagement in the allocation.

ARCIA and DB Telecommunications also supported a longer zero MHz limit period, with DB Telecommunications suggesting the period be a minimum of 12 months, in order to allow the industry fully develop following the initial release of the 3.8 GHz band, the likely major capital investments involved in participating in the allocation, and that technical guidelines have only recently been finalised.⁵⁸ Pivotel submitted that the zero MHz limit should be permanent.⁵⁹

The ACCC understands that given the nature of private wireless network deployment, many potential users would prefer to be able to access spectrum whenever their needs arise over time, e.g. through setting aside some spectrum for these users in the future or a permanent zero MHz limit on WA WBB users. The ACCC also acknowledges that such an approach may potentially result in inefficient use of spectrum and therefore unlikely to be palatable to the ACMA. On the other hand, providing a longer priority access period would nonetheless provide more opportunities for LA WBB users to access the spectrum, and better realise the competition benefit intended to be achieved by the proposed zero MHz limit.

4.3. The ACCC supports the ACMA's proposed associates policy

The ACMA proposes to adopt an associates policy such that any allocation limits imposed in the allocation will apply to each of the MNOs and NBN Co, as well as all of their associates collectively. This means that the zero MHz limit, which prevents NBN Co and the three MNOs from applying for AWLS for a defined period during and after the initial allocation window will also restrict any associates of those four entities from applying where the associated party is an related entity or has an arrangement in relation to AWLs in the 3.8 GHz band.⁶⁰

Telstra, along with its subsidiary Aqura Technologies, raised concerns that while the proposed associates policy would prevent the MNOs and NBN Co using associated entities to make proxy spectrum acquisitions, it also has the effect of blocking entities who would seek access to the 3.8 GHz band for the deployment of the type of new use cases the ACMA and the government are specifically trying to encourage in this band.

Telstra noted that Aqura Technologies, which it acquired in 2022, provides bespoke, private LTE and 5G communications networks. Aqura Technologies has been involved in the deployment of several private networks at various locations in Australia since 2014. Under the proposed associates policy, Telstra stated that clients considering using Aqura Technologies would be blocked from accessing spectrum in this band. Telstra proposed that instead of an associates policy, the ACMA should instead adopt a restriction of use condition on the licenses issued such that the AWLs could only be used for private network deployment and not for public mobile network deployment.⁶¹

⁵⁸ ARCIA submission to ACMA Consultation Paper, p. 2; DB Telecommunications submission to ACMA Consultation Paper, p. 2.

⁵⁹ Pivotel submission to ACMA Consultation Paper, p. 2.

⁶⁰ See full proposed definition of 'associate' in the ACMA's [Draft Radiocommunications \(Area-Wide Licence Allocation Limits\) Determination 2023](#).

⁶¹ Telstra submission to ACMA Consultation Paper, pp. 7–9.

Optus and TPG also raised some concerns regarding the proposed associates policy. Optus considers the application of the associates policy across the initial allocation period would appear to involve a disproportionate administrative burden relative to its potential benefits.⁶² TPG raised concerns regarding the inclusion of the words ‘acts in concert with a named person’ in the proposed definition of an ‘associate’, noting it is unclear what the ACMA is seeking to capture in these words.⁶³

The ACCC understands the fundamental intention of the associates policy is to prevent applicants from being able to circumvent any allocation limits that apply to them, and therefore necessary support the efficacy of any allocation limits. In this case, the ACCC supports the ACMA’s proposed associates policy as it is likely needed to support the operation of the zero MHz limit. This limit will likely provide LA WBB users the best opportunity to acquire the spectrum they need in the 3.8 GHz band and promote competition in relevant downstream markets, most notably the market for private wireless enterprise networks. Enabling the MNO’s associates, such as Telstra’s Aqura Technologies who directly compete with these new users in the private wireless enterprise network, to apply for AWLs in the initial allocation window would likely undermine the effectiveness of the zero MHz limit in promoting competition and infrastructure investment in this market.

We do not agree with Telstra’s view that the proposed associates policy would prevent its subsidiary Aqura Technologies from deploying the types of uses cases that the government and the ACMA are seeking to encourage, or that a restriction in use condition should be used instead of the associates policy. We consider that the proposed associates test will have limited impact on the ability of the MNO’s associates to provide innovative new services. As discussed in Chapter 3, that MNOs already have significant spectrum holdings which they may be able to deploy to facilitate new or innovative use cases either by themselves or their associates. Spectrum licences held by MNOs do not include any restrictions on their usage which may preclude them from using it for mobile services or private wireless networks. They also have more financial resources and flexibility to plan their spectrum requirements across a range of use cases, compared to smaller and new entrant operators in the private wireless enterprise market. In addition, the MNOs will be able to apply for the AWLs after the cessation of the zero MHz limit.

4.4. The ACCC supports cross-band limits of 140 MHz in metropolitan areas and 160 MHz in regional areas

The ACMA proposes to introduce a cross-band allocation limit that will apply across the 3.4–3.95 GHz band after the cessation of the zero MHz limit, or from the start of the allocation process if the zero MHz limit is not imposed. The ACMA proposed three options:

- 140 MHz in metropolitan/regional areas in 3.4–3.95 GHz band (**first option**);
- 140 MHz in metropolitan areas and 160 MHz in regional areas in the 3.4–3.95 GHz band (**second option**);
- No limits (**third option**).

In the event that the zero MHz limit is imposed, the ACMA proposed 3 time period options for the cross-band limits: 3 months, 6 months, and 12 months. The ACMA expressed

⁶² Optus submission to ACMA Consultation Paper, p.12.

⁶³ TPG submission to ACMA Consultation Paper, p. 5.

preference for a 12-month period. The ACMA proposed the cross-band limit options before the allocation limits for the 3.4 GHz and 3.7 GHz bands auction were finalised. The ACCC understands that the ACMA's intention is to align the cross-band limits in this allocation with the limits imposed in the 3.4 GHz and 3.7 GHz bands auction, which is the second option noted above. The ACCC recommended the first option in the context of the 3.4 GHz and 3.7 GHz bands auction. However, the ACMA was concerned that the ACCC's recommended option heightened the risk of unsold spectrum in some regional areas and determined that the second option is more appropriate.⁶⁴

Again, submissions on the proposed cross-band limits are mixed:

- Telstra and Aqura Technologies support the second option.⁶⁵
- Optus supports the first option stating that higher limits proposed under the second option or third option risked the possibility of Telstra further extending its spectrum dominance in regional Australia and therefore the lowest possible limit should be adopted.⁶⁶ Optus submitted that a revised cross-band allocation limit of 140 MHz in all areas should be applied to the allocation of metro and regional area AWLs in the 3.8 GHz band. Optus submitted that such an allocation limit will better promote competition and the efficient allocation of the spectrum.⁶⁷
- TPG reiterated its view that the cross-band limit should include the 2.3 GHz band.⁶⁸
- Pivotal supports a 140 MHz cross-band limit across both metro and regional areas, while DB Telecommunications supports a 140 MHz/160 MHz cross-band limit.⁶⁹
- ARCIA supports the ACMA applying a cross-band limit generally.⁷⁰
- NTT submitted that ACMA should consider a limit that preserves bandwidth for organisations that are not MNOs or NBN Co such as a 50 MHz block for private enterprise networks.⁷¹
- NBN Co submitted that if cross-band limits of 140 MHz or 140 MHz metro/160 MHz regional are applied, NBN Co recommends an exclusion from allocation limits for insignificant holdings, similar to that being applied in the context of the 3.4 GHz and 3.7 GHz bands auction, to address areas of overlap at the licence area boundaries of existing holdings.⁷²

The ACCC supports the ACMA implementing a cross-band limit after the cessation of the zero MHz limit. The cross-band limits apply to incumbent licensees in the broader 3.4–3.95 GHz band, i.e. the MNOs and NBN Co, as well as other applicants for AWLs. To the extent that the MNOs are interested in acquiring the AWLs to supplement their holdings after the 3.4 GHz and 3.7 GHz bands auction, the proposed cross-band limits would be necessary to prevent spectrum monopolisation in the broader 3.4–4.0 GHz band and promote competition in the mobile services market.

⁶⁴ [ACMA, Allocation and technical instruments for the 3.4/3.7 GHz bands allocation process – Outcomes paper](#), July 2023, pp. 27–28.

⁶⁵ Telstra submission to ACMA Consultation Paper, p. 12.

⁶⁶ Optus submission to ACMA Consultation Paper, p. 4.

⁶⁷ Optus submission to ACMA Consultation Paper, p. 4.

⁶⁸ TPG submission to ACMA Consultation Paper, pp. 4–5.

⁶⁹ Pivotal submission to ACMA Consultation Paper, p. 2.

⁷⁰ ARCIA submission to ACMA Consultation Paper, p. 2.

⁷¹ NTT submission to ACMA Consultation Paper, p. 4.

⁷² NBN submission to ACMA Consultation Paper, p. 6.

Additionally, while the cross-band limits are intended to apply to all applicants, incumbent licensees in the 3.4–3.8 GHz band are most affected given their substantial existing holdings (including spectrum they could acquire at the 3.4 GHz and 3.7 GHz bands auction). The proposed cross-band limits will restrict the amount of AWLs that incumbent licensees, i.e. the MNOs and NBN Co could acquire, further enhancing opportunities for LA WBB users to acquire spectrum following the cessation of the zero MHz limit.

The ACCC recommended the first option in the context of the 3.4 GHz and 3.7 GHz bands auctions, on the basis that it would provide opportunities for all MNOs to acquire additional spectrum in metropolitan and regional areas to improve the quality of their networks to accommodate projected increase in demand.⁷³ However, given the ACMA has imposed the second option for the 3.4 GHz and 3.7 GHz band auction, the ACCC considers it would be appropriate to align the cross-band limits for the purpose of the 3.8 GHz AWLs. This alignment would mean that:

- Bidders who acquire up to the limits in the 3.4 GHz and 3.7 GHz bands would be precluded from acquiring the 3.8 GHz AWLs when the proposed cross-band limits are in force; and
- Bidders that are less successful in acquiring up to the limits in the 3.4 GHz and 3.7 GHz bands auctions would be able to supplement their holdings using the 3.8 GHz AWLs, to the extent that the AWLs are useful to them.

The ACCC notes Optus's view that a lower limit of 140 MHz in regional areas would promote competition and efficient allocation of spectrum. The ACCC considers that imposing a lower limit of 140 MHz in the 3.8 GHz AWL process would likely have the perverse effect of penalising less successful bidders who failed to acquire up to the limit in regional areas in the 3.4 GHz and 3.7 GHz bands auction. The lower limit prevents the less successful bidders from acquiring up to the same amount of spectrum in regional areas as their more successful competitors at the auction, i.e. 160 MHz, thereby inhibiting their ability to acquire additional spectrum to improve their services. The ACCC does not consider this outcome is likely to promote competition.

For these reasons, the ACCC supports the ACMA's proposed cross band limits which aligns with the limits the ACMA has set for the 3.4 GHz and 3.7 GHz bands auctions, i.e. 140 MHz in metropolitan areas and 160 MHz in regional areas across the 3.4–3.95 GHz band.

4.5. The ACCC supports the cross-band limits be imposed for the duration of the allocation process

The ACCC notes that the ACMA's preliminary view is that the proposed cross-band limits should apply for a period of 12 months.

While the cross-band limits are intended to apply to all applicants, given it is the MNOs and NBN Co that have substantial existing holdings in the 3.4–3.95 MHz band, they are the parties that will be most restricted in their ability to acquire the AWLs while the cross-band limits are in force. This means the longer the cross-band limits are in force, the more opportunities users other than the MNOs and NBN Co will have in acquiring spectrum in this band.

⁷³ [ACCC Allocation limits advice for 3.4 GHz and 3.7 GHz spectrum allocation](#), August 2022, pp. 18–19.

TPG supported the ACMA imposing the cross-band limits for at least 12 months.⁷⁴ However, Pivotel and DB Telecommunications submitted that the cross-band limits should be permanent.⁷⁵ Pivotel argued that should the ACMA decide not to make the zero MHz limit permanent, then the cross-band limits should be permanent.⁷⁶ DB Telecommunications argued that the cross-band limits should be permanent to provide plenty of available spectrum for the emerging LA WBB industry.⁷⁷

The ACCC's view is that, to support the achievement of the objective of facilitating new users and new use cases of spectrum, particularly in the private wireless enterprise market, the cross-band limits should apply for the duration of the allocation process. The ACCC considers that this would enable the cross-band limit to be more effective in enabling new entrants and new use cases to emerge over time.

In saying that, we consider that it is prudent to review whether the cross-band limits remain appropriate after a period of 3 to 5 years, if there remains spectrum available for allocation at that point. The review could consider whether the cross-band limit remains necessary to promote new entrant and new use cases, having regard to the need to facilitate the efficient use of spectrum. We consider this period of time would also allow the equipment ecosystem for alternative bands such as mmWave bands to mature, thus providing more spectrum options for private wireless network deployment in metropolitan and regional areas.⁷⁸

The ACCC understands that the cross-band limits only apply to restrict the ability of parties to acquire spectrum *as a result of this allocation*, and therefore will not apply to spectrum trading in the secondary market.⁷⁹ This means that a party that is otherwise restricted from acquiring spectrum in this allocation by reason of the cross-band limits, could nonetheless acquire spectrum within the band from other parties, including those that have acquired the spectrum in this allocation. Trading of spectrum is separately subject to review and action by the ACCC under section 50 of the *Competition and Consumer Act 2010 (CCA)*. However, as section 50 of the CCA seeks to prevent the acquisition of assets that may have the effect of substantially lessening competition in a market, it is likely to be less effective in preventing small acquisitions that occur over a period of time, which may cumulatively expand or entrench the market position of a party. We note that some stakeholders raised the issues of spectrum squatting or spectrum hoarding and the need to prevent such conduct.⁸⁰ We would support the ACMA considering allocation settings that would incentivise licensees to put the spectrum to productive use. This would likely promote the efficient use of spectrum, and prevent speculative behaviour including the acquisition of spectrum for the sole purpose of trading for profit.

4.6. The ACCC does not have views on the proposed allocation quantum policy

The ACMA has sought the ACCC's views on the proposed use of an allocation quantum policy. The ACMA's proposed allocation quantum policy was discussed in Chapter 2. The

⁷⁴ TPG submission to ACMA Consultation Paper, p. 4.

⁷⁵ Pivotel submission to ACMA Consultation Paper, p. 2; DB Telecommunications submission to ACMA Consultation Paper, p. 2.

⁷⁶ Pivotel submission to ACMA Consultation Paper, p. 2.

⁷⁷ DB Telecommunications submission to ACMA Consultation Paper, p. 2.

⁷⁸ ACMA, [Private wireless networks using 4G or 5G in Australia: Market study](#), September 2023, p. 19.

⁷⁹ See section 102G(1) of the *Radiocommunications Act 1992*.

⁸⁰ NTT submission to ACMA Consultation Paper, pp. 2-3; ARCI submission to ACMA Consultation Paper, p. 2.

allocation quantum policy sets the maximum amount of spectrum that a party could use under the AWLs. Such a policy ensures that no single party could acquire all or the majority of the spectrum in one go and therefore enables the spectrum to be allocated to a range of users and use cases. The ACMA proposed options of 50 MHz, 60 MHz and 70 MHz. We understand that the quantum of such a limit is usually set having regard to the technical spectrum requirements of likely use cases.

As the allocation quantum policy is intended to apply in addition to the zero MHz limit and the cross-band limits, we consider that the purpose is likely to ensure there are a number of LA WBB and other smaller users who could access spectrum in any given area. This could have the effect of promoting competition amongst the smaller and new entrant users who wish to use the spectrum in the private wireless enterprise market.

On the other hand, the ACCC considers that the ACMA is best placed to assess the technical spectrum requirements of the various potential use cases. As such, the ACCC is not able to provide views on the quantum of the allocation quantum policy.

Glossary of Terms

AWL

Area Wide apparatus Licence for radiofrequency spectrum

An AWL authorises one or more radiocommunications devices in a geographic area and frequency or frequencies specified in the licence. It is capable of authorising a broad variety of services, uses, applications and technologies.

Apparatus licence

An apparatus licence lets the user operate the transmitters or receivers that they get a licence for. The user can only use them at the place or in the area specified on the licence.

Spectrum licence

A spectrum licence gives an entity exclusive rights to use a frequency band for a particular application, such as radio broadcasting, public mobile etc. Licenses are designated for a specific geographic area, such as rural areas, metropolitan areas, regions, or the entire nation. It is technology neutral.

Point to point service (PTP)

A telecommunications service connecting two end points directly with radio, optical fibre or other transmission systems.

WA WBB

Wide Area Wireless Broadband Services is a high-speed internet and data service delivered through a wireless network over a wide area. Typically it comprises several radio sites to cover a wide geographic area.

LA WBB

Local Area Wireless broadband is a high-speed internet and data service delivered through a wireless local area network (WLAN).

Private wireless

A private wireless network provides wireless broadband connectivity, like a public wireless network. But as the name suggests, a private wireless network is owned and controlled by the organization that built it or purchased it. Its operation is restricted to a limited area within the campus of an organisation. A private wireless network needs all the similar elements as a public network including spectrum.

FSS

Fixed satellite services: As per ITU definition, it is a radiocommunication service between earth stations at given positions, when one or more satellites are used. The given position may be a specified fixed point or any fixed point within specified areas. In some cases this service includes satellite-to-satellite links, which may also be operated in the inter-satellite service. Fixed satellite service may also include feeder links for other space radiocommunication services.

WISPs

Wireless Internet Service Provider is an Internet service provider with a network based on wireless networking. Technologies used may include commonplace Wi-Fi wireless mesh networking, or proprietary equipment designed to operate over unlicensed 900 MHz, 2.4 GHz, 4.9 GHz, 5 GHz, 24 GHz, and 60 GHz bands or licensed frequencies.

HCIS cell

The ACMA's hierarchical cell identification scheme (HCIS) provides an alphanumeric reference to areas described in the Australian spectrum map grid (ASMG). HCIS cell means a 20 x 15 seconds of arc cell in the ASMG, identified by an HCIS identifier.

5G network slicing

The network slice is a logically separated, self-contained, independent and secured part of the network, targeting different services with different requirements on speed, latency and reliability. Network slice characteristics could be, for example, low latency, high bandwidth and ultra-reliability for a critical IoT use case, or higher latency and lower bandwidth for a massive IoT use case. All network slices are built on the same core, transport and radio network physical infrastructure including spectrum.

mmWave spectrum

Millimetre wave spectrum is typically between 30 GHz to 300 GHz. However, 3GPP bands for mobile networks also include 26 and 28 GHz as mmWaves.