

**Submission to the  
Australian Communications and Media Authority**

**Draft spectrum reallocation  
recommendation for the  
3.6 GHz band**  
Metropolitan and regional areas of Australia

24 November 2017

## Contents

<b>Executive Summary .....</b>	<b>3</b>
<b>1 Introduction .....</b>	<b>4</b>
<b>2 Pioneer 5G bands are the ACMA's highest priority .....</b>	<b>4</b>
<b>3 Elements and matters of the draft recommendation .....</b>	<b>5</b>
3.1. Geographic areas.....	6
3.2. Earth Station Protection Zones (ESPZs).....	7
3.3. Minimum bandwidth requirement (MBR) .....	8
<b>4 Other matters .....</b>	<b>8</b>
4.1. Large contiguous blocks .....	8
4.2. Early access .....	8

## Executive Summary

We welcome the opportunity to respond to the ACMA's consultation on the *draft spectrum reallocation recommendation for the 3.6 GHz band (draft recommendation)*. The 3.6 GHz band is critical for enabling Australian consumers and businesses to continue having early access to the latest and best mobile services, noting the band is a global pioneer band for the launch of the fifth generation of mobile technology (5G). So we are pleased to see the band being given the highest priority by the ACMA, and we strongly encourage the ACMA to make its Reallocation Recommendation at the earliest possible time.

### ***We support the ACMA's position on the key elements of the draft recommendation***

We support the ACMA's position on the key elements of the draft recommendation as set out in Table 2 of the consultation covering **licence type**, **parts of the spectrum** (frequency range), **reallocation periods** and **reallocation deadline**.

In addition, we support the ACMA's position on the matters relevant to a price-based allocation, including:

- a **licence expiry date** of 13 December 2030 (to align the term with existing 3.4 GHz licences);
- the Enhanced Simultaneous Multi-Round Ascending (**ESMRA**) allocation methodology;
- a **lot configuration** of 25 x 5 MHz lots with a minor enhancement to set a minimum bandwidth requirement (MBR) of 10 MHz; and
- the proposal for **seven geographic lots** comprising six metropolitan and one regional lot.

The ACMA's position on these elements and matters are consistent with its assessment that the highest value use for the band has changed and this is best realised through reallocation of the band to spectrum licensing.

### ***We recommend alignment with 3.4 GHz geographical boundaries ...***

While not objecting the ACMA's proposed licence area structure, we recommend that the ACMA align the geographic boundaries of the six metropolitan areas with the 3.4 GHz band geographies, in order to better integrate new holdings with existing holdings in the 3.4 GHz band.

### ***... and sun-setting ESPZs where detailed studies reveal locations are not suitable***

We also recommend that where detailed studies for Earth Station Protection Zones (ESPZs) show that one or more proposed protection zones are unsuitable or not necessary, those zones expire at an earlier time or no later than the seven year reallocation period for the regional area. This is to avoid unnecessarily locking 5G services out of these areas.

### ***Certainty is required by mid-2018***

Commercial 5G network equipment and devices for the 3.6 GHz band are expected to become available during 2018 so it is important that the spectrum in this band is released as quickly as possible, to give industry the certainty it needs to invest in 5G services and allow Australia to be a leader in realising the benefits of this next revolution in mobile technology. This consultation is a welcome step towards achieving that outcome but it is critical that urgency continues to be applied to the remaining steps and conducting an auction as early as possible in the second half of 2018.

We also recommend that provision be made for early access apparatus licences to be issued during the re-allocation period immediately after the auction and until the new spectrum licences commence, so that successful bidders can deploy 5G services without delay.

## 1 Introduction

We welcome the opportunity to make this submission in response to the ACMA's consultation on the *draft spectrum reallocation recommendation for the 3.6 GHz band*, IFC 28/2017.

The consultation requests responses on the four key elements of the draft recommendation, as well as responses to four other matters relevant to a price-based allocation in the 3.6 GHz band, and we have framed our response accordingly.

Our submission is structured as follows:

- Section 2 – **Pioneer 5G bands are the ACMA's highest priority**, restates our position that the 3.6 GHz and 26 GHz bands must remain the highest priority on the ACMA's work program;
- Section 3 – **Elements and matters of the draft recommendation**, sets out our response to the elements and the other matters associated with the draft recommendation; and
- Section 4 – **Other matters**, contains our views on some further matters associated with the reallocation recommendation for the ACMA's consideration.

## 2 Pioneer 5G bands are the ACMA's highest priority

In previous submissions<sup>1, 2, 3</sup> we have stated the case for the 3.6 GHz and 26 GHz bands to be given the ACMA's highest priority for re-allocation work. We maintain that these bands should continue to be the top priority for the ACMA, due to their impending use in many countries for 5G mobile services and the substantial social and economic value predicted to be delivered by these services.

In October 2017, AMTA released a report<sup>4</sup> commissioned with Deloitte Access Economics into the ways in which 5G mobile services are predicted to enable business and economic growth. Section 3 of the report shows how 5G services will enhance a range of applications including smart cities, transport, logistics, IoT and augmented and virtual reality. Section 4 identifies key policy areas required to access future benefits from these applications, and figure 4.1 identifies **holistic government strategy, deployment and spectrum** as the key areas for urgent government action.

It is clear that spectrum is a critical component for delivering mobile services. Since existing mobile spectrum is already heavily used for 3G and 4G services, new spectrum is required to launch 5G services. There is an urgent need to release new spectrum in the 3.6 GHz and 26/28 GHz bands for this purpose<sup>5</sup>. Internationally, standards are in the process of being completed and aligned on these bands being used for the initial

---

<sup>1</sup> Telstra submission to ACMA consultation on "Future use of the 1.5 GHz & 3.6 GHz bands", 9 December, 2016, section 5, Pg 7.  
<http://www.acma.gov.au/~media/Spectrum%20Transformation%20and%20Government/Issue%20for%20comment/IFC%2025%202016/Telstra%20-%20submission%20pdf.pdf>

<sup>2</sup> Telstra submission to "FYSO 2016-2020", 20 January, 2017, Exec Summary Pg 3.  
<http://www.acma.gov.au/~media/Spectrum%20Licensing%20Policy/Issue%20for%20comment/IFC%2023%202016/Telstra%20submission.pdf>

<sup>3</sup> Telstra submission to "Future approach to the 3.6 GHz Band", 11 August 2017, section 2, Pg 6.  
<https://www.acma.gov.au/~media/Spectrum-Transformation-and-Government/Issue-for-comment/9-2017/Telstra-submission-pdf.pdf>

<sup>4</sup> AMTA / Deloitte Access Economics report "5G Mobile – Enabling business and economic growth", 18 October, 2017.  
<http://www.amta.org.au/amta/news/52523.new-report-australia-s-5g-mobile-pathway-to-2020> and  
<http://www.amta.org.au/files/deloitte-access-economics-5g-mobile-enabling-businesses-and-economic-growth-pdf>

<sup>5</sup> 5G Americas White Paper on the Spectrum Landscape for Mobile Services  
[http://www.5gamericas.org/files/8015/1061/9326/5G\\_Americas\\_Whitepaper\\_Spectrum\\_Landscape\\_For\\_Mobile\\_Services\\_11.13.pdf](http://www.5gamericas.org/files/8015/1061/9326/5G_Americas_Whitepaper_Spectrum_Landscape_For_Mobile_Services_11.13.pdf)

deployment of International Mobile Telecommunications (IMT), and we are pleased to see the sense of urgency being applied to accelerating access to spectrum.

We remain committed to providing our customers with the latest and best communications tools and services so that Australian consumers can benefit from these developments, and businesses can be increasingly competitive and productive on both domestic and international stages. The early adoption of 5G and other new technologies is important for delivering this commitment. While deployment of 5G services will commence in metropolitan areas and progressively move to regional areas, we note the importance of access to the 3.6 GHz band for 5G mobile services in regional areas. We restate our willingness to work with regional wireless ISPs to reach mutually beneficial commercial arrangements (within spectrum that we may be successful in acquiring through a price-based allocation) that enables continuity of their business model while allowing us to deliver 5G mobile services to regional communities.

### 3 Elements and matters of the draft recommendation

Table 2 on page 9 of the consultation outlines the ACMA's proposed position on key elements of the draft recommendation, including **licence type**, **parts of the spectrum**, **reallocation periods** and **reallocation deadline**. Section 5 of the consultation, raises four further matters relevant to a price-based allocation for comment including **licence term**, **allocation methodology**, **lot configuration** and **geographic areas**.

Table 1 below provides a summary of the ACMA's proposals for each of the elements and matters, along with our position for each of these.

Element / matter	ACMA's Proposal	Telstra's Position
Licence type	Spectrum licences	Support
Parts of the spectrum	3575–3700 MHz in metropolitan and regional Australia	Support
Reallocation periods	Two years for the Adelaide, Brisbane, Canberra, Melbourne and Sydney metropolitan areas (Area A) Five years for the Perth metropolitan area (Area B) Seven years for the regional area (Area C)	Support
Reallocation deadline	12 months before the end of the two year reallocation period for Area A	Support
Licence term	Until 13 December 2030 ( <i>i.e., roughly 13 years, and timed to coincide with the expiry of licences in 3400-3575 MHz band</i> )	Support
Allocation methodology	Enhanced simultaneous multi-round ascending (ESMRA)	Support
Lot configuration	25 lots of 5 MHz	Support
Geographic areas	Six metropolitan areas (Perth, Adelaide, Melbourne, Canberra, Sydney and Brisbane) and one regional area.	<b>Support with minor changes</b>

**Table 1:** Elements of the draft recommendation  
(Blue shaded cells are a reproduction of Table 2 from the consultation).

As shown in the table above, we support all eight of the elements and matters. In relation to the matter on geographic areas, while we do not object the structure of six metropolitan areas and one regional, we do recommend that changes are made to align the boundaries with the existing definition for the 3.4 GHz band. We also recommend the reversal of any of the excised areas for Earth Station Protection Zones (ESPZs) where detailed studies show that the site is unsuitable for use for satellite earth stations. We also respond to the ACMA's question in Box 1 of the consultation on minimum bandwidth requirements in section 3.3 below.

### 3.1. Geographic areas

We note and share the ACMA's previous<sup>6</sup> concerns about geographic spectrum licence boundaries and the unintended consequence of creating "dead zones", particularly for TDD based systems where the risk of base station to base station interference across a spectrum licence geographic boundary can be significant. The ACMA's concern that any spectrum boundaries should be located away from populated areas is a valid concern and one that needs to be considered very carefully.

In our previous submission we supported a single geographic lot, however we are not fundamentally opposed to the ACMA's proposal to have **seven geographic lots** comprising six metropolitan and one regional lot as the structure for the geographic lots, as per option 4 on page 33 of the consultation. We understand the rationale for not having a single geographic lot, in that it provides some flexibility to allow bidders to acquire spectrum at a future price allocation only in their areas of interest, or that complements any existing holdings in the 3.4 GHz band.

However, if there is to be a metro/regional geographic lot carve up, we recommend the current 3.4 GHz boundaries be used as the definition for the boundaries between metropolitan and regional areas within the 3.6 GHz band for the following reasons:

1. Common geographic boundaries will simplify any future spectrum trades, swaps or restacks. While different geographic boundaries are not a fundamental barrier to this (as we noted in our previous submission) we recognise that common boundaries do greatly simplify such considerations;
2. Geographic alignment between the bands may simplify spectrum management between network operators and help reduce interference between networks, given some network operators already hold spectrum in the 3.4 GHz band;
3. Creating new boundaries may lead to a long debate about exactly where those boundaries should be, potentially delaying the auction. Adopting the previous 3.4 GHz metro boundaries is in a sense relatively uncontroversial and effectively maintenance of the status quo, and may avoid lengthy debate and contention.
4. Bidders who wish only to purchase metropolitan spectrum should not impact any existing wireless ISP networks, as these all exist outside of the existing 3.4 GHz metro areas. If the larger boundaries are used, most of these wireless ISPs will fall within the metropolitan lots.

Concerns regarding potential "dead zones" across spectrum licence geographic boundaries can be ameliorated through the proposed ESMRA auction assignment phase. A bidder who successfully acquires a regional lot and one or more metropolitan lots would generally be motivated to bid for aligned spectrum positions across their lots in the assignment phase, i.e., positions which maximise common spectrum ranges across geographies. While perfect alignment may not be possible, depending on the number of successful bidders and the quantity of spectrum acquired in each market, the ESMRA auction format provides a mechanism for bidders to value various positions in the band and make decisions accordingly.

We also propose that where there are different licensees in adjacent geographic lots, the ability for MNOs to negotiate commercial solutions amongst themselves could reduce the negative impact of dead zones. This would involve a third party authorisation to overlap into adjacent territory or arrangements to reduce direct interference on a bilateral coordinated basis, rather than just relying on the technical limits imposed under the licensing scheme. We observe that the ACMA suggests that commercial negotiation could address WISP incumbency issues, and we propose that a similar model could serve to reduce the impact of dead zones. We

---

<sup>6</sup> ACMA consultation on "Future approach to the 3.6 GHz Band", June 2017, Pg 30-31.  
<https://www.acma.gov.au/theACMA/future-approach-to-the-3-6-ghz-band>

note that this is a common solution between MNOs on either side of national land borders where the border cuts through populated areas, for example in Europe and North America.

In summary, we propose that the ACMA reduce the size of six proposed metropolitan 3.6 GHz areas to align the borders of those metropolitan areas with the existing 3.4 GHz metropolitan areas and that bidders use the assignment phase of the proposed ESMRA auction to maximise the contiguous allocation of spectrum between geographic regions, in accordance with the value placed on such contiguity by the bidders. We also propose that at the completion of the spectrum review and passage of the new Radiocommunications Act, commercial solutions could further lessen the impact of dead zones through mechanisms such as third party authorisations.

### 3.2. Earth Station Protection Zones (ESPZs)

The ACMA has indicated that it is considering four small areas to be excised from Area C (inclusive of Lockheed Martin facilities at Uralla) as future ESPZs, and that *“In the event that one or more of these sites are found to be **unsuitable**, any protection criteria could be removed and options to make the areas available initially for the apparatus licensing of wide-area broadband services and possible eventual spectrum licensing, subject to a further re-allocation decision, could be investigated.”*<sup>7</sup>. Some areas under consideration are close to significant population centres in flat terrain which would lead to large exclusion zones. These are much less suitable for ESPZs and should only be considered as a last resort.

It is clear from comments (in the *Decisions and Preliminary Views* paper) that the ACMA is of a mind that it is not necessary to reserve **four** sites in perpetuity for the possibility of future earth stations, as the ACMA is proposing that other services could be deployed in these areas using apparatus licences, or possibly even spectrum licences under a subsequent reallocation decision. However, we would like to propose a different approach, whereby the ACMA **time limits the excision of three of the proposed sites** (Roma, Moree and Quirindi), to provide a maximum of seven years excision (to coincide with the end of the regional reallocation period). This will allow adequate time for detailed site investigation studies be completed, and one or more sites to be selected. Sites not selected by the end of the seven year reallocation period for regional areas should have the excision terminated, so these areas can be accessed by licensees that acquired regional lots in the auction.

This should be done, if possible, via a licence condition in the regional licences issued as part of the initial price-based allocation, avoiding the need for a further price-based allocation. The effective increase in licence area and population covered by those licences, should any excision removals be triggered, are relatively minor compared to the extent of the proposed regional geographic area. Hence the removal of any excised areas should not be considered a “windfall” for those licensees, but a prudent and efficient mechanism to maximise spectrum utility, the likelihood of which can be priced in by the auction bidders.

---

<sup>7</sup> ACMA paper “*Future use of the 3.6 GHz band – Decisions and preliminary views*”, last sentence of bullet point 2 on page 8.

### 3.3. Minimum bandwidth requirement (MBR)

Box 1 on page 28 of the consultation poses the question “... *is it desirable to have an MBR feature for the 3.6 GHz band auction, and if so, what might be an appropriate MBR?*” We submit that there would be value in having an MBR, and propose that the ACMA should adopt an MBR of 10 MHz, since that is the minimum 5G channel size accepted by 3GPP in this band (20 MHz was the smallest channel size but this was altered to 10 MHz at the last 3GPP RAN4 meeting<sup>8</sup>). An MBR of 10 MHz will also reduce the risk of spectrum fragmentation, and does not prevent a bidder from seeking 15 MHz or more spectrum.

## 4 Other matters

### 4.1. Large contiguous blocks

As we noted in our submission to the last consultation on the 3.6 GHz band<sup>9</sup>, it is important that mobile operators should be able to acquire spectrum in large contiguous blocks (up to 100 MHz) to realise the maximum benefits of 5G. 3GPP standards<sup>10</sup> are currently being finalised for 10 MHz, 20 MHz, 40 MHz, 50 MHz, 60 MHz, 80 MHz and 100 MHz channel bandwidths for 5G mobile services operating in this band (with Data subcarrier spacing of 30 kHz).

There is no guarantee that any other channel bandwidths will be supported by 5G equipment and devices. Further, selection of these channel sizes to be specified as mandatory for user equipment is still work in progress, but should be known well before the auction.

The ACMA proposal for 25 x 5 MHz lots should enable bidders to acquire spectrum to support any of these channel bandwidths.

Finally, we note that a technical framework still needs to be developed for this band to cover frequency coordination matters, including aspects such as guard-bands. We would welcome the opportunity to participate in the development of this framework, and its implementation through a Radiocommunications Assignment and Licensing Instruction (RALI) and/or a Radiocommunications Advisory Guideline (RAG).

### 4.2. Early access

Finally, and as we also noted in our submission to the last consultation on the 3.6 GHz band<sup>7</sup>, we also recommend that early access apparatus licences should be made available to successful bidders during the period following announcement of the auction outcome and until the new spectrum licences commence, in accordance with the provisions in section 153P of the Radiocommunications Act 1992, to ensure that deployment of new 5G mobile networks can proceed without delay.

---

<sup>8</sup> Approved at RAN4 #84 meeting (Berlin, Germany, 21 – 25 August, 2017). See slide 4 for sub 6GHz.  
[http://www.3gpp.org/ftp/TSG\\_RAN/WG4\\_Radio/TSGR4\\_84/Docs/R4-1708845.zip](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_84/Docs/R4-1708845.zip)

<sup>9</sup> Telstra submission to “Future approach to the 3.6 GHz Band”, 11 August 2017, section 2, Pg 7.

<sup>10</sup> 3GPP document R4-1706968\_WF. Way Forward on band specific user equipment channel bandwidth. 29 June 2017. Pg 5.  
[http://www.3gpp.org/ftp/Meetings\\_3GPP\\_SYNC/RAN4/Inbox/R4-1706968.zip](http://www.3gpp.org/ftp/Meetings_3GPP_SYNC/RAN4/Inbox/R4-1706968.zip)