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AMTA Submission

Australian Communications & Media Authority

# Planning options for the 3700-4200 MHz band



## About AMTA

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia, with members including the mobile network operators and service providers, handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>.

## Introduction

AMTA welcomes the opportunity to provide comment on the planning options for the 3700-4200 MHz band.

AMTA's view is that the following allocation will deliver the greatest economic and social benefit to Australia:

- 100 MHz (3700-3800 MHz) should be allocated under exclusive access (spectrum licensing) to the existing mid-band allocation in the geographic areas defined for the 3.6 GHz band. This will allow for sufficient spectrum to be made available and facilitate opportunity to access 100 MHz per operator; and
- A further 200 MHz (3800-4000 MHz) should be allocated under exclusive access in the six metro centres plus Hobart to further improve the 5G experience in areas of high demand.

AMTA submits that global allocations noted in the Options Paper demonstrate the suitability of this band for 5G mobile services and in Australia the lower part of the band (3700-3800 MHz) is clearly compatible for such use alongside the 3.6 GHz band and therefore well placed to deliver the greatest economic and social benefit as well as meet the continuing demand for 5G.

AMTA estimates that each mobile operator will need a minimum of 100 MHz of contiguous mid-band spectrum for optimal initial 5G deployments (with demand for mid-band spectrum expected to grow rapidly in the medium term). Given the current number of mobile network operators and incumbent users of the 3400-3700 MHz band, we consider a further 300 MHz within the 3700-4200 GHz band can be allocated for IMT and to support further deployment of 5G services in key metro centres.

We have outlined the rationale for and detail of our position below as well as provided information in relation to the continued and strong growth in demand for mobile technologies that is driving the need for more spectrum.

# Background

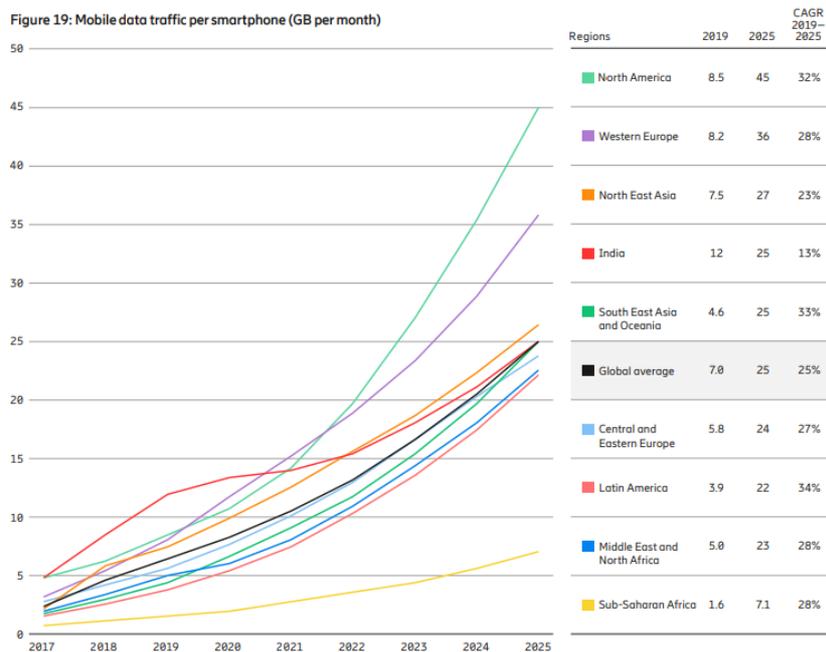
## Mobile demand continues to grow despite global pandemic

In 2020, the demand for mobile technologies continues to be strong and ever increasing, despite the disruption of the global pandemic.

In fact, Ericsson reports that mobile traffic increased during lockdowns due to COVID-19, with mobile traffic patterns reflecting the shift away from working in urban centres to working from home in suburban areas.<sup>1</sup> Consumer behaviour has also shifted remarkably during the pandemic with the sudden and widespread take up of video calls with up to 85% of consumers now using video calling to stay in touch with family and colleagues.<sup>2</sup>

With some markets experiencing accelerated growth in mobile subscriptions during the pandemic, Ericsson now forecast a total of 190 million 5G subscriptions by the end of 2020.<sup>3</sup> Ericsson also expects 5G mobile traffic to account for 45% of all global mobile traffic by 2025.<sup>4</sup>

While the take up of 5G can reflect consumers upgrading from 3G/4G, it is notable that Ericsson also forecast a 33% CAGR in mobile data traffic per smartphone for Australia and our region:



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<sup>1</sup> Ericsson Mobility Report, June 2020, page 5

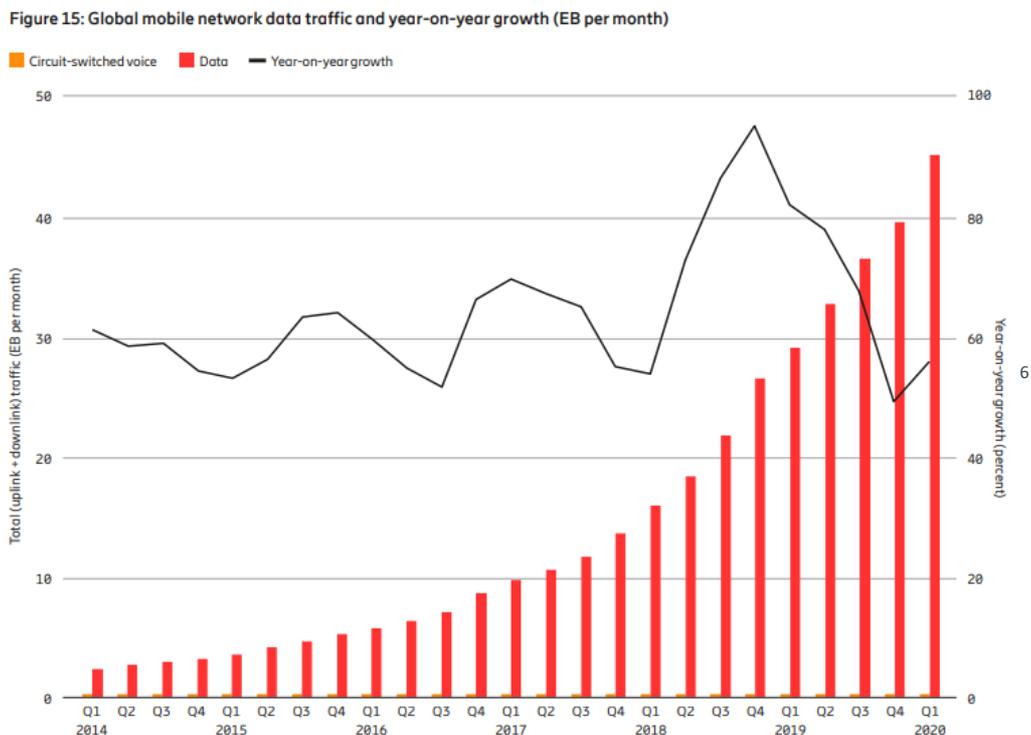
<sup>2</sup> Ibid

<sup>3</sup> Ericsson Mobility Report, June 2020.

<sup>4</sup> Ibid

<sup>5</sup> Ericsson Mobility Report, June 2020, page 21

This is a huge increase in the demand for data usage in our region that reflects the established and continuing trend of growth in global network data traffic, illustrated in the graph below, which will clearly require more spectrum to be allocated to IMT.



AMTA also notes that despite the continuing impact of the pandemic on economic certainty; Australia’s mobile network operators continue to deploy 4G and increasingly 5G in 2020 and the pace of deployment has not slowed due to COVID-19.<sup>7</sup> This aligns with Ericsson’s global observations that over 75 providers have now announced 5G commercial launches and that uptake in some markets, for example, China, has been faster than expected, although the pace of 5G adoption in the USA and Europe is expected to slow slightly in the short term but still achieve the original forecast results by 2025.<sup>8</sup>

### Evolving demand for contiguous mid-band

The February 2020 update to the GSA’s report **3300-4200 MHz: A Key Frequency Band for 5G** observes,<sup>9</sup> “At least 80–100 MHz **contiguous** blocks in the 3300–4200 MHz range are being made available per operator in several leading countries. This target should be achieved in all markets **by 2020**. Spectrum availability should grow further over time considering the steadily increasing market adoption of a growing number of use cases with more and more requirements (higher

<sup>6</sup> Ericsson Mobility Report, June 2020, page 17

<sup>7</sup> ChannelNews, Telstra 5G rollout undeterred by coronavirus, 26 May 2020

<sup>8</sup> Ericsson Mobility Report, June 2020, page 10

<sup>9</sup> GSA Report **3300-4200 MHz: A Key Frequency Band for 5G**, p.6 under the heading “Wide and contiguous channel assignments”. <https://gsacom.com/paper/3300-4200-mhz-a-key-frequency-band-for-5g/>

throughput and lower latency in the first place). GSA believes that additional mid-band spectrum may therefore be required for MNOs in leading markets by 2023–2025; the 3300–4200 MHz range may represent a valuable opportunity in this respect.” AMTA supports the GSA’s view on this matter and stresses the importance of mid-band spectrum for its optimal balance between coverage and capacity, as well as the ability to create contiguous allocations for mobile network operators. AMTA is of the view that by the middle of this decade, an allocation of at least 200 MHz mid-band spectrum per operator is required, and in order to make contiguous allocations, a restack is required. Given the length of time required to achieve a restack after the allocation is completed, it is important that 3700-4000 MHz is reallocated in 2022 to allow adequate time for the restack.

## **Mobile continues to enable social and economic benefits**

Mobile telecommunications have historically had an enabling impact on other industries across the economy and society. As the world starts to recover from the impacts of COVID-19, we expect that 5G will continue to drive economic growth and play a key role in Australia’s recovery as it enables service providers to offer cost-effective technology to meet consumer demand for data and new advanced 5G services.<sup>10</sup>

In fact, a recent survey of 2500 global executives (including 200 based in Australia) by Accenture<sup>11</sup> found that 80% of executives expected that 5G would bring tremendous value to their business in various ways. The survey found that while 34% are yet to adopt 5G; 28% have piloted it; 26% are using it in some areas and 10% have implemented it across their organisation. The main benefits around 5G were understood to be productivity gains with 75% of those surveyed seeing the potential for 5G to boost productivity; as well as create new revenue streams and modernise business models.

Accenture concluded that 5G is likely to be an integral part of the drive towards digitisation and that the current pandemic and its associated circumstances will only accelerate this process:

“It’s clear that Australian businesses recognise the huge potential of 5G, with many ready to take advantage of the opportunity to connect all their assets into an intelligent enterprise, creating new business potential.”<sup>12</sup>

And:

“A growing share of businesses are now working from home, which puts strong connectivity at the core of efficiency in operations. As businesses adapt their models to meet virtual working conditions, many are realising that remote working actually has concrete value for their business, indicating that these might end up being long term arrangements in some cases.”<sup>13</sup>

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<sup>10</sup> Ericsson and Arthur D. Little, 5G for business: a 2030 market compass, Oct 2019, page 3

<sup>11</sup> Accenture, 5G technology will benefit Australian businesses and society, 21 June 2020, Consultancy.com.au

<sup>12</sup> Ibid

<sup>13</sup> Ibid

Mobile technology delivers more than just economic benefit to the country. As Deloitte Access Economics observes,

“Mobile technologies are embedded in everyday life. Today, 89 percent of Australians own a smartphone, and the average Australian spends three hours every day using their smartphone - working, playing, connecting with family and friends.”<sup>14</sup>

Mobile technology and services have become indispensable to the way we communicate with family and friends, entertain ourselves, keep safe and manage our responsibilities. Importantly, the role mobile solutions play in these aspects of our lives is not lessening due to the impact of COVID-19; on the contrary, the ability of mobile to enable critical social benefits across sectors of the economy including health, education, transport and agriculture is only increased.

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<sup>14</sup> Deloitte Access Economics, Mobile Nation: the 5G Future, 2019.

## Preferred Option with variation

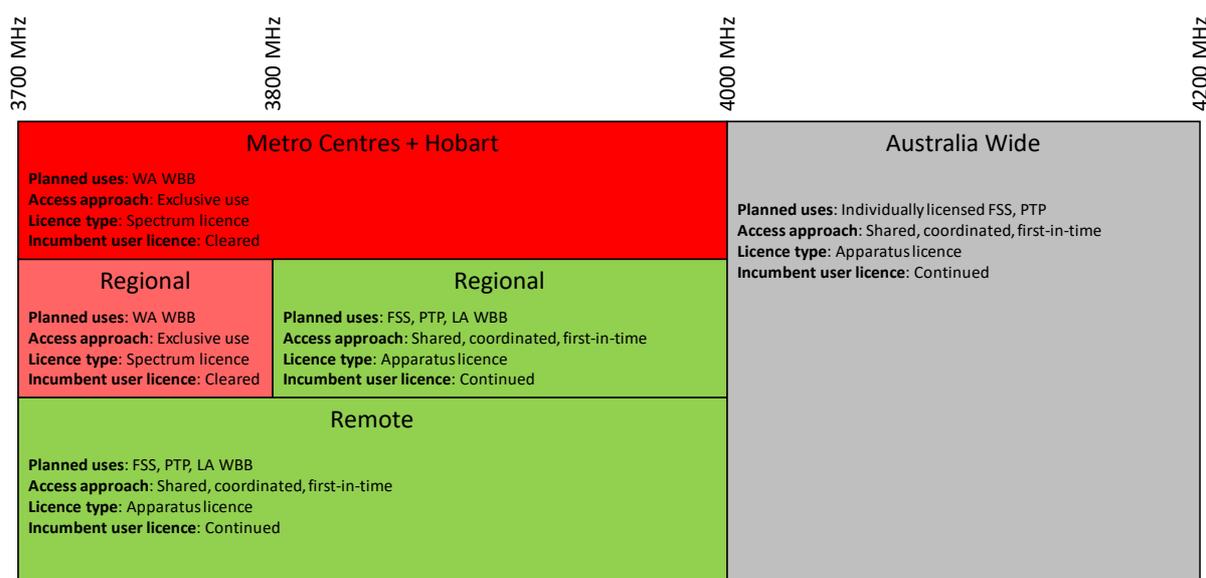
### AMTA recommends a modified version of Option 3

AMTA recommends a modified version of the ACMA’s proposed Option 3, with the following key attributes:

- Exclusive spectrum licensing in the six metro centres, plus Hobart, in the range 3700-4000 MHz (bright red shading);
- Exclusive spectrum licensing in regional areas in the range 3700-3800 MHz with geographic regions defined as per 3.6 GHz band (light red shading);
- Apparatus licensing in regional areas in the range 3800-4000 MHz and in remote areas in the range 3700-4000 MHz (green shading); and
- No IMT allocation above 4000 MHz (grey shading).

This is illustrated in Figure 1 below.

**Figure 1:** Modified Option 3



AMTA proposes this option provides a good balance that provides adequate capacity for existing use cases such as C-Band satellite services and Point-to-Point (PTP) links, as we outline in the following subsections.

We note that our Modified Option 3 is the same as the modified option described in the first paragraph under “Possible option variations” section of the ACMA’s Options paper, with the notable distinction that Perth, Sydney & Hobart are considered metro areas under our proposal.

AMTA also notes that a claimed benefit of Option 3 is the introduction of LA WBB in metro centres in the 3800-3900/4000 MHz segment<sup>15</sup>. AMTA does not support this and believes that WA WBB

<sup>15</sup> Replanning of the 3700-4200 MHz band, August 2020, bottom of p.25

represents the highest valued use that can be achieved for this spectrum. Our concern stems from the potential denial of spectrum that may arise from a LA WBB receiver claiming to be a victim of interference from other co-channel LA WBB operators. For example, a LA WBB operator may deploy a solution for a university campus or other localised precinct using an LTE or 5G base station antennas at a height of 20-30m (a five or six story building). Their intended use is a few square kilometers of land at most. However, these antennas will be 'visible' to other co-channel base stations possibly several tens of kilometres away. As the ACMA notes<sup>16</sup>, RALI FX19 is the likely template for coordination between LA WBB operators, and it specifies a protection criterion of I/N = -6 dB<sup>17</sup> at the receiving base station. This illustrates how a small, localized deployment could deny access to the spectrum for large portions of metro centres.

Furthermore, given demand for this spectrum will outstrip supply, allocating it over-the-counter via apparatus licensing (for LA WBB use) would likely promote the inefficient allocation and inefficient use of this spectrum. AMTA is of the view that a 'first-in-time', 'over-the-counter' apparatus licensing approach would not lead to effective or efficient use of the band. As the ACMA noted in IFC 2017- 09, there are high risks in adopting this approach which could result in a 'gold rush' situation, fragmented spectrum holdings and high levels of uncertainty with respect to being able to plan a network across a wide area. If prices are too low, there is a further risk of speculators buying licences to sell-on to future bidders. However, higher prices for over-the-counter licences would be speculative rather than determined by the market itself. The ACMA may wish to address some of these risks by running an administrative allocation process, such as that currently being proposed for the 26/28 GHz Bands. However, for C-band spectrum in metro areas, a "Stage 2b" scenario (i.e. insufficient spectrum for all applicants) will almost certainly eventuate, which would lead to an unfavourable scenario of the ACMA selecting winners by "beauty contest" on such factors as "diversity". As such, in 3700-4000 MHz in metro areas, AMTA's strong preference is for spectrum licensing, which will allow market mechanisms to determine access to spectrum.

In any case, there is potentially an unexplored option for introducing LA WBB in the 4000-4200 MHz segment, subject to ensuring adequate protections for FSS, PTP users and altimeters operating above 4200 MHz.

## **Declining FSS and PTP use in Australia**

As the ACMA observes in pages 14-15 of the consultation paper<sup>18</sup>, numerous countries are investigating or making parts of the 3700–4200 MHz band available for WA or LA WBB type applications. This is in part driven by declining use of the band for FSS and PTP links, and in part by the developing IMT ecosystem for 3GPP NR band n77.

In terms of declining use of the band, we agree with the ACMA's observation that the number of FSS earth station registrations has continued to decline. Table 4 on p.11 of the ACMA's 2019

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<sup>16</sup> Replanning of the 3700-4200 MHz band, August 2020, Appendix C – Technical Issues, top of p.70.

<sup>17</sup> RALI FX-19, Attachment 2a, Protection Criteria for 1900-1920 and 3575-3700 MHz band BWA receivers. Section 5.

<sup>18</sup> Replanning of the 3700-4200 MHz band, August 2020.

consultation<sup>19</sup> observed the 347 Earth Receive licences in June 2015 had declined to 255 by May 2019. This figure had further declined to 232 registrations by June 2020 according to Table 10 on p.60 of the current consultation paper. We also agree with the ACMA's observation that the number of PTP links has been declining over time. Table 3 on p.10 of the ACMA's 2019 consultation observed the 190 PTP licences in June 2015 had declined to 103 by May 2019, and declined further to around 94 licences by June 2020<sup>20</sup>.

Nevertheless, AMTA recognises demand for FSS earth stations and PTP links will not completely disappear, and there will be ongoing demand.

## Restacking C-Band satellite

In February 2020 in the USA, the FCC "*...adopted rules for the C-band that will free up 280 megahertz of spectrum for 5G. Specifically, the rules required existing satellite operators to repack their operations from the band's entire 500 megahertz into the upper 200 megahertz, allocated the lower 280 megahertz for terrestrial flexible use, and provided for a 20-megahertz guard band in between.*"<sup>21</sup> The entire 300 MHz has to be cleared by 5 December 2023. While AMTA is not advocating for the Australian Government to contribute toward the cost of restacking incumbent satellite services into the top 200 MHz, what this does show is that it is possible to restack 500 MHz of existing C-Band satellite capacity into 200 MHz, albeit with additional satellite capacity being brought online.

## Transition period

AMTA acknowledges the innovation described above, and the transition time to new solutions will take time.

**FSS Earth Stations:** The largest consequence of our modified Option 3 is the necessary retuning of FSS earth stations in the frequency range 3700-4000 MHz in Sydney and Perth, and of these two locations, Sydney is the most challenging. It will likely require deployment of new C-Band satellites operating in the range 4000-4200 MHz for incumbent services in the range 3700-4000 MHz to be retuned into 4000-4200 MHz. Inevitably, there will be plans for the deployment of new satellites, but this takes time. We note that the minimum reallocation period under the current Radiocommunications Act (1992) is two years. We would prefer to avoid a lengthy reallocation period (i.e. no longer than 5 years) noting the complexities involved in some licence areas e.g. Sydney and Perth, may require more than the minimum legislated reallocation period.

**PTP links:** AMTA is aware that some existing PTP links are used to support USO services in remote locations such as King Island and Flinders Island in Bass Strait. We are also aware that these links are used in parallel with other PTP links in a higher band (6 GHz) to provide frequency redundancy such that if atmospheric effects such as rain or temperature variations compromise the link in one

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<sup>19</sup> Planning of the 3700-4200 MHz band, August 2019.

<sup>20</sup> Based on count of unique licences for PTP links in 3700-4200 in the ACMA's RRL, 11 Aug 2020.

<sup>21</sup> <https://docs.fcc.gov/public/attachments/DOC-364655A1.pdf>

band, the other band may continue providing service. As such, it is not possible to simply re-tune to another band. We propose that where links are used to supply critical USO voice services, they should be grandfathered for the duration they continue to be essential for the delivery of the USO services. This means preserving the top four channels (channels 4, 5, 6 & 7) as defined in the FDD channel raster, namely 3710-3870 MHz and 4030-4190 MHz. For other PTP links operating in the 3.8 GHz band, AMTA believes these links could be transitioned to other bands without adverse consequences other than the cost of replacing the equipment. AMTA proposes the minimum two-year reallocation period in accordance with section 153B(4)(b) of the Radiocommunications Act (1992). Finally, we do not support the use of AWLs for grandfathered fixed point to point links or for earth stations. AWLs are clearly not fit-for-purpose for these services.

### **Observations on Appendix F – Cost Benefit Analysis.**

The ACMA provides a detailed cost benefit analysis of its three options. We make the following observations:

- It is unclear to us how the ACMA has formed the basis for a number of assumptions used in its calculations in its CBA analysis, particularly: (1) the retune/relocate ratio, and (2) the unit costs assumed for retune and more importantly for relocation.
- With regards to the retune/relocate ratio. It is unclear why a split of 30/70 was chosen for assessment of the FSS associated costs for option 1 (see Table 18 of Appendix F), and a split of 50/50 used for Option 3 (i.e. Table 24).
- In our view, the retune portion of this calculation is likely closer to 100% for any of the ACMA's options, as it is our view that satellite services will be able to transition to frequencies in the range 4000-4200 MHz,<sup>22</sup> or alternatively to a different band altogether (e.g. Ku-band) over the course of the next five years. Using a higher ratio of retune/relocate would substantially reduce the FSS associated costs which we are of the view, is much more congruent with reality.
- Ultimately, we largely agree with the ACMA that under the CBA exercise, the benefits accrued from band clearance (as per any option), far outweighs the perceived costs by many multiples.

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<sup>22</sup> We note that this is dependent on our assumption that some satellite services to migrate to Ku band as well as further satellite capacity becoming available over the proposed period.

For any questions in relation to this submission please contact Lisa Brown, Public Policy Manager, AMTA at [lisa.brown@amta.org.au](mailto:lisa.brown@amta.org.au) or (02) 8920 3555 or Juan Pablo Casetta (Open Spectrum), AMTA Spectrum Consultant at [juanpablo@openspec.com.au](mailto:juanpablo@openspec.com.au).

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