

12/05/2023



AMTA Submission

Australian Communications & Media Authority

Five-year spectrum outlook 2023-28  
and 2023-24 work program  
Draft for consultation



## 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 comments on the draft Five Year Spectrum Outlook (FYSO) for 2023-28, noting with appreciation, the ACMA's well-established practice of publishing a FYSO and detailed work program. AMTA welcomes the detail provided in the FYSO on how the ACMA intends to deliver on its spectrum management responsibilities in the new policy environment following last year's federal election.

Notably, AMTA values and supports the ACMA's focus on the facilitation of 5G throughout the document, not least through the inclusion of a number of frequency bands either intended to be, or in the process of being, re-planned for 5G.

That said, compared to previous editions, we note a reduced focus on satisfying spectrum demands to address ever-increasing growth in mobile broadband data—a critical economic enabler. Specifically, AMTA notes that the Government's Statement of Expectations and the ACMA's Statement of Intent do not specifically identify the economic and productivity benefits of 5G to the broader economy as a policy priority.

The FYSO identifies the increasing take-up of 5G and the likely acceleration of this trend with the closure of 3G networks<sup>1</sup>. The re-farming of 3G spectrum will support 5G deployment, however, we caution against adopting the view that existing spectrum holdings will satisfy future demand, including for 6G, in the longer term<sup>2</sup>. Demand for data will only increase and it is important that the ACMA continue to assess the need to re-allocate spectrum, particularly in mid-band, for mobile services given the long duration of spectrum planning processes and the timeframes for network investment decision-making.

AMTA considers that the Government should implement a forward-looking policy position on 5G spectrum to ensure that there are always sufficient resources to avoid a "spectrum crunch". Relatedly, the ACMA's work on "expiring spectrum licences" will be crucial to the future success and structure of the sector and to ensure sufficient investment certainty for critical national network infrastructure over the longer term.

While growing demand for data will drive spectrum demand for 5G uses, the ACMA and the Government can play a role in raising awareness of the positive potential of 5G, including through adopting 5G services for public service delivery and programs, thereby supporting take up and ultimately economic growth.

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<sup>1</sup> Draft FYSO, p.14

<sup>2</sup> Multi-carrier regional mobile infrastructure – ACMA Submission to House of Representatives Standing Committee on Communications and the Arts November 2022; p.4

## Part 1: Overview

### Demand for mobile broadband is unrelenting

The demand for mobile broadband continues to grow at an exponential rate. Globally 5G reached 1 billion subscriptions at the end of 2022, with 30% population coverage.

As at March 2023, the GSA noted almost 250 operators in 97 countries have launched commercial 3GPP-compatible 5G services<sup>3</sup>. There are at least 1472 commercially available devices, including at least 874 commercially available phones (an increase of 25 from Sept 2022)<sup>4</sup>.

The ACMA acknowledges that 5G is doing the heavy lifting and that by 2028, 5G networks will carry 69% of the world's mobile data traffic and cover 80% of the world's population<sup>5</sup>.

### 5G in numbers

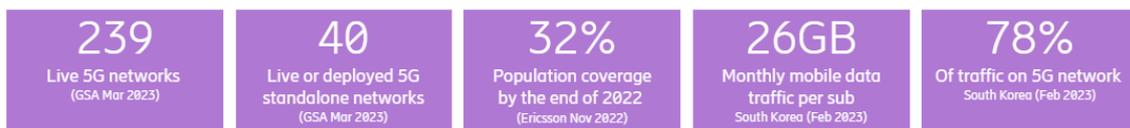


Figure 1—Ericsson snapshot of the latest 5G market statistics

Australia is currently a world leader in the deployment of 5G with economic modelling by Deloitte Access Economics showing that 5G will increase Australia's Gross Domestic Product (GDP) by \$67 billion in 2022 dollars by 2030. Further, accelerating 5G adoption could add an uplift of \$27 billion to the current forecast<sup>6</sup>.

<sup>3</sup> GSA, April 2023, *Public Networks and Operators: GAMBoD Database Snapshot*, available here: <https://gsacom.com/technology/5g/>

<sup>4</sup> GSA, March 2023, *5G Device Ecosystem*, available here: <https://gsacom.com/technology/5g/>

<sup>5</sup> Ericsson, November 2022, *Ericsson Mobility Report* cited at page 14 of the FYSO and available here: <https://www.ericsson.com/4ae28d/assets/local/reports-papers/mobility-report/documents/2022/ericsson-mobility-report-november-2022.pdf>

<sup>6</sup> Deloitte Access Economics, March 2022, *5G Unleashed*, available here: [https://amta.org.au/wp-content/uploads/2022/03/5G-Unleashed-Final-Report\\_combined-v2.pdf](https://amta.org.au/wp-content/uploads/2022/03/5G-Unleashed-Final-Report_combined-v2.pdf)

## Mid-band spectrum and the need to plan ahead

AMTA is of the view that the Australian market will need approximately 8 GHz in total spectrum assignments for IMT by 2030, as outlined in our spectrum policy position paper, *Future Spectrum Requirements for 5G and Beyond*. In doing so, AMTA is not suggesting that the ACMA adopt a target-setting approach to the FYSO work program.

In fact, we support the current band-planning process in the FYSO and agree that it has been a flexible and responsive way of addressing changes in spectrum demand and ensuring the delivery of spectrum to market. Through this process, which has been in the FYSO for over half a decade, the ACMA has kept mobile broadband (MBB) — and now more broadly wireless broadband (WBB) — at the forefront of its work activities, and progressed the pioneer 5G bands in C-band and mmWave, along with the 850/900 MHz auction and the optimization of the 2.3 GHz, 800 MHz, 1800 MHz and 2 GHz bands.

AMTA's spectrum demand forecasts were commissioned to provide a substantive and rigorous analysis of this complex area and support AMTA's high-level position that Australia needs to remain vigilant and proactive with respect to spectrum for 5G and beyond, and that we cannot be complacent. As such, AMTA considers it is critical for Government to adopt a long-term perspective on spectrum demand, including to support the transition to 6G.

AMTA sees mid-band spectrum as the next immediate priority for allocation to ensure sufficient spectrum is available in a timely manner for the continued enhancement of Australia's 5G mobile networks.

An Australian analysis by Coleago<sup>7</sup> showed that in Sydney there is a need for 1,230 to 1,440 MHz of mid-band spectrum compared to 703 MHz that are either currently licensed to operators, and which will increase to 803 MHz following the upcoming 3.7 GHz auction. Therefore, to deliver the city-wide 5G user experience in an economical and technically feasible manner in the 2025-2030 timeframe, an additional 427 to 657 MHz of mid-band spectrum is required. For Melbourne an additional 487 to 727 MHz is needed and for Brisbane it is an additional 279 to 469 MHz.

As per the GSMA's report on *The Socio-Economic Benefits of Mid-Band 5G Services*<sup>8</sup>, mid-band spectrum will drive an increase of more than \$610 billion in global GDP in 2030, **producing almost 65% of the overall socio-economic value generated by 5G**, which adds further weight to the view that mid-band is the "heavy-lifter" of 5G spectrum. However, this estimate depends on adequate mid-band spectrum being available—an average of 2 GHz per country by 2030 according to GSMA. AMTA submits that Australia must start now to formulate a forward-looking policy position for mobile spectrum requirements into the next decade and beyond to ensure we can meet growing

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<sup>7</sup> Coleago, Nov 2021, *Demand for mid-band spectrum in Australia*, available here: <https://amta.org.au/wp-content/uploads/2021/12/Coleago-Report-Demand-for-mid-bands-spectrum-in-Australia.pdf>

<sup>8</sup> GSMA, *The Socio-Economic Benefits of Mid-Band 5G Services*, available here: <https://www.gsma.com/spectrum/resources/mid-band-5g-spectrum-benefits/>

demand for mobile broadband and retain and build on our 5G leadership as the new measure of global competitiveness.

## **Waning Government support for 5G**

Noting the importance of a government policy roadmap supporting the preparation of adequate spectrum to meet demands for 5G and beyond, we are disappointed to note that the focus on the importance of 5G has diluted somewhat relative to previous years. While we appreciate that several bands that could potentially be replanned to support 5G remain in the ACMA's workplan—higher-level government and regulator policy support for the productivity and economic benefits of 5G seems to have waned.

The Government's Statement of Expectations (SoE) and the ACMA's Statement of Intent (Sol) focus on the policy priorities of Closing the Gap, Net Zero and *"deepening people-to-people links and cooperation"* in the Asia-Pacific region.

However, while the Government has identified *"promoting investment, innovation and the adoption of new and emerging technologies"* as well as the need to *"promote the long-term public interest derived from spectrum, including the benefits of technological developments that improve spectrum utilisation and efficiency"*, 5G and its evolution is not specifically mentioned in these policy documents. In AMTA's view, the absence of 5G-specific objectives including for Australia to be a world leader in the deployment and application of 5G-enabled connectivity, or to drive productivity and economic growth through the use of spectrum is concerning, and suggests to AMTA that perhaps Government considers that the "job is done".

Seemingly aligned with our observations of concern above, the Government has withdrawn grants to demonstrate the value of 5G to support economy-wide enterprise digitalisation in Australia as part of the *Australian 5G Innovation Initiative*<sup>9</sup>. This funding was targeted at seeding the market for enterprise adoption of 5G by supporting collaboration between enterprise, academia and MNOs to develop practical use cases in sectors relevant to the Australian economy on how 5G can drive productivity, de-carbonisation and new skills policy objectives.

AMTA notes that the enabling capabilities identified in new industry policy strategies, from the National Reconstruction Fund to the Robotics and Critical Minerals Strategies do not acknowledge Australia's 5G competitive advantage or the enabling capability of 5G to support economy wide digitalisation.

In short, it seems that we are no closer to the aforementioned forward-looking policy position for mobile spectrum requirements from Government.

However, we note that it does not have to be a case of "either-or" with respect to the requested Government initiatives and those that the Government has chosen to prioritise; in fact, mobile

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<sup>9</sup> *Grants to demonstrate the value of 5G to businesses in Australia*, available here: <https://business.gov.au/grants-and-programs/australian-5g-innovation-initiative>

services will be of critical importance to “closing the gap” and addressing regional connectivity and development objectives, as well as to the aforementioned innovation initiatives (e.g. National Reconstruction Fund, Robotics & Critical Minerals Strategies). Government can play a role in raising awareness of the positive potential of 5G, including through adopting 5G services for public initiatives and programs, thereby supporting take up and ultimately economic growth; such Government support will help accelerate 5G adoption which as mentioned earlier could add billions to Australia’s GDP.

## **Determining the highest value use of spectrum**

The *Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020* (“the Modernisation Act”) has introduced an increased level of regulatory discretion for the ACMA in terms of both its role in spectrum management activities as well as in its ability to determine the appropriate spectrum licensing arrangements for different spectrum bands. While we understand the need for this increased flexibility and its potential to lead to increased efficiency in how spectrum is managed, we are conscious of the need to match this with increased transparency around decision-making so that the wider discretion afforded under the legislation does not undermine the certainty required for long term network investment.

In particular, we suggest that the ACMA could be more transparent with regard to how it determines the highest value use of any spectrum band. We understand that such a calculation will always involve both qualitative and quantitative analysis (including factors that are difficult to quantify such as community interest, public safety/national interest and public policy considerations), however, we consider that the ACMA should provide more information to stakeholders about how it determines highest value use. This would, in turn, enable the spectrum community to better understand, at a more granular level, exactly what evidence we need to provide to the ACMA to demonstrate demand for additional spectrum as well as justification for one use over another competing use for the same spectrum.

We note that pg 7 of the draft FYSO refers to “optimal use”, while the term “highest value use” no longer features. It may not be intentional, but we do not agree with the shift in terminology if it is linked to an approach whereby the economic value derived from the use of spectrum is not a key consideration—even if this economic value is not revealed in an explicit manner by the prospective user, e.g., via a market-based allocation. In any case, the need for the ACMA to be transparent in its decision making applies equally regardless of whether it adopts the term “optimal use” over highest value use.

For example, we note that the ACMA’s decisions around the 3700-4200 MHz band have not entirely addressed AMTA’s contributions to the demand quanta. In fact, after three years of replanning work (not yet completed), the overall outlook for C-band 5G is less than ideal—out of 900 MHz in 3GPP Band n77 (3300-4200 MHz), only 325 MHz has been made available for wide-area 5G networks (3475-3800 MHz), even less in regional areas noting NBN Co’s large holdings. Despite the massive efforts involved, we can only really account for an additional 100 MHz gained,

noting co-existence issues severely impact the utility of Urban Excise spectrum and AWL-licensing of 3800-4000 MHz.

AMTA also maintains reservations with the ACMA's proposal to use AWLs for LA WBB deployment for 3800-4000 MHz, and with the ACMA's current preference to allocate 3750-3800 MHz for AWLs in Regional areas (albeit in lieu of other spectrum lower in the band within the range 3475-3542.5 MHz). Although we understand that these objectives come from Government policy beyond just the remit of the ACMA—for example in the Ministerial Policy Statement (MPS) on 3.4-4.0 GHz<sup>10</sup>—we do not agree with spectrum uses being determined by qualitative characteristics such as “diversity of use cases”. This should only be a factor for consideration where it is proven that such diversity does indeed lead to a higher economic value than if it were not supported. While such economic considerations were carried out years ago for the re-planning of the 3.6 GHz Band, we have not seen any such modelling for subsequent decisions to make spectrum available for AWLs<sup>11</sup>.

Furthermore, AMTA suggests that clear evidence of the failure of existing market mechanisms to cater to new demand, such as via spectrum trading or subleasing, should be established prior to introducing new licensing arrangements.

To summarise, AMTA does not support the ACMA's previous conclusion that 100 MHz of contiguous spectrum for each WA WBB operator is sufficient for this band. AMTA's Spectrum Policy Position Paper provides evidence of the need for an additional approx. 300 MHz (now 200 MHz) of mid-band spectrum, by the middle of this decade, noting that in order to make contiguous allocations, a restack is required. Most of this demand should have been satisfied within the 3.4-4.2 GHz frequency range, resulting in the need to look to other mid-band frequencies (e.g. the 6 GHz band) to fulfil the demand for mid-band spectrum for IMT.

We welcome further ACMA guidance and clarity on the types of information being sought from industry to ensure the information is relevant for informing the ACMA's decision making processes.

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<sup>10</sup> Department of Infrastructure, Transport, Regional Development and Communications, 10 February 2022, *Ministerial policy statement for the 3.4-4.0 GHz spectrum band*, available here:

<https://www.infrastructure.gov.au/departments/media/news/ministerial-policy-statement-34-40-ghz-spectrum-band>

<sup>11</sup> Pivotal has a different view on the issues mentioned in this paragraph and will present its views in its individual response to the FYSO 2022-27.

## Part 2: The 2023-24 annual work program

### **Expiring spectrum licences—AMTA’s top spectrum priority**

AMTA welcomes the transparency provided in the FYSO relating to the ACMA’s 2023-24 annual work program. In summary, AMTA considers that there are three key workstreams for the ACMA to prioritise concerning 5G (i) harmonisation/optimisation of existing spectrum bands for 5G (ii) identification and allocation of new spectrum for 5G and (iii) clarity and transparency over the ACMA’s approach to expiring spectrum licences.

AMTA notes that the 800 MHz and 1800 MHz bands—due to expire in 2028—will be the first set of spectrum licences to be considered under the new legislative framework established by the Modernisation Act. We support the ACMA’s view that consideration of these expiring licences should begin 5 years from expiry, and welcome the ACMA’s stated intention to undertake a broad consultation in Q2 2023 on the processes and criteria that will inform the ACMA’s approach to expiring spectrum licences. AMTA also appreciates the ACMA’s inclusion of the 800 MHz and 1800 MHz expiring spectrum licences in its Forward allocation workplan.

In terms of ACMA resourcing, the band-by-band exercise of optimising spectrum licence technical frameworks (SLTF) for 5G will be replaced by the band-by-band exercise of renewing spectrum licences from 2024, or “expiring spectrum licences” as the ACMA refers to it. While work on the bands themselves will commence in 2024, work on the general principles of licence renewals will commence with the imminent Q2 2023 consultation. We strongly agree with this approach, so the ACMA and industry are not considering high-level issues on a piecemeal basis with each band that is addressed.

In this context, AMTA members wish to take the opportunity to suggest certain principles that might inform the nature and scope of the initial consultation. In assessing the public interest relating to expiring spectrum licences, AMTA members submit that the ACMA should prioritise outcomes that maximise the benefit to the Australian economy and ultimately Australian businesses and consumers. To this end, the ACMA should have express regard to economic considerations such as the promotion of market competition, economic efficiency, investment and productivity.

For example, AMTA notes that—in relation to the processes for expiring spectrum licences and the matters that the ACMA would consider in assessing whether the renewal is in the public interest—the ACMA states that one matter that it may consider is ‘efficient use’ under a spectrum licence. While use of spectrum is an important indicator of the economic value of spectrum, AMTA members submit that broader economic considerations must also feature in the ACMA’s decision-making about “efficiency”.

AMTA considers that, in the context of these and other broader economic objectives, the most efficient and effective allocation of the expiring spectrum will continue to be mobile communications. In any event, AMTA considers that mobile services are and are highly likely to continue to be the highest value or “optimal” use of the spectrum, both from a technical and economic perspective.

The ACMA will need to allocate adequate resources to undertake this project thoroughly and diligently while in parallel progressing the band-by-band priorities in the list below. AMTA calls on the ACMA to establish a new internal work stream dedicated to implementing the ACMA’s “expiring spectrum licences” work program.

We wish to confirm that the renewal of the expiring spectrum licences for mobile services is the **mobile sector’s top priority**. Spectrum licence renewals—in terms of both investment certainty, industry sustainability and reasonable and efficient pricing—are of critical importance to the mobile services provided by MNOs and the associated data rates, costs and continuity of the service provided to consumers.

### **Industry priorities—new & optimised bands**

AMTA supports the detailed work program, and we have outlined below industry’s relative priorities in relation to making further spectrum available for 5G.

We note that the ACMA has already indicated that it plans to complete (or at least carry out the vast majority of the planning work) in relation to the 3.4-4.0 GHz range (item 1 below) and the optimisation of existing SLTFs (item 2 below) by the end of 2023. The use of 1800 MHz and 2 GHz bands (item 3 below) outside spectrum-licensed areas will commence this year, and we note that the ACMA plans to implement the decisions in 2024. We are happy with the timeframes outlined in the work program for these three items and do not wish to disrupt these, although we do note that the ACMA should specify targets for the commencement and completion of the 2.5 GHz band optimisation work (even if approximate). Items 4 through 7 focus on “future bands” for 5G and beyond, on which work should commence in 2024 with the highest-priority future band being the 6 GHz band.

As such, the order of the industry priorities list acknowledges there are pragmatic considerations for the sequence in which work may be completed, rather than an order of ‘importance’ or value of the bands per se. However, multiple bands can be progressed in parallel.

1. **3.4-4.2 GHz:** Noting the urgent need to make more mid-band spectrum available, we agree with the ACMA’s plans to complete work on this frequency range in 2023 (or at least the vast majority of this work, noting that restricted cell AWLs will not be allocated until 2024). We note that there are four processes related to this frequency range running in parallel; Q2 2023 alone will see the Remote AWL allocation process; the consultation on the draft Applicant Information Pack (AIP) for AWLs in metro and regional areas in 3750/3800-4000 MHz; and the TLG on the restricted-cell allocations (i.e. 3950-4000 MHz in metro and regional areas and 3400-3475 MHz in “Urban Excise” areas), with applications opening for the 3.4/3.7 GHz auction in Q3.
2. **Review of 700 MHz and 2.5 GHz SLTFs:** AMTA supports the ACMA including projects that consider optimising existing SLTFs in its work program. We note that the ACMA has flagged an imminent review process of protection criteria for 800 MHz apparatus-licensed receivers, related to the 700 MHz band SLTF.
3. **1800 MHz & 2 GHz outside spectrum-licensed areas:** We note that the 1800 MHz is a key band for 4G/5G services, and we support the ACMA’s plan to release an options paper in Q3 2023. We note that the ACMA proposes to review RALIs MS33 and MS34, which is welcome, particularly in the context of supporting 5G AAS and revising allocation limits. However, we believe that the ACMA should consider going beyond these policy-level changes and reallocating this spectrum space for spectrum licensing, particularly in regional areas in the lower 2 x 40 MHz of the 2 GHz band where MNOs have already deployed extensive networks that are currently authorised by PTS apparatus licences.
4. **6 GHz Band:** Noting AMTA’s earlier comments in the AMTA Policy Position Paper on Spectrum for 5G and Beyond (Nov 2021), additional mid-band spectrum may need to be brought to market by 2025—this could be in the order of half of the total 800 MHz additional mid-band spectrum forecast by 2030. We note that the main mid-band spectrum targets internationally are in 3.4-4.2 GHz (discussed above), as well as in 3.3-3.4 GHz, 4.4-5.0 GHz and in the 6 GHz band. It is clear that this spectrum demand was not addressed by the imminent auctions and allocations in the range 3.4-4.0 GHz, and therefore there will need to be progression on at least one of the other aforementioned mid-band spectrum targets<sup>12</sup>. At this stage, the highest mid-band spectrum priority (after 3.4-4.2 GHz) is the 6 GHz Band, and we support the ACMA’s acknowledgement that domestic planning work will commence in this band following WRC-23. In the meantime, we support the identification of the upper 6 GHz band for IMT under WRC-23 Agenda item 1.2; at least relevant parts thereof, i.e. 7025-7125 MHz in Regions 2 and 3 and 6425-7125 MHz in Region 1.

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<sup>12</sup> AMTA’s comments in this regard align with GSMA views in *New Spectrum for 5G: Adding Up the Mid-Band Maths*, see: <https://www.gsma.com/spectrum/new-spectrum-for-5g-adding-up-the-mid-band-maths/>

5. **600 MHz Band:** AMTA notes that the 600 MHz band is likely to be the most promising source of further low-band spectrum for 5G. We recommend progressing 600 MHz in the band-planning process to the Initial Investigation stage to complement the related higher-level government processes<sup>13</sup> and the ACMA’s work under the Television Research and Policy Development Program<sup>14</sup>, which we strongly support. The developments in North America and the development of the APT 600 MHz band plan warrant the next step in consideration of this band.
  
6. **Additional mid-band spectrum:** As per the dot point above on the 6 GHz band, access to additional mid-band spectrum is very important for the mobile industry. While the 6 GHz band is the next highest mid-band spectrum priority (after 3.4-4.2 GHz), it is unclear how much of it will become available, noting competing demands and incumbency issues that vary in severity across the different geographical areas of Australia. As such, maintaining 3.3-3.4 GHz (“3.3 GHz”) and 4.4-5.0 GHz (“4.0 GHz” as denoted by the ACMA) in the work program is crucial as potential fall-back options<sup>15</sup>. Beyond these options, it may be necessary to venture higher in frequency, so the preparation of harmonised spectrum options in the “cm-wave” region of 7-24 GHz via a future WRC-27 Agenda item will be an important part of the 5G and beyond spectrum toolkit (see also comments below under the heading “*Compliance and international engagement*”).
  
7. **mmWave spectrum ~40 GHz:** AMTA considers that further investigation of additional mmWave spectrum, such as the 40 GHz band, is not a short-term priority for industry, with the preferred timeframe for such work to commence being 2024. That said, we note that there is significant interest from the satellite industry in the spectrum between 40 and 50 GHz. If ACMA is planning to progress these bands, they should be considered in the context of coexistence between FSS and IMT services, because the mobile industry is indeed very interested in these bands for supporting long-term future growth. In this regard, we again refer to AMTA’s Spectrum Policy Position Paper, which identifies a potential future requirement for an additional 3.6 GHz of mmWave IMT spectrum by 2030.

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<sup>13</sup> Following on from the Government’s broadcasting reform agenda (the Media Reform Green Paper) concluding two years ago

<sup>14</sup> Draft FYSO, p. 54-55

<sup>15</sup> AMTA’s comments in this regard align with GSMA views in *New Spectrum for 5G: Adding Up the Mid-Band Maths*, see: <https://www.gsma.com/spectrum/new-spectrum-for-5g-adding-up-the-mid-band-maths/>

## Other high-level considerations

AMTA notes the considerable number of activities in the work program and the corollary effect this has in terms of resource management for both the ACMA and for industry stakeholders. We appreciate the ACMA's efforts to balance progress of the work program activities with the need to ensure effective engagement with stakeholders via consultations and collaborative processes, including Technical Liaison Groups (TLGs). Consultations are likely to require longer timeframes if the ACMA adopts a "reply comment" approach—mentioned later in this response under "*Approaches to consultation*", even though we see the benefits of this approach. We note that the challenge of resourcing is shared equally by the ACMA and stakeholders. We strongly support the need for the ACMA to be adequately resourced to effectively and efficiently implement the commitments contained in the work program.

As noted above, we consider that the work program relating to 5G for 2023-24 can be usefully broken into three workstreams. We have outlined our views above on industry priorities for the forward work program, acknowledging that there is also significant work to be progressed by the end of 2023 with regard to the technical optimisation of bands. In our 2021 response to the draft FYSO, we noted that this would likely make 2022 the "year of harmonisation" due to the technical work required to harmonise the bands for 5G. This will need to continue well into 2023 with the 700 MHz and 2.5 GHz bands as well as consideration of 1800 MHz and 2 GHz outside of spectrum-licensed areas.

In 2024, it will be necessary to re-focus on the next spectrum targets to support 5G and beyond growth, although we recognise that the re-planning work in the range 3.4-4.0 GHz is part of this effort and will require significant ACMA, government and industry resources during the remainder of 2023. However from 2024 onwards, we will need to start working on the industry priorities that follow (i.e. 600 MHz and 6 GHz).

## Other band-specific comments

### ***1.5 GHz Band***

In the context of provision of additional mid-band spectrum, the 1.5 GHz Band (1427-1518 MHz) could be important in addressing longer-term demand for mid-band spectrum. However, we note this band has complex incumbency issues, particularly in rural & remote areas, which support services used to meet Universal Service Obligations (USO).

AMTA's view is that the highest value use of the band in the long-term remains WA WBB via spectrum licensing, at least in metro areas<sup>16</sup>.

We acknowledge that the ACMA is facing pressure to make the Extended MSS L-band above 1518 MHz spectrum available for MSS services, so we support the ACMA progressing that work this year, while postponing further consideration of the 1.5 GHz band itself until Q2 2024, as a

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<sup>16</sup> Pivotal has a different view on the issues mentioned in this paragraph and will present its views in its individual response to the FYSO 2023-28.

subsequent phase. We understand that the issue of compatibility between 1.5 GHz WBB below 1518 MHz and MSS above 1518 MHz may need to be considered this year.

#### **4.5/4.8 GHz Bands**

AMTA notes that the ACMA is monitoring international developments in the 4.4-5.0 GHz band. This band, standardized by 3GPP as band n79, is becoming increasingly popular for mobile broadband (5G). Although the market is at an early stage, an increasing number of countries are considering this spectrum for IMT. Sub-bands in the 4400-5000 MHz range have co-primary mobile allocations. At WRC-19 over 40 countries identified some of the spectrum in the upper part of this range for IMT. A few countries have assigned spectrum in this range already. Specifically, in ITU Region 3; China, Hong Kong SAR, and Japan have assigned spectrum; in Region 1 South Africa has assigned spectrum in this range. As noted by the ACMA in the FYSO (pg 33), Brazil, China, Myanmar, Nigeria, Paraguay, Russia, Singapore, Uruguay and Vietnam are also considering use of all or part of the 4400-5000 MHz band for WBB.

Recalling the WRC-15 preparatory process and specifically WRC-15 Agenda item 10 considering the WRC-19 Agenda, domestically Australia did not support the study of 4500-4800 MHz due to sensitivities around Appendix 30B of the Radio Regulations (RR), in addition to the Defence incumbency which also complicates the 4.5 and 4.8 GHz Bands (as defined in the FYSO). Noting the international progress on the broader range 4.4-5.0 GHz, we believe that avoiding discussions on the band 4500-4800 MHz due to Appendix 30B is no longer justified, particularly noting that this band is not used for FSS downlinks in Australia. We appreciate that the ACMA has included the range 4500-4800 MHz in the Monitoring stage of the FYSO and packaged the entire range 4.4-5.0 GHz into a single band.

#### **6 GHz Band<sup>17</sup>**

Globally, 6 GHz is emerging as the main option for the expansion of 5G mid-band spectrum.

- The 6 GHz band has the potential to offer multiple operators access to large contiguous bandwidth to meet 5G mid-band needs—noting that in Australia there are incumbency & coexistence issues, primarily with fixed links, that need to be resolved.
- 6 GHz has wide support across the mobile industry: a GSMA survey finds that 90% of mobile operators see 6 GHz as high priority for the future.
- 3GPP standardisation work on 6 GHz as a new licensed IMT band is ongoing and is scheduled for completion by this year.
- The entire frequency range 6425-7125 MHz (“the upper 6 GHz band”) is already allocated to the mobile service on a primary basis.

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<sup>17</sup> Note that Pivotal has a different view surrounding advocacy of the upper 6 GHz band for IMT, and will present its views in its individual response to the FYSO 2023-28.

- As a major market which could generate a device ecosystem on its own, China is focusing on use of the 6 GHz band for 5G<sup>18</sup>.

Under WRC-23 Agenda item 1.2, the main band of interest for Australia is the upper 6 GHz. AMTA is working within the Government’s WRC-23 preparatory process to advocate for Australia’s support for the band 7025-7125 MHz to be identified for International Mobile Telecommunications (IMT) in Region 3 (Australia’s Region, the Asia-Pacific). While the rest of the upper 6 GHz band is only being studied for identification for IMT in Region 1 (i.e. Africa, Europe and the Middle East), Australia could indeed benefit from device ecosystems emerging overseas if the band was successfully identified for IMT in Region 1 (or a significant part thereof), and this could be leveraged to re-plan the upper 6 GHz for WBB in Australia.

As such, the WRC-23 outcomes are not of less importance because only 100 MHz is being considered in Region 3, and we believe that the ACMA has accepted our view on this noting that work will commence on the band after WRC-23. The suggested pause on this work is entirely appropriate noting that any urgency for additional WiFi spectrum would have been addressed with the additional 500 MHz recently included in the LIPD Class Licence.

In our Spectrum Policy Position Paper and our response to the 6 GHz consultation<sup>19</sup>, we referenced the Windsor Place Consulting (WPC) paper<sup>20</sup>, which made the case for partitioning the broader 6 GHz band for WiFi in the lower 500 MHz and IMT in the upper 700 MHz. Earlier this year, GSMA released a cost-benefit analysis<sup>21</sup> showing that socio-economic benefits of this same partitioned configuration are greater compared to those under an “all-WiFi” scenario, i.e. one with all 1200 MHz across the lower and upper bands being allocated to ‘unlicensed’ uses.

While we acknowledge the competing demands and incumbency issues in the band, we also note the possibility for geographical partitioning of different spectrum uses. Similar to the 1.5 GHz band, this could facilitate meeting the highest spectrum demands for WA WBB in metro areas, while minimising the disruption for long-haul fixed point-to-point (PTP) links (and earth station transmitters) in regional and remote areas. Long-standing coordination procedures would be adopted to ensure protection of fixed link and earth station receivers<sup>22</sup>—perhaps coupled with

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<sup>18</sup> GSMA blog, Jan 2023, *New Spectrum for 5G: Adding Up the Mid-Band Maths*, see:

<https://www.gsma.com/spectrum/new-spectrum-for-5g-adding-up-the-mid-band-maths/>

<sup>19</sup> October-December 2021, ACMA, *Radio local area networks (RLANs) in the 6 GHz band - consultation 37/2021*, available here: <https://www.acma.gov.au/consultations/2021-10/radio-local-area-networks-rlans-6-ghz-band-consultation-372021>

<sup>20</sup> Windsor Place Consulting, October 2021, *Optimising IMT and Wi-Fi mid-band spectrum allocation: The compelling case for 6 GHz band partitioning in Asia-Pacific*, available at: [https://www.mcmc.gov.my/skmmgovmy/media/Spectrum-File/23b\\_WPC.pdf](https://www.mcmc.gov.my/skmmgovmy/media/Spectrum-File/23b_WPC.pdf)

<sup>21</sup> January 2022, GSMA, *The socioeconomic benefits of the 6 GHz band*, <https://data.gsmaintelligence.com/api-web/v2/research-file-download?id=69042233&file=310121-The-socioeconomic-benefits-of-the-6-GHz-band.pdf>

<sup>22</sup> Earth station receivers are only relevant in relation to the Fixed-Satellite Service (FSS) space-to-Earth allocation in 6700-7075 MHz which, in accordance with ITU Radio Regulations No. 5.458B, is limited to feeder links for non-geostationary-satellite systems of the Mobile-Satellite Service (MSS). There are currently only four earth station receive sites in Australia, three in regional and remote areas, and one just north of Brisbane

some modest band clearance activities focussed on particular geographical areas—all the while ensuring protection of space station receivers of the FSS.

In summary:

- AMTA supports the identification of the 7025-7125 MHz for IMT in Region 3.
- Domestically, the entire 6425-7125 MHz should be maintained in the Band-planning process, and we believe there will likely be a future device ecosystem to support IMT networks across the entire upper 6 GHz band in Australia<sup>23</sup>.
- Well-established licensing arrangements and registration and coordination requirements facilitate the coexistence of IMT with existing services in Australia.

Lastly and as a side note, we note the ACMA's statement that "*arrangements already exist in Australia for RLANs in the 5150–5350 MHz band (for low power indoor use only), the 5725–5850 MHz band and the lower 6 GHz band (5925-6425 MHz)*". For completeness, this should also list the bands 5470-5600 MHz and 5650-5725 MHz, for which there are also provisions for RLAN in the LIPD Class Licence.

### **13 GHz (12.75–13.25 GHz)**

In Australia, the 13 GHz band is currently used to support fixed point-to-point (PTP) services and television outside broadcast (TOB) services. Our members use this band extensively for the provision of fixed microwave links. As the consultation paper acknowledges (p.30), there are over 2200 PTP links licensed in the band. While we acknowledge there is a growing interest from the satellite community in this band, it is important for the current arrangements in the 13 GHz band supporting PTP links to continue. Furthermore, it could potentially be studied for IMT identification under a potential future WRC-27 Agenda item<sup>24</sup>.

### **Microwave fixed link bands**

Mobile network operators (MNOs) currently use microwave fixed link bands for network backhaul more generally, and also to provide connectivity to rural and remote areas where fixed-line connectivity is not viable. As data traffic demand increases, so too does the demand for backhaul capacity. As such, we believe that this justifies the consideration of facilitating wider channels 112 MHz wide in the microwave bands 6 GHz, 8 GHz and 18 GHz. Furthermore, we request 28 MHz wide channel in the 7.5 GHz Band, which is currently limited to 14 MHz max.

Lastly, the 13 GHz band can be optimised by swapping PTP links on Channel 5 (both in the Main and Interleaved rasters) with TOB services on Channel 4 such that the PTP links would be consolidated in the bottom 4 channels of the band and the TOB services to the top 4 channels.

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<sup>23</sup> GSMA, August 2022, *The 6 GHz IMT Ecosystem*, available here: <https://www.gsma.com/spectrum/wp-content/uploads/2022/08/6-GHz-IMT-Ecosystem.pdf>

<sup>24</sup> April 2023, *Remarks of Chairwoman Jessica Rosenworcel to the National Science Foundation "6G: Open and Resilient by Design"*, available here: <https://docs.fcc.gov/public/attachments/DOC-392792A1.pdf>

This would then allow for introduction of wider channels i.e. 56 MHz channels which will support higher capacity backhaul radio links and further improve the efficiency of this band.

### ***Terahertz spectrum***

The ACMA has noted early developments with respect to “terahertz” spectrum above 100 GHz, increasing interest in this spectrum frontier, and asked questions about whether Australia should follow the UK and the US in establishing dedicated spectrum management arrangements, or wait for technological and business landscape becomes clearer. Noting the current loading of the workplan and the requirements for additional low- and mid-band spectrum over the horizon, we believe that terahertz spectrum is of low priority, and that a “wait-and-see” approach should be adopted, rather than investing stretched resources on investigating this spectrum.

### **Technical Liaison Groups – working together effectively**

AMTA believes that the continued preparation of spectrum to be “5G-ready” will require industry and the ACMA to focus on optimisation work in relation to several bands via further TLGs.

AMTA members agree on the following priorities for the TLG work program over 2023 and 2024:

- 3.4-4.0 GHz (various stages)
- 700 MHz optimisation
- 1.8 and 2 GHz outside of spectrum licensed areas
- 2.5 GHz

That said, we do understand the need for ACMA to address demands from other industries requiring TLGs not directly focussed on establishing technical frameworks for WBB (e.g. Extended L-band and 2 GHz MSS).

We note that the ‘optimisation’ of the 2.5 GHz is listed under “Other consultations” on pg 82, with the ACMA’s proposed timeline simply being “once 700 MHz work nears completion”. While we agree that this task is the lowest priority from the four listed above, we believe the ACMA should specify a target quarter for commencement of the 2.5 GHz TLG.

AMTA also notes that the ACMA work program in relation to the review of spectrum licence technical frameworks is substantial and that it is not always easy to predict how straightforward the consultation process around the review of a technical framework will be. AMTA does have some concerns regarding how the consultation processes around some of the TLGs have progressed over the past few years.

In particular, AMTA notes that TLGs necessarily include a broad range of stakeholders, all with varying concerns at stake in the outcome of the technical framework. However, despite varying levels of risk between stakeholders, the contributions/or lack of contributions from any particular stakeholder hold no more or less weight than any other.

AMTA suggests that for TLGs to work effectively, TLG stakeholders must be reasonably compelled to provide evidence and substantiation of claims made in any TLG as the TLG process can only be successful when all stakeholders participate within a co-operative, collaborative forum and no single participant is able to unnecessarily or unreasonably delay or deter a fair and equitable outcome for all parties.

In our response to the previous draft FYSO, we suggested that the TLG process should be punctuated with appropriately timed and scoped, ACMA-facilitated discussions to ensure that all participants, from multiple industries and spectrum use cases, have the opportunity to understand the ACMA's intent and objectives for any given TLG as well as the views of other participants. We appreciate that the ACMA has taken this on board with recent Tune-Ups and meetings, for example, prior to conclusion of the 3.4/3.7 GHz auction public comment period, and with a meeting to kick-off the 700 MHz TLG. We encourage the ACMA to facilitate complementary, issue-specific discussions if enough participants feel that to be necessary.

### **Approaches to consultation**

We support the ACMA's adoption of a "reply comment" period (e.g. another 30 days) following the initial consultation period, in which industry reviews the responses from the rest of industry.

### **Licensing and licensing systems**

AMTA notes the work being undertaken in relation to licensing activities for 2023-24, partly as a result of the implementation of the Modernisation Act. We will continue to engage with the appropriate ACMA teams in relation to most of the project priorities outlined in the table at page 63 of the draft FYSO. As noted, we have particular interest in the expiring spectrum licences project as well as drone regulation, the RNSS repeater trials and the ongoing trial of mobile phone jammers in NSW prisons.

In relation to the banned equipment and exemptions framework, we expect a suitable level of oversight that allows MNOs to operate in their spectrum-licensed spectrum space with a high degree of certainty. We welcome recent consultations on new exemption applications and urge the ACMA to continue to engage with industry on these applications as well as the use of otherwise banned devices under exemptions more generally.

### **Compliance and international engagement**

As per previous AMTA responses to draft FYSOs, we wish to express our support for the ACMA to remain heavily involved in and leading on compliance and international regulatory activities. It is of utmost importance for the ACMA to be adequately resourced to carry out these duties. Further to our concerns about the impact on spectrum licence rights, AMTA urges the ACMA to support compliance with licence conditions and relevant technical frameworks to minimise the risk of interference to spectrum licensed services in an increasingly complex interference context.

On the international front, we urge the ACMA to support the inclusion of a future WRC-27 Agenda item that will continue the search for suitable IMT spectrum options to add to the spectrum toolkit; nominally within the frequency range 7 to 24 GHz. This preparation is important to

prevent any future “spectrum crunch” in the face of ever-increasing traffic demands. There is growing recognition that this is where the next tranche of mid-band spectrum options for IMT (6G by this stage) is most likely to emerge from<sup>25,26,27</sup>.

### **Sunseting Instruments (Appendix A)**

We support the re-making of the 2.3 GHz spectrum licence technical framework instruments— noting that the framework and licence conditions were recently updated in 2021—and also note the imminent Q2 2023 consultation on the sunseting of the *Radiocommunications (Public Safety and Emergency Response) Class Licence 2013* (“the PSER Class Licence”). If the PSER Class Licence is not being used for the intended purpose, it may be better to allow it to sunset and further facilitate consideration of the 4.0-4.99 GHz frequency range for potential future use by IMT.

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<sup>25</sup> April 2023, Remarks of Chairwoman Jessica Rosenworcel to the National Science Foundation “6G: Open and Resilient by Design”, available here: <https://docs.fcc.gov/public/attachments/DOC-392792A1.pdf>

<sup>26</sup> Nokia’s vision for the 6G era, available here: <https://www.nokia.com/about-us/newsroom/articles/nokias-vision-for-the-6g-era/>

<sup>27</sup> GSA, Nov 2022, Mid-band spectrum and the 5G opportunity, available here: <https://gsacom.com/webinar/gsa-insight-mid-band-spectrum-and-the-long-term-5g-opportunity/>

Australian Mobile  
Telecommunications Association

PO Box 1507, North Sydney, NSW 2059

50 Berry St, Suite 504, Level 5, North Sydney NSW 2060

[www.amta.org.au](http://www.amta.org.au)