AMTA Submission to the ACMA:

16 May 2019

IFC 10/2019 Five Year Spectrum Outlook 2019 -23

Australian Mobile Telecommunications Association

Executive Summary

AMTA considers that enabling 5G is an appropriate goal around which the ACMA should develop near and medium-term priorities and workplans.

We therefore submit the following suggested priorities for the next five years:

- AMTA commends the ACMA for the preparation of the Forward Allocation Work Plan, and highlights the following:
    - AMTA supports the establishment of two separate work streams for planning activities: one on the allocation of new spectrum and the other on optimisation of existing spectrum. We believe both work streams can be carried out in parallel.
    - With respect to new spectrum, we support continued work on the 26 GHz band, and an accelerated planning decision on the 28 GHz so that future arrangements in the latter band can better inform detailed technical work on the former band.
    - With respect to existing spectrum, optimisation of the 3.4 GHz band is the priority. AMTA members are currently considering the ACMA consultation *Reconfiguring the 900 MHz band* and will provide detailed commentary in response to that consultation process. AMTA members have also identified that a review of the technical frameworks in the "2.X GHz Bands" (i.e. 2 GHz, 2.3 GHz and 2.5 GHz bands) would be valuable.
    - Further work on the 1.5 GHz band can be postponed to facilitate prioritisation of other items in the forward allocation work plan.

- AMTA is opposed to ACMA plans to introduce underlay class licensing in spectrum-licensed spectrum space, as alluded to in the options and decision papers for the 26 GHz band, and as alluded to in draft FYSO text on the 3.8 GHz band.

- AMTA submits that ACMA should develop Australian positions for WRC-19 Agenda item 1.13 that support international harmonisation of key bands 24.25-27.5 GHz, 37-43.5 GHz, 66-76 GHz and spectrum around 50 GHz, for use by IMT.

- AMTA supports progress of a 3.8 GHz (3700-4200 MHz) planning activity focused on clearance and allocation of the lower (approx.) 100 MHz of the band for WBB, and that we also remain interested in the 600 MHz band as a long-term future spectrum option.

- AMTA believes that the introduction of new experimental operation and/or use by non-MNOs can initially be facilitated by apparatus licences, and that class licences should only be used when technologies are mature to market and the interactions with existing uses of the band are well understood. AMTA stresses that the band 66-71 GHz requires further consideration following the outcomes of WRC-19.

- The exploration of apparatus licences based on spectrum space for mmWave FWA systems in the 26 GHz and 28 GHz bands is of interest.

- Finalisation and implementation of the Interference Management Principles, underpinned by a strong compliance and enforcement framework.

- AMTA also welcomes the ACMA's forthcoming consultation in relation to the implementation of the Spectrum Pricing Review.

Introduction

The Australian Mobile Telecommunications Association (AMTA) welcomes the opportunity to provide feedback to the Australian Communications and Media Authority (ACMA) regarding the Five-Year Spectrum Outlook 2019- 23(FYSO).

We note the FYSO proposes two main work streams in its Forward Allocation Work Plan – one for planning and replanning spectrum bands for new uses and one for optimising existing bands. We strongly support the value of both these activities and submit that they are both given equal priority by the ACMA.

5G deployment drives continued demand for spectrum resources

Australian mobile carriers have committed to deploying 5G mobile services from as early as 2019. The deployment of 5G requires significant capital investment in both spectrum resources and network infrastructure to both densify and expand network capacity.

5G will deliver substantial improvements in the speed, latency and reliability of mobile networks in order to meet the current and forecast strong and ever-increasing demand for mobile services including new capabilities that will be enabled by this next generation of services.

In terms of forecast demand, by the end of 2024 it is estimated that globally there will be 1.5 billion 5G subscriptions for enhanced mobile broadband, with 5G networks covering 40 percent of the world's population and carrying 25% of the world's mobile data traffic.[1]

AMTA estimates that each mobile operator will need 100 MHz of mid band and 1GHz of mmWave spectrum for 5G to reach its full potential and deliver on what it is designed to do.

AMTA notes the Government's recognition that spectrum must be made available in a timely manner to enable innovation and productivity across industry sectors with a particular focus on enabling the early deployment of 5G mobile networks in Australia.[2]

We strongly believe this is needed to ensure ongoing demand for all types of services can be met and Australia remains at the forefront of rolling out the next generation of mobile technologies to enable transformative social and economic benefits across industries such as transport and logistics, health, education and the automotive industry,[3] as well as consumer benefits.

Recent research points to the potential of 5G for consumers [4] with a key finding that data usage for one in five users could reach more than 160GB per month on a 5G device by 2025. Other key findings were:

- Australian consumers expect 5G to provide relief from urban network congestion in the near term - *especially in Australia's bigger cities, where nearly half (47%) smartphone users report facing network issues in crowded areas* - and to create more home broadband choices.

[1] Ericsson Mobility Report, Special Edition, World Economic Forum, January 2019
[2] Department of Communications and the Arts, 5G-Enabling the future economy, Directions paper, Oct 2017.
[3] AMTA Mobile Minute '5G A connected future for Australia' June 2017
[4] Ericsson 5G Consumer Potential report, 2019 l

- Current 4G usage patterns are not indicative of future usage behaviours. Video consumption is set to rise significantly with 5G. Australian consumers expect to not only stream video in higher resolutions but also use immersive video formats such as Augmented reality (AR) and Virtual reality (VR), resulting in an additional two hours of video content being watched weekly on mobile devices by users in the 5G future when they are out and about, including half an hour wearing AR glasses or VR headsets.
- Consumers are willing to pay a premium on 5G, with Australian smartphone users stating that they are willing to pay 20 percent more for fifth-generation services, and early adopters as much as 42 percent more.

We also note the ACMA's acknowledgement in the FYSO of "the importance and urgency of addressing the 5G spectrum needs" and its commitment to "ensuring that Australia is well placed to take advantage of the opportunities offered by 5G". AMTA supports these statements and is pleased with the allocation of the 3.6 GHz band and the progression of planning activities focussed on both the allocation of new spectrum under one work stream and the optimisation of existing spectrum under another work stream. With respect to new spectrum, we support continuing work on the 26 GHz band in support of early 5G testing and assessment deployment scenarios in preparation for allocation, and also support the replanning of the 28 GHz band. With respect to existing spectrum, optimisation of the 3.4 GHz band is the top priority.

On the other hand, we note the ACMA's thinking that "*some of the bands into which 5G will be introduced challenge us to consider new ways to plan and license that spectrum*" and see this as connected to the proposal for underlay class licensing in the 26 GHz Options Paper[5] . As outlined in the response to that paper[6], AMTA is opposed to underlay class licensing in spectrum-licensed spectrum space, as it can reduce certainty and/or increase interference potential to spectrum-licensed use. AMTA is pleased with the ACMA's decision to limit class licensed use to spectrum in 24.25-25.1 GHz, which will not overlap spectrum licences in the 34 large population centres or apparatus licences outside the 34 large population centres.[7]

Australia is a mobile nation – economic and social benefits of mobile

The *Mobile Nation 2019 – The 5G Future*[8] report by Deloitte Access Economics found that the mobile industry continues to make a significant contribution to Australia's economy. Deloitte Access Economics estimates that the mobile industry contributed $22.9 billion of value added to GDP in 2017-18. This figure includes $8.2 billion contributed directly from mobile industry activities as well as $14.7 billion supported through indirect activity in related sectors and across the economy. The mobile industry also supported approximately 116,100 full time equivalent employees. For every full-time employee in the mobile industry there are 3.7 full time roles supported in other sectors.

Beyond the value added to GDP and the employment contribution of mobile telecommunications, mobile technologies, including 5G, continue to drive productivity throughout the Australian economy. While productivity has generally declined over the last decade, mobile technologies have

[5] IFC 32/2018 Options for wireless broadband in the 26 GHz band (20 September, closed 9 November 2018)
[6] AMTA submission to IFC 32/2018, 13 November 2018.
[7] IFC 14/2019.
[8] Deloitte Access Economics, Mobile Nation 2019- The 5G Future, commissioned by AMTA 2019.

boosted both labour and capital productivity. Deloitte Access Economics estimates that the productivity impact of mobile will be equivalent to $2 500 for every Australian by 2023. This amounts to a total of $65 billion of additional GDP by 2023, or 3.1% increase in GDP which is more than the 2.8% contribution of the agricultural sector in 2018.

We believe that 5G will drive the current technological revolution – Industry 4.0 – as businesses move to increase automation and become ever increasingly reliant on data. Australian businesses will rely on mobile to drive innovation, develop new revenue streams, and streamline operations. A survey of 550 Australian businesses in 2018 by Deloitte Access Economics found that 80% reported that they have already implemented at least one emerging technology, or that they expect to implement one in the next 3 years.[9]

Mobile technology also provides significant social benefits with 60% of Australians reporting that their smartphone has replaced 3 or more other devices or items. And 94% of mobile users do not leave the house without taking their smartphone with them. Mobiles are now a multi-purpose utility tool that enable us to remain connected both at work and socially.[10]

Reform of the Radiocommunications Act and Regulatory Framework

AMTA recognises that the Government's reform agenda around the *Radiocommunications Bill 2018* has stalled in 2019 and we look forward to renewed engagement on reform of the regulatory and legislative framework in the second half of this year.

It is critical that we have a fit for purpose regulatory framework to support the deployment of 5G so that the enabling benefits of the next generation of mobile technology are fully realised across the economy.

AMTA submits that a fit for purpose regulatory framework must be based on the following fundamental principles:

1. The licensing framework needs to be flexible as well as provide sufficient certainty to encourage continued investment.

2. Flexibility means – streamlining processes, a technology neutral approach and support for multi-purpose use.

3. Certainty means – licence tenure of at least 20 years; with a clearly defined pathway to renewal for new allocations.

4. Clearly defined pathway to renewal for existing licences

5. Allocations need to be efficient and market-based; with secondary trading supported.

6. Property rights of licence holders need to be enforced so that licence holders can enjoy spectrum free of interference and encumbrances.

[9] Ibid p24.
[10] Ibid chapter 5

7. Sharing should never be imposed on licence holders.

We also note that the ACMA is planning to finalise its Interference Management Principles, first consulted on in 2017[11], when AMTA raised some issues with the Principles[12] that still concern us. AMTA strongly believes that the ACMA must be resourced to adequately and efficiently manage interference issues so that spectrum licences are not devalued and the property rights of spectrum licence holders are maintained and protected. The management of interference will be increasingly important with the roll-out of 5G and the associated proliferation of IoT devices.

[11] IFC 13/2017

[12] AMTA submission to IFC 13/2017.

Responses to Questions included in FYSO

1. **What further improvements to the FYSO would make it easier for stakeholders to engage with the ACMA on its spectrum management work program?**

AMTA recognises and appreciates the significant improvements that have been made to the FYSO – including how it works and its timing - by the ACMA. The only suggestion we could make is around the accessibility of the FYSO, in that it would be helpful if more detail could be included around the timeframes for consultations and the likely dates for decision-making.

2. **Are there other technology developments or sources of spectrum demand that the ACMA should be aware of in considering spectrum management over the next five years?**

We believe the ACMA is well aware of technology developments and sources of spectrum demand and these have been adequately covered in the FYSO.

3. **Do you have any comments about the ACMA's planned international engagement activities?**

AMTA supports the ACMA highlighting its international engagement activity in the FYSO, in particular noting the culmination of the four-year cycle at the 2019 World Radiocommunication Conference (WRC-19) in November this year.

For AMTA, the main desired outcome of the WRC is the identification of multiple millimetre-wave (mmWave) spectrum bands for International Mobile Telecommunications (IMT).

The identification of mmWave spectrum will serve to highlight spectrum options for mobile broadband networks—5G in the first instance—that are harmonised internationally among multiple countries (if not globally or regionally). Undertaking this activity during the four-year WRC work cycle and culmination of changes to the ITU Radio Regulations is important because it indicates which respective governments have are generally supportive of (though not necessarily committed nor obliged to), future rollout of mobile broadband in identified bands.

AMTA's key spectrum targets align with the bands of greatest interest internationally, as regional groups work to prepare their positions for the WRC. Namely, AMTA has previously announced[13] and continues to stress that international identification for IMT of the bands 24.25-27.5 GHz, 37-43.5 GHz and 66-76 GHz is needed to ensure sufficient mmWave spectrum for 5G moving forward, and to support and encourage the development of device ecosystems.

More recently in the WRC cycle, bands around 50 GHz seem to be gaining interest internationally—in particular noting the USA's allocation of the band 47.2-48.2 GHz for Upper Microwave Flexible Use Service (UMFUS)[14] and the African Telecommunication Union's (ATU's) support for identification of

[13] ZDNet, 6 Sep 2017, *Australia facing 'urgency' on 5G spectrum bands: AMTA*, available at: https://www.zdnet.com/article/australia-facing-urgency-on-5g-spectrum-bands-amta/
[14] Federal Communications Commission, Nov 2017, *Second Report and Order*, available at: https://www.fcc.gov/document/fcc-takes-next-steps-facilitating-spectrum-frontiers-spectrum

47.2-50.2 GHz and 50.4-52.6 GHz[15]. As such, AMTA believes that Australia should also be prepared to support identification of spectrum in this range.

As flagged at the ACMA's mmWave Tune Up[16], Australia needs to be ready to move on 5G as soon as mmWave spectrum for 5G is harmonised internationally at WRC-19. AMTA is therefore pleased with the progression of the 26 GHz Band (24.25-27.5 GHz), leading to the recent release of the ACMA's *Future use of the 26 GHz band—Planning decisions and preliminary views*. The ACMA's progression of the planning for allocation of the 26GHz band will ensure Australia has an internationally harmonised spectrum band ready to support timely 5G mmWave rollouts and allow it to keep the pace with other technological leaders around the world. As indicated in its response to the ACMA's IFC 45/2018—*Class licensing updates: Supporting 5G and other technology innovations*—progress of other mmWave bands domestically should wait at least until WRC-19, with further consideration required following the outcomes of WRC-19 Agenda item 1.13.

4. Do you have any feedback on the ACMA's plans for monitoring, initial investigation, preliminary replanning or re-farming of bands?

AMTA supports the inclusion of bands at the Preliminary replanning and Replanning stages of the ACMA's Planning activities, in particular those already reflected in the forward allocation work plan. More detail on our views on these bands is contained in our response to Question 6 below. AMTA's key priorities are:

- Under the planning work stream on new spectrum, work on the 26 GHz band is a priority, with a prompt planning decision on 28 GHz to better inform this work.
- Under the planning work stream on optimising existing spectrum, optimisation of the 3.4 GHz band is the top priority.

AMTA notes the inclusion of the 3.8 GHz Band in its planning agenda at the Initial investigation stage. For its part, the mobile industry notes that the band 3400-3700 MHz band provides insufficient spectrum for four operators (noting NBN Co's presence in the band in terms of spectrum holdings) and would consider 400 MHz a more appropriate quantum of spectrum for the provision of, in the order of, 100 MHz per operator in C-band. The extension of the spectrum-licensed arrangements above 3700 MHz, up to approximately 3800 MHz, is of interest to AMTA in the medium term. As demonstrated in previous consultations including on the 3.6 GHz and 26 GHz bands, the ACMA is well aware that the density of deployment and intensity of transmissions of mobile networks typically requires 'Tier 1' primary user status in the band. As such, the FCC's approach of clearing a portion of the band (with a lower edge of 3700 MHz) is preferred over a spectrum sharing approach as opportunistic 'lower tier' user as investigated by Ofcom, which does not provide the certainty and reliability sought by MNOs.

[15] African Telecommunications Union (ATU), 12 Nov 2018, *APM19-3 – Summary of African Preliminary Positions for RA & WRC-19*, available at: https://www.itu.int/dms_pub/itu-r/md/15/2ndwrc19prepwork/c/R15-2NDWRC19PREPWORK-C-0006!!PDF-E.pdf

[16] ACMA Tune-Up, September 2017 and consultation

AMTA remains interested in the 600 MHz band as a long-term future spectrum option. We believe that the FYSO should reflect some additional developments:

- Under WRC-15 Agenda item 1.1, the 600 MHz band was identified for IMT in a number of Asia-Pacific nations including New Zealand (RR No. 5.296A), and in a number of American nations including Canada, USA and Mexico (RR. No. 5.308A).
- The preliminary agenda for WRC-23 in Resolution 810 (WRC-15) includes a new agenda item to *inter alia* consider possible regulatory actions in the band 470-694 MHz in Region 1 in accordance with Resolution 235 (WRC-15). Noting that this preliminary new agenda item was the result of discussions under WRC-15 Agenda item 1.1 in relation to IMT use of the band 470-694 MHz, it is possible that additional countries in Region 1 may identify the 600 MHz band (or parts thereof) for IMT.

5. Do you have any feedback on optimising established planning frameworks?

AMTA observes the majority of activities identified for optimising established planning frameworks are not relevant to mobile broadband services. The last item in this section of the Draft FYSO covers the December 2018 consultation (IFC 45/2018) on Low Impact Potential Devices proposing class-licensing in the band 66-71 GHz, inter alia, and notes that the ACMA is currently considering submissions received. Our views are contained in our submission, where the key point is that the band is being considered for global international harmonisation as an IMT-2020 band at WRC-19, and that a decision on licensing arrangements should not be made until the outcome of the Conference is known. AMTA believes that the introduction of new experimental operation and/or use by non-MNOs can initially be facilitated by apparatus licences, and that class licences should only be used when technologies are mature to market and the interactions with existing uses of the band are well understood.

6. Do you have any comments about the ACMA's approach to the forward allocations, or the prioritisation and timing of allocations?

AMTA commends the ACMA for the preparation of the Forward Allocation Work Plan, and we are pleased with the progress on these items. In particular, we appreciate the ACMA's recent work in advancing consultation processes on four of the five items in the plan.

AMTA notes that the ACMA proposes for planning activities to be directed into two main work streams:

- Major band planning and replanning activities to support the establishment of new spectrum uses; and
- Optimising established planning frameworks for existing spectrum use through updating technical coordination arrangements.

We consider the progression of each stream in parallel to be possible.

New Spectrum Work Stream

In terms of major band planning activities for the establishment of new spectrum uses, 26 GHz is the top priority among the bands earmarked for new wireless broadband (WBB) spectrum. AMTA members see the progression of the 28 GHz band as another important body of work.

AMTA members see potential efficiencies in a holistic consideration of 26 GHz and 28 GHz. Specifically, AMTA members agree that the planning decision on the 28 GHz band be made by the ACMA before progressing too far into TLG work on the 26 GHz band, which could be impacted by band-edge issues at 27.5 GHz. We request that ACMA prepare a revised timeline for the forward allocation work plan based on the 26 GHz TLG being informed by a 28 GHz planning decision.

Pending further detailed commentary in response to the ACMA's Planning options for the 28 GHz band (IFC 12/2019), AMTA members support some variant of Option 1 for the 28 GHz band, whereby the lower 600 MHz of the 28 GHz band would be spectrum-licensed for WBB in large population centres.

We provide the following comments in support of progressing the 28 GHz band:

- As the WRC cycle and domestic planning of the TLG progresses, views of equipment vendors on the implementation of emission limits to protect adjacent-band passive services may impact the utility in practice of the lower end of the 26 GHz band, and hence the value for aspirant spectrum licensees in the band. It is likely that changes to the perceived value of the lower end of the 26 GHz band may impact the perceived value of the lower portion of the 28 GHz band.

- Under Option 1, fixed links would either be allowed to continue to operate (Option 1a) or existing links would be grandfathered for a minimum period of time (Option 1b). Noting that just 22 fixed links are licensed in the 28 GHz band, which has been available for fixed links since 2014, there does not appear to be a need to urgently resolve arrangements for 28 GHz fixed links. As such, the review of the 38 GHz band as an alternative spectrum option for fixed links should not result in any deceleration of a decision on the spectrum licensing of the lower portion of the 28 GHz band for WBB in population centres.

We also agree with maintaining the 1.5 GHz Band in the forward allocation program. The identification of this band for use by IMT internationally was among the key outcomes of WRC-15 Agenda item 1.1, and it is useful to have such valuable low-band spectrum in the pipeline for mobile broadband networks. However, at this stage, it is useful to delay the progression of the band due to more urgent priorities in the forward allocation program.

Optimisation Work Stream

We believe that the consolidation/re-stack exercise in the 3400-3575 MHz is the top priority in terms of activities focussing on optimisation of spectrum within the forward allocation work program.

In this sense, we agree with the ACMA's prioritisation of optimising the 3.4 GHz band and the prompt release of the discussion paper on that subject. AMTA members are interested in the

implications of a potential release to market of spectrum around Australia currently allocated to NBN Co by Ministerial Direction, but not used in all locations. Specific views held by AMTA and its members will be submitted in response to IFC 12/2019.

AMTA members are currently considering the ACMA consultation *Reconfiguring the 900 MHz band* and will provide detailed commentary in response to that consultation process.

AMTA members have also identified that it would be very valubale to review technical frameworks in the "2.X GHz Bands" (i.e. 2 GHz, 2.3 GHz and 2.5 GHz bands).

7. Do you have any feedback on the ACMA's approach to improving how we manage spectrum?

AMTA supports the ACMA's exploration of design of apparatus licences based on spectrum space for the fixed wireless access (FWA) systems in the 26 and 28 GHz bands, and we look forward to the consultation on this topic in Q4 2018/2019.

AMTA also welcomes the ACMA's forthcoming consultation in relation to the implementation of the Spectrum Pricing Review.

We have outlined some fundamental principles that we believe should underpin the regulatory framework for spectrum management earlier in this submission, noting that we look forward to re-engaging with Government on the reform of the regulatory framework in the second half of 2019.

8. Do you have any comments about the ACMA's planned activities for licensing and licensing systems, pricing, and compliance and enforcement?

AMTA strongly supports the necessity of ensuring that communications networks are not unduly interfered with or disrupted. Our telecommunications networks are fundamental to delivering connectivity and ensuring safety of the public through the provision of services including Triple Zero. Undue interference with telecommunications networks and licensed spectrum must be avoided and it is essential that the regulatory framework is sufficiently robust to ensure networks are protected.

The ACMA must be adequately resourced and empowered to undertake compliance and enforcement activities. Compliance and enforcement necessarily underpin the property rights of spectrum owners. Spectrum is a valuable national resource and it is vital that allocated spectrum is protected from undue interference in order for the economic and social benefits of spectrum use to be fully realised. AMTA therefore looks forward to engagement on the ACMA's Interference Management Principles as scheduled in the FYSO.

AMTA notes that there is an increasing trend to provide exemptions to the Radiocommunications (Prohibited Device) (RNSS Jamming Devices) Declaration 2014 (RNSS Jamming Device Prohibition) and the Radiocommunications (Prohibition of PMTS Jamming Devices) Declaration 2011 (PMTS Jamming Device Prohibition).

These exemptions have been made in response to applications for the use of jammers in relation to drone technology by law enforcement and security agencies as well as ongoing trials of jamming technologies in correctional facilities, bomb disposal and visits by international VIPs.

We urge the ACMA to consider a whole of Government, holistic and co-ordinated approach to the management of all prohibited devices, including jammers, so that a consistent policy can be applied to ensure we avoid a proliferation of exemption instruments as allowing exemptions may not be the most effective way to manage prohibited devices and also have the potential to cause interference and disturbance to communications networks.

AMTA urges the ACMA to review the exemptions already in place and those that are being contemplated to ensure a co-ordinated and considered regulatory approach that does not undermine the fundamental policy of prohibition of jamming devices.

AMTA would be happy to discuss how a co-ordinated and holistic approach to the management of prohibited devices could be considered further if that would be helpful.

Conclusion

AMTA recognises and appreciates the efforts of the ACMA in planning for and progressing spectrum bands for 5G and looks forward to continued engagement across the two work streams.

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