



**Australian Mobile
Telecommunications
Association**

AMTA Submission to ACMA

30 October 2015

*“Beyond 2020 – A spectrum management strategy to address the growth in mobile
broadband capacity”*

ACMA Discussion Paper – September 2015

Table of Contents

Background	3
Introduction	3
Importance of Mobile Broadband	3
Demand for MBB drives investment.....	3
Economic benefits of mobile broadband.....	4
Spectrum Review	5
A more liberal licensing framework is needed to free up spectrum	5
Prioritisation of the Work Program – total welfare analysis	5
Strategies for Mobile Broadband.....	6
Strategy 1—Holistic approach to mobile broadband capacity growth	7
Strategy 2—Transparent spectrum management planning process.....	9
Strategy 3—Utilising long-lead times	10
Strategy 5—Influencing international spectrum harmonisation.....	10
Proposed Work Program	12
2700-2900 MHz.....	12
Bands above 6 GHz	13
900 MHz	14
3400-3700 MHz.....	14
Conclusion.....	15
Appendix A – A liberalised licensing framework.....	16

Background

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 Carriage Service Providers (CSPs), handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see www.amta.org.au.

Introduction

AMTA welcomes the opportunity to comment on the ACMA's Discussion paper "*Beyond 2020- A spectrum management strategy to address the growth in mobile broadband capacity*" (the Discussion Paper).

AMTA supports the ACMA in its move away from focussing on explicit quantitative targets of spectrum to be made available for mobile broadband (MBB). AMTA agrees that the ACMA's proposed adoption of a holistic approach will enable greater flexibility and responsiveness in meeting the demand for spectrum for MBB as well as other uses.

Importance of Mobile Broadband

Demand for mobile broadband drives investment

The rising number of smartphone subscriptions and increasing data consumption per subscriber are driving global mobile data traffic growth. This will result in an 8-fold increase in global traffic by the end of 2020. It is forecast that the growth in global data traffic between 2019 and 2020 will be greater than the total sum of all mobile data traffic up to the end of 2013.¹

In Australia, the ACMA's research program has noted the following developments:

- 12.07 million people owned a smartphone as at May 2014²
- Use of the internet over mobile phones grew by 196% over three years from 2010-2013³
- The use of mobile commerce services is soaring with an increase of 448% in the use of m-commerce services from 2010-2013⁴
- 12% of Australians were exclusively mobile-users for accessing calls, internet and messaging services as at Dec 2014⁵
- 29% of Australians were mobile only users for phone use (no fixed line at home) and 21% used only their mobile for internet access.⁶

ABS figures for the June 2014 quarter show that Australians continue to have an increasing appetite for mobile data. While fixed-line broadband continues to account for the largest proportion of total

¹ [Ericsson Mobility Report Feb 2015](#)

² ACMA Research Snapshot, [M-Commerce](#)

³ *ibid*

⁴ *ibid*

⁵ ACMA Research Snapshot, [Australians Get Mobile](#)

⁶ *ibid*

data downloaded (93 per cent), mobile data downloads showed the strongest growth. They almost doubled from the June quarter 2013 to June 2014, with an increase of 97 per cent to 38,734 terabytes. This makes mobile the fastest growing way of downloading data, while fixed-line broadband download volumes increased by 53 per cent and wireless by 20 per cent.⁷

This continued growth in demand for more MBB capability is driving mobile network operators to continue to invest in and expand the capacity of networks.

Economic benefits of mobile broadband

Spectrum is key infrastructure for mobile technology that plays a critical enabling role in Australia's economy, driving growth and productivity. The Australian Communications and Media Authority (ACMA) has previously noted:

*"There is widespread recognition that mobile broadband services are an economic enabler within society and the provision of these services, technologies and applications in the wider community is in the public interest."*⁸

And the GSM Association has stated:

*"Mobile infrastructure is now as important to a country's economy as its energy grid or transportation network. It is a key enabling infrastructure that drives and supports growth in the wider economy."*⁹

Spectrum is a critical resource for the delivery of MBB which is forecast to deliver \$11.8 billion worth of productivity benefits to the Australian economy by 2025¹⁰.

The ACMA's report on 'The economic impacts of mobile broadband to the Australian economy, from 2006-2013' found that MBB has:

- increased the growth rate of the Australian economy by 0.28 per cent each year from 2007 to 2013; and
- led to an increase in Australia's economic activity of \$33.8 billion in 2013.¹¹

Finally, US research has shown that consumer benefits are 10 times higher than the value the actual spectrum generates at auction. So a US\$30 billion investment in spectrum equates to US\$300 billion of consumer benefits.¹²

⁷ Australian Bureau of Statistics [June Quarter 2014](#)

⁸ 2011 ACMA "Towards 2020 Future spectrum requirements for mobile broadband"

⁹ GMSA, The Mobile Economy 2013, p 7

¹⁰ [Mobile Nation](#), the Economic and Social Impacts of Mobile Technology, Deloitte Access Economics, Feb 2013

¹¹ 'Centre for International Economics, p 2

¹² FCC Chairman Julius Genachowski – 16 March 2011

Spectrum Review

The Spectrum Review reform process is critical to the ACMA's work program and future strategies for spectrum planning in relation to MBB as well as other services.

As such, AMTA believes that there are two priorities for the Spectrum Review reform agenda that can be implemented almost immediately to assist in the ACMA's planning and work program:

- 1) Liberalise the licensing framework so that existing (and future) licences are more flexible for licence holders.
- 2) Evaluate the opportunity costs for each band – in terms of MBB as well as other uses – to determine priorities.

A more liberal licensing framework is needed to free up spectrum

The new licensing framework proposed in the Spectrum Review has the potential to enable new opportunities for market forces to move spectrum to higher value uses (such as MBB) as the demand for those new uses emerges.

Such an approach would reward innovation and investment and take some of the pressure off the ACMA to make reallocation decisions, because the flexibility to move spectrum to other uses would be inherent in the licensing framework and a matter for negotiation between existing and new users. Please see **Appendix A** for details on a liberalised licensing framework.

Prioritisation of the Work Program – total welfare analysis

It is important that the ACMA is able to prioritise its work program. AMTA considers that undertaking a total welfare analysis of each option will assist the ACMA to prioritise its work program.

For example, a total welfare analysis would allow the ACMA to determine whether a band with considerable amounts of unused or very lightly used spectrum may yield higher value use if allocated to MBB than if it is not. Similarly, a total welfare analysis may indicate relatively low net benefits for the economy for a band that requires a costly transition of existing services to other bands and has a limited amount of spectrum available for the industry. As such, AMTA supports the ACMA's proposal to include assessments of the highest value use of the spectrum as a requirement for all spectrum identified by the ACMA regardless of its stage in the ACMA's planning process.

In addition, the market has a role to play in determining the 'priority' of frequency bands. That is, there should be a capability for an assessment of the highest value use of a frequency band to be carried out at any stage, including at Stages 0 and 3. Additional information on this proposal is provided below.

Strategies for Mobile Broadband

ACMA Question 1, pg 39—*The ACMA seeks comments on these assumptions. Do you agree? Why/Why not?*

AMTA broadly supports the assumptions listed at pages 38-39 of the Discussion Paper.

Nonetheless, close scrutiny of the implications from these assumptions is warranted.

More specifically, AMTA concurs with the ACMA's assessment that Australia currently has sufficient spectrum allocated for MBB in the 'short term' which we understand to be within the next 1-4 years. However, demand will surpass supply beyond the short term and it is therefore imperative that industry and the regulator continue to work together to ensure that Australia is able to meet the expected demand for spectrum for MBB in the 'medium' to 'long term' (i.e. beyond 4 years).

Also, even if the quantity of spectrum available for MBB in the short term is adequate, AMTA believes that the ACMA still has a role in encouraging the efficient allocation of spectrum that has been allocated for MBB use. This is discussed in more detail in the section on Strategy 2.

Finally, reforms that emerge from the Spectrum Review should cause the ACMA to reconsider its current working assumptions. For instance, "long lead-times" for spectrum allocation to its highest value use have become a function of the existing spectrum management framework and licensing system. AMTA has consistently argued that the existing spectrum management framework should be reformed to ensure the allocation of spectrum to its highest value use is achieved in the most efficient and timely way possible.

ACMA Question 2, pg 46—*What factors should be taken into account in assessing the highest value use of a spectrum band? What particular costs and benefits should be taken into account? Is there a recognised measure of these costs and benefits?*

ACMA Question 3, pg 48—*The ACMA seeks comments on these strategies. In particular, comment is sought on the stages of band replanning and considerations for advancing through these stages.*

AMTA maintains that demand for spectrum for MBB will outstrip supply by 2020 if we do not make adequate plans to meet demand now.

The future demand trend line for MBB is a strong indicator of future spectrum needs and underlines the need to maintain a sense of urgency in seeking new spectrum bands. Maintaining momentum in planning strategy is particularly important in order to reduce the impact of any long lead times involved in both domestic and international decision making forums, and the need to migrate incumbent uses to free up spectrum for new uses.

The Discussion Paper flags the need to focus on ensuring we adequately plan for the future and AMTA strongly supports this call to action.

AMTA supports the ACMA putting in place a strategy that:

- is proactive in its approach – both domestically and in Australia’s engagement in international forums;
- is flexible and responsive to market and technology change so that spectrum can easily be allocated to its highest value use – facilitating prioritisation as mentioned in the previous section; and
- takes into account whether spectrum is being used efficiently by all users.

Strategy 1—Holistic approach to mobile broadband capacity growth

AMTA strongly supports the ACMA’s shift towards a holistic approach to MBB spectrum management and its commitment to *“focus on the desired outcome – that is, the delivery of mobile broadband services enabled by mobile broadband capacity, with provision of spectrum being one of several inputs to delivering this outcome.”*¹³

However, AMTA disagrees with the prescriptive and unbalanced nature of Strategy 1. In particular, AMTA has great difficulty with the ‘checklist’ proposed by the ACMA on page 40 of the Discussion Paper.

First, the ACMA implies that it requires *all* existing MBB spectrum holdings to be utilised. While AMTA agrees that there is currently sufficient spectrum for MBB in the short term, AMTA submits that the ACMA’s quantification in the Discussion Paper of the spectrum currently available for MBB is an overestimation and misleading.

For example, there is no commercial ecosystem developed to date for the 1900 MHz band which has meant this band has not been useful for MBB. The 3.4 GHz technical framework is a compromise between fixed wireless and MBB technologies, and 3575-3700 MHz is currently not available for mobile use in regional and metro areas and also lacks a global technology ecosystem (due to it not yet being identified by the ITU as a global IMT band).

Further, it is clear that under a scenario in which *all* existing MBB spectrum holdings are being fully utilised, *any* increase of demand of MBB traffic will result in the ‘capacity crunch’ which in turn will lead to a degradation of services on which the Australian public and industry has become so reliant. AMTA, therefore, supports a progression of frequency bands to (and within) the re-farming stage of the spectrum planning process be designed well before a ‘capacity crunch’ scenario materialises.

Secondly, there is an inference in the Discussion Paper that spectrum is not used as efficiently as possible by mobile network operators. In the last three bullet points on page 40, the ACMA raises questions about re-farming existing spectrum holdings for newer technologies, network densification and capacity-increasing network topologies (including small cells, HetNets and WiFi offload).

As players in a competitive industry, mobile network operators have a strong incentive to employ the most effective combination of technology, network topology and spectrum utilisation possible to maximise the capacity that can be delivered to their respective customers. It is mobile network operators that are best-placed to make a decision on the most efficient combination of the three contributing factors to delivering capacity.

In fact, the Australian mobile industry has a proud history of leading the world in spectrum re-farming and has done so not because of any regulatory incentive, but because of business drivers to improve efficient use of its spectrum. The mobile industry has re-farmed the 850 and 900MHz bands from 2G to 3G, the 1800MHz band from 2G to 4G, and is starting to re-farm the 2100MHz band from 3G to 4G.

AMTA considers that the ACMA should not plan to withhold spectrum from the mobile industry on the presumption that mobile network operators are not acting as efficiently as possible with respect to technology or network technology. Rather, AMTA supports the ACMA applying a total welfare standard assessment to determine whether the allocation of spectrum to the mobile industry will maximise the public benefit.

Further, the proposed 'check list' appears to imply that to increase MBB capacity, approaches involving network densification are automatically or inherently more efficient than those involving additional spectrum for MBB. The deployment of network infrastructure requires consideration of more than just commercial factors, in particular community concerns, which can limit deployment activities in some areas. It is important that community concerns, technical capabilities and geographic realities are also considered as key elements of the spectrum planning process.

In addition, re-farming of spectrum holdings for use by newer technologies also requires consideration of more than just commercial factors. Re-farming is especially hindered by the need to support backwards-compatibility in order to, for example:

- maximise coverage (in terms of population, not area);
- support international roaming;
- consider user groups with large switchover costs; and
- the need to work within existing spectrum arrangements that may not support or be optimised for current and future MBB technologies.

Further, obligations for efficient use of existing spectrum allocations, should not only rest on MBB network operators but instead continuously apply to all users of the radio spectrum resource – to ensure that Australia is deriving the maximum economic benefit from this important and scarce resource.

In summary, AMTA stresses that while spectrum is a vital resource for mobile network operators, it also represents a significant investment, with acquisition decisions subject to high levels of analysis and scrutiny. Operators will always look to use their spectrum assets as efficiently as possible to deliver the required capacity to their customers by the most effective means—including deployment of additional infrastructure and more spectrally-efficient technologies. Moreover, AMTA submits that the requirement to use spectrum efficiently must be an imperative for all spectrum uses and not only spectrum used for MBB.

Strategy 2—Transparent spectrum management planning process

AMTA supports the proposed move away from the quantification of spectrum requirements to a more flexible and responsive approach that is based more closely on the opportunity cost, efficiency and technical and market developments. In particular, AMTA strongly supports the proposed approach to:

“rather than focus on arbitrary and simplistic targets, seek to provide the right spectrum at the right time to address the growth in demand for mobile broadband capacity.”¹⁴

AMTA understands the ACMA’s identification of stages in the spectrum management planning process. However, as mentioned earlier, the prioritisation of frequency bands should be facilitated by permitting an assessment of the highest value use of the spectrum at any stage. While such analysis has been explicitly defined as part of Stages 1 and 2, there appears to be scope for ensuring this can also occur at in Stages 0 and 3.

The ‘criteria for progressing from Stage 0 to Stage 1’ are particularly restrictive, as they appear to keep bands in Stage 0 until international deliberations are well progressed. This approach does not encourage:

- domestic preparatory work to be carried out in parallel with work in international fora which would be one approach to minimising the impact of long-lead times (discussed in the following section on Strategy 3).
- exercising Australian influence on international fora, discussed in more details in the section on Strategy 5.

The proposed criteria (particularly the first and last dot points) have a distinct ‘wait and see’ flavour that is not supportive of a proactive strategy in which Australia plays protagonist on international spectrum management matters.

While not stated or otherwise in the proposal for Stage 3, it should be made clear that there is scope for prioritisation among bands identified as being at Stage 3, as well as scope for parallel work on more than one band at Stage 3.

As mentioned earlier in the response to ACMA’s Question 1, AMTA sees that the ACMA still has a role in managing spectrum that has been allocated to the mobile industry, and that this would be consistent with the ACMA’s proposal of a staged MBB spectrum management planning process. For instance, if licence holders agree that the configuration of their spectrum in an existing band could be reviewed so that use of spectrum by the mobile industry can be better optimised, then they could ask the ACMA to incorporate this into the MBB spectrum management planning process.

A recent example of this was the role the ACMA played in supporting the aggregation of 1800 MHz spectrum licences for the rail and mobile industries. A potential future example of this are holdings in the 2 GHz band, which are currently fragmented for some players and if left unaddressed, will lead to less than optimal use of this spectrum in the long-term.

¹⁴ Page 40, Discussion Paper

In conclusion, the MBB strategy should include flexibility for MBB operators to include bands already allocated for MBB into the spectrum management planning process, with a view to use this process to improve the efficiency of use of their spectrum holdings.

Strategy 3—Utilising long-lead times

AMTA suggests that the ACMA’s approach to spectrum planning needs to be more proactive at both a domestic and international level to ensure long lead times are minimised and prevented from inhibiting use and innovation in Australia.

Under the Spectrum Review, the ACMA and policy-makers should look for ways to stream-line domestic processes and shorten lead-times.

To combat long lead times at an international level, AMTA supports the ACMA’s consideration of the adoption of a more proactive approach by seeking progressive positions on proposed new spectrum bands to create flexibility and options for strategic and investment decision making processes in domestic markets.

It is AMTA’s view that the ACMA’s adoption of a ‘progressive position’ approach will allow the ACMA to undertake domestic planning reviews and analysis in parallel with international deliberations – instead of sequentially – that will assist reduce overall lead-times.

Strategy 5—Influencing international spectrum harmonisation

AMTA supports the ACMA’s proposed ‘Strategy 5’—“engagement in international deliberations to influence the development of domestically suitable internationally harmonised spectrum options”.

Under the section ‘International harmonisation and standardisation’, the ACMA highlights the importance of the generation of economies of scale (to reduce the price of equipment) and international roaming opportunities, both of which are well-known benefits of harmonisation and standardisation.

AMTA specifically welcomes the ACMA’s proposal that “Australia can influence and encourage harmonised spectrum management arrangements by participating in international fora such as the APT and the ITU”¹⁵, adding that it *should* do so to promote Australia’s interests in accordance with section 3 of the *Radiocommunications Act 1992*.

AMTA also supports the ACMA’s confirmation that identification for International Mobile Telecommunications (IMT)¹⁶ does not mandate use of that band in Australia, nor is it prerequisite for a band’s use for MBB in Australia. There appears to be a common understanding between AMTA and the ACMA that the main purpose of IMT identifications is to promote more widespread international harmonisation and the consequential benefits.

¹⁵ Discussion Paper, page 34

¹⁶ International Mobile Telecommunications (IMT) is a term used within ITU-R to collectively describe a number of cellular mobile communications technologies, including 3G (W-CDMA) and 4G (LTE). Since these technologies are typically used to provide mobile broadband services to end-users, the terms IMT and mobile broadband are interchangeable for discussion of this issue; the term IMT is used in the context of international spectrum regulatory matters.

As demand for spectrum resources increases and becomes more complex, AMTA strongly believes that a core aspect of Australia's spectrum policy approach should be to maximise flexibility and keep all viable options open in relation to future spectrum bands for MBB services.

AMTA considers that such a policy approach will better enable Australia to maximise the overall public benefit derived from use of the radiofrequency spectrum as latest generation mobile telecommunications technologies evolve.

AMTA can see no downside to this approach, as decisions to support the identification of specific bands for MBB do not commit Australia to allocating them to MBB but are important for creating future options in Australia.

The future demand trend line for MBB is a clear indicator of future spectrum needs and underlines the need to maintain a sense of urgency in seeking new spectrum bands, particularly given the long lead times involved both domestically and internationally, and the need to migrate existing uses to free up spectrum.

For example, Australia is taking this approach to WRC-15 by promoting new spectrum opportunities for MBB such as the 1.5 GHz band. This approach supports the Discussion Paper's proposal that there is a role for the ACMA to promote options that are viable for possible implementation in Australia by seeking to influence decisions made in relation to the identification of spectrum bands for IMT, through Australia's participation in regional and international fora (including ITU-R and APT).

However this view has not been put into practice with other longer-term options, such as the 2700-2900 MHz band, which is still in the 'monitoring' stage and not promoted in the current Australian position for WRC-15 (see following section for more detail). AMTA remains concerned that WRC preparatory processes should not take primacy over policy guidance based on a higher level principle of maximising future flexibility for spectrum use in Australia.

Another example of a proactive spectrum policy agenda was noted by the Minister of Communications in his speech to the ACMA's 2014 RadComms conference that referred to a second digital dividend in the UHF TV band as a future spectrum re-planning opportunity.¹⁷

AMTA understands that the 600 MHz spectrum, which could support such a second digital dividend, will be considered for identification for MBB use at WRC-15. If this is unsuccessful then WRC-15 could decide to undertake further studies and reconsider this band at the next WRC in 2019 (WRC-19).

AMTA believes that if Australia does not support further consideration of these spectrum options, it will miss an opportunity to take an active interest in securing viable future MBB spectrum options. If alternative uses of the band that are viable are not considered in terms of their value (i.e. they are not progressed to at least Stage 1), then there is no possibility of a full appreciation of the highest value use of the spectrum.

In summary, AMTA believes that Australia's fundamental spectrum policy approach should be to maximise flexibility and keep all viable options open in relation to future spectrum bands for MBB services. Such an approach is important if we are to create longer term spectrum options for MBB

¹⁷ Minister Turnbull's [speech](#), Radcomms 2014

that can be used to ensure that Australia continues to be a competitive, innovative and productive economy.

Proposed Work Program

ACMA Question 4, pg 53—*The ACMA seeks comments on the proposed work program. Are there any frequency bands or other projects which should/should not be included in the current work program? Why/Why not?*

As a matter of style, AMTA suggests that the terminology be amended so that the first “Stage” is referred to as “Stage 1” rather than “Stage 0”. However for the remainder of this submission, AMTA refers to the nomenclature used in the Discussion Paper for the stages.

In terms of substance, AMTA suggests that the ACMA amend Table 3 of the Discussion paper so that:

- 2700-2900 MHz is in Stage 1 – initial investigation
- Above 6 GHz is in Stage 1 – initial investigation
- 3400-3700 MHz is added at Stage 2 – preliminary re-planning (broad review of entire frequency range)
- 900 MHz is in Stage 2 – preliminary re-planning (to enable a technology review and the potential downshift of the 850 MHz band to be considered)

AMTA has elaborated the reasons for these suggested changes to each of these bands below.

2700-2900 MHz

As mentioned in the discussion paper, the band 2700-2900 MHz is currently being considered as part of the deliberations around WRC-15 Agenda item 1.1. Developed as part of the ACMA’s preparatory process for WRC-15, the Australian administration’s position on this band is that Australia will not actively support the band being allocated to the mobile service on a primary basis or identified for use by IMT.

The ACMA’s main concern leading to this position is the protection of the main incumbent use of the band—radar systems—including primary surveillance radar (PSR) for air traffic control (ATC), meteorological radars and Defence radars. In Australia and many other countries, the band is only lightly used, by a limited number of radars at fixed locations, and therefore some radar systems in this band could be ‘restacked’ to free up a significant portion of spectrum for MBB use, as submitted by AMTA to the ACMA during the WRC-15 preparatory process.

AMTA welcomes the ACMA’s comment that it will continue to engage with stakeholders via the international preparatory process. However, in line with Strategy 5 for MBB and the associated discussion in the previous section, the Australian administration should play its role in maintaining momentum for this international preparatory process.

AMTA maintains its position that Australia should remain open to supporting a mobile allocation in and identification for IMT of the band 2700-2900 MHz under WRC-15 Agenda item 1.1. Furthermore, if the band is not identified for use by IMT at WRC-15, any proposals made at WRC-15 to study the band for mobile allocation and IMT identification during the WRC-19 cycle should be supported by

Australia in order to preserve the international preparatory process which facilitates further discussions on the band domestically.

The support for identification of the band for IMT sought by AMTA should be facilitated by further recognition of the band in the ACMA's strategy on MBB spectrum management, namely by progression of the band to (at least) Stage 1. The Discussion Paper describes Stage 1 as involving "scoping of potential planning options for domestic re-farming of a band informed by preliminary technical assessment". AMTA notes that much of this work has been undertaken as part of the WRC-15 preparatory process, both internationally and domestically, and as such listing the band at Stage 1 is more representative of the progress of the work. The preliminary studies include, among other things, consideration of relocation/retuning costs for incumbent users.

Consideration of the highest value use of (parts of) the band 2700-2900 MHz has already commenced. For example, a study commissioned by the GSMA¹⁸ suggested that if these benefits were fully passed through to consumers, the provision of an additional 180 MHz of paired spectrum in the 2700-2900 MHz band could increase customer surplus by around US\$1 billion over a 20 year period. Such savings would further enhance consumers' purchasing power, which as the ACMA pointed out in its Annual Report¹⁹, has increased by \$652 each year as a result of the use of MBB services.

Therefore, the band 2700-2900 MHz should be listed at Stage 1, with the next step being a preliminary assessment of the highest value use of the portions of the band that are not used or could be cleared of incumbent uses for MBB.

Bands above 6 GHz

The ACMA has correctly highlighted that a new agenda item for WRC-19 to study spectrum above 6 GHz for IMT is being pursued, and AMTA welcomes the ACMA's comment that it will continue to engage with stakeholders via the international preparatory process. However, the current statements in the Discussion Paper, and the classification of this spectrum at Stage 0, do not appear to be a clear or suitable representation on what should be Australia's position on the future WRC-19 Agenda item.

All countries that support future study of spectrum above 6 GHz for IMT agree on the need to limit the future Agenda item to a viable suite of frequency bands. Given that all proponents of the future Agenda item support this concept, the ACMA should express support for the study of spectrum above 6 GHz for IMT more clearly. In doing so, the ACMA will create an opportunity to encourage innovation—both domestically and more indirectly, internationally—and to lead on preparing the necessary regulatory basis for future MBB technologies, including 5G.

The ACMA's support for the future Agenda item is in line with Strategy 5 discussed earlier, and through the WRC preparatory process, could help to steer research and development effectively towards frequency bands that are viable for use in the Australian radiofrequency spectrum environment. With this in mind, the support of spectrum options in different frequency ranges is important, especially while research and development on technology and propagation aspects are

¹⁸ Aetha Consulting, October 2014, *Economic benefits from making the 2.7-2.9 GHz band available for mobile broadband services in Australia*

¹⁹ ACMA, October 2014, *Annual Report 2013-14*

ongoing. For example, spectrum at frequencies nearing 100 GHz are not interchangeable with cm-wave spectrum.

With WRC-15 commencing within a few days, AMTA emphasises the importance of the Australian Delegation, led by the ACMA, to serve Australian interests by supporting and encouraging the creation of an opportunity to study spectrum for next generation MBB. AMTA understands that developments at the WRC will allow a better informed discussion, and AMTA requests another opportunity to be consulted on the ACMA's MBB strategy following WRC-15.

900 MHz

The Discussion Paper states that under Stage 2, a comprehensive assessment of the highest value use of the spectrum is undertaken, but then later in the paper the 900 MHz band (890-915 MHz / 935-960 MHz) is highlighted as an example of replanning pre-existing MBB spectrum, rather than replanning of spectrum used for other services.

The technology assumptions underpinning the preliminary replanning in the 900 MHz were made around 5 years ago. There has been significant technology progress in the mobile industry since that time and it is worth the ACMA undertaking a technology stocktake to assess if its initial assumptions remain valid. There is also a need to consider the opportunity to make the future utilisation of the 900 MHz band more efficient by down shifting the 850 MHz band to create a 1 MHz guard band between the two bands. For these reasons, AMTA considers that the 900 MHz work is best categorised as being at Stage 2 (the preliminary re-planning stage). However, AMTA still considers this work to be high priority and does not wish the change in categorisation to detract from this.

3400-3700 MHz

Spectrum in 3400-3700 MHz is one of the primary spectrum options for providing increased MBB capacity in the short-to-medium term, due to a desirable combination of *capacity*—provided mainly by a larger quantum of spectrum potentially available compared to lower frequencies—and *coverage*—more favourable propagation and building penetration characteristics compared to higher frequencies above 6 GHz. This is in part recognised by the ACMA's proposal to incorporate the 3.5 GHz band (specifically, 3400-3425 MHz and 3492.5-3542.5 MHz) at Stage 3 of the MBB spectrum management planning process.

The ACMA's Discussion Paper also proposes to incorporate the '3.6 GHz band' (specifically, 3575-3700 MHz) at Stage 1 of the planning process for initial investigation of the value of use of the band for MBB. The ACMA notes that future investigation of this band for MBB will be better informed by the outcomes of WRC-15, with respect to the international extent of identification of the band for use by IMT and the associated regulatory measures to enable sharing with other services to which the band is allocated.

Further, the ACMA has referred to the optimisation of the 3.4 GHz technical framework for use by internationally harmonised next-generation mobile technologies as an example of Stage 3 re-farming. The ACMA's review of the 3.4 GHz technical framework did make changes to spectrum licence conditions, for example out-of-band emission limits, and to the minimum contiguous bandwidth in the *Radiocommunications (Trading Rules for Spectrum Licences) Determination 2012* to better reflect new mobile telecommunications technologies like LTE-Advanced. The ACMA is also restacking this band in the context of spectrum licence reissue, in order to maximise contiguous

spectrum holdings for licensees who accept reissue offers (current licences expire in December 2015). This will go a long way to maximising the utility of this band for MBB. The utility of this band for MBB could be further improved if the adjacent apparatus licensed space (e.g. the 3.5 GHz band in metro areas) could ultimately become spectrum licensed and holdings fully aggregated across the entire 3400-3700 MHz band.

Given that there is scope for review of licensing arrangements to support use by MBB services in the 3.5 GHz and 3.6 GHz bands, and integrate these with a restacked 3.4 GHz band (which then covers the entire 3400-3700 MHz frequency range), AMTA believes that the outcome resulting in the most efficient use of this spectrum would arise from a broader review of this frequency range rather than individual reviews of different parts of the frequency range (potentially affecting different geographical areas). The latter could potentially result in deliberations on one band not fully taking the impact on another band into account, and decisions on the use of one band could potentially preclude options for use in another band. These risks are likely to be mitigated with a review of the 3400-3700 MHz frequency range as a whole, thereby maximising the efficiency of its use, provided that the rights of existing spectrum licence owners in the 3.4 GHz band are retained.

To facilitate a future review of the broader 3400-3700 MHz frequency range, AMTA would recommend the incorporation of this frequency range at **Stage 2** of the MBB spectrum management planning process, albeit with the constraint that the rights of 3.4 GHz spectrum licence owners cannot and will not be degraded as a result of such a review. While AMTA notes that the ACMA carried out a similar review in the second half of 2014, another review should commence in 2016 to take into account international developments that are likely to result from the imminent WRC-15.

Finally, AMTA wishes to clarify that it is not making a statement on the relative value of MBB compared to fixed wireless access (FWA); or broadband wireless access (BWA) services operated in the frequency range 3400-3700 MHz. AMTA is, instead, proposing that a review of the spectrum arrangements in the band under the MBB strategy is likely to benefit these service types also.

Conclusion

A robust spectrum strategy for MBB needs to encompass more than just a consideration of spectrum bands. We need a spectrum strategy that is based on a flexible and responsive domestic regulatory framework and that adopts a proactive approach to international engagement.

AMTA believes that liberalising the licensing framework under the Spectrum Review and assessing the opportunity costs for each band will enable more efficient spectrum use (for MBB as well as other uses) and improve Australia's ability to realise the potential social and economic benefits of MBB.

AMTA supports the ACMA's commitment to delivering spectrum in a timely manner to the highest value use and looks forward to continued engagement on the ACMA's strategy for meeting the demand for spectrum for MBB.

Any questions about the above comments can be directed to Lisa Brown, Policy Manager, AMTA at 02 6239 6555 or lisa.brown@amta.org.au.

Appendix A – A liberalised licensing framework

AMTA considers that reform of the licensing regime is fundamental to reform of the spectrum management framework.

The use of licensing as a means of managing spectrum is intended to promote coordination of uses, prevent spectrum exhaustion and manage the risk of interference. AMTA considers the primary objective of the licensing framework is to maximise the efficient use of the spectrum, while managing interference and preventing users from causing interference to their neighbours (or causing undue spectrum denial to potential future neighbours). Efficiency of use in the future should also be enabled by the licensing framework, i.e. dynamic efficiency, typically by making licensing as technology agnostic as possible.

AMTA notes, however, that a poorly designed licensing framework may lead to less than efficient use of spectrum.

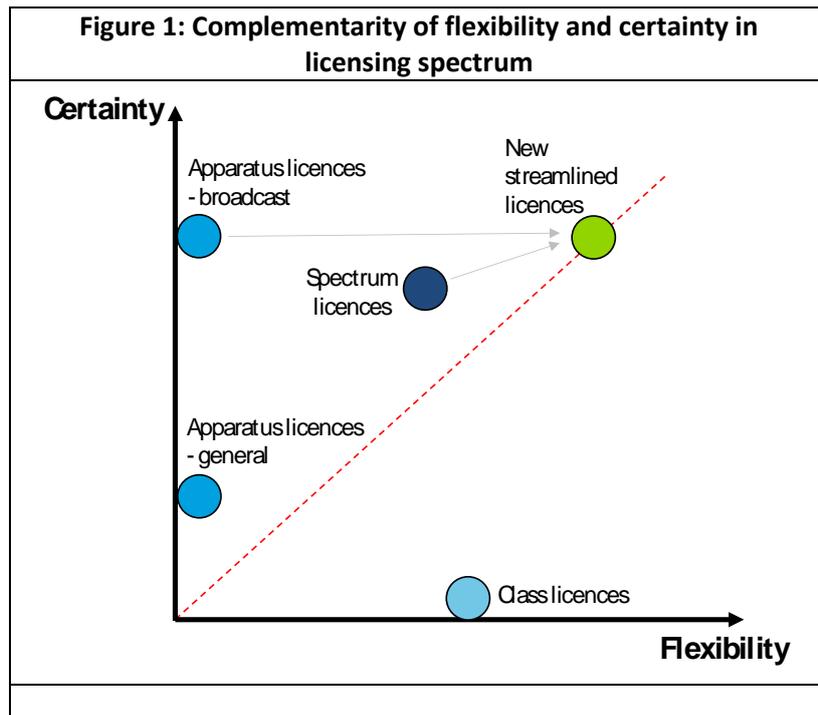
Several economic and social considerations are important in ensuring an effective licensing framework for spectrum management:

1. **Exclusivity** – private property rights are exclusive rights, with the benefits of costs of owning and using the resource flowing to the owner.
2. **Universality** – all scarce resources are owned by someone.
3. **Transferability** – ensure resources can be allocated from low yield to high yield uses.
4. **Enforceability** – ensure property rights are secure from misappropriation by others.
5. **Diversity** – preserving the availability of spectrum for a range of different uses.
6. **Competition** – preventing monopolisation of spectrum resources in contestable industries.

Conflict between these considerations can be minimised through an incentive approach. For example, if spectrum sharing is regarded as an important policy objective then the holders of exclusive rights should be enabled by the licensing structure to retain and enhance existing licence flexibility to lease or sell spectrum to other entities. Other forms of incentive could include licence fee rebates.

Certainty of spectrum access is another important consideration in defining the objectives of the licensing regime. Short licence tenure and the presumption of non-renewal for spectrum licences are examples of the shortcomings of the existing licence regime that create unnecessary uncertainty to licence holders. Ostensibly, such measures appear to be intended to preserve flexibility for policymakers and regulators to reallocate spectrum to higher value uses.

AMTA considers a new spectrum licensing regime can deliver both certainty and flexibility. The more flexibility there is to allow licences to be reallocated between different uses; the more licences will provide certainty of property rights to licence holders. A conceptual map of the complementarity between flexibility and certainty of licences and Australia's range of existing licences is illustrated in **Figure 1**.



AMTA supports some specific changes to the treatment of certain aspects of licensing:

- include a presumption of renewal in primary legislation with any exceptions clearly prescribed (such as conformity with international obligations etc.);
- reduce current expectation of political involvement in allocation and reallocation pricing decisions, with such powers reserved only where there is market failure, a deadlock or in an emergency;
- remove any reference to a maximum term of tenure from legislation so that this is flexible and becomes a policy decision; and
- make provision for encumbered spectrum to be reallocated or transferred quickly without significant delays to wait for incumbents to clear their services.