

**COMMUNICATIONS
ALLIANCE LTD**



**ACMA BEYOND 2020—A SPECTRUM
MANAGEMENT STRATEGY TO ADDRESS THE
GROWTH IN MOBILE BROADBAND CAPACITY**
COMMUNICATIONS ALLIANCE SUBMISSION
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INTRODUCTION

Communications Alliance welcomes the opportunity to provide this submission in response to the ACMA's *Beyond 2020 — A spectrum management strategy to address the growth in mobile broadband capacity* Discussion Paper (the *Discussion Paper*).

Executive Summary

Communications Alliance commends the ACMA's foresight to consider spectrum management strategies for mobile broadband beyond 2020. There is much to gain from exploring these strategies now. Nevertheless, a number of our members note that the timing of this review may be premature as current activities both nationally and internationally will influence the spectrum environment, including other Government and regulatory reviews and of course, the World Radiocommunications Conference WRC-15.

Communications Alliance agrees with the ACMA that engagement with the respective international bodies is essential, both to facilitate global harmonisation and to promote Australia's interests. We emphasise that global harmonisation is important to both operators and to vendors. The need to stay aligned with international industry developments is essential for sustaining these outcomes.

A framework of the future should be one underpinned by flexibility. The flexible use of spectrum has become critically important to facilitate innovation in future markets with the advent of 5G, M2M communication and the Internet of Things (IoT). The market of tomorrow will be quite different from the market of today, becoming ever increasingly difficult to segment and categorise. The proposals in the spectrum review are expected to assist in providing such flexibility and should reduce the requirement for the ACMA to make reallocation decisions in the future providing the thinking is broad ranging enough.

Communications Alliance welcomes the focus of the *Discussion Paper* on mobile broadband but believes that a more holistic approach is required. There needs to be an acknowledgment of the broader framework that is being developed under the spectrum review to maximise the overall public benefit arising from spectrum use. This would include taking into account that user demand for broadband services is met via a range of delivery access technologies including mobile.

In addition, our members feel the policy dimension is largely missing from the *Discussion Paper* and that this needs to be explicitly taken into consideration. The policy dimension is critical to formulating regulatory strategies and without the understanding of the policy settings, the rationale behind the proposed strategies may not be apparent or at best poorly understood. The review should also be forward looking to take into account the fact that policy set in the future by Government will influence how spectrum is allocated.

Communications Alliance believes that the two issues of spectrum sharing and spectrum refarming also need further consideration. The characteristics of sharing arrangements in the higher spectrum bands are still emerging. Some members consider that the use of competitive market mechanisms are likely to be the optimal approach to sharing this spectrum amongst users, while others consider that an approach based on cooperation and complementary development could be more appropriate.

With the identification of new bands in the higher frequencies still to be debated in the international fora, any assessment on spectrum refarming at this point in time may suffer from lack of information. Discussions on the spectrum use in new bands should take into

consideration adopting a flexible approach to spectrum use and for the bands to be technology agnostic.

About Communications Alliance

Communications Alliance is the primary telecommunications industry body in Australia. Its membership is drawn from a wide cross-section of the communications industry, including carriers, carriage and internet service providers, content providers, equipment vendors, IT companies, consultants and business groups.

Its vision is to provide a unified voice for the telecommunications industry and to lead it into the next generation of converging networks, technologies and services. The prime mission of Communications Alliance is to promote the growth of the Australian communications industry and the protection of consumer interests by fostering the highest standards of business ethics and behaviour through industry self-governance. For more details about Communications Alliance, see <http://www.commsalliance.com.au>.

SECTION 1 – GENERAL

The membership of Communications Alliance represents a diversity of interests in spectrum usage, including mobile broadband services and also services using frequency bands that may be impacted by future use of mobile bands, including backhaul, fixed broadband, broadcast and satellite services.

This submission focuses on addressing the strategic elements of the *Discussion Paper* where there is common ground and a consensus of views among our membership. We acknowledge that other associations, including the Australian Mobile Telecommunications Association (AMTA) and Free TV, will be championing their respective members' views and we are aware that individual Communications Alliance members will also provide separate responses to the *Discussion Paper*.

Communications Alliance welcomes the ACMA's acknowledgment of the concern of some stakeholders that further or revised commentary on the proposed work program may be appropriate following conclusion of WRC-15, which might generate, for example, changes in the international planning status of particular bands. In light of this, band-specific comments in this submission have been kept to a minimum. It is our intention to provide a separate submission on the proposed work program, including band-specific comments, by the subsequent submission comment closing date of 24 December 2015.

Communications Alliance acknowledges the efforts being undertaken by the ACMA to engage with industry in managing radiofrequency spectrum. Spectrum is a critical resource and its importance in providing societal and economic benefits to all Australians cannot be overstated. Notably, the ACMA Beyond 2020 Tune Up event held in September was a good example of this welcomed level of engagement, and the offer to have 'an alternate industry perspective' on the day was appreciated. As it turned out, within the available time, the two views of mobile vs satellite presented at the event could have been complemented by the interests of other stakeholders to provide a more rounded view of the issues. In addition to the presentation by the Department of Defence during the panel session, it is our observation that the areas of broadcasting, telecommunications, the resource sector, scientific services and metrology would have contributed usefully to the discussion.

While welcoming the extension of the date to provide comments on the work program, our members are still somewhat apprehensive in committing to the consultation timetable for the *Discussion Paper* review as proposed by the ACMA. There are activities both nationally and internationally that will influence this review. On the national front, the Government (which has just had a number of Ministerial changes) and the regulator both have a number of reviews in process. Internationally, the WRC-15 and associated ITU meetings are in play. Our members believe it may have been better to hold the ACMA's review in 2016, once the outcomes of some of these activities are known.

This submission addresses the questions as posed in the *Discussion Paper*, including those relating to the assumptions, the highest value use and proposed strategies. Some members noted that the *Discussion Paper* contains a great amount of detail, some of which is relatively obscure. At times, members were uncertain whether correct interpretations were being attributed to the material presented. It is in this context that the comments being presented in this submission are offered but as previously noted, many of our members would have preferred to provide industry comments at a more appropriate time in the future, rather than potentially prejudicing their views through this submission.

SECTION 2 – ASSUMPTIONS

The ACMA identifies ten assumptions to guide its considerations in reviewing its mobile broadband strategy. They are:

1. The highest value use of spectrum will vary between bands and geographic areas over time. As such, mobile broadband will only sometimes be the highest value use of a particular spectrum band.
2. Mobile broadband services will continue to deliver societal and economic benefits to Australia and these benefits will increase with greater use of mobile broadband services made possible through increased network capacity.
3. Demand for mobile broadband services (and therefore capacity) will continue to increase for the foreseeable future, though the rate of this increase is difficult to determine.
4. Australia currently has adequate spectrum available for mobile broadband purposes in the short to medium term, but it is likely that in the medium to long term, additional spectrum will be necessary.
5. Long lead-times will often remain to make additional spectrum available domestically for mobile broadband due to the timeframes for mobile broadband technology development and standardisation, international spectrum harmonisation and the domestic re-farming of spectrum.
6. Spectrum will continue to be a key enabler for many other, non-mobile broadband, services that provide economic and societal benefits to Australia. The associated requirement for spectrum to enable these services will continue but may vary over time.
7. The use of technology flexible technical frameworks and provision of sufficient tenure will remain fundamental when designing spectrum arrangements including for mobile broadband services.
8. International spectrum harmonisation and technology standardisation will continue to play an important part in delivering equipment economies of scale, consumer choice and international roaming opportunities. International spectrum harmonisation and technology standardisation will continue to be considered when developing domestic arrangements.
9. The review of established frameworks for spectrum already in use for mobile broadband services will continue to be necessary so that the efficient use of the spectrum is able to be maximised.
10. Increases in mobile broadband capacity will continue to be met through a combination of additional spectrum, improved technologies providing increased spectral efficiency, increased network infrastructure and new network topologies.

In reviewing the assumptions reproduced above, our members concurred that there is little with which to disagree. Having said that, our members felt that only time will provide the visibility and clarity of the arguments in the *Discussion Paper* from which the assumptions have been derived. These assumptions will need to be validated over time.

In this context, Communications Alliance makes the following observations.

Global harmonisation is important to both operators and to vendors. It is vital for open markets and to foster equipment availability. The need to stay aligned with international industry developments is essential in sustaining these outcomes. Another important benefit is that global harmonisation supports local innovation and market development which can

then be exported into global markets, a policy driver which the ACMA should take into account.

We agree that the benefits from the increase in Australia's economic activity through mobile broadband (\$33.8 billion in 2013, *Discussion Paper*, Page 11) is significant. Having said that, Australia benefits from many non-mobile broadband services in the spectrum that may be considered for mobile broadband in the future. Meteorology, for example, is an important user of C-Band. In addition there are many other sectors, including broadcasting, telecommunications, resources, scientific and meteorology where the benefits need to be weighed up against those of mobile broadband.

SECTION 3 – HIGHEST VALUE USE

The ACMA asks 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 and whether there is a recognised measure of these costs and benefits.

Communications Alliance notes the *Discussion Paper* states that the ACMA employs a total welfare standard as its overarching framework when assessing the optimal approach to individual spectrum management issues. In considering the highest value use for a given spectrum band, the ACMA considers the impact that a change in use would have on all parties in the economy, both monetarily and the intangible costs/benefits.

This total welfare standard is a useful concept but there is little evidence of it being applied in previous spectrum allocations. It is also likely to become more difficult to apply in the future, noting that the market of tomorrow will be quite different from the market of today, becoming ever increasingly difficult to segment and categorise. Communications Alliance expects that the Australian digital economy will fragment further as the 'Internet of Things' (IoT) pervades. Even segmenting the market to separate out a 'mobile market' will have its challenges as the distinction between fixed and mobile services will continue to blur as technology advances. Another example is the importance of the fixed networks with the introduction of 5G. The interplay of these future wireless solutions with existing networks is currently being studied within the ITU-R.

In asking the question 'how does the highest value use facilitate markets', the concept of 'highest value use' of spectrum needs to be teased out. For example mobile spectrum is a high value use but not always the highest value use. There is the potential danger of the process lacking rigour and not taking into account all the costs and benefits that may be at play. This is particularly relevant in relation to mobile broadband where the impact of reallocating spectrum on other uses is often given insufficient consideration.

An example of an inadequate process to identify the highest value use in Australia resulted in a Direction from the Minister to require the ACMA to enable apparatus licences for the nbn's fixed wireless spectrum in the 3.5 GHz band. The extended C-Band (3.4 to 3.6 GHz) had been identified by the ACMA as a candidate IMT band under Agenda Item 1.1 in WRC-15 and in this case, the Government's communications policy objective for very fast broadband to all Australians was actioned through the Ministerial Direction (see Media Release: [NBN spectrum gap - Consultation on draft Direction](#), Department of Communications, 21 August 2014).

With respect to the provision of broadband services, there is a need to look at all the services that contribute in the supply chain to understand the complete picture, including the nbn wholesale access network, mobile and fixed wireless networks, satellite networks, backhaul networks and also techniques such as Wi-Fi offloading and other similar solutions.

Communications Alliance proposes that the framework of the future is one that is underpinned by flexibility. The flexible use of spectrum becomes critically important to facilitate innovation in future markets. By way of an example, one could envisage a framework where parties could agree with each other to transfer uses of spectrum over time on a commercial basis. Ideally this could result in moving spectrum to highest value use over time. The opportunity would also be there for incumbents' costs and the business value of their spectrum to be compensated. It would also need to be recognised that this would not work for all spectrum, for instance with radio science bands and radioastronomy.

Communications Alliance understands that this flexibility is contemplated in the spectrum review proposals. This option would not be recognised under the current ACMA process but it could have the benefit in facilitating the ACMA administrative decision making process. It would require a new discipline for users to use spectrum more efficiently in the future. Incentives could be introduced for the surrender of spectrum, the timely transition to new uses, the efficient use of spectrum and innovation.

Stronger linkages and accountability of the administrative decision making process to the policy makers would also be seen to bring benefits to how spectrum is assessed. The ACMA and/or the Department should be encouraged to further explore how to best implement a total welfare standard approach to the reallocation of spectrum. Communications Alliance would imagine that the ACMA is aware of the Plum Consulting report developed for the European Commission (EC). Thought processes such as this work have fed into a truly holistic assessment of spectrum use by the UK Government, involving a balance of policy, strategy and implementation to which the ACMA should aspire in its coverage. This is lacking in the presentation of the ACMA Discussion Paper (see Policy Paper: *The UK Spectrum Strategy*, Department of Culture, Media and Sport, 10 March 2014).

SECTION 4 – STRATEGIES

The ACMA seeks comments on the set of five proposed strategies developed in the *Discussion Paper*. In particular, comment is sought on the stages of band replanning and considerations for advancing through these stages.

Strategy 1: Holistic approach to mobile broadband capacity growth

Encouraging a holistic approach to addressing the outcome of mobile broadband capacity growth that balances the available inputs of spectrum, technology and network infrastructure/topology.

Communications Alliance welcomes the focus of the *Discussion Paper* on mobile broadband but believes that a more holistic approach is required. There needs to be an acknowledgment of the broader framework that is being developed under the spectrum review to maximise the overall public benefit arising from spectrum use. This would include taking into account that user demand for broadband services is met via a range of delivery access technologies including mobile.

A number of members felt that the timing of this review may be premature as there are activities both nationally and internationally which will influence this review, including other Government and regulatory reviews that are currently underway and also various international activities, notably the World Radiocommunications Conference WRC-15.

With respect to national activities, Communications Alliance suggests that the *Discussion Paper* needs to be considered in relation to other discussion papers and reports that have been instigated during 2015, notably:

- the Department of Communications Spectrum Review Report which was published in March 2015 with draft legislation anticipated by the end of the year;
- the ACMA Review, which closed in August; and
- the next instalment of the ACMA Five-year spectrum outlook paper 2015-19.

The *Discussion Paper* references a number of overseas reports and papers but does not take the next step to develop thoughts on the information provided by these papers. Of note, the following overseas reports and papers need to be further explored and leveraged upon:

- Quotient Associates: 5G Candidate Band Study - Study on the Suitability of Potential Candidate Frequency Bands above 6GHz for Future 5G Mobile Broadband Systems - [Final Report](#) to Ofcom, March 2015;
- Ofcom: Laying the foundations for next generation mobile services Update on bands above 6 GHz. 20 April 2015. [Report](#); and
- FCC Use of Spectrum Bands Above 24 GHz For Mobile Radio Services – [Notice of Inquiry](#).

There are various ITU reports and recommendations, 5G policy papers and outputs from GSMA and other relevant bodies that would also be worth considering.

As a final observation, our members consider that the policy dimension is largely missing from the *Discussion Paper* and that this needs to be explicitly taken into consideration. As an example, if there was a policy to vacate users from a band and users were unaware of that policy, then the rationale for any strategy that was developed to meet that policy outcome would be readily apparent. The policy dimension is critical in understanding the regulatory strategies.

Strategy 2: Transparent spectrum management planning process

Articulation of a transparent spectrum management process for identifying potential future spectrum options for mobile broadband. This includes the identification of a pool of potential spectrum options at varying stages of consideration. This will provide the ACMA with capacity to react to demand requirements on a contingency basis if, and when, needed, and when the evidence suggests that mobile broadband is, or is becoming, the highest value use of a particular band.

Communications Alliance has some concern with the apparent shortcomings of the *Discussion Paper* to address spectrum needs beyond 2020, two examples being the forthcoming 5G networks and the management of spectrum bands above 30 GHz.

With respect to 5G networks, the reality is that these services will begin to emerge prior to the end of the decade. It is conceivable that 5G will be rolled out in lower frequency bands first while higher bands are being designated. Having said that, the use of higher order Multiple-Input and Multiple-Output (MIMO) antennas is less effective for smart phones for frequency bands below 3 GHz due to the limitation of physical spacing between the antennas on devices. This will lead to many 5G services naturally being located in the higher spectrum

bands. There is a great deal of research being undertaken within Europe and the USA on 5G which need to be taken into consideration.

If Australia is serious in having in place the required resources for 5G beyond 2020, discussions should be already past Stage 0. Noting that lead times can be up to ten years, Communications Alliance feels that the 'wait and see' approach that the ACMA is apparently adopting at this point in time is not an effective strategy.

Networks in the future are going to be structured quite differently. There will be the need for short latency and for a large amount of information to be located closer to the client depending on the applications. Not all of this will be provided from mobile broadband networks, with much coming from other networks such as fixed broadband and Wi-Fi networks.

There will be a wide range of requirements on networks from slow intermittent services (with many small transactions and payloads adding up to a large bandwidth and a huge signalling overhead) to real time, large bandwidth services such as those for broadcast type applications. Both place very different demands on networks. Users in metro areas will typically place greater demands on networks, with these networks designed for high frequencies, high bandwidth and small cells compared to regional/rural areas where there will be less demand and a greater focus on coverage using macro cells.

Bandwidth will be in demand to support new services. Two areas where this will become apparent are Machine-to-Machine (M2M) connectivity and electronic news gathering (ENG) services. M2M will be supporting a multitude of growing industries including intelligent transport systems (ITS) and the Internet of Things (IoT). ENG services used within the broadcasting sector will be taking advantage of high speed data services as they become available.

Although the contingency planning approach has merit, its success will hinge upon its ability to be proactive and forward looking. If this is not the case, by the time circumstances change, it will be too late to implement. Options will need to be created and risks will need to be managed ahead of time. Using the satellite industry as an example of a long term industry, our members saw the benefits in having these options in place providing the needed planning flexibility.

With respect to the forthcoming WRC-15 conference, Agenda Item 10 looking at future items, has the potential to be very relevant to this Discussion Paper. The discussion paper indicates that the ACMA is in effect only monitoring discussions above 6 GHz without any specific engagement at WRC-15. Concern has been raised by our members that the Australian delegation will not feel obliged to engage in the absence of any policy direction. This does not appear to be the strategic approach that industry feels is necessary at this point in time.

Strategy 3: Utilising the often long lead-times to reduce effect on incumbents

Where possible, utilisation of the often long lead-times to assist in reducing the effect on incumbents arising from re-farming of spectrum to mobile broadband.

Communications Alliance maintains that any approach to be adopted needs to have the necessary flexibility and be responsive to change. The industry that we are in is very disruptive, e.g. the increasing demand for video with Subscription Video on Demand (SVOD) services such as Netflix, Presto and Stan. There is a concern that the approach being

proposed by the ACMA is somewhat linear, a matter of 'stepping through' stages 0 to 3. This approach may not be sufficiently agile to respond to the WRC planning cycle or to market demand and technological change. These demands may very well be faster than the steps outlined in the *Discussion Paper*.

The environment that broadband services are being supplied in needs to be agile and innovative. There is a distinct need to be more creative and flexible in how we think about sharing spectrum.

Communications Alliance notes that the longest and most sensitive lead times within the industry are in the satellite industry. There are currently 169 commercial satellites that use C-band spectrum today with an estimated value of US\$50B (approximately US\$300M each).

Globally, over 100 million households rely on C-band for television. \$15B has been spent by industry in the past five years alone launching 52 C-band satellites, with satellite remaining active up to 20 years. A new generation of high throughput satellites are being launched supplying future broadband, highlighting the fact that broadband is not all just terrestrial and which needs to be taken into account in broadband spectrum planning.

With the identification of new bands in the higher frequencies still to be debated in the international fora, any assessment on spectrum refarming at this point in time may suffer from lack of information. Discussions on the spectrum use in new bands should take into consideration adopting a flexible approach to spectrum use and for the bands to be technology agnostic.

Strategy 4: Exploring opportunities for increased spectrum sharing

Exploration and, where appropriate, the adoption of opportunities for greater sharing between mobile broadband services and other services.

The characteristics of sharing arrangements in the higher spectrum bands are still emerging. Some members consider that the use of competitive market mechanisms are likely to be the optimal approach to sharing this spectrum amongst users, while others consider that an approach based on cooperation and complementary development could be more appropriate.

Strategy 5: Influencing international spectrum harmonisation

Engagement in international deliberations to influence the development of domestically suitable internationally harmonised spectrum options.

Communications Alliance agrees with the ACMA's view that engagement with the respective international bodies is seen as essential, both to facilitate global harmonisation and to promote Australia's interests.

Australia's next steps are contingent on the outcomes of WRC-15 as well as what is envisaged for WRC-19. An aspirational goal for all involved would be to avoid where possible the wrangling experienced during the last study session and to work more congenially over the next study session leading up to WRC-19, particularly with discussions concerning 5G.

SECTION 5 – WORK PROGRAM

The ACMA seeks comments on the proposed work program, asking whether there are any frequency bands or other projects which should/should not be included in the current work program.

Communications Alliance will be deferring any comments on the proposed ACMA work program until the next submission comments closing date of 24 December.



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