COMMUNICATIONS ALLIANCE LTD

®

COMMUNICATIONS ALLIANCE

SATELLITE SERVICES WORKING GROUP (SSWG)

SUBMISSION

to the

Australian Communications and Media Authority's (ACMA)

Planning of the 3700-4200 MHz band

13 September 2019

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Communications Alliance Satellite Services Working Group (SSWG) welcomes the opportunity to provide a response to the ACMA's *Planning of the 3700–4200 MHz band* Discussion paper.

The SSWG observes that legacy C-band satellite services are projected to extend well into the future, providing a range of valuable and sometimes unique connectivity solutions to many industries and communities. The SSWG also acknowledges the changes occurring in other countries and regions, with the most common international element being a re-casting of usage of the 3700 to 3800 MHz segment of the band.

Whilst C-band is not part of the WRC-19 Agenda for identification of IMT services, it remains a reality that requires consideration. Compared with other potential services, IMT would particularly influence the different sharing scenarios and level of optimism for those other services.

This submission presents two differing points of view because of the different focus of members. Some members have interests in both terrestrial mobile and satellite communications, whilst others have a pure satellite systems focus. Hence the presentation of two views when considering answers to the questions presented in the Discussion Paper. While the majority of current Australian satellite service operators (including the major users of this band in Australia) are aligned with View 1 described in this submission, it has not been possible to fully reconcile views with Intelsat and SES holding firmer opinions on the preservation of spectrum for the satellite industry.

The SSWG presents both cases to the ACMA to allow for a full assessment of the issues involved and how much they mean to the different members of the SSWG.

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.

Introduction

The SSWG appreciates the consideration by the ACMA on the planning of the 3700 to 4200 MHz band, which will bring greater certainty to the market with this band. Legacy C-band satellite services are projected to extend well into the future, providing a range of valuable and sometimes unique connectivity solutions to many industries and communities.

The SSWG also acknowledges the changes occurring in other countries and regions, with the most common international element being a re-casting of usage of the 3700 to 3800 MHz segment of the band. A revaluation of this segment of the band would be timely and an opportunity to evaluate the protection and sharing requirements, including with incumbent uses which would be and appropriate and timely thing to do.

Whilst C-band is not part of the WRC-19 Agenda for identification of IMT services, it remains a reality that requires consideration. Compared with other potential services, IMT would particularly influence the different sharing scenarios and level of optimism for those other services. Therefore, a principle to be evaluated is how much bandwidth should be given consideration for new services, and the least disruptive answer would be zero or 100 MHz depending on different members' points of view. 100 MHz would add to considerable contiguous spectrum.

The differing points of view arise because of the different focus of members. Some members have interests in both terrestrial mobile and satellite communications, whilst others have a pure satellite systems focus. Hence the presentation of two views when considering answers to the ACMA questions. While the majority of current Australian satellite service operators (including the major users of this band in Australia) are aligned with View 1 described in this submission, it has not been possible to fully reconcile views with Intelsat and SES holding firmer opinions on the preservation of spectrum for the satellite industry. These two organisations have a lot at stake with their investments in C-band.

The SSWG presents both cases to the ACMA to allow for a full assessment of the issues involved and how much they mean to the different members of the SSWG.

A further factor to consider is the role of dynamic spectrum allocation technology and how this could improve the availability of spectrum when applied to cellular mobile services and indeed any services. In the view of some SSWG members, the ACMA has the opportunity to adopt modern dynamic spectrum management to accommodate the needs of incumbents and potential new entrants into this band. There are efficiencies to be gained and planned for and perhaps realistic goals and targets need to be set for better efficiency outcomes. Other SSWG members are less sanguine about the efficacy of such technologies to protect existing FSS or FS services from WBB interference or to enable future FSS or FS stations to deploy after the introduction of WBB services.

Of the scenarios presented, the one most favoured by the satellite industry would be to maintain existing arrangements. However, in the opinion of some members this is probably not likely to prevail and an outcome of access to one or more (lower) segments of the band on either an exclusive or shared basis would be the next best. The decisions and types of service envisaged greatly influence the licensing arrangements. For instance, where coordination is envisaged amongst services then sharing is much easier. However, if ubiquitous terminal usage is envisaged e.g. with IMT, then the sharing scenarios are much more limited and become constraining on other services.

Purpose and Scope

The current approach in this paper by the ACMA is reasonable in firstly committing to an initial investigation stage through a survey of the mixture of present and future services. Within that mixture the Fixed Satellite Service (FSS) has a high dependence on C-band especially for

its modest bandwidth applications, coverage and atmospheric resilience. These are natural characteristics which make C-band so relevant and unique to uses by the satellite services which cover disaster relief, broadcasting, backhaul, rural, remote and global communications and national development. These various uses cover all geographic areas.

The lifetime of satellite systems of up to 25 years is also an important factor in recovering the investments by the industry. Importantly, investments continue to be made.

Whilst the scope of discussion is limited to the spectrum range of 3700 to 4200 MHz, some members recognise that the least destructive approach would be to concentrate initially on 3700 to 3800 MHz. This recognises a gradual encroachment by alternative services in extended (lower) C-band and would recognise relevant international developments. Many members believe that the whole 3700 to 4200 MHz band should not be the subject of replanning.

Legislative and Policy Environment

Managing spectrum efficiently and effectively is a more refined implementation of the objects of the legislation, as opposed to a primary driving force of extraction of the highest value use (HVU), which sometimes means that those with the 'deepest pockets' are influential when spectrum decisions are made.

Such HVU decisions can lead to spectrum licensing and fifteen-year tenures which may freeze out innovation service and technology scope as time elapses. One example comes from dynamic spectrum management of terrestrial networks, which is not likely to take root if the incentives are not there. Likewise, the highly innovative satellite sector is at risk of being starved of necessary spectrum if traditional methods of spectrum allocation and long-term assignments are to prevail. Today, satellite networks in the form of Non-Geostationary-Satellite Orbits (NGSOs) and low earth orbit systems are approaching the technical performance and pricing of terrestrial networks. More so, these NGSO networks are likely to interwork with Geosynchronous (GSO) networks in the future (including C-band) to combine the advantages of both architectures and bring to the market substantial capabilities beyond the ability of terrestrial networks. It is therefore important to preserve the breathing room for these development in satellite services.

Existing Licensing Regimes

The three types of licences available today include the spectrum licence, which probably represent the greatest constraint to other services – because of its duration – in an otherwise demanding current era of highly innovative developments.

A spectrum licence may abrogate the ability of policy makers and regulators to assist in real time new developments coming to market, because spectrum management is relinquished to the new spectrum proprietor who then has the ability to control spectrum usage.

The discrepancy between lifetimes of an apparatus and a spectrum licence has been shown to be a mismatch of poor proportioning. Satellites with a long lifetime have been apparatus licensed, whilst terrestrial mobile networks have a long licence which isolates them from pressure to perform efficiently when using spectrum. At the same time those terrestrial networks are crowding out other services. This highlights the need for considerable attention to relevant coordination and sharing within C-band, starting in an incremental way.

An approach to utilisation of C-band which maximises the use of apparatus licensing and associated coordination, together with relevant class licensing has been highly effective in the past. Any introduction of ubiquitous mobile services and spectrum licensing needs to be very cautiously approached.

Preparing for the Future

The administration of spectrum by the ACMA is founded on static approaches to spectrum management and assignment. In the near future these approaches may be challenged by more dynamic approaches to spectrum management in near real time. The ACMA is doubtless be cognisant of this looming new environment, which is not founded in traditional approaches and especially in bands such as C-band, where the current exercise is a more fundamental assessment and should have long lasting effect to meet an unfolding future environment. Whilst some members are yet to make their minds up on this dynamic approach, it will become clearer in the next ACMA consultation exercise for which submissions are requested by 27 September 2019[1].

The advocates of more spectrum for future mobile applications involving IMT and 5G have for a long time been opposing dynamic frequency assignment in spectrum licensed geographies on the basis that ultimately network rollout will cover all populated areas, therefore requiring temporary or itinerant users to return the spectrum, possibly before a commercial return is realised. Mobile Network Operators (MNOs) do not need to be the judge of whether others can realise a commercial return, and if commercial entities are willing to risk capital to invest for short-term returns, then dynamic allocation is an approach to achieve this. They are not applying the technology which is now available to integrate into their plans and designs, and thereby tempering the apparently insatiable desire for increasing amounts of spectrum. We recommend that the ACMA build into its approach to spectrum management an efficiency dividend and look at the potential for reductions in the claims for spectrum from the terrestrial mobile industry.

The SSWG recognises the concurrent ACMA discussion paper on sharing techniques.[2] Some members of the SSWG would recommend that the ACMA adopt a bolder approach in C-band, invoking dynamic spectrum management, in order to leverage work being carried out by regulatory bodies such as the FCC and Ofcom. Others within the SSWG are less sanguine about the efficacy of such approaches and their contribution to safeguarding existing FSS earth stations and enabling future FSS earth station deployments.

Dynamic spectrum assignment requires a widespread platform of sensing and central network resources to process the adaptation of networks to current spectrum usage in play. Those platforms can be immediately put in place and activated using satellite technology which has the necessary technical attributes to put these spectrum management techniques in place. This has largely been ignored by the current focus of the mobile industry and other terrestrial associations such as the Citizens Broadband Radio Service (CBRS) Association, and is an oversight which should be corrected to recognise the potential of new and innovative satellite technology which can catalyse mobile developments in a complementary way. The focus to date of the FCC has been in protective mechanisms for incumbent services (including the FSS), and not how the satellite industry can also assist. For the benefit of the ACMA, this is an example of why spectrum consideration for satellite networks should make way for new growth and applications, including in C-band and other bands. Adequate provision should be made for that potential.

In summary, the SSWG feels that there is an opportunity for the ACMA to be far more forward looking. This exercise represents an opportunity for the ACMA to step up its efforts and join the world leaders in approaching the new future of spectrum management. To set aside this opportunity would potentially shortchange the future and cause unnecessary later adjustment and disruption. At the same time, the ACMA should ensure that the dynamic spectrum management techniques being considered will effectively protect existing FSS (and FS) stations and enable their deployment in the future.

[1] ACMA Spectrum sharing - Overview and new approaches. AUGUST 2019
[2] ibid

Current Use and Arrangements

The ACMA has laid out a very useful summary of existing uses and arrangements for assignments and licensing in the band. This can be regarded as the outcomes of traditional spectrum management and as a basis for re-evaluation in a more advanced spectrum management environment.

The continuing existence of the use of unlicensed (Television receive-only) TVRO terminals is an example where regulation has apparently failed a sector of the market. Yet there is the opportunity to cater for this in the new licensing regime or even in the current regime through class licensing amendments. Many members of the SSWG are of the view that the ACMA could tidy up this discrepancy.

The SSWG notes that progress with Earth Station Protection Zones on the East Coast is still outstanding and can only assume that this is a result of lower priorities in the ACMA's work. Nevertheless, this forms an element of the considerations in the Discussion Paper.

The ACMA has drawn attention to some (one-off) evidence of declining usage by the FSS of C-band. We question the statistical validity of this. In addition, it relates to traditional services and markets, but does not make an attempt to recognise growing innovation and uses as have been mentioned above.

Details of licences in the 3700 to 4200 MHz band

The details of licences reveal a strong dependency on coordinated services. This, combined with class licensing, has served Australia well to date for the classes of services provided. Increasing demand can be accommodated with more dynamic spectrum control. If ubiquitous IMT services were to be also contemplated sharing would be very difficult, unless mobile services were offered with dynamic assignment capability to protect other services. However, exactly how dynamic spectrum management will be implemented, and the efficacy in protecting FSS and FS services in the band, will need to be carefully assessed.

An additional thought from Inmarsat is that there seems to be a trend in Europe towards local area licensing for terrestrial broadband, e.g. for individual factories. That could be a good basis for sharing with a limited number, to date, of earth stations.

International Developments

Taking into account the information provided by the ACMA, the 3700 to 4200 MHz band was not identified for IMT consideration by WRC-15. There is thus no global basis for spectrum for the 3GPP bands n77 and n78. Adequate global spectrum has been considered for the needs of IMT and like all other services these should be developed within the spectrum allocated to them and using better efficiency of their design and operations, and not to pre-suppose access which will make existence of other services very difficult.

Vendor claims of a viable ecosystem and tunability ranges are not in themselves sufficient argument for extensions of spectrum allocations. Within the ITU, 33 GHz is currently under consideration for IMT identification and apparently that is still not enough. Further consideration on spectrum below 6 GHz may come under consideration for the next study period but that cannot be guaranteed or pre-empted ahead of the WRC-19 Conference.

Within Europe, useful initiatives are emerging, especially within Ofcom and the ACMA is encouraged to follow this closely. The Middle East is focussed on spectrum below 3.8 GHz. Likewise, New Zealand is also tracking this way. Canada points the way towards a dynamic spectrum access approach in C-band, and there is much innovation within the FCC.

In the opinion of some SSWG members, the evidence points towards two conclusions:

- the 3700 to 3800 MHz band is a prime band for study and evaluation of the needs to be accommodated including for incumbent services, and

- it is important to engage in Dynamic spectrum management studies – otherwise the traditional management methods will overgild spectrum needs in the near future. It is time to accelerate regulatory thinking and to discipline demand.

Domestic Considerations

The ACMA is looking for feedback from stakeholders on the future accommodation of incumbent and new services. This will require a modernisation of regulatory thinking and spectrum management to achieve a durable outcome. The modernisation would need a blend of traditional solutions and a close consideration of non-traditional methods. This is probably the first hurdle to achieve. Otherwise time will quickly eclipse the solutions coming from a traditional approach.

Issues for comment

The following responses are to the itemised questions posed in the ACMA in the Discussion Paper. VIEW 1 is the proposals from the SSWG members, with the exception of Intelsat and SES. VIEW 2 represents the diverging views created by Intelsat and SES.

Question 1

Are there any other international developments in the 3700–4200 MHz band that the ACMA should be aware of?

VIEW 1: Because of symmetry, the complementary band (uplink) in the C-band is 5900 to 6400 MHz. There are proposals for this latter band which should be evaluated, as this band would no doubt affect the downlink in the 3700 to 4200 MHz band.

VIEW 2: No comment.

Question 2

What are the future requirements of point-to-point links and FSS earth stations in the 3700–4200 MHz band? Does this differ by geographical area and/or segment of the band?

VIEW 1 and VIEW 2: Because of the long-term nature of satellite systems, and the foreseen ongoing need for the existing uses of C-band, this is a first guide to future needs. Existing systems should be protected indefinitely, and consistent with View 1 of this submission, this can be accommodated above 3800 MHz (albeit with some retuning) to allow for new planning considerations in the 3700 to 3800 MHz range. However, as pointed out in the response new applications such as networks of sensors may also be invaluable to dynamic spectrum management, provided their efficacy is proven. These could be furnished quickly with satellite systems and would probably be geographically widespread in nature. In addition, interworking between NGSO and GSO systems would take advantage of the broad geographic reach of GSOs, including in the C-band.

Question 3

If licensed point-to-point links and FSS earth stations are affected by replanning activities in the 3700–4200 MHz band, what alternative deployment options could be considered?

VIEW 1 and VIEW 2: This depends on licensing models. Where coordination is possible then the situation is tolerable. If ubiquitous deployment is envisaged, such as with IMT, then this should be limited in bandwidth and close to extended (lower) C-band for benefits of spectrum continuity. Regarding Wireless Broadband (WBB), there is no need for any of the existing licensed FSS earth station in Australia to be affected as protection measures can be developed to ensure their protection from WBB systems. There are a number of examples of the necessity for continuing access to C-band by the FSS and these have their basis in the unique advantages which C-band brings as opposed to other bands such as Ku or Ka-band. One example is with Telecommunications Telemetry and Control (TT&C) services spread throughout the band. Another is with disaster relief, where C-band offers a reliable immediate network restoration. Other critical dependences occur in vertical industry segments e.g. mining and resources which require 24 x 7 network availability.

For point-to-point links there is a similar case to be made in support of preserving existing deployments, especially where these links are used for the delivery of Universal Service Obligation (USO) telephony services. Often these links cannot be migrated to higher bands, as higher bands are not capable of spanning the long distances (often in excess of 100 km) to remote locations over water (e.g., islands off the coast of Australia) where it is

not possible to operate a min-span repeater, or where band diversity is required to provide a greater level of robustness.

Question 4

In the event arrangements are made for new services in the 3700–4200 MHz band, do stakeholders have any comments on the ACMA's proposal to maintain the existing arrangements for Radiodetermination and LIPD devices, and the existing policy around TVRO systems?

VIEW 1 and VIEW 2: Low Interference Potential Devices (LIPD) arrangements have been successful and the SSWG encourages their continuation.

Question 5

What are the future requirements for WBB services in the 3700–4200 MHz band and what arrangements should be considered? Does this differ by geographical area and/or segment of the band?

VIEW 1 and VIEW 2: For fixed WBB this is in the same category as for point-to-point links with regard to coordination. Rural and remote areas are most likely.

Question 6

What WBB deployment scenarios should be considered for the 3700–4200 MHz band? Should use be limited to one scenario or should more flexible arrangements be implemented?

VIEW 1 and VIEW 2: The use of one scenario is probably unlikely.

Question 7

What is the current and planned availability of fixed and mobile WBB equipment in the 3700–4200 MHz band?

VIEW 1 and VIEW 2: The SSWG has no comment on Question 7.

Question 8

Is there interest in the use of other new service types in the 3700–4200 MHz band?

VIEW 1 and VIEW 2: There are new satellite opportunities associated with the Internet of Things (IoT), dynamic spectrum management (DSM), and the potential for 'unlicensed' spectrum (or the Australian interpretation of what this type of service is called).

Question 9

What services/applications should be accommodated in the 3700–4200 MHz band?

VIEW 1: In the 3700 to 3800 MHz band, the new services as mentioned in the Discussion Paper. It should be possible to also introduce new FSS earth stations, subject to coordination with terrestrial services, including WBB if that is introduced.

VIEW 2: Prior to making any decisions on whether the 3700 to 4200 MHz band should be made available for deployment of WBB services in Australia, the ACMA needs to undertake an extensive review and audit of the usage of the 3575 to 3700 MHz band (i.e., the 3.6 GHz band), which was awarded to terrestrial 5G services in December 2018 with some pain to the satellite industry. This review and audit should be undertaken to determine whether or not there is a need for additional spectrum for such applications

and, if so, how much additional spectrum will be needed. The outcome should be made available to the public, and ACMA should conduct another public consultation before any decision is made on the 3700 to 4200 MHz band.

Question 10

Which frequencies ranges should be made available for these services/applications?

VIEW 1: The 3700 to 3800 MHz band should be made available. In addition, the whole of the 3700 to 4200 MHz band should remain available for the FSS.

VIEW 2: This view would like to highlight to the ACMA the importance of making sure that spectrum already identified for and made available to terrestrial 5G applications is fully utilised before any additional spectrum is considered for such applications. The latest findings concerning the countries in the Asia-Pacific region not only evidence the progress that has been made in the last few years to this end but also demonstrate that there is even more harmonised spectrum for IMT that could be utilised for terrestrial 5G services.

As shown in Figure 1, on the following page, significant progress has been made in licensing additional spectrum for 5G in the Asia-Pacific region, with many countries now having licensed double the spectrum which they had five years ago.[3] It is essential, though, that the current harmonised spectrum for IMT be more extensively used by the mobile industry before seeking additional spectrum identifications for 5G. In accordance with Figure 1, there is about 50 MHz of spectrum identified for IMT in Region 3 that has not yet been licensed and utilised in Australia. Should there be a need to identify more spectrum for WBB services in Australia, and based on the ACMA conducting an extensive review and audit as discussed above, this 50 MHz of spectrum that has not yet being licensed and utilised should be the primary candidate band for the deployment of WBB services. Meanwhile, we note that the 5G NR technology supports bandwidths 10, 15, 20, 30, 40, 50, 60, 70, 80, 90, and 100 MHz, and carrier aggregation can be used for combining spectrum in different frequency bands. Thus, there is no imminent need for wide contiguous spectrum blocks of additional spectrum for 5G.

As an additional reference, the ACMA should also consider the information in Table 1, on the following page, which shows the harmonised spectrum for terrestrial mobile services that is available in Region 3. This Table shows a total of up to 935 MHz that could be used for the deployment of WBB services in Australia in a harmonised manner. The ACMA could review and identify which harmonised IMT spectrum has not yet been licensed and utilised and could be made available for the deployment of WBB services.

In addition, as noted above, the ITU-R is exploring possible additional IMT identifications on more than 33 GHz of spectrum as a part of WRC-19. Therefore, there seems to be little merit to the consideration at this time of other frequency bands for 5G, in particular those frequency bands that are critical to other radiocommunication sectors. Intelsat is fully supportive of some of the frequency bands being studied under Agenda Item 1.13 being made available for IMT at WRC-19. An adequate and generous allowance of spectrum for IMT is available without having to resort to other frequency bands, in particular C-band.

[3] For more information on the analysis of the status of licensing of IMT spectrum which is used for commercial mobile services and the extent to which licensed spectrum has been put into use by terrestrial mobile operators, *see* LS Telcom, 'Analysis of the World-Wide Licensing and Usage of IMT Spectrum' (5 April 2019), available online at https://www.lstelcom.com/fileadmin/content/marketing/news/2019_Study_LicensingUseofMobileSpectrum.pdf.

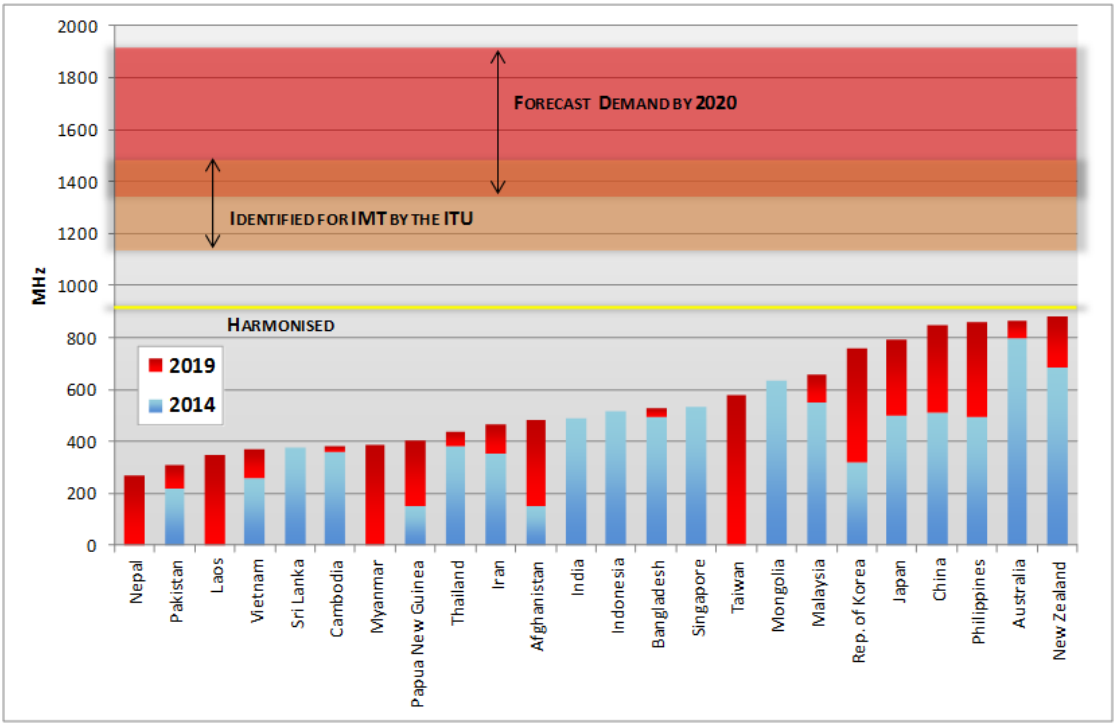

Figure 1: Spectrum licensed for IMT services in Region 3

3GPP Band		Uplink band (MHz)	Downlink band (MHz)	Region 3 (MHz)
FDD Bands				
31	450 MHz	452.5 - 457.5	462.5 - 467.5	10
28	700 MHz	703 - 748	758 - 803	90
5	850 MHz	824 - 849	869 - 894	Up to 130
8	900 MHz	880 - 925	935 - 960	
3	1800 MHz	1710 - 1785	1805 - 1880	150
1	2100 MHz	1920 - 1980	2110 - 2170	120
7	2600 MHz	2500 - 2570	2620 - 2690	140
Sub-Total				640
TDD Bands				
75/76	1400 MHz	1427 - 1517		90
33	1900 MHz	1900 - 1920		20
34	2000 MHz	2010 - 2025		15
40	2300 MHz	2300 -2400		100
38	2600 MHz	2570 - 2620		50
Sub-Total				275
TOTAL				915

Table 1: List of harmonised IMT spectrum in Region 3

Among the more than 33 GHz of spectrum under Agenda Item 1.13 at WRC-19, there is at least a total of 3250 MHz of spectrum within the 26 GHz band (i.e., 24.25 to 27.5 GHz) that can be identified for IMT. The 26 GHz band should be carefully considered by the ACMA for the deployment of WBB services in Australia. Agenda Item 1.13 at WRC-19 identifies this band as one of the candidate bands for IMT, and the 26 GHz band is considered as one of the core spectrum resources for terrestrial 5G by several administrations in several regions around the world. Should there be a need for additional spectrum for the deployment of WBB services in Australia, the ACMA should wait for the outcome of WRC-19 and consider first the bands with high probability for global harmonization.

Another approach for the ACMA to consider when considering the deployment of WBB services in Australia should be the refarming of those frequency bands that have been used for 2G, 3G and 4G networks. This kind of approach has been used, for example, in China. In December 2018, China Mobile was authorised to conduct 5G trials in the 2515 to 2675 MHz band. In the future, according to the needs of MNO operators, this frequency band could be refarmed for 5G, including WBB.

Question 11

Which geographic areas should be made available for these services/applications?

VIEW 1: Australia-wide should be made available for the range of services, with subdivision for particular services. Existing licensed earth stations should continue to be protected. It should also be possible to deploy new earth stations anywhere in Australia provided that coordination with terrestrial services is possible. Small cell design offers the more widespread opportunity to enable a broader coexistence services and applications.

The 3700 to 4200 MHz band is heavily used for satellite communications in the Asia Pacific region, including Australia, for critical services such as air navigation, maritime communications, and meteorology services. These services complement other economically important ones like TV broadcasting, VSAT networks, internet broadband services, banking networks, and mobile backhaul used to extend terrestrial networks. These services take advantage of the unique physical characteristics of C-band, which make satellite communications more suitable than other frequency bands given the region's geography and climate. Additionally, co-frequency sharing between FSS and terrestrial 5G/IMT is not feasible and interference into FSS will occur when terrestrial 5G/IMT and FSS operate, even in adjacent bands.

VIEW 2: If any WBB services are to be introduced in any part of the 3700 to 4200 MHz band (the case for which is less than clear), then existing FSS earth stations will require protection at their existing locations. It would be infeasible and prohibitively expensive to relocate FSS earth stations from their existing sites in major metropolitan areas to particular geographic regions or exclusion zones. The present concentration of licensed C-band earth receive stations in cities like Sydney and Perth reflect, in part, the major use of the frequency band for important services such as international and trans-Australian broadcasting of live news, sporting events and entertainment, and for which terrestrial options have not been viable alternatives. Protecting such earth stations from WWB interference would require significant protection zones within cities.

In addition, there may be challenges in introducing WWB services in rural areas as well. As the ACMA notes, there are also some 200,000 TVRO earth receive stations scattered throughout Australia, often in rural areas. While not legally entitled to interference protection unless licensed, the disruption of such services is nevertheless a public interest loss that may lead to public dissatisfaction with the ACMA's decisions. Before undertaking such a path, the ACMA should consider carefully whether it is even necessary to devote any part of the 3700 to 4200 MHz for WWB when other mid-band spectrum may be sufficient to meet demand.

Question 12

On what basis should access be provided? Should access be granted on an exclusive or shared basis, on a coordinated or uncoordinated basis, et cetera?

VIEW 1: For the 3700 to 3800 MHz band, access should be provided on a shared basis. For spectrum greater that 3800 MHz, the current basis should prevail. Alternatively, if access to all or part of the 3700 to 4200 MHz band is given to WBB systems, it should be on a secondary basis or a co-primary basis with the FSS, with some form of coordination necessary to provide compatibility.

VIEW 2: The ACMA should give its considerations first to our View 2 answers to Questions 9 and 10 prior giving any access to the new services in the 3700 to 4200 MHz bands.

Question 13

What licensing mechanisms are appropriate (spectrum, apparatus or class licensing)?

VIEW 1: Spectrum licensing is the least attractive because of the freeze-out of innovation at the wrong time in history. In addition, licensing of FSS earth stations should continue under the apparatus licensing regime. Regarding WBB systems, given the need for coordination with respect to FSS earth stations, apparatus licensing would be preferred, e.g. licensing of each base station. If this is not practical, spectrum licensing could be considered but a means to require coordination between earth stations and WBB stations would need to be developed. The impact of potential Area Wide Licences (AWLs) has yet to be evaluated, but this offers benefits for registered sites.

VIEW 2: Spectrum licensing is the least attractive because of the freeze-out of innovation at the wrong time in history. In addition, licensing of FSS earth stations should continue under the apparatus licensing regime. Regarding WBB systems, given the need for coordination with respect to FSS earth stations, apparatus licensing would be preferred, e.g. licensing of each base station.

Question 14

If arrangements for WBB specifically are implemented in the 3700–4200 MHz band, are the proposed interference management techniques with services in the 3.6 GHz band suitable? Are any other techniques proposed? Are there any other compatibility issues with the 3.6 GHz band the ACMA should consider?

VIEW 1: If the 3700 to 3800 band is contemplated, then spectrum continuity would indicate similar interference management techniques. With regard to adjacent bands, there is potential for interference from WBB operating in the 3700 to 4200 MHz band to FSS earth stations receiving in the 3600 to 3700 MHz band. Provided adequate protection measures for FSS operations in the 3700 to 4200 MHz band are provided, there may be no need for any additional protection measures for FSS operations in the adjacent band, but this would need to be confirmed as the detail of any new plans for WBB are developed.

VIEW 2: This view firmly believes that there is no justification for introducing WBB services into any part of the 3700 to 4200 MHz band, for the reasons already stated. An additional compelling reason is that no suitable interference management techniques have been demonstrated. The ACMA would first need to conduct additional technical studies and field trials to properly identify the regulatory measures (e.g., indoor use restrictions, guard bands, out-of-band emission (OOBE) conditions, separation distances and filter specifications, etc.) that are required to prevent harmful interference to incumbent services in C-band. In addition, the practicability and logistics of migrating existing satellites services in Australia out of a determined range of the C-band (e.g., above

3800 MHz) or to any other frequency band will also require further assessments, including the impact to deliver satellite services with the availability and coverage it requires.

The interference management techniques in the 3.6 GHz will not be suitable for WBB services if these new services are implemented in the 3700 to 4200 MHz band with the considerations that FSS usage in the 3700 to 4200 MHz bands is more extensive than in the 3400 to 3700 MHz band.

Question 15

Should the ACMA consider extending existing apparatus and spectrum licence arrangements in the 3.6 GHz band into the 3700–3800 MHz band or another segment of the 3700–4200 MHz band?

VIEW 1: Considerations should be limited to the 3700 to 3800 MHz band.

VIEW 2: No comment, other than the view disagrees with extending the existing apparatus and spectrum licence arrangements in the 3.6 GHz band into the 3700 to 3800 MHz band. Further, any consideration of additional spectrum for WBB services should first be identified in the alternative bands stated in the answer to Question 10 above.

Question 16

Is there any additional information available that would assist the ACMA in assessing compatibly of potential new WBB services in the 3700–4200 MHz band with WAIC and radio altimeter systems in the 4200–4400 MHz band?

VIEW 1 and VIEW 2: The SSWG has no comment on Question 16.

Published by:
COMMUNICATIONS
ALLIANCE LTD

Level 12
75 Miller Street
North Sydney
NSW 2060 Australia

PO Box 444
Milsons Point
NSW 1565

T 61 2 9959 9111
F 61 2 9954 6136
E info@commsalliance.com.au
www.commsalliance.com.au
ABN 56 078 026 507