

AMTA submission to the ACMA

Planning of the 3700-4200 MHz Band

IFC 27/2019

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**Australian Mobile
Telecommunications
Association**

Introduction

The Australian Mobile Telecommunications Association (AMTA) welcomes the opportunity to respond to the Australian Communications and Media Authority's Discussion Paper on the *Planning of the 3700-4200 MHz band*. We have outlined our overall position on progression of the band, including priorities and our preferred option for replanning; as well as responded to some of the specific questions in the Discussion Paper below.

Progressing the band to preliminary replanning

AMTA supports progressing the 3700-4200 MHz band to the *preliminary replanning stage*. Many countries have already allocated or are in the process of allocating the whole of, or a part of, this band for 5G services and this spectrum is compatible with the 3.6 GHz band recently auctioned by the ACMA.

Within the 3700-4200 band, AMTA also supports prioritisation of the reallocation of the 3700-3800 MHz range in the geographies defined for the 3575-3700 MHz (3.6 GHz band) to meet the expected demand for 5G services as we believe this will deliver the greatest economic and social benefit.

AMTA estimates that each mobile operator will need 100 MHz of mid-band spectrum for initial 5G deployments. Given the current number of mobile network operators and incumbent users of the 3400-3700 MHz band, we consider at least a further 100 MHz within the 3700-4200 GHz band can be allocated for IMT and to support further deployment of 5G services.

Specifically:

- 100 MHz (3700-3800 MHz) should be allocated under exclusive access (spectrum licensing) to the existing mid-band allocation in the geographic areas defined for the 3.6 GHz band. This will allow for sufficient spectrum to be made available and facilitate opportunity to access 100 MHz per operator; and
- 200 MHz (3800-4000 MHz) should be considered for potential allocation in capital cities where incumbency is low under exclusive access to further improve the 5G experience in areas of high demand.

Delivering the greatest economic and social benefit to Australia

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

In *Mobile Nation 2019: The 5G Future*,² Deloitte Access Economics, forecast that an additional \$65 billion of GDP (or \$2500 per person) will be added to Australia's economy by 2023 through mobile technology. Similarly, the Bureau of Communications and Arts Research³ estimates that 5G alone will add between \$1,300 and \$2,000 in additional GDP per person by 2030.

Mobile technology delivers more than just economic benefit to the country. As Deloitte Access Economics observes,

"Mobile technologies are embedded in everyday life. Today, 89 percent of Australians own a smartphone, and the average Australian spends three hours every day using their smartphone - working, playing, connecting with family and friends."⁴

Mobile technology and services have become indispensable to way we communicate with family and friends, entertain ourselves, keep safe and manage our responsibilities. Importantly, the role mobile solutions play in these aspects of our lives will not abate or reduce in the future; on the contrary, they will only grow in importance as 5G delivers critical social benefits across sectors of the economy including health, education, transport and agriculture.

Preferred Option – band planning considerations

Spectrum scenarios

The section of the Discussion Paper titled **Band planning considerations** outlines a number of generic scenarios for consideration. AMTA supports **Scenario c**: the hybrid combination of exclusive use in the lower part of band and shared use in the upper part.

AMTA proposes the lower 100 MHz (3700-3800 MHz) should be reallocated as the priority work item in the 3700-4200 band, before other parts of the band considered in the scope of the Discussion Paper, on an exclusive, spectrum licensed basis using the metropolitan and regional geographic areas defined for the 3.6 GHz band to provide seamless additional spectrum along the eastern and southern seaboard of Australia for IMT. Geographic areas outside of the 3.6 GHz band geographies should remain available for apparatus and class licensed services, consistent with the 3.6 GHz band.

¹ [Ericsson Mobility Report](#), Special Edition, World Economic Forum, January 2019.

² Deloitte Access Economics, [Mobile Nation: the 5G Future](#), 2019.

³ Bureau of Communications and the Arts Research, [Impacts of 5G on Productivity and Economic Growth](#), April 2018.

⁴ Deloitte Access Economics, [Mobile Nation: the 5G Future](#), 2019.

In addition to the reallocation of 3700-3800 MHz in the 3.6 GHz band geographies, AMTA supports a further 200 MHz (3800-4000 MHz) being considered for allocation on an exclusive, spectrum licensed basis to IMT in four of the six metropolitan areas (Brisbane, Canberra, Melbourne and Adelaide), again using the same geographic boundaries as the 3.6 GHz band. These four metropolitan areas have relatively low incumbency, and could be reallocated on an exclusive basis to IMT with minimal disruption to incumbent users.

In Sydney and Perth, AMTA supports further investigation by the ACMA to identify the optimal and efficient use of spectrum in the band.

The Discussion Paper also seeks input on whether small cell deployments may facilitate IMT deployment closer to FSS earth station sites. We are aware that some studies⁵ have been conducted on the coexistence between small cells and FSS earth stations, and early indications appear promising. However, in order to determine the extent to which the use of small cells could allow closer physical coexistence, and/or the extent to which it might allow a greater allocation of spectrum from 3800-4000 MHz to IMT, further study is required, which we ask the ACMA to initiate.

Geographic scenarios

The ACMA also seeks stakeholder views on the geographic areas for new service types, and we have stated our recommendation that the geographic areas created for the 3.6 GHz band should be used for IMT allocations above 3700MHz. It is important to align geographic boundaries for regions identified for allocations to IMT above 3700 MHz with the boundaries of the areas defined for the 3.6 GHz band in order to minimise coordination effort and to reduce the risk of creating “dead zones” in locations along boundaries where adjacent channel or co-channel coordination cannot be achieved seamlessly.

AMTA recognises the need for ongoing access to parts of the 3700-4200 MHz band by a range of users including fixed satellite service and point-to-point links. AMTA believes that with coordination, the frequency ranges and geographies described above can be allocated to IMT and incumbent services can be re-tuned to a frequency higher up in the band.

Embargoes

While the ACMA is working through the replanning process, AMTA recommends that embargo 73 is updated, and a new embargo is created to limit the introduction of new services in geographies and parts of the spectrum that are being contemplated for reallocation to IMT services.

- **Embargo 73:** Embargo 73 currently prevents licences being issued for P2P links in geographies matching the 3.6 GHz band between 3710-3790 MHz. We recommend the

⁵ For example, Inmarsat response to the ACMA options paper: Future Use of the 3.6 GHz band. 11 Aug 2017. <https://www.acma.gov.au/-/media/Spectrum-Transformation-and-Government/Issue-for-comment/9-2017/Inmarsat-submission-docx.docx>

frequency range is expanded to 3700-3800 MHz, and that P2MP, earth stations and earth receive stations apparatus licence types are added.

- **New Embargo:** Create a new embargo for the frequency range 3800-4000 MHz for all six metropolitan areas defined for the 3.6 GHz band to restrict new licences from being issued for P2P, P2MP, earth stations and earth receive stations.

These changes will limit the potential for spectrum denial caused by other services in critical areas while the ACMA works through the replanning process.

Licence type

AMTA recommends spectrum allocated to IMT from 3700-4200 MHz should be on an exclusive, spectrum licensed basis where possible, with core licence conditions and associated instruments harmonised in alignment with the 3.6 GHz band. As a minimum, this includes the 3700-3800 MHz band and the 3800-4000 MHz band for Brisbane, Canberra, Melbourne and Adelaide, with consideration being given to allocating at least part of 3800-4000 MHz in Perth and Sydney.

For the upper component of 3800-4000 MHz, investigation into all options for incumbents needs to be undertaken before proposing a licence framework.

Radiodetermination, LIPD and TVRO

Radiodetermination. AMTA notes the ACMA also proposes any new arrangements in the 3700-4200 MHz band as a result of replanning will require existing radiodetermination services to be protected from interference, and that any new arrangements will not be afforded interference protection from existing radiodetermination services. AMTA members understand and accept these conditions.

LIPD devices. AMTA has previously noted⁶ its opposition to the addition of ‘ultra-wide band’ ground and wall penetrating radar devices to the LIPD class licence. Our view remains that these devices should be apparatus licensed, the cost of which is very low (\$54 to establish and annual renewal thereafter is \$44). The benefit is, through the apparatus licensing system, the ACMA has a record of these radars that could be in operation throughout Australia and a contact that could assist in tracking down the device if required for interference investigation and resolution.

TVRO. AMTA supports the ACMA’s proposal to maintain the status quo for TVRO; namely, they remain unlicensed.

Earth Station Protection Zones

AMTA supports the investigation of suitable ESPZs to assist in clearance of the encumbered portions of the band identified in Perth and Sydney, allowing a uniform allocation and licensing regime across all capital cities.

⁶ AMTA submission to IFC 45/2018:
<https://www.acma.gov.au/-/media/Spectrum-Engineering/Issue-for-comment/IFC-45-2018/AMTA---IFC-45-2018-docx.docx>

It is acknowledged that this exercise is unlikely to happen quickly, requires coordination between multiple satellite operators in different bands and would be costly.

Dynamic Sharing

The Discussion Paper canvasses stakeholder input on both traditional sharing techniques and emerging sharing techniques such as Dynamic Spectrum Access (DSA). A separate ACMA consultation (IFC 25/2019) tackles sharing in a broad sense, and we will cover the broader opportunities and issues we see regarding dynamic models of sharing in our submission to that consultation. However, due to the substantial industry investment in the adjacent 3400-3700 MHz band, and the ACMA's interest in techniques such as DSA for the 3700-4200 MHz band, we offer some commentary specific to this band.

While we acknowledge mobile network rollout in an entirely new band can take many years to complete, 3700-3800 MHz is an augmentation of capacity to the 3400-3700 MHz band. Thus, rather than the lengthy process where entirely new radio infrastructure (transmitters, antennas, etc) must be deployed, the potential exists for additional spectrum in 3700-3800 MHz to be utilised in a comparatively short period of time.

AMTA members remain of the view that there are sufficient mechanisms within the current secondary market trading, third party authorisation and geographical licence separation frameworks that can facilitate spectrum sharing within licensed areas. These currently provide sufficient sharing opportunities for primary licence holders to meet existing needs, while allowing the primary licensee to control and determine additional users or uses within their spectrum licence areas.

Responses to Issues for Comment:

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

Our submission only covers the availability of mobile WBB equipment, not fixed WBB.

Regarding network equipment, 5G IMT equipment for 3GPP band n78 (3300-3800 MHz) is readily available and is already being deployed worldwide. As such, the mobile industry is ready today to make use of an allocation of 3700-3800 MHz. Equipment vendors are well advanced on developing network equipment for 3GPP band n77 (3300-4200 MHz), and AMTA expects n77 equipment to be available well in advance of the earliest possible time where an allocation above 3800 MHz could be made available for IMT deployment. There will be availability of equipment for initial 5G deployments above 3800MHz from 2020 in Japan.⁷

However, the Australian-specific emission mask for 3.6 GHz spectrum licences at the 3700 MHz edge of the 3.6 GHz band imposed by the ACMA means that some AMTA members are unable to take

⁷ <https://www.ericsson.com/en/press-releases/2019/5/ericsson-and-softbank-corp.-to-deploy-multi-band-5g-network>

advantage of the global equipment scale as vendors are forced to make a unique Australian market variant. Further engagement via the ACMA is required to consider options to vary these requirements to align with global standards for the 3.6 GHz band.

Regarding devices, the Discussion Paper references the June 2019 update⁸ to the GSA's **5G Device Ecosystem**, to observe there are 39 vendors who had announced 90 available or forthcoming devices. We note that like equipment vendors, device manufacturers are also working to develop devices to operate in the full range of band n77, and we similarly expect devices to be available well in advance of an allocation of spectrum above 3800 MHz.

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

AMTA members have expressed interest in an allocation for IMT in the 3700-4200 MHz band.

AMTA proposes the lower 100 MHz (3700-3800 MHz) is allocated as a priority, before other parts of the band within the scope of this Discussion Paper, on an exclusive, spectrum licensed basis using the metropolitan and regional geographic areas defined for the 3.6 GHz band. AMTA also supports a further 200 MHz (3800-4000 MHz) being considered for allocation on an exclusive, spectrum licensed basis to IMT in four of the six metropolitan areas (Brisbane, Canberra, Melbourne and Adelaide), again using the same geographic boundaries as the 3.6 GHz band.

Further details can be found in our comments above.

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

AMTA's primary interest is in spectrum for IMT, which we propose should be allocated under a spectrum licensing regime in the geographic areas defined for the 3.6 GHz band.

AMTA acknowledges that the C-band is an important band for a range of existing and future services, including P2P links, P2MP and satellite services, which we believe in the majority of cases can be optimally restacked to operate to use the least amount of aggregated spectrum in the upper part of the band, or in the case of many P2P and P2MP services could readily migrate to a new band as equipment reaches end of life and comes up for renewal. Encouraging existing operators of these services along these lines will enable more spectrum in the 3700-4200 MHz band to be allocated to IMT to deliver the economic and social benefits forecast to arise from 5G technology.

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

See our answer to question 8 and further details in our comments above regarding the proposed frequency ranges for IMT.

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

AMTA recommends the geographic areas defined for the 3.6 GHz band should be used for IMT allocations in the 3700-3800 MHz and 3800-4000 MHz ranges. This is important to minimise

⁸ <https://gsacom.com/paper/5g-devices-ecosystem-june-2019-update/>

coordination effort and to reduce the risk of creating “dead zones” in locations along boundaries where adjacent channel or co-channel coordination cannot be achieved seamlessly.

Further details can be found in our comments above.

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?

AMTA recommends spectrum allocated to IMT from 3700-4200 MHz should be allocated on an exclusive, spectrum licensed basis where possible, in alignment with the core licence conditions set out in the 3.6 GHz band.

Regarding sharing, we note that as 3700-3800 MHz is immediately adjacent to the 3.6 GHz band, the traditionally lengthy process where entirely new radio infrastructure (transmitters, antennas, etc) must be deployed may not be required, resulting in the opportunity for spectrum in 3700-3800 MHz being utilised in a comparatively short period of time. This would also limit instances for short term, opportunistic use of the band ahead of roll out.

Further detail can be found in our comments above.

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

AMTA supports adopting spectrum licensing arrangements in the 3700-3800 MHz segment that are similar to the arrangements for the adjacent 3.6 GHz band.

It is premature to consider what arrangements might be suitable for the 3800-4200 MHz range. Investigation into all options for incumbents needs to be undertaken before proposing a licence framework.

For any further questions relating to this submission please contact Lisa Brown, Public Policy Manager, AMTA at lisa.brown@amta.org.au or 02 8920 3555.