

Global mobile Suppliers Association

Response to Australian Communication and Multimedia Authority's Re-planning of the 3700–4200 MHz band

Options paper

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GSA¹ response to Australian Communication and Multimedia Authority's Re-planning of the 3700–4200 MHz band Options paper

The GSA submitted general information related to the deployment of 5G in the 3700 – 4200 MHz band in its response to the ACMA's consultation on *the Draft Five Year Spectrum Outlook 2020 – 2024*. In this response to the *Re-planning of the 3700–4200 MHz band Options paper* (herein referred to as “the Options Paper”) the GSA focusses on the ACMA's band planning option 3 and associated issues in order to maximise the utility of the subject spectrum (and hence provide the greatest economic and social value to Australia), whilst also affording sufficient protection to the operation of other Radiocommunications services. If the ACMA requires any clarification to this response, please do not hesitate to contact:

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Introduction

The GSA is pleased that the ACMA is re-planning the 3700 – 4200 MHz band in order to provide additional spectrum for the delivery of Wireless Broadband Services (WBB), also known as Mobile Broadband services (MBB)). The ACMA's licensing of low band (< 3 GHz), mid band (< 7 GHz) and high band spectrum (> 24.25 GHz) will allow the deployment and development of 5G services in Australia covering a wide variety of use cases, with differing business models across different rural, suburban and metropolitan environments.

¹ *The GSA (Global mobile Suppliers Association, <https://gsacom.com>) develops strategies and plans, and contributes studies and technical analysis to international, regional and individual country policymakers and regulators to facilitate the timely availability of spectrum for use by mobile network operators. GSA has a focus group for spectrum topics for technical and regulatory matters of radio spectrum pertaining to the successful evolution of International Mobile Telecommunication (IMT) and associated radiocommunication systems and comprises a team made up of spectrum and regulatory affairs specialists from GSA Executive Member and GSA Member companies. In addition, GSA reports regularly on global spectrum developments.*

Increasing demand for WBB services

The demand for WBB services is increasing.

During 2020 the coronavirus pandemic (COVID-19) forced an unprecedented number of people all over the world to change their workplace from office to home and become accustomed to new routines in their daily lives. As new digital behaviours are formed, the critical role of communications service providers to support a functioning society with flawless digital communication capabilities in times of crisis has become apparent.

As people spent more time online at home, network traffic loads shifted geographically from city centres and office areas to suburban residential areas. The largest share of the traffic increase as lockdowns went into place was absorbed by the fixed residential network, but many service providers also experienced an increased demand on the mobile network.

Looking forward, over 70 percent of the global population will have mobile connectivity by 2023 and the total number of global mobile subscribers will grow from 5.1 billion (66 percent of population) in 2018 to 5.7 billion (71 percent of population) by 2023.²

5G devices and connections will be over 10 percent of global mobile devices and connections by 2023. By 2023, global mobile devices will grow from 8.8 billion in 2018 to 13.1 billion by 2023 – 1.4 billion of those will be 5G capable.³

It is clear that there is global demand for 5G services and to meet the demand 207 operators hold licences issued for 5G bands worldwide - between them they hold more than 310 licenses to use 5G spectrum bands⁴.

As of end August 2020 GSA's NTS database showed:

- C-band spectrum has been a key early focus of investment by operators. 178 operators were investing in C-band spectrum (3300-4200 MHz), with 82 of those known to be actively deploying networks using 3GPP Band n77 or Band n78.
- C-band spectrum was already well supported in devices at that point. By August GSA had catalogued 178 announced 5G devices positioned as supporting Band n78 or Band n77. The majority (117) of those were phones, followed by non-industrial CPE at 27 devices, with modules making up the next largest category at 23 announced devices.

The importance of mid-band spectrum

The 3300 - 4200 MHz spectrum range offers a particularly optimal balance between coverage and capacity, It is widely held that this mid-band range will support a broad array of 5G applications – from enhanced Mobile Broadband (including Augmented Reality/Virtual Reality and Ultra High

² Cisco Annual Internet Report (2018–2023) White Paper, CISCO March 2020

³ ibid

⁴ 5G Spectrum September 2020 Snapshot, Global Mobile Suppliers Association 2020

Definition video) and Fixed Wireless Access to a plethora of new and emerging applications that impact, and are impacted by, the ongoing digital transformation of society.

This mid-band spectrum range has the additional merit of offering the largest contiguous bandwidth available for IMT below 6 GHz. Further, the proximity of this spectrum range to existing bands in use for mobile and the implementation of Massive MIMO / beam-forming techniques provide potential for the reuse of the existing infrastructure in areas where dense networks are deployed, thus delivering enhanced capacity without incurring network densification costs.

A growing number of national administrations are recognizing the salience of 3300–4200 MHz range for the deployment of 5G-NR networks. For instance, in Europe, the 3400-3800 MHz is now broadly accepted as the primary band for 5G. The ten commercial 5G deployments in Europe can now leverage the recently updated CEPT framework for the 5G-NR air interface and for Massive MIMO base stations. Some administrations in Europe are eyeing the opportunity to utilize additional mid-band spectrum in the 3800-4200 MHz range for 5G, the UK has started assignment procedures for this range.

The U.S. Federal Communications Commission (FCC) announced that a public auction of 280 MHz (3700 MHz-3980 MHz) of spectrum in 3.7-4.2 GHz range (i.e., the “C-Band”) will be held for 5G starting December 8, 2020. The incumbent Fixed Satellite Service (FSS) will be cleared for that range and will continue to operate in 4000-4200 MHz.

Wide contiguous bandwidths

The ability of operators to cost effectively fulfil the market demand for 5G services will largely depend on the availability of contiguous wide frequency blocks for operators. GSA supports the availability of the largest possible contiguous frequency range for IMT within the 3300-4200 MHz range at national level. As a consequence, many countries need to address the current fragmentation of existing assignments and plan the assignment procedures accordingly.

Presently, it is common for 80/100 MHz contiguous blocks in the 3300-4200 MHz range are being to be made available per operator. Spectrum availability will further grow over time considering the steadily increasing market adoption for a growing number of use cases with more and more requirements (higher throughput and lower latency in the first place): GSA believes that additional mid-band spectrum may therefore be required for MNOs in leading markets by 2023-2025: the 3700-4200 MHz range may represent a valuable opportunity in this respect.

Compared to the aggregation of noncontiguous carriers, the assignment of contiguous blocks to operators leads to significant benefits in terms of; spectrum efficiency, signaling overhead, physical layer flexibility, latency performance, BS radio unit implementation, spectrum management implications and UE implementation.

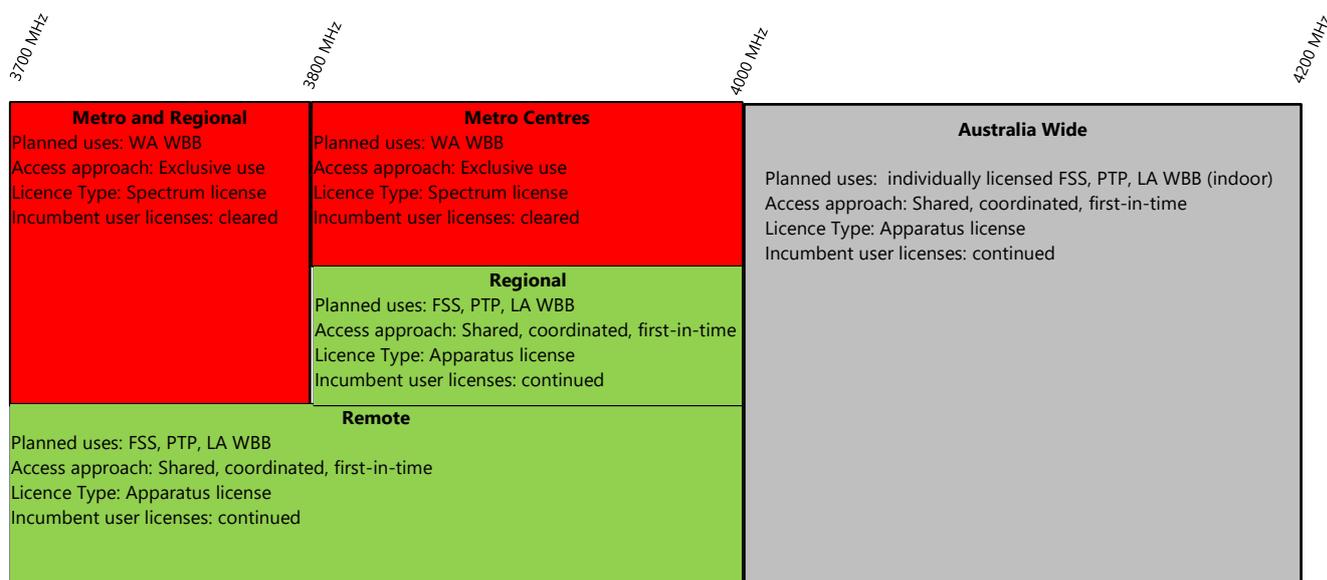
GSA recommends a modified “Option 3”

Taking into consideration the ACMA’s desirable outcomes: to introduce new WBB uses, both wide area and local area, with suitable technical frameworks; support continued uses in the band; and to ensure coexistence with adjacent band services, in particular radio altimeters operating above 4200 MHz and services below 3700 MHz⁵ the GSA concurs with ACMA’s evaluation that Option 3 is preferred. By further considering the points made in the sections above the GSA recommends additional small adjustments to the Option 3 proposal to maximize the benefits to Australian businesses and consumers and ensure the desirable outcomes are enabled to the greatest extent.

The adjustments recommended by GSA, shown in the figure below, are:

- Extending the amount of contiguous spectrum available for spectrum licensing in the major metropolitan centers by 200 MHz
- Exclusive spectrum licensing in regional areas in the range 3700-3800 MHz
- Apparatus licensing for LA WBB in regional areas in the range 3800-4000 MHz; and
- Apparatus licensing LA WBB in remote areas in the range 3700-4000 MHz
- Apparatus licensing for indoor LA WBB Australia wide in the range 4000-4200 MHz

Figure 1: GSA recommended modified "option 3"



Importantly, the proposal for an indoor restriction for apparatus licensing of WBB in the 4000 – 4200 MHz is intended as an initial step to allow WBB in this band segment whilst protecting incumbent co-channel services (FSS and PTP) and adjacent channel radio altimeter use. GSA members are participating in studies in various fora on the coexistence

conditions for 5G near the radio altimeter band of 4200-4400 MHz. Once the co-existence studies have been completed the provisions for WBB in the 4000 – 4200 MHz may be reviewed. It may be possible to create exclusion zones or deployment restrictions around sensitive areas, flight routes near airports, that will allow radio altimeters to operate without interference and WBB to be used in outdoor scenarios.

Conclusion

The GSA thanks the ACMA for its open, consultative approach towards allocation of further mid-band spectrum in the range 3700 – 4200 MHz. In this paper the GSA provides information to show that there is demand for this spectrum to meet the varied use-cases, environments and business models that 5G enables.

The GSA's preferred band planning option is "option 3" with minor improvements.

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