TELSTRA GROUP LIMITED

Five-Year Spectrum Outlook 2023-2028

Public submission

12 May 2023

EXECUTIVE SUMMARY

We welcome the opportunity to provide our comments to the Australian Communications and Media Authority (ACMA) in response to its draft *Five-Year Spectrum Outlook 2023-28* (FYSO) *and 2023-24 Work Program* consultation. The effective management and allocation of spectrum is critical to driving innovation, improving connectivity, and enhancing the digital experiences of Australians. We are committed to working with the ACMA and other stakeholders to ensure that Australia's spectrum resources are used efficiently and effectively to deliver the best possible outcomes for consumers and businesses alike.

Prioritisation of the ACMA's work plan

Our number one priority is that that the 3.4 GHz and 3.7 GHz auction timeline remains on track and that the auction itself starts by 3 October 2023. Following on from this, we recommend the spectrum work program be prioritised as set out in the table below.

Activity	Priority	Comment
Allocation of 3.4 GHz & 3.7 GHz	1	Start the auction as soon as possible and no later than Tuesday 3 October 2023.
Renewal of expiring spectrum licences	2	We strongly support the ACMA's intention to commence consultation on renewal process for spectrum licenses expiring between 2028 and 2032 in Q2 2023.
Regulatory rules for Direct to Handset services	3	We recommend the ACMA take a more proactive approach to how satellite 'direct to handset' services will be licensed and regulated when using existing terrestrial mobile spectrum bands. With the first services mooted to be commercially launched as early as 2024 this work needs to be prioritised and accelerated.
Use of the 'upper' 6 GHz band	4	We support the entire upper 6 GHz band (6425 – 7125 MHz) being identified for IMT. This is spectrum that is likely to be required to launch 5G advanced and/or 6G services. Since critical decisions will be made on the future allocation of this spectrum at WRC-23 it's important this opportunity is adequately considered in Australia's preparations ahead of the next APG meeting (APG23-6) in August 2023 and the WRC in November 2023. In the meantime this spectrum should remain in initial investigation pending the outcomes of WRC-23. We support the ACMA's proposal to consult on future use of the band in Q2 2024.
Allocation of 1800 MHz in remote areas	5	We support the ACMA's plan to release a discussion paper in options paper in remote areas in Q3 2023. The 1800 MHz band is a key band for the delivery 4G/5G services. However, there are significant incumbency issues to consider in this process.
Allocation of 600 MHz (617-694 MHz)	6	We support continued monitoring of the 600 MHz band. The high value of low-band spectrum for mobile communications, and the particularly long lead times that would be required to clear this band,

		means this band should be prioritised ahead of additional mm-wave bands.
Allocation of 40 GHz	7	We support continued monitoring of the 40 GHz band. This is a candidate band for future 6G services.

Introduction

We broadly agree with the assessment of demand drivers for new spectrum, as outlined in the *Five-year spectrum outlook 2023–28 and 2023–24 work program: draft for consultation* (FYSO). The amount of data being consumed over mobile networks continues to grow at rapid pace. The increasing take-up of 5G, the likely commercialisation of 6G by the end of this decade, domestic implementation of Wi-Fi 6E and 7, and the emergence of low earth orbiting (LEO) satellites are all factors that the Australian Communications and Media Authority (the ACMA) needs to consider for the FYSO.

Prioritisation of the ACMA's workplan

Our submission focusses largely on the spectrum needs (and priorities) of terrestrial mobile network operators, although our recommendation for the ACMA's third highest priority is in relation to LEO Direct-to-Handset (DTH) satellite services operating in terrestrial International Mobile Telecommunications (IMT) bands. Our focus on IMT is not to say that other uses of radio-spectrum are unimportant or less valuable. Indeed, Telstra is an extensive user of radio spectrum across a wide range of uses including satellite, fixed link and point-to-multipoint services. Our focus simply reflects where we consider the ACMA should prioritise its work program over the coming years.

Allocation of 3.4 GHz (3400-3575 MHz) & 3.7 GHz (3700-3800 MHz)

Timely release of additional mid band spectrum for IMT is important as we look to maximise the opportunity for 5G over the period covered by the FYSO. The 3.4 GHz and 3.7 GHz bands sit within the broader 3.3-4.2 GHz band that has been internationally harmonised for use by 4G and 5G wireless technologies. Making this spectrum available in a timely manner will improve the overall utility of the spectrum across the 3400-3800 MHz frequency range along with improved 5G performance for all Australians.

We urge the ACMA to commit to starting the auction as soon as possible, and no later than Tuesday 3 October 2023. We also reiterate our request that the ACMA reconsider the need for the proposed fixed delay periods which it proposes to hardwire into the auction process.

Renewal of expiring spectrum licences

We strongly support the ACMA's intention to commence consultation on *'matters relating to expiring spectrum licence process and licence use'* for expiring spectrum licenses in the 700 MHz, 850 MHz, 1800 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz bands (which expire between 2028 and 2032) in Q2 2023.[1]

These bands are fundamental to the delivery of mobile broadband services across Australia. Licensees should be provided with as much certainty as possible prior to the point at which renewal applications may be lodged (currently specified as 2 years from expiry[2]), noting licences in these bands begin expiring in June 2028. It is critical that the renewal mechanism (e.g. a fixed renewal price based on administrative or market rates, or a price-based reallocation) is known well in advance of the licence

[1] Australian Communications and Media Authority, *Five-year spectrum outlook 2023–28 and 2023–24 work program: Draft for consultation*, March 2023, p. 65.

[2] For licences not containing a specified renewal application period, see *Radiocommunications Act 1992*, s77A(3).

expiry so that incumbent licensees can plan their investment decisions accordingly and that services to the Australian community are not unduly disrupted.

Regulatory rules for Direct to Handset services

We believe the ACMA needs to take a more proactive approach to the regulation of how satellite DTH services will be licensed and regulated when using existing terrestrial mobile spectrum bands. With the first services mooted to be commercially launched elsewhere in the world as early as 2024 this work needs to be prioritised and accelerated.

Currently, the regulatory processes and framework for this potential application are either unclear or ambiguous, putting the potential commercial launch of such a service in Australia at risk.

We suggest it would be useful to consider the policy approach proposed by the FCC in Notice of Proposed Rule Making 23-22A1 (NPRM 23-22A1)[3] for the licensing of satellite-based transmission in IMT bands.[4] We would like to see the ACMA confirm the licensing arrangements for DTH satellite transmission within IMT bands by the end of this calendar year (2023).

Use of the 6 GHz band

Telstra supports the entire upper 6 GHz band (6425 – 7125 MHz) being identified for IMT use in ITU Region 3. Mobile traffic continues to grow strongly in all markets and there are no other new spectrum bands below 7 GHz with more than 100 MHz of spectrum available that could be made available for mobile services within the next decade.

Also, 6G will require a brand new "pioneer" spectrum band and 6 GHz is a likely candidate, with the first 6G services appearing around 2028-2030. The quantity of this spectrum actually allocated for mobile services in different countries could vary due to local factors including level of incumbent use, however the full upper 6 GHz band should be designated for IMT in order to retain maximum optionality and flexibility across the region.

To support the demand for 6 GHz spectrum for IMT, the GSMA's vision for the 6 GHz band[5] contains four pillars, including that mobile networks will, on average, need 2 GHz of mid-band spectrum per country by 2030, and that 6 GHz capacity will be required to meet increasing customer demand at the required speeds of ITU IMT-2020. The GSMA's report goes on to show that for a variety of reasons, including cost-benefit analysis of having additional spectrum when deploying IMT networks, and the socio-economic benefits of mid-band spectrum, it is essential additional mid-band spectrum is made available by 2030. We agree with the GSMA's assessment.

In Australia, we recognise there is considerable incumbent use of this band by point-to-point microwave links and FSS services. Hence there will need to be detailed engagement and consultation with stakeholders to identify the economically optimal quantum of spectrum in different geographies that

3 FCC 23-22A1, available at: https://docs.fcc.gov/public/attachments/FCC-23-22A1.pdf

4 Including amending the US Table of Frequency Allocations (akin to the Australian Radiofrequency Spectrum Plan) by addition of a footnote to allow satellite transmissions into nominated IMT bands.

5 See GSMA Report: **6 GHz in the 5G Era** – Global Insights on 5925-7125 MHz, July 2022, p.5. Available at https://www.gsma.com/spectrum/wp-content/uploads/2022/07/6-GHz-in-the-5G-Era.pdf

could be allocated to IMT and in what timeframe in order to balance the competing economic interests in this band.

This could mean that domestically, the entire 700 MHz is not allocated to IMT nationwide, but some lesser amount, or alternatively that different amounts could be allocated in different geographies. However, until that engagement and analysis is done, we do not know what the best outcome is.

None of this can happen unless Australia adopts a position that the entire upper 6 GHz band should be identified for IMT to provide the required flexibility for future domestic allocation, and promotes this outcome at WRC-23, as we outline later in this submission.

Allocation of 1800 MHz (1710–1785 MHz and 1805–1880 MHz) in remote areas

1800 MHz is a key band for 4G/5G services. We support the ACMA's plan to release an options paper in Q3 2023 to propose options and gather feedback for the future of the band in remote areas.

There are a significant number of incumbent users of this band in remote areas which will be an important consideration in how and when this band could be reallocated. Adequate protection of incumbent services, and/or the timeframes in which incumbent services would be required to exit the band are significant considerations that we expect would be addressed as part of the consultation process.

Allocation of 600 MHz (617-694 MHz)

We support the media reform work program including the ACMA's technical research work. We also recognise any potential reallocation of this band has a range of technical, commercial and political hurdles to overcome and that working through these issues will take considerable time.

While the 600MHz band is unlikely to be reallocated within the five years covered by this FYSO, the high value of low-band spectrum for mobile communications (due to its propagation and building penetration characteristics), and the particularly long lead times that would be required to clear this band, means this band should be a priority for the ACMA. The prospect of making more low-band spectrum available for IMT use should take priority over additional mm-wave bands.

Allocation of 40 GHz (37-43.5 GHz)

The 40 GHz band is further along the maturity curve than other mm-wave bands and therefore should be progressed to the initial investigation stage ahead of others. Additional mmWave spectrum should be the lowest priority on the spectrum workplan for 5G and wide-area MBB. However, we note that this is a candidate band for future 6G services, so maintaining a monitoring position is appropriate.

Other matters

Bands being studied under WRC-23 Agenda Item 1.2

We recognise that under WRC-23 Agenda Item 1.2, only the top 100 MHz of the Upper 6 GHz band (i.e., 7025-7125 MHz) is being considered for an IMT identification for Region 3.

The remainder of the upper 6 GHz band (6425 – 7025 MHz) is not being considered for Region 3 under Agenda Item 1.2 but some countries in Region 3 (including China) wish to add their name to a footnote identifying this frequency range for IMT. We consider that Australia should do the same. Studies have

been conducted on this issue under AI1.2 and any regulatory requirements implemented in Region 1 could also be applied to Region 3 countries.

Furthermore, we recommend Australia should promote and support the inclusion of an agenda item for WRC-27 under Agenda Item 10 to consider studies on the identification of 6425 – 7025 MHz for IMT in Region 3. While there are clearly incumbency issues in Australia that will need to be worked through ahead of any domestic allocation (as we have noted above), we consider it is important that this additional 600 MHz of spectrum is clearly earmarked during the current WRC cycle for IMT use. We believe this is not only an important signal to other countries in the interests of regional harmonisation of this band, it also signals interest in the band to equipment developers (network and user) to allow them to commence planning cycles, and maximises domestic planning flexibility.

WRC-23 is a critical meeting for deciding the future of IMT in the 6425 – 7125 MHz range for Australia and Region 3. Given the likely importance of this band for the deployment of future 5G and 6G services we believe the ACMA and Government must give priority to carefully considering this matter in its preparations for the upcoming 6th Meeting of the APT Conference Preparatory Group for WRC-23 (AP23-6).

Determining highest value use

We support the observations made by AMTA in their submission concerning subtle changes in the ACMA's language and tone regarding highest value use. Prior to the Modernisation Act, the ACMA focussed on HVU, and while we appreciate this includes both quantitative and qualitative aspects, we always understood the HVU approach led to spectrum allocations that were for the highest socio-economic gains for Australia. We agree with AMTA's position that the ACMA could be more transparent regarding how it determines the highest value use of any spectrum band.

In this regard, we consider the GSMA Intelligence's report on *The Socio-Economic Benefits of Mid-Band 5G Services*,[6] while not specifically focussing on Australia, does provide a good, holistic view of the socio-economic benefits of mid-band spectrum and 5G services. We consider the GSMA Intelligence's approach, which looks at different use cases for mid-band spectrum (e.g., consumer, smart cities, agriculture, etc) to build up an overall picture of the benefit is a good empirical approach that facilitates comparison between 5G use cases (in aggregate) and other potential uses of the band.

Spectrum sharing

We agree with the ACMA that the sharing of spectrum can offer unique and diverse opportunities that can benefit the public and the economy. We do, however, have concerns over the potential diminishment of spectrum licence holder rights if spectrum sharing is administratively imposed in existing spectrum licensed bands[7], and the knock-on impacts to spectrum valuation should spectrum sharing use cases be accommodated without careful consideration and consultation with existing spectrum licensees.

6 GSMA Intelligence. The Socio-Economic Benefits of Mid-Band 5G Services. Feb 2022. Available at: https://www.gsma.com/spectrum/wp-content/uploads/2022/02/mid-band-5G-spectrum-benefits.pdf

7 Spectrum licenced holders coming to a commercial agreement to share spectrum is an entirely different matter.

Class licensing and the spectrum commons

While we appreciate the merits of class licences, we consider that the rights of existing spectrum licence holders must be the priority and adequate protections maintained. Notwithstanding that the rationale for the introduction of new class licences is to lessen regulatory burden and costs on class licence holders, this must not come with the increased risk of interference to spectrum licence holder's spectrum.

The draft FYSO notes,[8] "*We will continue to review class-licensing arrangements to assess if regulatory settings can be changed to support new technologies, including RLANs such as wi-fi, or be used to decrease regulatory burden. Considerations will include whether more spectrum is required and if changes to existing arrangements are necessary*." We propose that ACMA considerations should also include whether the introduction of new class licences will cause an increased risk of interference to spectrum licence holder's spectrum.

Allocation of 2 GHz MSS Band (1980-2005 MHz and 2170–2195 MHz)

We support the ACMA's proposal to use a price-based allocation mechanism (potentially an auction) for the 2 × 25 MHz (1980–2005 MHz paired with 2170–2195 MHz) for MSS Australia-wide licensing, as outlined in the January 2021 Outcomes Paper on the 2 GHz band,[9] given the number of LEO operators expressing interest in NTN (non-terrestrial network) solutions for providing direct-to-handset type services.[10] We are comfortable with the ACMA's proposed timing of commencing consultation on the technical framework and allocation instruments in Q2 2024.

1.5 GHz (1427–1518 MHz)

This band has challenging incumbency issues, including fixed links for universal service obligation (USO) services to regional and remote communities. As per our submission to previous FYSOs, we do not consider that reviewing this band should be a priority in the short-medium term. In the longer term, planning for the release of the 1.5 GHz band could be progressed in metro areas but regional and remote areas should be deferred for as long as fixed links carrying USO services are required to remain in place.

The FYSO indicates there is interest in using the 1.5 GHz band for private LTE solutions. In response to this, we would like to note that there are a number of other possible bands and access arrangements at various stages of maturity that may provide options for private LTE such as the proposed allocations in the 3.4 and 3.7 GHz bands and the recently released Area Wide Licences (AWLs) in the 26 and 28 GHz bands.

We also acknowledge the interest from the satellite industry in progressing consideration of the adjacent extended MSS L-band (1518-1525 MHz and 1668-1675 MHz bands), noting the common frequency boundary at 1518 MHz between the 1.5 GHz Band and the Extended MSS L-band.

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8 Draft FYSO, p.23.

9 Replanning options for 2 GHz band, available at https://www.acma.gov.au/consultations/2020-07/replanning-options-2-ghz-band-consultation-232020

10 Not to be confused with the "DTH" designation which refers to using existing terrestrial mobile network spectrum bands for a LEO to communicate directly with an unmodified terrestrial handheld device.

Extended MSS L-band (1518–1525 MHz and 1668–1675 MHz)

We support the ACMA's proposal to consider of the extended L-band before progressing preliminary replanning of the 1.5 GHz band. However, as noted above, we do not consider replanning the 1.5 GHz a priority in the short to medium term.