

The logo for Optus, consisting of the word "OPTUS" in a bold, teal, sans-serif font.

Submission in response to
ACMA Consultation Paper

**Review of the 1.5 GHz
band**

PUBLIC VERSION

June 2022

EXECUTIVE SUMMARY

1. Optus welcomes the opportunity to provide feedback to the Australian Communication and Media Authority's (ACMA) Discussion Paper: *Review of the 1.5 GHz band – May 2022*.
2. Optus understands that the purpose of the ACMA's consultation is to seek feedback on current and future use cases for the 1427–1518 MHz, 1518-1525 MHz and 1668–1675 MHz frequency ranges (collectively referred to as the 1.5 GHz band). The ACMA intends to consider the feedback in its decision making on whether to progress the band to the preliminary replanning stage.
3. The Discussion Paper highlights that demand for the band may come from a wide range of potential use cases, including wireless broadband (WBB) services and mobile-satellite services (MSS). As the ACMA notes, previous World Radiocommunication Conferences (WRCs) have identified the 1427 – 1518 MHz frequency range for International Mobile Telecommunications (IMT) use, while the 1518-1525 MHz and 1668-1675 MHz frequency ranges have been allocated to MSS (the “extended MSS L-band”).
4. While Optus understands that the ACMA's consideration of the 1.5 GHz band remains at the initial investigation stage, Optus welcomes the ACMA's review of the band given the ever-increasing demands on spectrum across all sectors. As the ACMA is aware, this trend is only set to intensify, particularly for mobile services, with recent research forecasting the need for 8 GHz in total spectrum assignments for mobile to be auctioned by the ACMA by 2030 to meet demand.¹
5. Mid-band spectrum is crucial to the deployment of 5G and ultimately to Australia's Digital Economy Strategy 2030 and broader economic goals. Mid-band spectrum of sufficient quantity and quality must be made available to avoid the potentially prohibitive costs of cell densification that would otherwise be required to deploy 5G services across Australia's unique geography.
6. Lower mid-bands, such as the 1.5 GHz band, have been used as the capacity layer for 4G data traffic and most countries use low mid-band spectrum in Frequency Division Duplex (FDD) mode.² In contrast, the ACMA notes that, in addition to multiple existing uses for the band, the current *Radiocommunications 1.5 GHz Frequency Band Plan 2015* preserves options for possible terrestrial and satellite audio broadcasting services in the 1452–1492 MHz band.
7. Long term spectrum planning is required to provide sufficient certainty for investment in 5G mobile networks. Planning decisions that result in high levels of fragmentation risk the underutilisation of spectrum and Australia's 5G enabled economic future.³ Given the potential for competing uses of the 1.5 GHz band,

¹ Spectrum for 5G and Beyond, The need for a long-term perspective of Australia's approach to mobile spectrum policy and planning; AMTA Policy Position Paper; p.4

² Notable exceptions of 5G deployments in China and the US in the 2600 MHz band; see IMT spectrum demand; Estimating the mid-band spectrum needs in the 2025-2030 time frame in Australia; A report by Coleago Consulting Ltd; 15 November 2021; p.4 and 5

³ Fn1; p.4

Optus agrees with the ACMA that co-existence considerations will likely be key to ensuring the band moves towards its highest value use.

8. The ACMA has set out a significant scope of work in its Five-Year Spectrum Outlook (FYSO). As Optus notes in its submission to the ACMA's recent consultation on its FYSO 2022-27 and 2022-23 work program, Optus supports the ACMA maintaining a balance between planning and optimisation activities, noting that planning of new bands is more resource intensive for all parties. Optus urges the ACMA to retain a balance of effort and return between allocating new bands and ensuring existing allocations are fit for purpose and 5G-ready.⁴
9. Optus refers the ACMA to the Australian Mobile Telecommunications Association (AMTA) submission in response to the ACMA's Discussion Paper. Optus generally supports the position set out in the AMTA submission, other than in relation to the comments set out in response to specific questions below. Where Optus has not directly responded to a question, Optus supports the AMTA submission.

RESPONSES TO ACMA ISSUES FOR COMMENT

International arrangements and technology trends

Issue for comment 1 – Are there any international arrangements or technology trends that the ACMA should be aware of?

10. The Discussion Paper sets out the key international arrangements and technology trends that Optus is aware of concerning the 1.5 GHz band. In particular, Optus note the World Radiocommunications Conference (WRC-15) identified the 1427-1518 MHz band for IMT and Japan and the EU have allocated spectrum for WBB use in all or part of the 1427-1518 MHz range.
11. These initiatives will support the development and expansion of an equipment ecosystem, which is crucial to the successful allocation of the band to IMT. Optus urges the ACMA to continue monitoring these developments with a view to informing any future plans for the band. Ultimately, Optus recommends that any arrangements for WBB in the band should support 3GPP-compliant equipment.
12. As Australia's leading satellite service provider, Optus appreciates there is increasing policy attention being given to satellite and space industry related use cases for spectrum.
13. At this time, Optus does not have any specific comments relating to proposals to allocate the 1518-1525 MHz and 1668-1675 MHz frequency ranges ("extended L-band") for MSS use other than to note that the ACMA should consider the outcomes of any co-existence studies that may be undertaken in parallel with the WRC work to inform its planning and interference management framework.

⁴ Optus submission to FYSO 2022-27; May 2022; p.9

Domestic considerations

Issue for comment 2 – What is the demand for access to the 1.5 GHz band for WBB, MSS and broadcasting services? Are there any other new services that should be considered?

Issue for comment 3 – What are the ongoing requirements for incumbent services in the 1.5 GHz band? Are there any viable alternative options?

14. In addition to the 3.4-4.2 GHz range, the AMTA position paper identified the 4.4 to 5.0 GHz and the Upper 6 GHz range (6425-7125 MHz) as the main mid-band spectrum targets required for 5G.⁵ Given its propagation characteristics, the 1.5 GHz band may also serve to address the spectrum demands of 5G, particularly in regional Australia.
15. Accordingly, Optus supports the development of this band for IMT services in the medium term. Optus suggests that any developments in this and adjacent bands pay particular attention to coexistence and interworking, whereby any interference mitigation is not placed solely on one of the adjacent bands or on one use case.
16. Optus has no incumbent services in the band and directs the reader to the AMTA response to this consultation for considerations from other MNOs. That said, Optus reiterates its concerns about the ongoing utility and transparency of the administration of Telstra's Universal Service Obligation (USO).⁶ In particular, Optus has urged the Government to review the USO and consider whether regional and remote communities may be better served by alternative services, such as next generation satellite services and/or voice over data services being trialled under the Alternative Voice Services Trials (AVST) Program.⁷ In this context, Optus encourages the ACMA to engage with the Government on whether the 1.5 GHz band may be better re-allocated to alternative services.

Band planning scenarios

Issue for comment 4 – What planning scenarios should be considered in the 1.5 GHz band?

17. Any planning outcomes for the band must be compatible with 3GPP compliant equipment to make efficient use of the international technology ecosystem. AMTA's response to this paper articulates this point clearly.

⁵ Fn1

⁶ For example, see Optus' February 2022 submission to the Departments consultation paper on the Review of sunsetting payphone instruments [Submission - Review of payphone rules - Optus \(infrastructure.gov.au\)](https://www.infrastructure.gov.au/infrastructure/consultation/papers/2022/02/01/review-of-sunsetted-payphone-instruments)

⁷ Following trial last year, the Department published a report on which noted that Optus recorded the highest satisfaction rating among all trial services with the highest "median opinion score" (4.4) and stating that "Optus's triallists reported few issues. They were generally positive about the quality of the service" – see page 6 of the Alternative Voice Services Trials, Summary Report to 31 December 2021 [Alternative Voice Services Trials Program | Department of Infrastructure, Transport, Regional Development and Communications, Australian Government](https://www.infrastructure.gov.au/infrastructure/consultation/papers/2022/02/01/alternative-voice-services-trials-program)

18. As the ACMA notes, Japan has for some time identified the 1427-1518 MHz frequency range for WBB use with arrangements in place to support FDD systems. More recently, a number of European countries have begun using the band for SDL with a limited number of 5G enabled devices supported in the 1.5 GHz 3GPP n75 and n76 3GPP operating bands.
19. Notwithstanding this, Optus prefers a spectrum licenced Time Division Duplex (TDD) arrangement where geographically feasible (see answer to next question on coexistence). As the ACMA indicates, it will be important to monitor international developments to support TDD WBB in the 1.5 GHz and the development of a sustainable device ecosystem.
20. While adjacent to the band planning scenarios, licencing arrangements in the band should weigh heavily on the ACMA's consideration of the appropriate band planning outcomes. TDD in the band will not lend itself to small licence areas due to the potential for interference issues across licence boundaries. Optus has a significant amount of history and expertise at managing TDD boundary interference in the 3.4 and 2.3GHz bands and urges caution if the ACMA is contemplating small licence areas under a TDD arrangement – the efficiency of the band will be compromised.
21. FDD in the band would be a less difficult proposition to manage if smaller licence areas are considered, notwithstanding the inherent inefficiencies that FDD may bring. AMTA's response to the consultation paper deals with this matter.
22. In short, Optus would prefer very large, spectrum licenced areas operating on TDD in order to maximise the efficiency of this band while ensuring that interference can be effectively managed between licensees.
23. Optus agree with proposal for a small guard band for passive earth exploration satellite service (EESS) if no other solution is available. This is the same approach that Optus supported for the Lower 26GHz band. The Upper guard band should be temporary or a restricted use block as MSS do and should have responsibility for their own receiver blocking performance.

Preliminary co-existence considerations

Issue for comment 5 – Comment is sought on the coexistence scenarios identified, including the ACMA's preliminary thinking on these scenarios. Are there any other coexistence scenarios the ACMA should consider?

24. Optus is generally comfortable with the coexistence scenarios described by the ACMA. Optus makes the following specific comments from the perspective of use of the 1.5 GHz band for WBB:
 - (a) **Radioastronomy services:** Optus broadly agree with the ACMA
 - (b) **Below 1427:** Optus broadly agree with the ACMA
 - (c) **1427 – 1518MHz:**
 - (i) Fixed links – the proposed metro/regional split seems reasonable (and works for 1.8 and 2.1GHz)

- (ii) Weather balloons – Optus suggests relocation
 - (iii) Defence – more information is required for Optus to comment
- (d) **Above 1518MHz:** MSS receivers must meet minimum receiver blocking performance so that all mitigations are not placed on WBB licensees. Optus notes that it is incumbent on all licensees to protect their own spectrum and this obligation cannot be left to other licensees in adjacent bands. Optus considers that guard bands are inefficient and should generally be used only as a last resort. We expect that reasonable and achievable unwanted emission limits will be applied to WBB spectrum licensees.
- (e) At this time, Optus has no comments on the ACMA's discussion of coexistence from an MSS perspective.