

OPTUS

Submission in response to
ACMA's draft Five-year
spectrum outlook 2024-29
and 2024-25 work program

Public Version

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EXECUTIVE SUMMARY

1. Optus welcomes the opportunity to provide feedback on the Australian Communications and Media Authority (ACMA) *draft Five-year spectrum outlook 2024-29 and 2024-25 work program* (the draft FYSO).
2. Optus continues to support the ACMA's development and publication of the FYSO as a best practice spectrum management tool. By setting out a roadmap for the ACMA's proposed spectrum releases and uses, the ACMA promote transparency and industry engagement, helping to inform network planning and deployment. Optus generally supports the ACMA's approach to spectrum management outlined in the FYSO.
3. The telecommunications and radiocommunications technology sector remain highly dynamic. Spectrum remains the lifeblood of all wireless networks and services and is a crucial input to Australia's productivity and digital economy. The management of spectrum must always be informed by the overarching legislative objectives of the Act, namely, to promote the long-term public interest derived from use of the spectrum.
4. Spectrum management decisions impact the economics of mobile networks – and flow through to the affordability of essential mobile communications services for consumers and the broader economy. Delivering the mobile networks that will support Australia's future economic growth will require sufficient certainty about future access to spectrum of sufficient quality and quantity. Optus welcomes the ACMA's recognition of the increasing investment required to deliver improved network resilience and security.¹
5. Optus sets out its response to the draft FYSO 2024-29 and associated work program for 2024-25 in further detail below. In our view, the ACMA's expiring spectrum licences (ESL) process should be the priority work program for the ACMA over the period of this FYSO and beyond.
6. Until future spectrum holdings of existing ESLs are sufficiently clear, Optus does not consider it useful to undertake significant allocations of new blocks of spectrum. In this context, Optus suggest that the ACMA's technical work focus on spectrum management fundamentals of defragmentation, optimisation and harmonisation to maximise ESL spectrum efficiency for the long term.
7. We also refer the ACMA to the Australian Mobile Telecommunication Associations (AMTA) submission. Optus supports the position set out in the AMTA submission, other than in relation to any points of difference set out below.

The Expiring Spectrum Licences process is the key priority for 2024-29

8. The ACMA's decisions on future use of ESL spectrum will have a profound impact on the shape of Australia's mobile sector and Optus considers the ESL process to be the ACMA's first spectrum management priority for the foreseeable future. Not only will the work associated with this process be intensive, but it is also fundamental to the future structure of the mobile sector and broader telecommunications market.
9. Through the ESL process, the ACMA must seek to enable MNOs to continue to provide better coverage and more resilient services in periods of high demand, as well as in response to challenges to ongoing infrastructure investment. This includes recognising

¹ Draft FYSO, p.6

the market dynamics, economics and long-term sustainability of the telecommunications industry.

10. The ACMA's proposed approach to ESL indicates that the ACMA intends to afford this project a high degree of priority in its 2024-25 work program. We consider that ESL project work should remain the ACMA's spectrum management priority until completion. Optus suggest that spectrum management over the period of this FYSO should focus on the following key issues (in order of priority):
 - (a) Prioritising the ACMA's consideration of the spectrum arrangements governing ESLs for the foreseeable future – Optus welcomes the ACMA's clarification of its decision-making framework and welcomes ongoing efforts to expedite the process, with a view providing early certainty as to its preferred approach to future use of ESL bands to the greatest extent practicable.
 - (b) Satellite planning – carefully balance the demands for spectrum from satellite and mobile services with a view to help Close the Gap. To this end, the ACMA should provide continuing support for the operation of IMT direct to mobile services under the existing regulatory framework. Design spectrum arrangements that promote the growth of satellite services in Australia, while ensuring that solutions offered are fit for purpose, avoid unacceptable interference and support domestic satellite operators.
 - (c) Continue work on and prioritise changes to current licensing arrangements in existing spectrum licensed bands (including 700MHz and 2.5GHz) to support the transition to 5G.
 - (d) Progress the proposed Q2 2024 consultation on the preferred approach to allocation of the upper 6GHz band with a view to providing greater certainty around future spectrum access to deliver high-capacity mobile services.
 - (e) Progress the ACMA's options paper on 1800MHz and 2GHz band proposed for Q2 2024 on RALIs MS 33 and 34.
 - (f) Ensure Technical Liaison Groups (TLGs) remain effective in designing appropriate technical frameworks for use of scarce spectrum.
 - (g) The deployment of advanced 5G networks in both metro and regional areas, in an environment of increasing network costs, declining revenue and uncertain incremental revenue opportunities.
 - (h) Further industry engagement and guidance materials on the criteria that inform the ACMA's spectrum management decision-making including via the ACMA's proposed Q2 2024 consultation on revisions to its "our approach to licensing and allocation decisions" guidance document.
 - (i) Supporting ACMA's ongoing activities to monitor international developments in the lead up to WRC-27 relating to additional mid-band spectrum for IMT to meet future spectrum demand for mobile services.

CONSIDERATIONS FOR SPECTRUM OUTLOOK 2024-29

11. The objective of the *Radiocommunications Act 1992* (the Act) is to promote the long-term public interest derived from the use of spectrum. This is to be achieved by ensuring spectrum is managed in a manner that facilitates (i) the efficient planning, allocation and use of the spectrum, (ii) the use of spectrum for commercial or specified public interest purposes and (iii) supports the communications policy objectives of the Australian Government.²
12. The ACMA is operating in a complex policy environment, with numerous reviews, inquiries and studies all informing the future direction of communications in Australia. Optus considers that the spectrum management framework should remain sufficiently flexible to support ongoing innovation and investment while being robust enough to enable the ACMA and licensees to respond proportionately to limit the potential for harmful interference.
13. Optus generally endorses the ACMA's approach to spectrum management as set out under Part 1 of the draft FYSO and strongly agree with the ACMA's recognition of 5G/6G and satellite as key market and technology drivers of change in spectrum demand. We commend the ACMA's efforts to harmonise bands and deliver technical updates to enable 5G. We welcome the ACMA's increasing focus on supporting satellite services as an important complement to terrestrial mobile networks, particularly to achieve Close the Gap targets.
14. However, spectrum management cannot, nor should it be used to, deliver all the Governments communications policy objectives. While the ACMA's spectrum management must be guided by and support the delivery of policy objectives, its spectrum management practices must remain founded on sound engineering principles. Optus encourage the ACMA to continue to focus on spectrum management fundamentals as a key mechanism to facilitating technical and economic efficiency thereby promoting the long-term public interest derived from spectrum use.
15. The following sections set out key issues that Optus considers that the ACMA should prioritise in its spectrum management functions over the five-year term of FYSO 2024-29. To reiterate, Optus considers that the ACMA's ESL process should be the priority work program for the ACMA over the period of this FYSO and beyond.

Prioritising spectrum management fundamentals promotes efficient spectrum use

16. Focussing on well tested spectrum management practices will remain crucial to promoting the long-term public interest to be derived from use of spectrum. Among other practices, this includes continuing to harmonise and optimise spectrum bands for specific uses. It means that effective industry cooperation and engagement on technical frameworks and interference management remain crucial to delivering workable coexistence that respects the rights of existing licensees.
17. A key outcome of these practices will be to deliver, to the greatest extent practicable, sufficient certainty about spectrum access to support long-term investment in networks and services. To this end Optus encourages the ACMA to:
 - (a) Carefully consider, including through the ESL process, how it can best optimise technical frameworks for wide area (WA) mobile services. All three

² Section 3, Radiocommunications Act

MNOs require sufficiently large contiguous blocks of spectrum to remain competitive and to supply mobile services efficiently.

- (b) Maintain the relative exclusivity and flexibility afforded to spectrum licence holders under the existing licensing framework. This has enabled Optus to collaborate with SpaceX on Australia's first direct to mobile solution in IMT spectrum, highlighting the potential of LEOSat services to help address the digital divide and Close the Gap.
 - (c) Support existing mechanisms of spectrum access which have enabled Optus and TPG to innovate in their use of spectrum to conclude our proposed regional MOCN services agreement, which promises to challenge Telstra's dominance in regional Australia, supporting the Government's regional policy objectives and delivering network resilience.
18. In this context, Optus note the ACMA's statement that "While spectrum licences may be 'technology flexible' in that they do not explicitly preclude any use, they are designed and optimised with a likely technology in mind to maximise the efficiency of these licences for their expected use, consistent with co-existence requirements of other spectrum uses/users".³
19. Optus agree with this statement to the extent that co-existence and coordination with other spectrum licence holders is a fundamental principle of effective spectrum management. We also note that the relative flexibility afforded to spectrum licensees within the spectrum space is central to enabling innovation such as our SpaceX collaboration.
20. Indeed, the existing provision for third party authorisation under the Act provide an effective balance between enabling access and innovative spectrum use, while ensuring adherence to the relevant spectrum licence technical framework. Maintaining responsibility for interference management with a single licensee helps ensure that the task of delivering effective co-existence is clearer and more straightforward, thereby lessening the administrative burden of compliance on all stakeholders.

Expiring spectrum licences – promoting long-term network investment

21. Optus reiterates its view that the ACMA should consider the work program relating to spectrum licence expiry to be of the very highest priority.
22. Not only will the work associated with this process be intensive, but it is also fundamental to the future structure of the mobile sector and broader telecommunications market. Until future spectrum holdings of existing ESLs are sufficiently clear, Optus does not consider it useful to undertake significant allocations of new blocks of spectrum.
23. In assessing the public interest, Optus submit that the ACMA should prioritise outcomes that maximise the benefit to the Australian economy and ultimately Australian businesses and consumers. To this end, the ACMA should have express regard to economic considerations such as the promotion of market competition, economic efficiency, investment, productivity and sustainability.
24. Mobile communications are essential for most Australian businesses and consumers. Notwithstanding the increasing importance of alternative technologies, particularly satellite services, to meeting Australia's communications needs, mobile networks are

³ Draft FYSO, p.10

and will remain central to realising economic growth and delivering quality high bandwidth communications services for all Australians.

25. Optus welcomes the ACMA's finalisation of its decision-making framework and process for assessing whether existing arrangement governing ESL spectrum remain fit for purpose. Optus also welcomes the Minister's publication of the Ministerial Policy Statement (MPS) and in particular, welcomes the recognition of continuity of service and the need to support sustained investment and innovation as key considerations in the ACMA's decision-making.
26. While ESLs are due to expire during the period 2028-2032 – network deployment and investment plans have long lead times. Optus understands that the ACMA can only provide a definitive view on whether it will renew a spectrum licence in response to a renewal application. However, Optus urges the ACMA to continue to progress its ESL work program with a view to providing the greatest degree of certainty, sufficiently early, across all ESL bands.
27. Optus maintains that providing MNOs with the option to renew all ESLs, on the same terms and conditions, will best promote the long-term public interest derived from use of the spectrum. Mobiles services are and will remain the most efficient use of ESL spectrum. Mobile technologies are the optimal/most efficient uses for ESL spectrum. Mobile services increase Australia's wealth by \$37 billion each year in 2030. There are more than 29 million mobile services in operation.⁴ There is no alternative use of ESL spectrum that can deliver the same public benefit.
28. Having regard to past, current and future use of spectrum, it remains in the public interest to provide Optus with the option to renew all its ESLs on the same conditions. Optus strongly cautions against any changes to existing arrangements designed to support new entry without clear substantiation as to the failure of existing mechanisms of spectrum access and the likely success of prospective licensees. Actual or potential fragmentation of spectrum can have disproportionately adverse consequences for existing mobile network performance and coverage. Optus recognises that new prospective licensees and use cases should be supported, but via other allocations and licensing arrangements for non-ESL spectrum such as in the 3.8GHz band.
29. In light of the ongoing Stage 2 of the ESL consultation process, Optus also takes the opportunity to highlight certain key considerations relevant to the ACMA's assessment for expiring spectrum licences:
 - (a) All ESL spectrum holdings should be offered for renewal to the respective spectrum licensee – mobile services are and are highly likely to continue to be the highest value or "optimal" use of the spectrum, both from a technical and economic perspective in perpetuity.
 - (b) The ACMA's decision-making for renewals must reflect Government policy priorities as well as Australian market conditions with a view to promoting sustainable competition and consumer policy objectives over the long term.
 - (c) Spectrum should be renewed rather than reaucted – re-auctioning the spectrum creates considerable investment uncertainty and has the potential to cause public harm including undermining continuity of service and competition.

⁴ ACCC Communications Market Report – 2022-23; p.26

- (d) Renewal pricing and allocation methods should be designed to promote the economic benefits of 5G and 6G to the Australian economy by ensuring fair, reasonable and suitably certain long-term access to the required spectrum.
 - (e) High renewal prices undermine sustainable competition and investment in 5G and 6G – any short-term benefit of higher renewal fees to public finances should not override broader long-term economic benefits that will flow from lower renewal prices.
 - (f) Efficient use of existing network infrastructure should be a critical consideration in the ACMA's decision-making relating to expiring spectrum licences and future intended use.
 - (g) Spectrum licence expiry for individual spectrum bands, particularly the 3.4GHz band, should be aligned to promote efficient use of spectrum. Optus considers that this may also support holistic engagement on the expiry of spectrum licences, defragmentation, band consolidation and secondary market trading.
 - (h) In light of the significant adverse impacts of carving out ESL spectrum from public mobile networks, the ACMA should prioritise consideration of non-ESL spectrum for non-public WBB use cases.
 - (i) Optus considers that support for new entry/use cases in ESL spectrum requires a higher threshold of proof than the ACMA appears to be requiring. Where there is no interest expressed from any prospective licensees for ESL spectrum in response to the ACMA's Stage 2 consultation process, the ACMA should issue as definitive a view as possible at Stage 3 that existing arrangements (i.e renewal of ESLs as is) promote the public interest.
30. The future uses of ESL spectrum have the potential to address long-standing communications policy concerns, for example by way of ongoing deployment of 5G networks in regional Australia and the "ubiquitous" and seamless connectivity to be delivered via terrestrial and non-terrestrial network interoperability. The implementation of this project will determine Australia's communications landscape and the success of Australia's digital future in the long term. Optus looks forward to engaging closely with the ACMA in its assessment and implementation.

Supporting competitive 5G networks and services

31. Australia is a leader in 5G (deploying over 9000 operational 5G base stations by early 2023)⁵. The ever-increasing demand for mobile services is set to continue with the increasing take-up of 5G services. Access to spectrum of sufficient quality and quantity is central to enabling MNOs to deploy mobile networks efficiently and to promote effective mobile competition.
32. The quality of 5G, and ultimately 6G, services will also depend on the quality of the spectrum available to MNOs. The significant investments required of mobile network deployments demand sufficient certainty as to a spectrum licensee's right to utilise its spectrum. Clear evidence of unmet demand should be provided before the ACMA considers requests to access or interfere with licensed spectrum.

33. The ACMA should seek to use the ESL process to optimise ESL spectrum for 5G, promoting spectrum efficiency via defragmentation, harmonisation and the revision of spectrum licence technical frameworks.
34. Competition remains crucial to delivering new and innovative services to market. The ACMA's successful allocation of 850/900MHz spectrum was a significant step towards rebalancing low-band spectrum holdings. If approved, Optus proposed MOCN services agreement with TPG Telecom goes a significant step towards correcting Telstra's historical spectrum advantages and enabling infrastructure-based competition in regional Australia. While this will not, in and of itself, ensure market competition in regional Australia, the quantum of spectrum held remains a crucial factor to enabling efficient utilisation and ultimately determines the level of investment required to compete.
35. Optus accepts that current spectrum holdings may be sufficient to meet anticipated demand in the short-term. However, it is widely accepted that demand for data is set to increase with the proliferation of 5G beyond the consumer market to M2M and other industrial and commercial use cases in the future. Furthermore, given industry forecasts of 3GPP 6G specifications in the late 2020's and the forecast "single network future", Optus encourages the ACMA to closely monitor developments to ensure spectrum supply meets demand.
36. To this end, Optus encourages the ACMA to adopt a long-term plan for allocation of mid-band spectrum to mobile services. Specifically, we suggest that the ACMA carefully consider the timing and procedure for any future allocation of the upper 6GHz in the context of the ESL process. The ACMA should seek to ensure that timing of the allocation will coincide with demand for the spectrum from the use cases that will ultimately maximise the long-term public benefit.

Band harmonisation processes to promote spectrum efficiency

37. Over recent years, the ACMA has undertaken processes to update spectrum band and licence conditions to enable deployment of 5G technologies. Optus supports the ACMA's ongoing work in this area and welcomes the statement in the draft FYSO that "reviewing the arrangements in bands that are already licensed for WBB is important to ensure existing allocations are efficient and can cater for new technology".⁶
38. Optus notes that the ACMA should consider how it can assist industry cooperation to address fragmentation and other licensing issues. Over time, as IMT technologies have developed and consumer appetite for data services increased, demand has grown for access to large contiguous spectrum portions. Differences in spectrum allocations and mix of licensing types, including across the different regions, as well as differences in geographic definitions have also added band complexities for licensees to address.
39. For example, Optus has noted its concerns about the level of fragmentation in the 3.4GHz band. It has also been a mix of licensing types that has impeded commercial negotiations to implement defragmentation and efficient use of the band. This example highlights that the review of existing and licensed band arrangements is still required to address the historic band complexities.
40. Optus acknowledges the ACMA's acceptance of previously provided TLG feedback from Optus and other members of AMTA. At the same time, we reiterate that such industry wide discussions cannot always be delivered via the market, which generally involve bilateral engagement, rather than the multilateral discussions that entire band

⁶ Draft FYSO, p.17

defragmentation discussions require if they are to achieve long-term efficient outcomes for all relevant band licensees. In such circumstances, such as in relation to fragmentation of the 3.4GHz band, the ACMA should intervene to support the realisation of its spectrum management objectives.

41. The technical processes of the TLG, while often not getting the attention of other processes, are extremely important in setting the conditions under which licences are allocated. As such, one of the purposes of the TLG is to make public consultation more efficient by enabling informal technical discussions and potential agreement to inform the contents of the ACMA's public consultation on these technical matters.
42. Optus looks forward to working with the ACMA to ensure TLG outcomes for 700MHz and 2.5GHz set out in the ACMA's FYSO 2024-25 work program receive the right level of technical contribution from all participants and promote the objectives of the Act.
43. Licence harmonisation and band reallocation and defragmentation are also key steps in enabling allocated spectrum to be used for new technologies. Consistent, manageable and rational licence conditions, structures and supporting instruments are critical to the success of such an activity. This is particularly the case for the deployment of 5G technology, which can be used over multiple spectrum bands. Optus continues to encourage the ACMA to consider the exercise of its powers to intervene or facilitate defragmentation of bands where the market is unable or unwilling to do so.

Co-existence, coordination and cooperation to deliver spectrum utility

44. Increased spectrum use means heightened risks of interference which imposes costs and resourcing constraints on operators to manage. Increased interference also undermines investment certainty and ultimately the value of any spectrum licence under which a service may be supplied.
45. Optus understands that no licensee is entitled to operate in a completely interference-free environment. Carefully designed technical frameworks along with traditional and modern interference resolution techniques are all necessary to support co-existence, minimise interference potential and ensure efficient spectrum utilisation.
46. However, while operators can often be relied on to cooperate to resolve interference, disputes can arise, particularly between operators in different sectors. Co-existence is only as effective as the availability of recourse to the regulator in the event of an unresolved dispute. Optus notes that the public benefits of co-existence arrangements must be carefully and transparently weighed against the potential negative impact on investment in well-established and proven business cases.
47. As Australia's only dual mobile and satellite network operator, Optus is well placed to understand the importance of well-designed co-existence arrangements to deliver Australia's communications needs. In light of the inevitability of increasing complexity in interference management, Optus looks forward to closer engagement with the ACMA on establishing workable technical frameworks to ensure maximum spectrum utility while respecting existing licence rights.

Regional connectivity and satellite communications

48. As a leading satellite service provider in Australia, Optus welcomes the ACMA's recognition of the significant technological innovation taking place in the sector and in particular the entry of non-geostationary satellite orbit (NGSO) systems. Optus understands the increasing role that satellite can and likely will play in addressing Australia's regional and remote connectivity needs and in helping to "Close the Gap".
49. Optus notes the significant satellite planning activities that the ACMA has undertaken and plans to undertake for 2024-25. Optus welcomes the ACMA's ongoing efforts to support Australian-filed satellite networks. Optus looks forward to the outcome of the ACMA's review of the Australian satellite filing procedures, which provide important transparency around Australia's approach to assessing satellite filings to the ITU.
50. Optus also welcomes the ACMA's increasing focus on supporting satellite services as an important complement to terrestrial mobile networks.⁷ Optus collaboration with SpaceX highlights the potential of LEOSat services to help meet the Government's regional and remote communications policy objectives, promoting the use of our spectrum in previously unserved areas and hinting at the potential of a "single network future" of seamless connectivity between terrestrial and non-terrestrial networks. Optus looks forward to the outcome of the ACMA's consultation on regulatory arrangements for satellite direct to mobile services in due course.
51. Optus is also the only network provider in Australia to operate its own fleet of (five GEO) satellites, providing a number of critical and sovereign satellite services to millions of Australians. LEOSat solutions such as Optus and SpaceX collaboration have captured the public attention with the potential of satellite direct to mobile services. However, satellite systems of all configurations (GEO, MEO and LEO) have a role to play in "plugging gaps" in terrestrial connectivity. Optus notes that, GEO satellites can provide voice services across the country as demonstrated by Optus during the Government's AVST. Further, despite higher latencies than LEO Sat, GEO satellites can also provide the speeds and capacity that outperform existing universal services.
52. Optus's future launch of the multi-band (Ka/Ku/QV bands) Optus-11 GSO satellite will deliver a new reliable high-capacity broadcast/broadband service that will cater to a wide range of market demand nationally. Optus continues to encourage the ACMA to investigate the impact of major NGSO/LEO operators on Ku/Ka-band operations in Australia. Given the level of activity and the likelihood of increasing potential for interference in the band, Optus urges the ACMA to continue to consult Australian satellite operators on licence applications from prospective NGSO/LEO operators.
53. While a light touch regulatory model will encourage market entry from operators of large constellations, it is important that existing Australian filed satellite systems have sufficient recourse to the ACMA to resolve interference issues where coordination is unsuccessful. To this end, Optus encourages the ACMA to ensure any regulatory gap that may hinder the transparent and accountable supply of satellite services within the Australian market can be readily overcome.

⁷ Draft FYSO, p.15

Spectrum licensing

54. Spectrum licences are afforded a high degree of exclusivity and certainty under the *Radiocommunications Act 1992* (“the Act”).⁸ This has made the licence type suited to the long-term investment required for multiple generations of mobile network deployment. As a result, the Australian mobile market is one of world’s leading in terms of penetration and speeds. Australia is served by multiple advanced 4G and 5G mobile networks, supplying data throughputs that rank amongst the best in the world.
55. The deployment of 5G networks involves substantial investment in new infrastructure and spectrum across the nation. In the context of high-cost investments and low and uncertain incremental revenue, the ACMA must ensure that spectrum licensees continue to be afforded sufficient protections to support ongoing investment in network deployment and upgrades to deliver the high quality, high-capacity services the market demands. In this context, Optus welcomes the ACMA’s statement in the draft FYSO that spectrum licences have “a high degree of exclusivity”.⁹
56. The proposed introduction of new apparatus and class licensed services within or adjacent to spectrum licensed bands increases the risk of interference—or spectrum denial—to existing spectrum licensed services. This imposes administrative and operational costs on spectrum licensees that were not anticipated at the time the spectrum was purchased. The effect is to dilute or erode the scope of rights that the spectrum licensee had reasonably anticipated could be exercised for the term of the licence. This in turn undermines the certainty required for long term network investment.

Co-existence of spectrum licences with apparatus and class licences

57. Optus understands that, in specified circumstances, the ACMA may authorise class and apparatus licensed services to co-exist with spectrum licensed services. However, in doing so, the ACMA must consider the effect on radiocommunications of the proposed operation of the devices that would be authorised under the licence in deciding whether to grant a licence.¹⁰
58. A class licence such as the Low Interference Potential Devices (LIPD) Class Licence, can be “an effective and efficient means of spectrum management for services where a limited set of common frequencies is employed, and where equipment is operated under a common set of conditions”.¹¹
59. However, class licencing creates challenges for interference monitoring, management and enforcement – adding exemption overlays will similarly compound this issue, particularly where it applies over a prolonged period or for undefined parameters. Consistent with our view on the need to have suitable administrative arrangements in place to support interference management, Optus supports the use of licensing that requires registration of devices on the RRL as a condition of use. This promotes a degree of transparency that supports more cost-effective interference management.

⁸ For example, sections 60B, 105 and 138 of the Act support the relative exclusivity of spectrum licences by limiting the ACMA’s power to issue class and apparatus licences (respectively) that overlap with spectrum licences while certainty of access is implied in the long-term duration of spectrum licences under s.65 of the Act and the protections afforded to licensees regarding variation or resumption of spectrum licences by the ACMA (chap 3).

⁹ Draft FYSO, p.63

¹⁰ Subsection 100(4) of the Act

¹¹ ACMA, Variation to the Low Interference Device Class Licence, Consultation Paper, October 2022, p.5

60. Optus reiterates its view that AWLs should be subject to the same restrictions and requirements for the purposes of interference management, registration and other related obligations imposed on spectrum licensees. The concept of ‘co-primary’ status should not apply insofar that use of an AWL impedes on the operational capability and licence conditions, including s145 requirements, set out for spectrum licences issued and operating within the same spectrum frequency ranges.
61. Optus looks forward to the ACMA’s proposed consultation on its revised guidance document on the ACMA’s approach to licensing and allocation scheduled for Q2 2024.

Spectrum sharing

62. Optus acknowledges the ACMA’s openness to supporting industry-led trials of DSA or other non-traditional spectrum sharing methods, with a role for ACMA in facilitating discussions between affected/interested operators as the need arises. Spectrum flexibility needs to be approached with caution, while still adhering to a framework that respects the rights afforded to existing or future spectrum licences.
63. Secondary market trading, spectrum leasing and geographical licence separation currently provide traditional sharing opportunities to meet existing needs, while allowing the incumbent licensees to control and determine additional uses within their spectrum licence areas. Other technical measures, such as, geographical separation distances between systems, physical shielding, filtering, interference coordination and frame synchronisation, where necessary, may also be considered in some cases.
64. Optus notes its proposed MOCN services solution with TPG includes an agreement authorising Optus to use TPG’s regional spectrum. If approved, this will facilitate the use of previously underutilised spectrum thereby enabling the more cost-effective and efficient deployment of 5G networks and services in regional Australia. Similarly, Optus’ agreement with SpaceX authorises SpaceX to use our spectrum in areas outside mobile network footprint, thereby potentially extending the reach of our mobile services across the country. It is therefore clear that existing mechanisms of spectrum access can be used to promote spectrum efficiency for the long-term public benefit.

PROPOSED 2024-25 SPECTRUM WORK PLAN AND FYSO

- 65. The ACMA has proposed a robust work plan of activities for the next 12 months that acknowledges major activities being undertaken in both the band planning and optimisation of existing frameworks workstreams.
- 66. As stated earlier, Optus considers that the ACMA's key spectrum management priority is the Expiring Spectrum Licence (ESL) process. While Optus supports the ACMA maintaining a balance between planning ("new allocations") and optimisation ("band harmonisation") activities, ESL related activities must take precedence over all other spectrum related activities.

ESLs are the priority spectrum management activity for 2024-25 and beyond

- 67. Optus notes the ACMA's ongoing ESL Stage 2 consultation and will be providing a detailed submission in response. We support the ACMA's statement in its Consultation paper that "continued support for wireless broadband (WBB) use of" ESL spectrum bands is "likely conducive to promoting the long-term public interest" and reiterate our view that MNOs should be provided with the opportunity to renew all ESLs on the same terms and conditions.
- 68. A key risk in the ESL process remains the lack of certainty surrounding the ACMA's preferred view. A lack of sufficient certainty around spectrum access undermines the investment environment and jeopardises long term network planning and investment in critical infrastructure. To the greatest extent practicable, Optus urge the ACMA to provide certainty as to its preferred view as to the future use of each spectrum band at its earliest opportunity.
- 69. As the ACMA notes, the ESL process is not a 'greenfields' or 'from the ground up' exercise, and where there is "evidence of strong support for a particular use or uses of a band" that should weigh heavily in favour of a decision to renew ESLs. Such an approach delivers the requisite certainty for ongoing investment, having a comparable effect to the Class of Services Determination issued during the previous renewals process which precipitated significant investment in national 4G mobile networks.
- 70. Given the potentially negative impacts on incumbents of a loss of spectrum, it appears unreasonable to suggest that prospective licensees do not bear responsibility for demonstrating that the public interest is better served by their proposed use of ESL spectrum. A prospective licensee's claim for spectrum access must show that the re-allocation of ESL spectrum is on balance, of greater public benefit than renewal of that ESL spectrum, having regard to all relevant material.
- 71. As the spectrum has already been allocated efficiently via auctions processes, there should be no auctions for the purposes of renewal. The administrative renewal of ESL spectrum at a nominal price will help promote investment certainty and the sustainability of a sector crucial to Australia's digital future.
- 72. Optus urges the ACMA to eschew the short-term benefit of higher renewal fees to public finances in favour of supporting the broader long term economic and competition benefits that will flow from lower renewal prices. In Optus' view, any price above a nominal level could be regarded as an inefficient tax that will need to be recouped through lower spending/investment or higher prices. Renewal fees should be set at a level that allows operators to make a fair return on their investment. This will maximise the public interest from use of the spectrum in terms of network performance and usage.

It will also enable the mobile sector to support and realise the local, state and national government objectives for digital transformation.

73. Our proposed MOCN deal with TPG Telecom includes an agreement to share regional spectrum that will enable Optus and TPG to deliver improved mobile coverage and service performance to their customers in regional Australia. Optus will also accelerate our 5G deployment by fast-tracking the number of 5G sites in the regional MOCN to 1500 by 2028 and 2,444 by the end of 2030, providing real infrastructure-based competition to Telstra and improved network resilience for the long term public benefit of regional Australians.¹² Optus ability to do this is enabled by the cost efficiencies arising from sharing TPG's regional spectrum. Renewal of ESL spectrum will be crucial to the success of this proposed arrangement.

Prioritising harmonisation, optimisation and workable co-existence

74. In addition to progressing the ACMA's expiring spectrum licences work program, Optus also considers the following band activities warrant further attention during 2024-25 (in descending order of priority):
- (a) Progress work on the harmonisation and technical optimisation of spectrum licensed bands for 5G – in particular finalise the review of the spectrum licence technical frameworks in the 700MHz and 2.5GHz bands with a view supporting deployment of 5G.
 - (b) Progress the ACMA's options paper on 1800MHz and 2GHz bands in Q2 2024. Optus also welcome the review RALIs MS33 and MS34. The ACMA should consider going beyond these policy-level changes and reallocating this spectrum space for spectrum licensing, particularly in regional areas in the lower 2 x 40MHz of the 2GHz band where MNOs have already deployed extensive networks that are currently authorised by PTS apparatus licences.
 - (c) Carefully consider whether and how the ACMA may help industry facilitate a defragmentation of the 3.4 to 3.8GHz band with a view to optimising the band for 5G services. Optus suggest that such activity be planned to complement the ESL process.
 - (d) Ongoing monitoring of the implementation of the revised banned equipment and exemptions framework, with a view to ensuring limited impact on spectrum licensed services and appropriate oversight of compliance with new arrangements for notification of exempt activities to enable spectrum licensees to manage interference and other compliance risks. Optus note the impending expiry of the Radiocommunications (Exemption) Determination 2021 and look forward to the ACMA's Q2 2024 consultation on a possible replacement instrument.
 - (e) Prioritise forward planning work on identifying new mid-band spectrum for WBB. Optus welcome the ACMA's proposed consultation on the upper 6GHz (6425-7025MHz) scheduled for Q2 2024.
 - (f) Satellite planning – satellite will support the Government's regional connectivity objectives through effective licensing and co-existence frameworks. Allocating spectrum to satellite services based on established

¹² [TPG Telecom and Optus sign network sharing agreement marking new era of mobile services for regional Australia](#)

business case and clear unmet demand. As a dual mobile and satellite network operator, Optus is well placed to contribute to such engagements.

- (g) Optus supports the identification, through ITU-R processes, of key segments of the 7 to 24GHz for satellite services that alleviate increasing congestion in existing spectrum bands and support the expansion of Australian based satellite operators. However, Optus notes that the 7 to 24GHz will continue to attract interest, including from IMT. Optus supports retaining the 13GHz band at the monitoring stage at this time.

- 75. Optus' views on the ACMA's plans for monitoring, initial investigation, preliminary replanning or re-farming of spectrum bands are summarised below.

Monitoring

- 76. Optus supports monitoring the bands identified by the ACMA.

600MHz band

- 77. As the ACMA notes, other leading jurisdictions have issued licences for WBB use of the 600MHz band, including for 5G, while the ITU has also updated its recommendation ITU-R M.1036 to include IMT in this band. There is clearly broader international momentum following WRC-23, for the allocation of the band to mobile services.

Mid-band spectrum

- 78. Optus notes that the 3.3GHz, 4.5GHz and 4.8GHz bands have been included in the FYSO for many years, and we welcome continued monitoring of these bands for international developments.
- 79. We welcome the ACMA's recognition of a growing international trend towards assigning all or part of the 4400-4990MHz band to WBB.¹³ We also note with interest that, following studies by the US Department of Defence, the US National Spectrum Strategy identifies the "lower 3GHz" (3.1-3.45GHz) as a candidate for possible shared use between public and private sector users in the US.¹⁴

Other bands

- 80. Optus note that the 40GHz band (37-43.5GHz) has been identified globally for IMT at WRC-19 but that it is competing with demand for Fixed Satellite Services (FSS). Optus reiterates the view expressed in response to last year's FYSO that the whole band must be considered with a view to ensuring co-existence between WBB use cases and satellite services.
- 81. These bands are vital for the future development of FSS services that require wide bandwidth (10GHz) for up to 50 Gbps data throughput. The high gain, narrow beamwidth directional nature of Q/V band antenna beams, together with high elevation angles for transmitting to satellites, results in small coordination zones that facilitate sharing.
- 82. Optus notes that a large number of satellite network filings have been submitted to the ITU containing these Q/V bands. Optus considers that these Q/V bands are important for

¹³ Draft FYSO, p.35

¹⁴ US National Spectrum Strategy; The White House, 13 November 2023; p.6

the future development of satellite services needed to provide high-capacity services to isolated regions of Australia.

83. Optus note international developments in the use of 40GHz, 46GHz and 47GHz for FSS. We also welcome retaining the 40MHz, 46GHz and 47GHz bands in this monitoring stage. Again, noting there is no immediate need for the expedited progression of these new mmWave spectrum bands (i.e. 40GHz and 47GHz).
84. Optus would not support the allocation of these bands in advance of the global ecosystem to deploy new spectrum bands not yet harmonised or supported. Optus also notes that any proposed allocation in the 40GHz band for satellite services should emphasise the coordination and coexistence requirements between land mobile IMT services and satellite services.
85. Optus supports measures that promote transparency of spectrum use and enable cooperation and timely and effective coordination between satellite operators and with non-satellite operators. Optus support the ACMA's interim licensing processes (under spectrum embargo 80) for gateway satellite earth stations in these bands, before undertaking a comprehensive review to determine long-term arrangements.¹⁵

Future bands

86. Optus notes WRC-27 agenda item 1.7 will consider studies on sharing and compatibility and technical conditions for the possible use of IMT in the frequency bands 4400-4800MHz, 7125-8400MHz and 14.8-15.35GHz..
87. Optus also notes WRC-27 agenda item 1.13 will consider studies on possible new allocation to the mobile-satellite service to enable direct connectivity between space stations and IMT user equipment to complement terrestrial coverage.
88. As noted in our February 2024 submission to the ACMA's consultation on satellite direct-to-mobile services, Optus considers that this agenda item enables the ACMA to now proceed to authorise IMT satellite DTM services under ITU-Regulation 4.4.¹⁶ Also of relevance is the FCC's Supplemental Coverage from Space (SCS) Order issued on 14 March 2024 authorising the SCS based on lease arrangements between a terrestrial licensee and a satellite operator.
89. Optus also welcomes that the 7025-7125MHz range has been identified for IMT in Region 3 and looks forward to the proposed Q2 2024 consultation on the upper portion of the 6GHz band (6425-7125MHz)

Initial investigation

2300 – 2302MHz

90. Optus welcome the ACMA's recognition that the current 98MHz of spectrum available in the 2.3GHz band is not operating over a standard 5G bandwidth (100MHz). Consideration of 2300–2302MHz as a band priority should be maintained to support the inclusion of the bottom 2MHz of the 2300MHz band to mobile so that a contiguous

¹⁵ Draft FYSO, p.36

¹⁶ In Optus view, immediate authorisation appears consistent with the ITU Board's recommendations on the use of No. 4.4, including in cases where "a new space allocation that would provide international recognition to the frequency assignment is under study...or under consideration at an upcoming WRC".

100MHz can be deployed to increase the overall 5G efficiency and utility of the 2.3GHz band.

91. Optus faces ongoing issues of managing interference with NBN Fixed Wireless access (“FWA”) services in this band. We note that spectrum licences in the 2.3GHz band are due to expire on 24 July 2030 and acknowledge the ACMA’s proposal to reassess the timing priority for replanning this band in FYSO 2025-2030. That said, given the long-standing nature of the concern, Optus would support progressing this band to the preliminary replanning stage as part of this year FYSO.

Preliminary replanning

92. Optus acknowledges the addition of the 1.5GHz, the extended L band (1518–1525MHz and 1668–1675MHz) and 1.9GHz bands being advanced in the planning process. We acknowledge the ACMA’s activities in these bands and will maintain a watching brief.

1.5GHz (1427–1518MHz) and Extended MSS L-band (1518–1525MHz and 1668–1675MHz)

93. Optus acknowledges the progression of these bands to the preliminary planning stage. Mid-band spectrum is crucial to deployment of 5G and ultimately to Australia’s digital economy and broader economic goals. The level of competing demand for 1.5GHz means that co-existence considerations will be important to maximising efficient use of the spectrum.
94. Optus September 2023 submission to the ACMA’s August 2023 Options Paper expressed support for the ACMA’s Option 2, under which the ACMA will implement arrangements to allow MSS operation in the extended MSS L-band on a “no interference, no protection basis” facilitated by ongoing use of the apparatus licence regime and the proposed expansion of the CSO Class Licence 2015. Optus welcomes the ACMA’s December 2023 Outcomes Paper indicating the ACMA’s intention to progress Option 2 to the implementation stage of the ACMA’s planning process.
95. Optus also welcomes the ACMA’s proposal to review arrangements for services in the broader 1427-1535MHz band in FY 2024-25. Optus reiterates its view that co-existence, coordination and cooperation between services across the 1427-1518MHz band is necessary to promote the long-term public interest derived from use of the extended MSS L-band. Ultimately, the nature and scope of co-existence measures between WBB and MSS in 1.5GHz band should be informed by international studies and Optus welcomes the ACMA’s reference to the ITU-R recommendation M.2159 on “Technical and regulatory measures to provide compatibility between IMT and MSS” in this band.

6GHz

96. Optus welcomes the ACMA’s progression of the 6GHz (5925-7125MHz) band to the preliminary replanning stage. As the ACMA notes, WRC-23 identified 7025-7125MHz band for IMT use in Region 3, while the broader 6425-7125MHz (the upper 6GHz band) was identified for IMT in Region 1 and Region 2 (less the top 100MHz in Region 2).
97. We welcome the ACMA’s February 2024 spectrum tune-up on future use of the upper 6GHz band in Australia and look forward to the ACMA’s proposed Q2 2024 consultation on potential planning options. We note that the ACMA has already made the 5925-6425MHz (lower 6GHz band) available for use by RLANs.

98. Optus does not consider there is sufficient evidence to support extending this to the upper 6GHz and reject the suggestion of a “hybrid” or shared access as a workable solution in this context, as we consider that segmentation of this spectrum between use cases will cause inefficient fragmentation of the band. Optus reiterates that the timing of any future allocation of the upper 6GHz should be considered in the context of the ESL process with a view to ensuring that supply reflects demand thereby promoting its efficient allocation. Implementation
99. Optus acknowledges the bands currently listed at the implementation stage; but notes that focus should remain on the bands already listed in the forward allocation work plan.

850MHz expansion band (814-824MHz and 859-869MHz)

100. Optus acknowledges ACMA’s ongoing work to clear or relocate incumbent services in the band prior to the commencement of spectrum licences in those frequencies on 1 July 2024.

1800MHz (1710–1785MHz and 1805–1880MHz) and 2GHz (1920–1980MHz and 2110–2170MHz) outside of spectrum-licensed areas

101. Optus notes the ACMA’s proposal to issue an options paper in Q3 2023 regarding future use of these bands following which it intends to implement appropriate changes to the RALIs (MS 33 and MS 34).
102. Optus welcomes the review of RALIs MS33 and MS34 with a view to support 5G AAS. However, Optus consider that ACMA should consider going beyond these policy-level changes and reallocating this spectrum space for spectrum licensing, via administrative re-allocation. This would be particularly beneficial in regional areas in the lower 2 x 40MHz of the 2GHz band where MNOs have already deployed extensive networks that are currently authorised by PTS apparatus licences. If the ACMA were to proceed, then it should ensure licence expiry aligns with ESLs in the band. Optus look forward to the ACMA’s Options paper in Q2 2024.

1.9GHz (1880 – 1920MHz)

103. Optus acknowledges the ACMA’s Outcomes Paper issued in December 2023 indicating the ACMA’s intention to implement Option 3, which entails the inclusion of DECT 2020 Australia-wide in the 1880-1900MHz frequency range and indoor only in the 1900-1920MHz range, and rail mobile radio (RMR) along rail corridors in 1900-1910MHz frequency range.
104. While Optus supported Option 4 as the best initial starting point for developing this band, we welcome the ACMA’s approach to “pull back” the class-licensed SB WBB proposed in Option 4 (Australia-wide across 1900-1920) to be apparatus-licensed (and therefore coordinated) and limited to indoors only. We look forward to engaging with the ACMA further on the next steps required to implement its proposed approach.

2GHz MSS (1980–2010MHz and 2170–2200MHz)

105. As indicated in our February 2024 submission, Optus broadly supports the ACMA’s proposed approach to this spectrum. In particular, we strongly support the principle that technical design of the 2GHz MSS band should align with both the 2GHz spectrum licensing framework and the equipment requirements for 3GPP band n256 and band 65/n65, which should allow the band to be configured for 5, 10 or 15MHz bandwidths in line with 3GPP specifications.

106. We note that the ACMA has not yet formed a final view on its preferred approach to allocation. In line with the ACMA's statement that a transparent mechanism should be used to resolve competing demand, particularly for an allocation to a new use case, Optus support the use of a price-based allocation (auction) process for the purpose of allocating this spectrum.
107. Optus notes the inclusion of 2GHz band in the forward allocation plan, with consultation on the technical framework and a proposed allocation design to commence in Q3 2024, with a view to allocating licences in 2025.

3.4 – 4.0GHz

108. Optus acknowledges the significant program of work that the ACMA has undertaken to allocate the 3.4 to 4.0GHz, which is key spectrum identified for WBB use. Optus has long advocated for harmonisation across the entirety of c-band (3.3GHz to 3.8GHz) and for allocations of at least 100MHz contiguous bandwidth to each MNO and NBN Co, consistent with 3GPP standards.
109. While Optus appreciates that there is high-level of demand for this spectrum, we consider that the ACMA's attempts to cater to a wide variety of use cases has ultimately undermined the utility of the band and resulted in inefficient fragmentation of the spectrum.
110. The ACMA's approach to this band has been piecemeal, with multiple different allocation processes and diverse licence types issued across a long period of time. Channel sizes for 5G mid-band deployment are generally limited to between 30 and 60MHz and the geographic areas covered by 3.4GHz and 3.6GHz and 3.7GHz licences do not align. This undermines the tradability of the spectrum products, hindering a market led defragmentation.
111. We reiterate our concerns about the level of fragmentation in this band and notes that market mechanisms alone are unlikely to ensure that the spectrum will be defragmented in the near future. We encourage the ACMA to carefully consider how it can assist with promoting the use of this spectrum for WBB for the long-term public benefit.
112. To this end, we also note our continued objection to the imposition of limitations on the use of spectrum between 3.7 and 4.2GHz band in and around airports to protect old radio altimeters used by the aviation sector and call for the ACMA to help ensure that all these mitigations can be lifted by no later than March 2026 as proposed.

Optimising established planning frameworks – coexist, coordinate, cooperate

113. Optus considers that the ACMA should be prioritising the use of existing spectrum for 5G and supporting any enabling licensing variations. Optus considers that work to optimise existing planning frameworks for 5G should coincide and complement the ACMA's ESL process with a view to maximising the efficient use of the spectrum over the long term. The prioritisation of satellite planning activities also continues to be a welcome addition.
114. Recognising the ever-increasing demand on spectrum resources, Optus supports the development of technical arrangements that limit interference potential to the greatest extent practicable and are conducive to workable co-existence, coordination and cooperation.
115. The ACMA should facilitate and drive outcomes for the efficient use of spectrum across multiple industry groups. Consistent, manageable and rational licence conditions,

structures and supporting instruments are critical to the success of such an activity. This requires careful consideration of often competing uses and issues, with a heavy weighting applied to the public benefit of any such outcomes. In particular, Optus would support careful consideration of how the ACMA can assist with the long term optimisation of C-Band spectrum for 5G services.

Review of spectrum licence technical frameworks for 5G readiness

116. Optus strongly supports progression of these activities to ensure existing allocations are efficient and can cater for new technology developments such as 5G.
117. Optus notes the ongoing TLG for 700MHz band and the proposed Q2 2024 consultation on any changes to the technical conditions on licences. Optus encourages the ACMA to adopt a long-term view in seeking to maximise the utility of this important low band spectrum. We reiterate that the relative exclusivity afforded to 700MHz spectrum licensees when licences were acquired via auction in 2013 helped ensure that the 700MHz band was then heavily utilised by mobile carriers to deploy national 4G mobile networks. The propagation characteristics of 700MHz mean that it will remain key spectrum to support the supply of 5G and 6G mobile and WBB services on a national basis in the future. Optus maintains that any erosion of MNOs capacity to use this key low band spectrum is inconsistent with the long-term public interest in delivering essential mobile services to the national mobile market.
118. Optus also notes the ACMA's proposals for the 2.5GHz band TLG to commence once the 700MHz TLG has been finalised in Q4 2024. The 2.5GHz is FDD spectrum and is currently licensed on a national basis. As such it is an important band in realising the long-term vision of single network connectivity for Australia. Optus urges the ACMA to carefully consider how utilisation of this band can be maximised for use and interference management by a single spectrum licence holder.
119. As a general comment, TLG participants should be required to participate in good faith, with any issues raised to be ideally supported by quantitative evidence and that any requests for information be met in a timely fashion. In particular, Optus considers that the TLG process that precipitated the introduction of limitations on licensees' use of 3.7GHz to 4.2GHz spectrum in and around airports until March 2026, would have greatly benefitted from genuine technical engagement from all stakeholders and adherence by all branches of the ACMA to the technical decisions provided by the Spectrum Planning and Engineering branch.
120. Optus maintains that there is insufficient evidence of interference risk to radio altimeters from 5G services. Further, the aviation sector remains principally responsible for passenger safety and as such, should be subject to clear and enforceable deadlines to upgrade relevant equipment no later than March 2026 deadline. Without such a deadline, the risk of indefinite limitations on spectrum use constitutes a disproportionate reduction in the public benefit that could be derived from this spectrum, including for 5G.

Satellite planning activities

121. Optus notes that the ACMA has a significant number of satellite planning activities for 2024-25. This reflects the increasingly significant role that satellite services are and will continue to play in meeting Australia's communications needs.
122. Optus supports the ACMA's work to optimise arrangements for satellite services, while continuing to respect and afford sufficient priority to the long-term benefits of high capacity, high performance terrestrial mobile networks.

123. Recognising the many difficulties of both balancing the terrestrial and satellite interests, while continuing to offer a spectrum product that is fit-for-purpose, Optus supports the ongoing role of the ACMA in facilitating discussions across multiple industry groups, and between affected/interested operators as the need arises. The following sets out Optus' comments on several satellite issues set out in the FYSO and in general supports the continued progress on activities that have commenced.

Providing ongoing operational support for Australian-filed satellite networks

124. Optus supports the position that the ACMA will continue providing ongoing operational support for Australian-filed satellite networks and welcome the ACMA's assistance with international coordination processes. This will be required as future satellites may operate in frequency bands not currently provided on existing spacecraft.

Ongoing monitoring of regulatory arrangements for satellite DTM services

125. Optus welcomes the ACMA's further consideration of regulatory arrangements for satellite DTM services. We note that regulatory clarity for all affected parties can support the seamless and expeditious deployment of these innovative services that will help fill gaps in Australia's communications landscape.
126. It is Optus view that Australia's current spectrum management framework is fit for the purpose of enabling the delivery of IMT satellite DTM services now and into the future. We consider that any further regulatory steps should be confined to clarifying the ACMA's expectations concerning compliance with the existing framework. To this end, Optus supports express confirmation from the ACMA, via regulatory guidance material, that a spectrum agreement between a satellite operator and a spectrum licence holder's IMT spectrum band. We endorse the ACMA's clarifications on the issue provided in last year's FYSO and encourage the ACMA to realise the opportunity for Australia to now authorise IMT satellite DTM services under ITU-R Regulation 4.4.

Ongoing monitoring of spectrum related trends in space-based communications

127. Optus welcomes the ACMA's planned activities relating to space-based communications systems, technologies and applications for 2024-25. Optus notes that this monitoring activity should help ensure that the emergence of medium/large NGSO constellations does not unduly impact on Australian filed satellite systems, including on Ku/Ka-band operations in Australia. Given the level of activity and the likelihood of increasing potential for interference in the band, Optus suggests that the ACMA consult Australian satellite operators on licence applications from prospective NGSO/LEO operators.
128. Optus understands that the ACMA wishes to maintain a light touch regulatory approach to licensing to support entry and take up of satellite services in Australia. Optus notes that the rapid entry and take up of NGSO services means that there is increasing potential for interference within satellite spectrum bands in Australia. Optus welcomes the ACMA's confirmation that it will continue to monitor the impact of foreign filed systems on Australian filed satellite systems and urges the ACMA to ensure the licencing of foreign filed satellite networks does not undermine the use of Australian filed satellite networks.
129. Optus welcomes the ACMA's work to review the Australia satellite filing procedures. As noted above, we also support the ACMA's ongoing work to assess new radiocommunications licence application for space-based communications systems. In this context, Optus endorses the ACMA's statement "that coordination matters between foreign-filed satellite systems are the responsibility of the relevant filing administration

and satellite operators. Accordingly, Australia's and the ACMA's role is limited to the domestic licensing of these satellite systems."¹⁷ We look forward to the ACMA's outcomes paper on this review proposed for Q3 2024.

Low interference potential devices

130. Optus acknowledges the ACMA possible consideration of further updates to the LIPD Class Licence. Optus reiterates its view expressed in its December 2022 response to the ACMA's previous consultation on draft variations to the LIPD Class Licence. In particular, we note that any new arrangements or radiocommunications devices authorised under the LIPD Class Licence must be conditional on ensuring that existing technical limitations are adhered to, particularly for power and emissions limits.
131. The increased risk of harmful interference to adjacent spectrum licensed services has the potential to increase the costs of managing interference, including to essential mobile services. It follows that any expansion of the scope of devices authorised to operate under the class licence and adjacent to spectrum licensed services must be supported by clear evidence that such devices can and will operate in a manner that does not cause harmful interference to adjacent spectrum licence services.

Ongoing review of spectrum planning, assignment and coordination requirements

132. Optus supports the ACMA proposed activities to review its spectrum planning, assignment and coordination requirements and look forward to engaging with the ACMA on this work program.

Spectrum sharing approaches.

133. Optus acknowledges the ACMA's openness to supporting industry-led trials of DSA or other non-traditional spectrum sharing methods, with a role for ACMA in facilitating discussions between affected/interested operators as the need arises. Spectrum flexibility needs to be approached with caution, while still adhering to a framework that respects the rights afforded to existing or future spectrum licences.
134. Optus reject the suggestion of a "hybrid" or shared access as a workable solution in the context of the upper 6GHz, as we consider that segmentation of this spectrum between use cases will cause inefficient fragmentation of the band.

Licensing

135. Optus reiterates its view that the ESL process remains the ACMA's number one spectrum management priority for the foreseeable future. We look forward to further productive engagement with the ACMA on this project.
136. Optus also note the other licensing priorities that the ACMA has identified in its draft FYSO. We generally support the ACMA's proposed work program but note that this should not distract from the ESL work. We look forward to the ACMA's proposed Q3 2024 outcomes paper on the consultation on the scope and operation of the Innovation and Industry Development Framework and Radiocommunications (Exemption) Determination 2021. As a general comment, Optus considers that the revised banned equipment framework appears to be generally working effectively, with most, if not all, exempt parties actively notifying Optus of their activities.

¹⁷ Optus submission to ACMA filing procedures consultation

THE FORWARD ALLOCATION WORK PLAN

137. Optus reiterates that the ESL process remains the ACMA's first priority spectrum management activity over the course of this FYSO work program. Optus appreciates the ACMA's efforts to expedite the process with a view to providing the sufficient certainty, sufficiently early, as to the ACMA's preferred approach to future use of these bands.
138. Optus reiterates that the timing of allocations will have important implications for potential spectrum users, including business and network resourcing activities, as well as spectrum valuation activities.
139. To this end, Optus supports the ACMA proposed approach to issue its preferred view on the use of these spectrum bands by mid-2025. The ACMA's decision-making on the future use of these critical bands must be undertaken in the context of the ACMA's broader spectrum management work to ensure that MNOs have access to the spectrum required to cost-effectively deliver the digital infrastructure that will underpin Australia's digital future.

General forward allocation comments and Optus priorities

140. Optus also wishes to reiterate that the readiness of existing bands to accommodate the latest and future technologies is as important as new allocations to accommodate the relentless and rapid growth in demand experienced by licensees.
141. Optus presents a general view of priorities for each band or band type for the forward allocation, noting that it is expected that new allocations, existing band modifications and renewals can be undertaken in parallel. These views are outlined in the table below.
142. We reiterate our view that all forward allocation priorities, other than the mandated RALI instrument updates, should remain secondary to the ESL process, and considered in the broader context of the market with a view to ensuring that supply of spectrum meets market demand. For absolute clarity, the ranking of 1 against New allocations does not indicate that this activity has equal priority with the highest ranked item under Expiring spectrum licences.

Priority	Expiring spectrum licences
1	Holistic assessment of all expiring spectrum licences Q4 2023
2	Issue preliminary view on future use of ESL bands, with a view to maximise certainty of the ACMA's preferred approach to the greatest extent practicable
3	850MHz and 1800MHz licence renewal
4	2.5GHz and 700MHz
5	2300MHz and 3.4-3.6GHz
6	2100MHz

Priority	Harmonisation
1	700MHz
2	2.5GHz

Priority	New allocations
1	Mid band (6GHz)
2	Low band (e.g. 600MHz)
3	mmWave (e.g. 40GHz and 46/47GHz)

OTHER ISSUES: PRICING AND COMPLIANCE PRIORITIES

Implementation of the Spectrum Pricing Review

143. There is no one-size-fits-all approach that suits all spectrum bands today or would fit the uses for different spectrum bands that change over time; therefore it is important that transparency over the arrangements to be applied in each pricing decision should be encouraged. This will also have important implications, with particular regard to continuity of service, price, and investment incentives for existing licensees.
144. Optus supports the ongoing implementation of the recommendations of the Spectrum Pricing Review. For 2024-2025 these will include maintaining the tax regimes for annual updates of apparatus licence taxes based on the new population-based methodology, as well as updating the spectrum licence tax to adjust for the annual EME component amount. These annual updates will be guided through formal consultations.
145. Optus similarly appreciates that the ACMA's consideration of the expansion of pricing mechanisms, such as pricing for varying levels of interference, remains at its early stages. However, we emphasise that it is important that any future proposals in this regard reflect careful consideration of the impact that the proliferation of devices may have on existing spectrum-licensed services. This includes consideration of the potential impact of the additional cost on licensees to manage interference.
146. In addition to encouraging 'efficient' spectrum use, any price signalling through apparatus licensing which offers users the ability to opt for lower levels of protection at a reduced price can also increase the complexity of interference management more generally. This issue also does not necessarily address allocation concerns around potential colocation and or synchronisation issues, whether transmit or receive, within the same spectrum range which can lead to inefficient spectrum use.
147. Optus therefore considers caution should be exhibited when considering specific applications, frequencies and licence sub-types for alternative pricing arrangements. Importantly, the need to address short-term demand should be appropriately balanced to ensure that longer-term interference issues do not arise and thereby erode the efficient operation of spectrum deployments already authorised under existing licences.
148. Setting efficient price signals to encourage efficient spectrum deployments should similarly consider both the adjacent and co-located spectrum users. This should also be balanced against the ACMA's role in maintaining oversight and enforcing interference management breaches when they occur.

Compliance priorities

149. Optus supports the ongoing compliance focus for 5G EME compliance and interference activities to continue in 2024-2025. With the rollout of 5G networks, there will be continued need for public awareness on the safety of 5G technology.
150. Optus also note the increased potential for interference to existing spectrum licensed services and urges the ACMA to ensure that interference management arrangements, including resourcing, remain fit for the purpose of ensuring cost-effective compliance with spectrum licence technical frameworks. Optus reiterates its concern about the potential interference that may arise from the revised banned equipment and exemptions framework and encourages the ACMA to continue to monitor compliance of exempt parties with new notification and record keeping requirements.