



Submission in response
to ACMA consultation

**Satellite direct-to-
mobile services:
regulatory issues**

Public version

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EXECUTIVE SUMMARY

1. Optus welcomes the opportunity to provide feedback to the Australian Communication and Media Authority's (ACMA) consultation *Satellite direct-to-mobile services: regulatory issues* which follows the ACMA's five-year spectrum outlook 2023-28 (FYSO) and the spectrum tune-up on 31 October 2023.
2. Satellite direct-to-mobile (DTM) services are an increasingly important complement to terrestrial mobile networks and recent advances in satellite technology offer an opportunity to help bridge the digital divide, delivering connectivity to previously underserved or unserved areas of Australia. The potential socio-economic benefits of extending mobile network coverage are significant and the redundancy afforded by a fallback satellite based mobile service could be game changing during disasters.
3. Importantly these benefits can start to be realised in the near future via IMT satellite DTM services.¹ Mobile handsets are nearly ubiquitous, which means the time to (mass) market for IMT satellite DTM services is shorter than alternative MSS options that do not have such a well-established device ecosystem. The recent launch of Starlink satellites marks a milestone in the collaboration between Optus and SpaceX to deliver direct to Optus 4G compatible mobiles across Australia. Optus plan to launch SMS from late 2024 with voice and data services in late 2025.²
4. Spectrum licences are afforded a high degree of exclusivity and certainty under the *Radiocommunications Act 1992* ("the Act"). This has made the licence type suited to supporting the long-term investment required for multiple generations of mobile network deployment.³ The technological flexibility of the spectrum licence framework also allows licensees to repurpose spectrum for other uses, enabling licensees to operate any type of radiocommunications device for any purpose, provided there is compliance with the technical framework and applicable regulations.⁴
5. These features of Australia's spectrum licence regime have helped enable the innovative solution from Optus and SpaceX. The existing framework encourages the investment necessary to deliver IMT satellite direct-to-mobile (DTM) services, while established practices of coordination, cooperation, and co-existence through mutual agreement between affected licensees will continue to provide an effective means of managing interference risk. While the interference risks posed by IMT satellite DTM services appear somewhat novel, Optus is confident that they can be effectively managed via coordination and cooperation arrangements.
6. Optus welcomes the ACMA's further consideration of regulatory issues and notes 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. To be clear, it is our view that Australia's current spectrum management framework enables the delivery of IMT satellite DTM services now and into the future. Any further regulatory steps should be confined to clarifying the ACMA's expectations concerning compliance with the existing framework. We endorse the ACMA's clarifications in its FYSO and encourage the ACMA to realise the opportunity for Australia to now authorise IMT satellite DTM services under ITU-R Regulation 4.4.

¹ See further 3GPP Releases 17 & 18

² [Optus | SpaceX](#)

³ ACMA document – "Our approach to radiocommunications licensing and allocation"; March 2021, p.6

⁴ ACMA, Expiring Spectrum Licences – finalised framework and response to submissions; December 2023, p.3

THE SPECTRUM LICENCE FRAMEWORK SUPPORTS INNOVATION AND INVESTMENT IN AUSTRALIA'S FUTURE

7. The telecommunications and radiocommunications technology sector remain highly dynamic. As a guiding principle, Optus considers that regulatory frameworks affecting these services should be sufficiently flexible to support ongoing innovation and investment while also being robust enough to enable regulators to respond proportionately to limit harm to users and the community. This balance can be hard to strike, however, the existing spectrum licence framework generally delivers on both.
8. Spectrum licences authorise the holder of the licence to operate radiocommunications devices within a specified 'spectrum space', which is defined by frequency bandwidth and geographic area, the core conditions of a spectrum licence. Within this spectrum space, spectrum licensees "can operate any type of radiocommunications device for any purpose, provided they comply with the licence conditions and technical frameworks relevant to the licence."⁵
9. Spectrum licence technical frameworks are designed to manage interference with other spectrum users. The ACMA notes that "although a technical framework may be optimised for technologies or services most likely to be deployed in the band, it is intended to be technology flexible. This means licensees can operate any type of radiocommunications device for any purpose, provided they comply with the technical framework relevant to the band."⁶
10. From a spectrum management perspective, the manner in which spectrum licensed spectrum is used within the confines of the licensed spectrum space is ultimately up to the spectrum licence holder. In other words, there is no impediment to the operation of a IMT satellite DTM service under a spectrum licence pursuant to an agreement between the spectrum licensee and a satellite operator. To limit the interference risk, such an agreement would ideally oblige the satellite operator to comply with the licence conditions and the technical frameworks applicable to the spectrum to be used.

AUSTRALIA'S SPECTRUM MANAGEMENT FRAMEWORK IS FIT FOR THE PURPOSE OF IMT SATELLITE DTM

11. For the above reasons, Optus considers that the existing spectrum licence regime is fit for the purpose of enabling IMT satellite DTM services now and in the future. However, Optus recognises that, as with many new service offerings, IMT satellite DTM services may appear to raise somewhat novel questions about how the service fits within the regulatory framework and particularly how such services may co-exist with existing licensed services. Therefore, as the ACMA has noted in its FYSO, it is appropriate that IMT satellite DTM services initially operate on a "no-interference, no-protection" basis, as required by ITU-R Regulation No. 4.4.
12. That said, Optus consider that any spectrum management concerns for Australian licensees can be addressed via the existing spectrum licence framework. In this context, Optus welcomes the ACMA's statements in its recent FYSO that:

⁵ The ACMA's "Know your obligations – spectrum licensees" document; p.3

⁶ Ibid, p.4

- (a) handsets used in an IMT satellite DTM system can be operated, without the need for explicit approval from the ACMA, under the current spectrum licensing framework, subject to the handset complying with all applicable licence conditions;
 - (b) a key feature of IMT satellite DTM services is the need for an agreement or partnership between satellite operators offering a satellite direct-to-mobile service and MNOs who hold a spectrum licence in the IMT band;
 - (c) any spectrum licensee is expected to undertake their own due diligence to manage coexistence with other spectrum uses and users.⁷
13. To promote regulatory certainty, Optus supports express confirmation from the ACMA, via regulatory guidance material, that a spectrum agreement between a satellite operator and a spectrum licence holder is a pre-requisite to the supply of IMT satellite DTM services in the spectrum licence holder's IMT spectrum bands. The form of the agreement should be left to be determined by the parties. That said, for reasons set out further below, Optus considers that a third-party authorisation agreement may provide the greatest degree of assurance with regards to interference management.
14. Optus emphasises that coordination and cooperation between affected stakeholders will continue to play a central role in managing interference risks and promoting co-existence and compliance with the spectrum licence technical framework. <<CIC begins>><<CIC ends>>

Third-party authorisation agreements provide sufficient assurance of spectrum compliance

15. The ACMA has noted that foreign filed satellite systems providing IMT satellite DTM services are "not considered foreign space objects...meaning that the satellite systems are outside the scope of the Radiocommunications Act for licensing purposes."⁸ Unlicensed radiocommunications are prohibited under Part 3.1 of the *Radiocommunications Act 1992* (the Act). For foreign satellite systems to supply IMT satellite DTM services to end-users in Australia, they must do so under licence.
16. Section 68 of the *Radiocommunications Act 1992* (the Act) provides for a spectrum licensee to authorise other persons (third parties) to operate radiocommunications devices under a spectrum licence.⁹ The existing conditions for third party use provide an incentive for spectrum licensees to embed spectrum management obligations within the terms of the agreement. While the spectrum holder ultimately remains accountable for any breach of the spectrum licence, such arrangements can ensure contractual recourse for breach of what are otherwise licensee obligations.
17. As such Optus considers that third party authorisation arrangements offer a sensible and balanced means of enabling compliant IMT satellite DTM services. However, the need for such an agreement may of course depend on the ACMA's willingness or to pursue the satellite operator for non-compliance. For clarity, Optus does not consider that section 195 of the Act applies to IMT satellite DTM services authorised under a spectrum licence issued by the ACMA. Optus has not identified any reference in the Act or

⁷ ACMA FYSO 2023-28, p.21-23

⁸ Ibid

⁹ Section 68 of the Radiocommunications Act

applicable regulatory framework to suggest that spectrum space does not extend “to the space (including the atmosphere and outer space) above”.¹⁰

Devices authorised for use under a spectrum licence may be registration exempt

18. Radiocommunications transmitters cannot be operated unless they are registered in accordance with the requirements of Part 3.5 of the Act or they are classified as exempt from registration.¹¹ Optus considers that there is no registration requirement for LEO Sat transmitters if they meet the exempt criteria and are operated by a licensee directly or under authorisation agreement between the licensee and satellite operator.
19. <<CIC begins>> <<CIC ends>>
20. If the ACMA wishes to explore registration options further, Optus recognises that, given the dynamic nature of LEO Sat constellations, it is unlikely that a LEO Sat transmitter could be registered on the ACMA’s Register of Radiocommunications Licences (RRL). Optus also submit that an exemption from registration is consistent with a service that operates on a “no interference, no protection” basis.
21. Consistent with existing arrangements allowing for a spectrum licensee to determine commercial arrangements for use of its licensed spectrum, we also do not consider that it is appropriate to introduce any requirement for the ACMA to approve an agreement between commercial parties. That said, we would not oppose a requirement to notify the ACMA of an agreement between a satellite operator and an MNO and indeed consider this to reflect best practice.

Close engagement to ensure effective co-existence and coordination arrangements

22. Optus notes concerns expressed during the ACMA’s Spectrum Tune-up about the potential for interference, complicated by the geographic expanse of LEO Sat systems. The CSIRO has raised concerns about the capacity of such services to avoid harmful interference to deep space radiocommunications, including within the Radio Quiet Zone (RQZ) which is specifically carved out from the scope of spectrum licences under RALI MS32.
23. CSIRO has also indicated that protection is also of concern at smaller radioastronomy sites (RAS) and protected under RALI MS 31, such as Tidbinbilla.¹² <<CIC begins>> <<CIC ends>>. Optus has commenced initial discussions with CSIRO for the purpose of concluding arrangements to limit the potential for harmful interference to CSIRO radio astronomy services that may be occasioned by our IMT satellite DTM collaboration with SpaceX.

Satellite DTM services can be supplied on a “no interference no protection” basis under ITU-R Reg 4.4

24. Optus acknowledges the ACMA statement that, given that the ITU framework does not currently assign IMT bands for use by satellite services, IMT satellite DTM services are to operate on a “no-protection, no interference basis”.¹³ This reflects the fact that the deployment of IMT satellite DTM services would be in derogation of the ITU Table of Allocations (ToA). Optus accepts that this means that the station may be authorised on

¹⁰ Section 18 of the Act

¹¹ Section 69 of the Act

¹² ACMA Consultation: Review of Australian Satellite Filing Procedures

¹³ FYSO, p.21

the express condition that it will not cause harmful interference to, nor claim protection from, other stations operating in accordance with the Radio Regulations.¹⁴

25. Optus also acknowledges that the ITU Board has urged administrations to not over-use ITU-R Regulation No. 4.4. For instance, it has encouraged administrations to “refrain from using No 4.4 for commercial applications that would provide services on a long-term basis, if a new space allocation that would provide international recognition to the frequency assignment is not under study in the ITU-R or under consideration at an upcoming WRC.”¹⁵
26. However, it has also specifically identified “direct-to-cell” along with “use of a frequency band that is not allocated to a space service but is under consideration at the upcoming WRC for a new space allocation” as “typical” use cases for which an administration may or has used ITU-R Reg 4.4.¹⁶ As the ACMA is no doubt aware, Member States have recently resolved, under Agenda Item 1.13 at WRC-23, to undertake “studies on possible new allocation to the mobile-satellite service for direct connectivity between space stations and International Mobile telecommunications (IMT) user equipment to complement terrestrial IMT network coverage” in time for WRC-27.¹⁷
27. Given Agenda Item 1.13, Optus submit that there would appear to be no reasonable impediment to the ACMA’s authorisation of IMT satellite DTM services under ITU-R Reg 4.4. Indeed, 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*”.
28. Optus is aware that some stakeholders may argue that the ITU Board prefers a “cautious approach” to Reg 4.4 that entails the need for an Administration to ensure that all potential interference is mitigated, and co-existence studies completed before IMT satellite DTM services may commence supply. Optus submit that such an interpretation would, if taken literally, only serve to delay the use of ITU-R Reg No. 4.4 in the very instances for which it is intended – namely by delaying use of a band by new services until studies for a new space allocation are completed, rather than underway.
29. Optus also submit that the ACMA has already expressed views, in its recent FYSO, consistent with the Rules of Procedure for 4.4; namely by confirming that any IMT satellite DTM service will be supplied on a “no interference no protection” basis and that the services must “cease or vary operation if interference occurs”.¹⁸ Coupled with the need for satellite operators offering a satellite DTM services to partner with MNOs who hold spectrum licences for the IMT band, Optus considers that the ACMA has already determined sufficient mechanisms and arrangements to limit harmful interference to existing services operating in accordance with the Radio Regulations.

¹⁴ As per ITU-R Reg 4.4

¹⁵ Report by the Radio Regulations Board to WRC-23 on Resolution 80 (REV. WRC-07); see 4.14.4 at page 43; [R23-WRC23-C-0050!MSW-E.docx \(live.com\)](#)

¹⁶ Ibid, at the end of section 4; p.45

¹⁷ Resolution COM6/9; pg 567-568 of the Provisional Final Acts “provides for “studies on possible allocations to the MSS in the frequency range between 694/698 MHz and 2.7 GHz, taking into account the IMT frequency arrangements addressed in the most recent version of Recommendation ITU-R M.1036;” and “studies on spectrum requirements and on technical, operational and regulatory matters related to the implementation of the mobile-satellite service for direct connectivity to the IMT user equipment to complement the terrestrial IMT network coverage”.

¹⁸ ACMA FYSO 2023-28, p.21

30. Optus acknowledges the potential regulatory complexities created for Administrations by the global and non-stationary nature of large LEO Sat constellations such as that operated by SpaceX. However, Optus submit that the primary concern of the ITU Regulations is to establish a framework to manage the interference risk between Member States rather than within the jurisdiction of Member States. The ITU satellite filing arrangements provide a well-established and increasingly utilised framework to support international cooperation in the administration of space activities, including resolution of interference disputes.
31. In considering whether any further steps are required to address the potential for interference to incumbent services that may arise from authorisation of IMT satellite DTM services, the ACMA should seek to maintain the procedural distinction between filing and licensing that it has always done.¹⁹ Optus endorses the ACMA's recent 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."²⁰
32. Optus notes that the ACMA is sensibly monitoring international developments relating to regulatory frameworks to support IMT satellite DTM services, including the Federal Communications Commissions Proposed Rule Making "Single Network Future: Supplemental Coverage from Space, Space Innovation", released 17 March 2023. Optus understands that the FCC granted SpaceX a 180-day experimental authorisation to test its direct to cell service using its terrestrial mobile partner's (T-Mobile) spectrum.²¹
33. In any event, the ACMA is best placed to administer spectrum within Australia. As the ITU-R looks to study possible allocations across a wide array of bands to support connectivity between space stations and IMT user equipment, the ACMA remains empowered to take a broader view domestically, including via No. 4.4. As a large remote island Australia is in the relatively unique position to avoid the "spill over" risk of interference across national borders inherent to satellite services.
34. Australia's unique geography and relatively sparse population outside of major centres, coupled with a well-established and respected spectrum management regime, makes Australia one if not the most suitable jurisdiction in the world to make use of the opportunity afforded by ITU-R Reg 4.4 to take a leading role in the adoption of IMT satellite DTM services.
35. When considered in context of the potential public benefit that may be realised for Australians over the long term, the case to support immediate authorisation of IMT satellite DTM services is even stronger. While delaying authorisation may be understandable where there is a high risk of spill over, any benefits to interference risk management are outweighed by the opportunity cost for Australia of helping to bridge the digital divide now, a key Government policy objective.
36. From a spectrum management perspective, Optus sees no reasonable impediment to the ACMA authorising the use of IMT satellite DTM services under ITU-R Reg 4.4.

¹⁹ section 16 of the Act sets out when the Act may apply outside Australia and section 16(1)(ca) enables the ACMA to determine the circumstances in which the Act applies to foreign space objects – which is the power the ACMA used for Foreign Space Objects Class Licence.

²⁰ Optus submission to ACMA filing procedures consultation

²¹ [OET Approval | PDF | Space X | Satellite \(scribd.com\)](#)

Non-radiocommunications specific regulatory considerations

37. The ACMA has stated that “there may be other regulatory obligations for operators to consider including telecommunications carrier licensing under the *Telecommunications Act 1997* and emergency call services under the *Telecommunications (Emergency Call Service) Determination 2019*. Interested parties should seek further advice on such matters”.²² Optus notes that the supply of carriage services within Australia must always be under a carrier licence or nominated carrier declaration arrangement.²³ However, Optus agrees that there may be other material non radiocommunications related regulatory concerns about the supply of IMT satellite DTM services that should be clarified, particularly as the service offering improves over time.
38. For example, Optus recognise the importance of ensuring that any future voice service via the IMT satellite DTM service is of sufficient reliability and performance to deliver the emergency call service.²⁴ Indeed, when voice calls are enabled, Optus will ensure that calls to Triple Zero from a 4G compatible handset is available to anyone in Australia, regardless of provider. To this end, Optus notes that:
- (a) If a satellite operator is supplying carriage services to end users located in Australia which are also Standard Telephone Services (STS), then the satellite operator’s supplied STS must always support access to the Emergency Call Service (ECS) i.e. Emergency Calls to 000 & 112.
 - (b) The satellite operator’s non-terrestrial base stations (BTS) must not interfere with the MNO’s terrestrial BTS so that there is no adverse impact to the Emergency Calls being handled by the MNO’s terrestrial BTS.
 - (c) The satellite operator’s non-terrestrial BTS must be designed in a way that they do not present a stronger RF signal strength to the mobile phone where it is operating in a location also being served by the MNO’s BTS.
 - (d) Release 17 (and/or subsequent Releases 18 & 19) are likely to enable use of NTN’s (Non-Terrestrial Networks) by LEO SAT Operators and will require Release 17 capable mobile handsets for access.
39. The ACMA’s FYSO states that the handsets used in such a system can be operated under the current spectrum licensing framework, subject to the handset complying with all applicable licence conditions, without the need for explicit approval from the ACMA under the Act. Of course, handsets will still need to comply with the ACMA’s Labelling Notices under the Telecommunications Act 1997 as well as ACMA Radio Equipment General Rules (REGR) under the Act before they can be operated in Australia.

²² ACMA FYSO 2023-28, p.21

²³ E.g section 5 and 42 of the Telecommunications Act

²⁴ In accordance with regulatory requirements governing the emergency call service, such as section 19 and 21 of the Emergency Call Services Determination 2019

THERE ARE IMMEDIATE AND LONG-TERM PUBLIC BENEFITS TO BE REALISED FROM IMT SATELLITE DTM

40. The potential benefits of IMT satellite DTM have already been recognised through the Departments LEOSat Working Group.²⁵ The FCC has observed that “Connecting consumers to essential wireless services where no terrestrial mobile service is available can be life-saving in remote locations and can open up innovative opportunities for consumers and businesses.”²⁶
41. Government communications policy is also seeking to bridge the digital divide by prioritising regional connectivity and digital inclusion. It is well recognised that due to lower expected returns on network investment in regional and remote areas, there is less commercial incentive to deploy in these areas. Policy settings should be designed to maximise industry investment in multi-tiered and targeted solutions to regional Australia. For context, Optus notes that if a NBN satellite RSP cannot guarantee the success of a call to 000 and if they cannot rely upon a mobile service in their geographic area, they would have to apply to Telstra for the retention of a copper service.
42. An IMT satellite DTM service can, when designed correctly, promote the efficient utilisation of IMT spectrum, particularly in areas outside the existing mobile network footprint. This accords with the objectives of the Act to promote the long-term public interest derived from the use of spectrum.²⁷ It offers the potential to promote the public interest objectives of the Act in other ways – for example, by potentially delivering emergency communications to provide mobile phones in areas affected by disaster, including where terrestrial networks are disrupted. Longer term it may also deliver reliable mobile network connectivity to remote communities across Australia. Promoting use of spectrum in areas that are hard or uneconomic to serve via terrestrial networks can only be a positive development and one that should be supported.

Any changes should be necessary and proportionate and not delay deployment

43. Optus considers that the existing regulatory regime is largely fit for the purpose of enabling the supply of IMT Satellite DTM Services. Optus supports an approach to regulation that is not excessively complex so as to inhibit innovation or new entry. Any changes should be necessary and proportionate to the problem identified – the risk to be mitigated must be real and substantiated before regulatory changes are considered. Only a balanced approach to supporting IMT satellite DTM services will ensure the objectives of the Act to promote the long-term public benefit derived from the spectrum are realised.
44. Ultimately, the spectrum licensee must remain responsible for overall compliance with the spectrum licence and the relevant technical framework. Based on the information available Optus remains confident that it can ensure that any risk of harmful interference from its satellite DTM service is mitigated. For the reasons outlined above, Optus consider that any regulatory steps should be limited to clarifying certain elements of the

²⁵ Stating that “direct-to-mobile services” are especially significant for a country like Australia and present “enormous potential benefits...closing mobile coverage gaps...improved public safety by expanding availability of emergency communications”.

²⁶ [DOC-391794A1.pdf \(fcc.gov\)](#)

²⁷ Section 3

existing spectrum licence framework to support deployment of IMT satellite DTM in a manner consistent with ITU-R Reg 4.4.

45. To this end, Optus would welcome further confirmation from the ACMA that a spectrum agreement with a spectrum licence holder is a pre-requisite to the supply of IMT DTM services within Australia. Optus suggest that this clarification may be provided by way of policy or regulatory guidance material relating to the rights and obligations of spectrum licensees – such as the ACMA’s “know your obligations – spectrum licensees” document.²⁸ This may help avoid any unintended consequences that may arise from the fact that foreign filed satellite systems that use IMT spectrum for DTM are “outside the scope of the Radiocommunications Act for licensing purposes”.²⁹

²⁸ [know your obligations - spectrum licensees.docx \(live.com\)](#)

²⁹ Ibid, p.22