

ONLINE SUBMISSION

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The Manager
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Australian Communications and Media Authority
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Re: Draft Five Year Spectrum Outlook 2024-29

Intelsat, the leading provider of fixed-satellite services (“FSS”) worldwide,¹ is pleased to submit comments to the discussion paper on *Draft Five Year Spectrum Outlook 2024-29*, published by the ACMA in March 2024.²

**Part 2: 2024 – 25 annual work program
Monitoring stage**

13 GHz (12.75 – 13.25 GHz)

Today, Earth Stations In Motion (ESIM) are being used around the world by airlines on commercial and private planes, by the maritime sector on cargo, tanker, ferry and passenger vessels, and for land transportation on trains, buses, emergency response vehicles and other motor vehicles. The increasing demand from airline and cruise passengers, government and enterprise sectors is resulting in a rapid growth for broadband connectivity demand for in-flight and cruise ships.

GSOA reported³ that inflight connectivity (IFC) data consumption is on a steep rise and subscribers expect more value. In 2021 approximately 9,900 aircraft were actively providing IFC services through

¹ For the past 50 years, Intelsat has been delivering information and entertainment for many of the world’s leading media and network companies, multinational corporations, Internet Service Providers and governmental agencies, among many users. Intelsat Asia Carrier Services, LLC, a subsidiary of Intelsat US LLC, holds an Australian carrier licence under subsection 56(1) of the Telecommunications Act 1997.

³ GSOA WRC-23 Position document for Agenda Item 1.15 <https://gsoasatellite.com/WRC23/>

over 120 airlines. This number is expected to surpass 20,900 aircraft by 2031 representing 58% IFC penetration. The high demand for inflight and maritime connectivity can be partially satisfied by additional capacity obtained by allowing operation of ESIM communicating with GSO space stations in the FSS in the frequency band 12.75-13.25 GHz (Earth-to-space). This reflects that people are accustomed to being connected, even on the move, and their appetite for data is increasing.



As a result of WRC-23 (Agenda Item 1.15) international (ITU-R) regulation is now in place to allow ESIMs on aircraft (A-ESIMs) and vessels (M-ESIMs) to use the 12.75-13.25 GHz band to communicate with geostationary space stations in the fixed-satellite service under Appendix 30B. To operate these ESIMs, the notifying administrations need to file assignments (Appendix 30B ESIM) in accordance with Annex 1 of Resolution **121 (WRC-23)**. Resolution **121 (WRC-23)** contains technical, regulatory and operational conditions for operation of A-ESIM and M-ESIM, while ensuring protection of allocated services among other things protection of terrestrial services with both a minimum distance from the low-water mark and maximum e.i.r.p. density towards the horizon for M-ESIM, and a pfd mask for A-ESIM.

Australia will be able to derive economic benefits from the deployment of ESIM operations in Australia, in the 13 GHz band if A-ESIMs and M-ESIMs are authorised to operate within Australia. Aeronautical ESIM installed in the Australian domestic airlines such as Virgin Australia, Qantas, Jetstar and Rex and commercial international airlines flying into and out of Australia will be able to provide value added services using this additional bandwidth to meet the expectations of airline end users including passengers and flight crew by providing broadband in flight connectivity services. Australia's international and even domestic route lengths are such that pleasure and business passengers will benefit. Such internet broadband connectivity is also expected by passengers and ship crew in Australian and international commercial maritime vessels include cruise ships, since it has become an expectation for passengers to be well connected everywhere and whenever they are. Installation of maritime ESIM in vessels would be able to fulfill the broadband connectivity needs of ship passengers and crew.

Recommended actions

Now that WRC-23 has allocated in the 12.75-13.25 GHz band a new application under the FSS identification of ESIMs to communicate with geostationary space stations under Appendix 30B, the ACMA is encouraged to implement domestic licensing policies to allow this use in Australia. As indicated in the previous section, Australia will benefit economically by allowing aircraft and maritime vessels of Australian and international origin to use this band.

Intelsat would encourage the ACMA to consider moving this band into the 'Initial investigation stage'.

40 GHz (37–43.5 GHz)

As the CA SSWG indicated in their submission to the ACMA's *Draft Five-year spectrum outlook 2023–28 and 2023–24 work program* "some satellite operators have imminent plans to use these and the adjacent 48.2 – 50.2 GHz and 50.4 – 52.4 GHz bands between gateway stations in Australia,

geostationary (GSO) satellites and non-GSO satellites. This may include uncoordinated class licence and coordinated earth station use.”

Intelsat supports the ACMA’s initiative in the *Response to submissions: Draft FYSO 2023-28* in developing an interim licensing process or licence applications for gateway satellite earth stations in this band and the 47.2–50.2 GHz and 50.4–51.4 GHz bands discussed below.

47.2–50.2 GHz, 50.4–52.4 GHz

WRC-27 Agenda Item 1.1 is considering the technical and operational conditions for the use of the frequency bands 47.2–50.2 GHz and 50.4–51.4 GHz (Earth-to-space), or parts thereof, by A-ESIM and M-ESIM communicating with GSO and non-GSO space stations in the fixed-satellite service.

The ITU-R has addressed ESIM in Ku- and Ka-bands at several previous WRCs, which have adopted technical and regulatory regimes to allow such operations. Meanwhile advances in satellite manufacturing and earth station technology have made ESIM more widespread and more practical. Consequently, the utilization of Ku- and Ka-band frequency spectrum for providing ESIM connectivity is growing exponentially to meet user demands, which may lead to scarcity in spectral resources in these bands. On the other hand, the rapidly increasing use of non-geostationary satellite orbits (non-GSO), such as medium Earth orbits (MEO) and low Earth orbits (LEO), represents an important innovation in satellite technology enabled by enhanced satellite design, manufacturing and launch service capabilities. The passengers’ ever-increasing hunger for bandwidth, combined with immense potential to obtain utmost operational proficiency with IFC use will lead to steep increase in the required capacity.

WRC-27 Agenda Item 1.3 is considering the use of the frequency band 51.4–52.4 GHz to enable its use by gateway earth stations transmitting to non-geostationary-satellite orbit systems in the fixed-satellite service (Earth-to-space).

Intelsat supports the ACMA’s initiative in the *Response to submissions: Draft FYSO 2023-28* in developing an interim licensing process or licence applications for gateway satellite earth stations in these bands.

Part 1: Five-year spectrum outlook 2024–29

Satellite direct-to-mobile services

As noted in CA SSWG’s submission to the ACMA on *Satellite direct-to-mobile (DTM) services regulatory issues* (7 Feb 2024), DTM services are developing rapidly, already offering messaging, with the future holding the promise of higher speed networks, with speeds in the tens of megabit per second to a 3rd Generation Partnership Project (3GPP) non-terrestrial networks (NTN) Release 17 handset for satellite operations in the S and L bands. Releases 18 and 19 promise even higher speeds with the possible introduction of additional frequency bands (e.g. C and Ku-bands).

Australia, due to its geographical environment and the absence of land borders, is in a better position than small land-locked countries to continue supporting the development of MSS DTM and IMT Sat DTM technology standards and regulation including operation of a system within the requirements of RR Article No. 4.4. This would support a competitive market which benefits from the economies of scale being created through the inclusion of NTN in the 3GPP standards. It is important to remember

that Direct to Mobile services are already in operation and soon will be available in many parts of the globe. Australia can benefit from them quickly if so allowed.

Wireless (mobile and fixed) broadband Private Networks

Intelsat notes in this draft FYSO the ACMA's discussion on the 3 broad categories of WBB use-cases using 5G technology. For private networks in the bands also allocated to FSS, Intelsat would encourage the ACMA in careful selection of maximum eirp levels to enable sharing with satellite services.

Intelsat stands ready to provide additional information on any of the topics discussed in this contribution.

Respectfully submitted,



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