

Inmarsat response to
ACMA FIVE YEAR SPECTRUM OUTLOOK 2021-26
27 April 2021

Inmarsat welcomes the opportunity to comment on the Australian Communications and Media Authority (ACMA)'s Five Year Spectrum Outlook (FYSO) 2021-26 and provides some comments related to the outlook and work program in L-, Ka- and Q/V bands.

Inmarsat looks forward engaging with the ACMA in more detail on these bands and other issues in the coming months as consultations are called for by the ACMA.

Part 1: Satellite communications

Satellite communications provide affordable connectivity to underserved or unconnected customers, and satellites also enable broadband connectivity to critical industries such as oil and gas, mining as well as connected devices on-board mobile platforms such as planes, trains and ships. Without adequate spectrum, the satellite communication industry will not be able to maintain and grow its services.

As the ACMA has identified, Australia plays an important role in the global space community and the Australian Government announced a \$7 billion investment in space capabilities over the next 10 years. Inmarsat supports such a priority placed on the space sector in Australia and Inmarsat is pleased to be contributing to the Australian space sector through our services and through our presence and investments in Australia. Australia is a major hub in our global network, supporting both the L-band and Ka-band operations throughout the region. The availability for suitable and adequate radio spectrum is a key component in a successful space sector and the ACMA will need to ensure sufficient allocation of spectrum for satellite communication in Australia and the growth of the industry.

Part 1: Spectrum for government requirements

The ACMA points out the importance of military Ka-band satellite services. Inmarsat's Global Government Global Express (G2X) provides customers with a global, on demand, network for multi-megabit communication capability for Government needs. G2X uses the GX constellation of Ka-band geostationary satellites.

Inmarsat is supplying a large number of services to Australian Government. The L-band Satellite Data service tends to cover 'highly-portable' needs for very remote areas of Australia, and also in use for disaster recovery and support operations where Defence and Federal Government assist remote and regional communities. Inmarsat L-band satellite terminals are used on-board Australian vessels, bringing constant all-weather data connectivity across oceans and seas.

Inmarsat is the current contractual provider of L-band and Ka-band services to the Commonwealth of Australia, Department of Defence (**ADF**) until 31 December 2027 and with extension options till 2033. The total contract value (**TCV**) is in excess of AUD221 million¹. Alongside the CoA, ADF contract Inmarsat is also the contractual provider to the Australian Maritime Safety Authority for Global maritime distress and safety services², the Bureau of Meteorology for SafetyNET and weather services³ and the Australian Antarctic Division for both on—ice and transport services to and from the region. Inmarsat provides mobile SATCOM services to many Local, State and Federal Agencies for Workplace Health and Safety communications and mobility solutions.

Part 2: 1.5 GHz (1427–1518 MHz) and Extended MSS L-band (1518-1525 MHz and 1668-1675 MHz)

Since 2013 (at least) Inmarsat has been requesting the ACMA to start planning for the use of the extended L-band frequencies for new Mobile Satellite Service (**MSS**) operations in Australia. It is disappointing to have seen that this issue has been repeatedly delayed. It appears that the main reason for the delay is the related issue of possible use of the 1.5 GHz band for terrestrial mobile broadband – which has only lukewarm interest from the mobile operators – and it is unfortunate that lack of interest from the mobile industry apparently causes delay to the introduction of new MSS services in Australia.

Inmarsat notes that the ACMA proposes to release an initial discussion paper in Q2 2022 to consider plans for the use of extended L-band by the MSS and plans for new uses of the 1.5 GHz band by Long Term Evolution (**LTE**) networks. It is important that there is no further slippage in the timing of ACMA activities on these bands.

Inmarsat’s L-band MSS network, which operates in the 1518-1559 MHz (space-to-Earth) and 1626.5-1660.5 and 1668-1675 MHz (Earth-to-space) frequency bands, provides safety-of-life communications and mission-critical voice and data services in Australia and around the globe. Emergency responders, military users, and diverse industries including the transportation, energy, and agriculture sectors rely upon land-based MSS terminals. Inmarsat services are currently provided in Australia in the “standard L-band” frequencies (1626.5-1660.5 MHz and 1525-1559 MHz). Inmarsat plans to start providing MSS services using the extended L-band frequencies in the Asia Pacific region during 2022, following the planned launch of the “Inmarsat-6” satellites.

Because of the importance of MSS operations to key communications services in Australia, including critical safety operations, protecting MSS should be an important consideration for the ACMA in its radiofrequency spectrum strategy. International Telecommunication Union (**ITU**) studies have demonstrated that mobile broadband systems in the 1.5 GHz band pose a serious risk to MSS operations above 1518 MHz, including operations in the standard MSS L-

¹ [AUSTRALIAN DEFENCE FORCE TAKES CONTROL WITH INMARSAT VIRTUAL SATELLITE SYSTEM - Connect-World](#)

² <https://www.amsa.gov.au/safety-navigation/navigation-systems/global-maritime-distress-safety-system>

³ <http://www.bom.gov.au/marine/radio-sat/bureau-inmarsat.shtml>

band frequencies, because of the susceptibility of MSS terminals to harmful interference from out-of-band emissions and receiver overload.

In preparing the Discussion Paper, Inmarsat respectfully suggests that the ACMA should consider to not include the 1492-1518 MHz frequencies of the 1.5 GHz band in plans for possible LTE use. Inmarsat is aware that several other countries (e.g. the Netherlands, Germany, Romania and Malta) have chosen to authorise mobile services only in the band 1452-1492 MHz and to refrain from authorizing terrestrial mobile systems in the upper part of the 1.5 GHz band. As far as Inmarsat is aware there is currently no LTE equipment available that operates in the upper part of the 1.5 GHz band (1492-1518 MHz). This approach would allow the upper part of the 1.5 GHz band to be used for other applications for which compatibility with L-band MSS operations can be more easily achieved.

Should the ACMA decide nevertheless to include the potential use of the 1492-1517 MHz portion of the 1.5 GHz band for LTE in its discussion paper, it must also consider technical measures necessary to ensure protection of MSS operations. The ITU and the Asia-Pacific Telecommunity (APT) Wireless Group are currently considering potential coexistence measures, including measures to safeguard MSS above 1518 MHz. As a result of extensive study in the CEPT, Europe has established a number of compatibility measures, including PFD limits for LTE base stations, in-band EIRP limits for LTE base stations, and out-of-band emission limits for LTE base stations. These measures do not seek to protect all L-band MSS operations and are based on certain assumptions about LTE network characteristics and expected deployment. Given the extensive use of Inmarsat services in Australia, in particular by land MSS terminals, additional compatibility measures, beyond those in the CEPT regulatory framework, would likely be needed. If the ACMA does seek to consider LTE/5G systems in the band 1492-1518 MHz, whether for private or public networks, it will be necessary to carefully assess the technical compatibility measures and Inmarsat is ready to engage with the ACMA as necessary.

Part 2: 6 GHz RLANs

The ACMA plans to release a discussion paper in Q2 2021 related to the possible use of the 6 GHz band for Radio Local Area Networks (RLANs) (5925-7125 MHz). Inmarsat would like to highlight that an important consideration is the compatibility with Fixed Satellite Service (FSS) satellite (Earth-to-space) operations. In particular, it will be necessary to establish technical and operational measures on RLAN systems to avoid harmful interference to satellites using the band 5925-7075 MHz. RLANs may also need to operate on the basis of not claiming protection from any interference from FSS earth stations.

As is noted in the consultation document, other countries have already made such assessments and established rules to allow RLAN operations in a manner compatible with FSS operations, and it is likely that the same or similar measures will be required in Australia.

Part 2: Q/V band (40 GHz, 46 GHz and 47 GHz)

The ACMA plans to continue to monitor the Q/V bands:

- 40 GHz (37 – 43.5 GHz)
- 46 GHz (45.5 – 47 GHz)
- 47 GHz (47.2 – 48.2 GHz)

The above three bands, and the band 48.2 – 52.4 GHz, are of significant importance to satellite community generally and to Inmarsat. We are aware also of the interest in some parts of these bands for 5G mobile systems, following the decisions of WRC-19.

It is likely that Inmarsat and other operators will be seeking authorisation of earth station operations in the near future in Australia, and it is necessary that the ACMA is able to provide authorisation of earth stations while use of these bands remains at the “monitoring” stage.

Part 2: WRC-23 agenda item 1.2

The ACMA includes in the “monitoring” stage the bands being studied under WRC-23 agenda items 1.2 and 1.4. Regarding WRC-23 agenda item 1.2, the only band that is considered for IMT identification in ITU Region 3 is the band 7025-7125 MHz and this band is also addressed in the context of the possible use for RLANs in the 6 GHz band, which is at the “initial investigation” stage. Therefore we are not sure what purpose would be served by monitoring the AI 1.2 bands and the ACMA may wish to clarify.
