

**Inmarsat response to
RSM WLAN use in the 6 GHz band
30 June 2021**

Inmarsat is pleased to provide comments to the New Zealand Radio Spectrum Management (RSM)'s discussion document on WLAN use in the 6 GHz band (the “**Discussion Document**”).

1. General comment

Under the New Zealand Radio Spectrum Usage (PIB 21), the 5 925 – 7 075 MHz band is allocated for Fixed Satellite Service (FSS) on a co-primary basis, and satellite operators have valuable operations and commercial satellite services in this band in New Zealand.

Inmarsat uses the frequency band 6 425 – 6 575 MHz to provide feeder links within its L-band Mobile Satellite Service (MSS) network. These feeder links support safety of life services such as the Global Maritime Distress and Safety System (GMDSS) and Aeronautical Mobile-Satellite (R) service (AMS(R)S). As these FSS Earth-to-space links are vital for the safe operation of the maritime and aeronautical industry, they must not receive unacceptable interference from devices used under the General User Radio Licence for Short Range Devices (GURL-SRD). Hence, the proposed introduction of wireless local area network (WLAN) devices, or any other proposed future uses in the 5 925 – 7 075 MHz band must be subject to appropriate measures to ensure that they have a low interference potential to the primary services in this band, such as the FSS.

2. Inmarsat response to specific RSM's questions

Inmarsat responses to the questions specified in the Discussion Document as follows.

- Q1. Do you agree with RSM's proposal on making the 5 925 – 6 425 MHz available for WLAN use?**
- Q2. What are your views on the potential future use of 6 425 – 7 125 MHz for new applications (e.g. Wi-Fi or IMT)?**

Inmarsat does not oppose RSM's proposal on making use of 5 925 – 6 425 MHz available for WLAN use as outlined in the response to question 3 below.

Inmarsat considers that any proposal for the upper 6 GHz band (6 425 – 7 125 MHz) to be used by International Mobile Telecommunication (IMT) systems would result in interference to satellite receivers. The necessary limits to protect the satellite receivers are many dBs lower than those typically associated with IMT systems, whether the interference would be from

higher powered IMT base stations or from the aggregation of multiple IMT user terminals. It is also noted that only a small part of this band (7 025 – 7 125 MHz) is envisaged for IMT identification in Region 3 at the World Radiocommunication Conference (WRC) in 2023. Accordingly, RSM should not consider the potential future use of IMT systems in the upper 6 GHz band, noting also that IMT systems cannot, in practice, share with WLANs in this band. Furthermore, the ITU WRC-19 identified an additional 17.25 GHz for spectrum for IMT, and RSM has already provided early access to spectrum in the 3.5 GHz band, considered mid-band spectrum, in June 2020, for terrestrial 5G deployment in New Zealand. Inmarsat therefore considers that IMT would not be a suitable choice of technology for the upper 6 GHz band, and Inmarsat opposes such use in this band.

Regarding possible use of the upper 6 GHz band for WLAN, as the FSS systems operate across the full upper 6 GHz band and satellite operators (including Inmarsat) use the 6 425 – 6 575 MHz band for feeder uplinks for MSS systems, a reliable means of protecting those systems from WLAN systems in the band will be required.

Inmarsat supports the consideration of the upper 6 GHz band for WLAN operation, which could be introduced in New Zealand in a manner compatible with current FSS services, subject to the same technical constraints as already adopted in European Conference of Postal and Telecommunications (CEPT) for the lower 6 GHz band for the protection of FSS uplinks.

Q3. Do you agree that RSM should include 5925 - 6425 MHz in the GURL-SRD for WLAN low power indoor and very low power use?

Q4. Do you agree that RSM should mandate ETSI EN 303 687 as the radio standard for WLAN use in the 6 GHz band? Is there any other regulatory compliance standard we should consider?

Inmarsat does not oppose RSM's proposal to include 5 925 – 6 425 MHz in the GURL-SRD for WLAN low power indoor and very low power outdoor. Inmarsat's view that the risk of aggregate interference into the FSS uplinks in the 5 925 – 6 425 MHz band is acceptably low for GURL-SRD for WLAN operations if the WLAN devices are limited to low power indoor operations and very low power outdoor operations, following the CEPT power limits.

The RSM's proposal of 24 dBm (11 dBm/MHz density) for indoor use, and 14 dBm (1 dBm/MHz density) for all locations is slightly higher than the limit adopted in Europe for indoor use of 23 dBm (10 dBm/MHz density)¹.

It is noted that New Zealand is largely an importer of WLAN devices and, as such, importers rely heavily on New Zealand standards being compatible with those in other parts of the world, especially those of the European Union.

While the limits proposed by RSM are the same as those adopted in the UK, the UK adopted their power limits before the CEPT completed its work and suggested that they would meet the CEPT limits when finalised (they have not yet done so).

¹ See Electronic Communications Committee (ECC) Decision (20)01.

On balance, it is proposed that New Zealand adopt the slightly lower limit for indoor use of 23 dBm (10 dBm/MHz density), consistent with ECC Decision (20)01. This will also have a benefit to any New Zealand developers of WLAN devices in the band, as they will more readily meet the European standards, should they intend to export their devices.

Regarding the European Telecommunications Standards Institute (ETSI) standard EN 303 687, it is Inmarsat's understanding that this standard is not yet published and hence we cannot comment on its suitability as a basis for regulations in New Zealand. In any case, it will be important to regulate the power limits for WLAN devices in a separate regulation and the limits contained in ECC Decision (20)01 are recommended to be adopted by RSM.

Q5. What are your views on using a licensing approach to support 30 dBm EIRP WLAN devices?

Q6. What are your views on supporting 36 dBm EIRP standard power devices using Automatic Frequency Coordination (AFC) system? Do you have any proposals to provide AFC systems to New Zealand?

Inmarsat does not support either: Approach 1: 30 dBm EIRP WLAN devices; or Approach 2: Automatic Frequency Coordination (AFC) system to support 36 dBm EIRP devices operation.

The main issue with respect to the FSS operations in the 6 GHz is aggregate interference from the WLAN devices to the satellite receiver. In the 6 GHz band, satellite antenna beams typically cover a very wide area, covering several countries and typically covering the whole of the visible earth surface through use of a global beam. Both approaches to allow for high power WLAN operations would cause interference to the satellite receivers. Further, AFC would not reduce the likelihood of interference to satellite receivers as that system is designed solely to minimise interference to other terrestrial systems such as fixed services.

Inmarsat considers that operation of higher powered WLAN systems (30 dBm or 36 dBm) would cause interference to the satellite receivers.