

29 May 2020

Radio Spectrum Management Policy and Planning
Ministry of Business, Innovation and Employment
PO Box 2847
Wellington 6140

Email: Radio.Spectrum@mbie.govt.nz

Dear Sir / Madam,

RE: 1710-2300 MHz Discussion document

Microsoft Corporation (“Microsoft”) and SES World Skies Singapore Pte Ltd (“SES”), respectfully submit their comments on the Radio Spectrum Management (RSM) 1710-2300 MHz Discussion document (“**Consultation**”). Microsoft and SES commend RSM for taking steps to consider alternate uses of the spectrum bands from 1710 to 2300 MHz upon the expiry of existing spectrum management rights in the band. We offer our views on the Consultation, and specific proposals below, especially concerning new uses for lower and upper portions of the paired 2025-2110 MHz and 2200-2290 MHz bands.

1. Increasing Demand for Use of S-band Frequencies for Space Services

The 2025-2110 MHz and 2200-2290 MHz bands (“S-band”) are globally allocated for terrestrial fixed and mobile services, as well as for the earth-exploration satellite service (“EESS”), space research service (SRS) and space operation service (SOS). Microsoft and SES agrees with the Consultation’s recognition of increasing demand for use of these frequency bands for earth observation (“EO”) and other space missions, including by small satellites and constellations. Whilst RSM’s proposal to reserve 2081.5-2110 MHz and 2256.5-2290 MHz exclusively for space services in New Zealand is promising, Microsoft and SES believe close attention should also be paid to whether the reserved spectrum would be adequate to support existing satellite constellations and the growing demand for these frequencies to support the full range of space activities being conducted in these bands.

Besides telemetry, telecommand and network tracking for satellite network operators and space launchers, the paired S-band frequencies are among the most common frequencies used for the EESS. This is evidenced with the numerous EO satellite systems, licensed thus far by various jurisdictions that operate in this band, including: Digital Globe (World View); Planet Labs (Skysat, Dove, Flock, Rapid Eye); Spire Global (Spire); Hawkeye 360 (Hawk eye); and Urthecast (Deimos). In fact, some of the satellites from these constellations were launched from the Mahia Peninsula, New Zealand. Importantly, the EO satellites in these constellations do not only use the 2081.5-2110 MHz and 2256.5-2290 MHz bands that RSM is proposing to reserve for space services. Instead, they use frequencies throughout the 2025-2110 MHz and 2200-2290 MHz bands. Reserving only a portion of the S-band for EESS and space operations may mean that EO satellites operating in other parts of the S-band will not choose to establish ground stations in New Zealand.

This would be an unfortunate result, as New Zealand's location makes it an attractive location for EO ground stations, due to the high contact times that can be achieved at high latitudes. EO satellites will typically fly over New Zealand for much longer periods of time during the day than over locations closer to the equator. For this reason, Microsoft and SES have a joint interest in establishing ground stations that will directly connect EO systems to Microsoft Azure data centres in New Zealand.¹

Microsoft and SES would therefore request that the RSM consider providing space services with access to the entire S-band. This would be in keeping with New Zealand's vision of being the "ideal location for New Space." In addition to reserving the 2081.5-2110 MHz and 2256.5-2290 MHz bands exclusively for space, Microsoft and SES would recommend that the remainder of the S-band be made available to the full range of space services on a coordinated, co-primary basis with the Fixed Service.

2. Fixed links in lower portion of the S-band

Microsoft and SES recognize that RSM has proposed to make the lower portion of the S-band (2025-2081.5 MHz and 2200-2256.5 MHz) available for fixed links to enable the clearing of the 'L' and 'LL' (1427-1518 MHz) bands and their migration to the lower portion of the S-band. However, it is unlikely that all of that spectrum will be required in every part of New Zealand to support those fixed links.

Most of the fixed links in the 'L' and 'LL' bands are used to serve the public switched telephony network (PSTN) via customer multi-access radio (CMAR). This legacy system is gradually becoming redundant in many parts of New Zealand, except in the most remote areas, due to the proliferation of fiber and fixed-wireless networks funded by government programmes under the Ultra-Fast Broadband and Rural Broadband Initiatives. As a result, the spectrum required to enable the migration of any remaining fixed links from 'L' and 'LL' bands into the paired 2200 MHz band is likely to be much less spectrum than the portion of the S-band anticipated in this Consultation. The spectrum is also unlikely to be required in all parts of New Zealand, given the remote locations of these fixed links.

For all of these reasons, it should be possible to make the lower portion of the S-band available for coordinated geographic sharing of the band with co-primary space services, while satisfying fixed link spectrum requirements.

The above views are provided as a collective response to questions 4 to 10 in the Discussion Document. Please contact the undersigned if you have any questions about this submission. Microsoft and SES look forward to continuing their engagement with RSM.

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¹ <https://www.itnews.com.au/news/new-zealand-to-get-its-own-microsoft-azure-region-547817>;
<https://www.stuff.co.nz/business/121422743/microsofts-significant-investment-shows-faith-in-nzs-digital-future>.