

## Response to Radio Spectrum Management Discussion Document Re-planning options for frequency bands within 1710-2300 MHz

Thank you for the opportunity to provide feedback on this discussion document.

Sky's Outside Broadcast team produces live events right across New Zealand, with more than 550 live events produced in the last year. We are heavy users of radio microphone systems designed for outdoor usage.

We have a particular interest in the proposal for repurposing spectrum between 1785-1805MHz for radio microphone usage, and the consequences of any future clearance of portions of the 600 MHz band. We respond below to Questions 1 and 2 accordingly.

If you have any questions or require further information please contact:

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### 3.1. Radio microphones in the 1800 MHz Duplex Gap

RSM proposes to re-purpose the 1800 MHz duplex gap (1785-1805 MHz) to accommodate radio microphones, complying with ETSI standard EN 300 422-1.

Accommodating radio microphones in the 1800 MHz duplex gap would ensure that sufficient spectrum is available for this use in lieu of the previous clearance of the 700 MHz band in 2013, and any future clearance of portions of the 600 MHz band.

If a decision is made to make this spectrum available for radio microphones, RSM will need to quantify the appropriate size of guard bands at both ends, of this frequency

**Question 1:** *Do you agree with the RSM proposal to use the 1800 MHz duplex gap (1785- 1805 MHz) for radio microphones? If not, what is a better use of this block of spectrum?*

range.

Sky agrees in principle with RSM's proposal to use the 1800MHz duplex gap (1785-1805MHz) for radio microphones, **but this spectrum alone is not a viable replacement should there be a future clearance of the 600MHz band.**

New Zealand is highly reliant on radio microphone systems manufactured for other markets. Approximately 5 manufacturers offer radio mic systems suited to the "Live Sports Broadcast" market, but currently only 2 of these manufacturers offer product in the 1800MHz band and their systems have reasonably low transmission power (between 1mW to 20mW).

Sky requires radio microphone systems designed for outdoor usage, which is also capable of medium to long range transmissions (50-250 metres).

With reference to the product range, none of the above manufacturers make a plug-on style transmitter in the 1800MHz band and neither do they make any battery powered portable receiver packs, which are both highly used on Sky's Outside Broadcasts. The plug-on style transmitters are the only devices that can directly power condenser mics (such as shotgun style mics) that require P48v powering to operate.

Sky is a professional user of radio microphones and we broadcast sports events where anywhere between 20-80 radio microphone channels are required. This usage is spread across anywhere between 4-10 user groups at the event.

The number of channels that can be used simultaneously within the 1800MHz spectrum varies greatly between these 2 manufacturers.

- Manufacturer A – up to 12 channels
- Manufacturer B – up to 24 channels

Sky notes that usage of radio microphones in the 1800MHz band within Australia is prescribed under their [Low Interference Potential Devices \(LIPD\) Class Licence](#). The approved frequency range in Australia is 1785-1800MHz, so they employ a 5MHz guard band at the upper end of the spectrum.

Sky also notes their licence has the following limitations:

- a) The transmitter must not be operated on a carrier frequency within 1 MHz of 1785 MHz.*
- b) The transmitter must only be operated indoors on a frequency below 1790 MHz.*

The current radio microphone systems in the 1800MHz band are targeted to semi-professional users such as Schools, Community Theatres and Gyms. Their systems are designed primarily for indoor usage, so is a viable product for these user groups, but would offer very little benefit to Sky and other professional users.

Radio microphone users in New Zealand currently have 76MHz of spectrum available in the 600MHz band (622-698MHz). The available spectrum in the 1800MHz band would at best be limited to 15MHz (1785-1800MHz); assuming a guard band of 5MHz. This would equate to a loss of 80% of available spectrum when directly compared against the 600MHz band.

**We submit that the RSM cannot deem the allocation of the 1800MHz duplex gap as sufficient replacement spectrum in lieu of clearance of the 600MHz band.**

**Question 2:** *What size guard band would be appropriate for achieving compatibility between radio microphone use and mobile networks operating below 1785 MHz and above 1805 MHz?*

New Zealand is highly reliant on radio microphone systems manufactured for other markets. The various manufacturers are best to determine what is an appropriate guard band for their products.