24-30 GHz use in New Zealand Discussion document
Response of Apple Inc.

Deadline	5pm, 10th June 2021
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Apple Inc. (**Apple**) appreciates the opportunity to provide this submission in response to Radio Spectrum Management's (**RSM**) 24-30 GHz use in New Zealand discussion document dated April 2021 (**Discussion Document**).

Apple believes it is important to award 24.25-27.5 GHz for 5G, or portions thereof, in alignment with 3GPP FR2 band plans (n258) to aid in harmonising global manufacturing.

Apple also believes it is important to award 27.5-28.35 GHz (not 28.35-29.5 GHz) for IMT use since it is adjacent to 24.25-27.5 GHz for 5G and will assist global manufacturing in alignment with 3GPP FR2 bands (n261) and other major markets where 28 GHz is already deployed.

Apple's submissions to the questions in the Discussion Document are set out below, where relevant.

THE TECHNOLOGIES AND APPLICATIONS IN 24 - 30 GHZ
2.1 IMT-2020 ("5G")

Q1. What are the most likely use cases in New Zealand for mmWave based 5G services?

The mmWave bands (e.g., 26 GHz and 28 GHz) suit dense 5G networks in environments where additional capacity is vital to deliver high speed eMBB connectivity to customers.

3 SPECTRUM ALLOCATIONS
24.25 - 27.5 GHz
3.1.2 New Zealand's Proposal

Q6. Do you agree New Zealand should allocate 24.25 - 27.5 GHz primarily for IMT use?

Prime 5G mmWave bands (e.g., 26 GHz here) suit dense 5G small cell networks in urban hotspots where additional capacity is vital.

According to the GSMA:

> 5G needs a significant amount of new harmonised mobile spectrum so defragmenting and clearing prime bands should be prioritised. Regulators should aim to make available 80-100 MHz of contiguous spectrum per operator in prime 5G mid-bands (e.g. 3.5 GHz) and around 1 GHz per operator in high-bands (e.g. mmWave spectrum).

Apple also notes that ACMA in Australia conducted a 26 GHz (25.1-27.5 GHz) band spectrum auction in April 2021. Of the 360 lots available in the auction, 358 were sold, raising a total revenue of AUD$647,642,100.

Apple believes it is important to award 24.25-27.5 GHz for 5G, or portions thereof, in alignment with 3GPP FR 2 band plans (n258) to aid in harmonising global manufacturing.

27.5 - 29.5 GHz

3.2.2 New Zealand Proposal

Q8. How do you see our proposal of the 28 GHz band allocation?

Apple believes it is important to award 27.5-28.35 GHz (not 28.35-29.5 GHz) for IMT use since it is adjacent to 24.25-27.5 GHz for 5G and will assist global manufacturing in alignment with 3GPP FR 2 bands (n261) and other major markets where 28 GHz is already deployed.

3.4 Licensing Options

Q17. Do you agree RSM should adopt 3GPP NR FR2 based channel bandwidth to design a channel plan in the radio licence regime for IMT services?

Yes, Apple agrees with RSM adopting 3GPP NR FR based channel bandwidth to align with existing major market deployments of user terminals.

4 TECHNICAL CONSIDERATIONS
4.1 5G technical standards

Q18. Do you agree RSM should refer 3GPP standards to set the regulatory requirements for spectrum allocated to IMT?

Apple supports regulations that are as technologically neutral as possible for the 26 GHz and 28 GHz bands, or portions thereof, that would be licensed to MNOs. Apple's preference is to align the regulations as close as possible to the 3GPP FR2 bands in the 3GPP specifications to achieve better global harmonization, take advantage of market availability based on existing products, and ease mobile network compliance testing in New Zealand.

4.2 Regulatory regime for equipment
Q20. Do you agree RSM should mandate equivalent ETSI harmonised standards for radio licences in Radio Standards Notices and review these standards regularly?

Apple supports New Zealand retaining its current practice of mandating equivalent ETSI harmonised standards and reviewing them regularly, provided that additional compliance and product certification requirements are made available where there may be deviations from ETSI for the specific regulations and market access conditions for New Zealand. In this consultation, RSM

is proposing the potential introduction of IMT in the 28 GHz band that would not have an equivalent ETSI harmonized standard and therefore would need additional compliance methods and/or guidance associated with the ETSI standard to assist in product testing and market access in New Zealand.

4.5 Sharing and compatibility considerations

4.5.1 Sharing and compatibility with Earth Exploration Satellite(Passive) Service in 23.6 - 24 GHz

Q24. Do you agree that we should we implement (e.g. through UELs and AFELs) the ITU Radio Regulations, Resolution 750 limits, including the 1 September 2027 transition date and grandfathering clause for the protection of the EESS (Passive) Band? If not, please explain what limits and transition dates you consider to be more appropriate.

Apple agrees that the protection of the EESS (passive) band is needed; however, we do not agree with the implementation of the 1 September 2021 transition date (that would automatically apply a more stringent limit) without evidence of reported interference justifying such an action is required. If RSM decides to implement the 1 September 2021 date and associated limit, without evidence provided in interference reports, it is vital to Apple the transition would ensure that legacy products on the market certified and compliant under the current limit specified for IMT mobile stations in Table 1-1 of Resolution 750 (Rev. WRC-19) would be exempt from this transition to the more stringent limit for the duration of their lifecycle per footnote b to Resolution 750 (Rev. WRC-19) Table 1-1.

Q25. Do you have any insights on equipment availability at, or close to, the edge of 24.25 GHz that can meet both pre-1 September 2027 and post-1 September 2027 unwanted emission limits? Is there any additional technical solution such as frequency separation or filtering required for some equipment types?

See Apple’s response to Q24.