



COVERSHEET

Minister	Hon Ginny Andersen	Portfolio	Digital Economy and Communications
Title of Cabinet paper	Use of the 24-30 GHz radio spectrum for satellite and mobile services	Date to be published	4 September 2023

List of documents that have been proactively released

Date	Title	Author
July 2023	Use of the 24-30 GHz radio spectrum for satellite and mobile services	Office of the Minister for Digital Economy and Communications
19 July 2023	Use of the 24-30 GHz radio spectrum for satellite and mobile services DEV-23-MIN-0143 Minute	Cabinet Office

Information redacted

YES / NO

Any information redacted in this document is redacted in accordance with MBIE's policy on Proactive Release and is labelled with the reason for redaction. This may include information that would be redacted if this information was requested under Official Information Act 1982. Where this is the case, the reasons for withholding information are listed below. Where information has been withheld, no public interest has been identified that would outweigh the reasons for withholding it.

Some information has been withheld for the reasons of Free and frank opinions and Confidential advice to Government.

In Confidence

Office of the Minister for the Digital Economy and Communications
Chair, Cabinet Economic Development Committee

Use of the 24-30 GHz radio spectrum for satellite and mobile services

Proposal

- 1 This paper seeks initial decisions on the proposed high-level organisation of the 24 – 30 GHz radio spectrum, providing for mobile, satellite, and shared use. It also lays the foundation needed to make this frequency range available for long term use.

Relation to government priorities

- 2 Replanning the 24 – 30 GHz radio spectrum aligns with the Government’s ‘Digital Strategy for Aotearoa.’ There are a range of use cases for the 24 – 30 GHz spectrum range that will support the following government priorities:
 - 2.1 Increasing productivity and innovation in businesses using digital technologies and data.
 - 2.2 Increasing access to high-speed internet for all New Zealanders.
 - 2.3 Building a thriving, fast growing and inclusive tech sector.
- 3 Replanning the 24 – 30 GHz spectrum also aligns with the December 2022 ‘Lifting Connectivity in Aotearoa New Zealand: Government Statement of Intent for Improving Digital Connectivity.’ Making this spectrum available will support the vision that “all people in New Zealand have broadband and voice connectivity networks available to them that meet their life, work and study needs.”

Executive Summary

- 4 Radio waves can be transmitted and received at different frequencies. Together, these frequencies are the radio spectrum. Radio spectrum is a limited resource that requires careful planning to get the best from it for the benefit of New Zealanders. Radio spectrum underpins all wireless communications, from Wi-Fi routers, mobile phones, satellite services and AM/FM radio, to wireless devices such as garage door openers.
- 5 “24 – 30 GHz” refers to a range of radio spectrum. Previously, satellite services have been the main user of this radio spectrum range. However, at the World Radiocommunications Conference 2019, parts of the band were also identified for mobile (e.g. 5G) services.

- 6 Now that a portion of this band has been identified for mobile use, equipment manufacturers around the world are building equipment to provide mobile services in these frequencies. This means wider availability of mobile equipment capable of using this band in future. Given New Zealand is largely an equipment-taker and relies on global manufacturing to provide for our use, I consider it is in our best interests to allocate a portion of this band to mobile, as well as to satellite services.
- 7 For clarity, the 24 – 30 GHz radio spectrum range can be divided into two bands:
- 7.1 24.25 - 27.5 GHz, referred to as the **26 GHz band**
 - 7.2 27.5 - 29.5 GHz, referred to as the **28 GHz band**.
- 8 I propose that the 26 GHz band is primarily allocated for mobile use, with the option to include some satellite services in some areas under technical conditions.
- 9 I propose that we divide the 28 GHz band again into the following portions:
- 9.1 27.5 – 28.35 GHz – to follow a sharing model between mobile and satellite services
 - 9.2 28.35 – 29.5 GHz – to be primarily allocated for satellite services, with the option to include some mobile use under technical conditions.
- 10 There are competing interests between the mobile and satellite industries about the allocation of this spectrum as both wish to maximise access, and both wish to access overlapping frequency bands.
- 11 There are satellite services currently using some of this spectrum and their current licenses expire in October 2023. Operators are seeking confirmation around ongoing spectrum availability. Some operators are waiting on an announcement to invest in further infrastructure. Mobile network operators have indicated they also want access to this band to expand the use cases for 5G in New Zealand. Both industries want preferential access to the 28 GHz band.
- 12 The 24 – 30 GHz spectrum range will therefore need to be managed carefully. This means:
- 12.1 balancing industry interests
 - 12.2 taking advantage of radio equipment manufactured overseas
 - 12.3 making the most efficient use of the radio spectrum
 - 12.4 providing the best outcomes for New Zealand based on the proposed use cases.

- 13 After initial high-level decisions are communicated to industry, further work will be undertaken in coming years to make this spectrum available on a long-term basis. Interim arrangements for current satellite license holders will be put in place to allow this work to occur.
- 14 Commitments made in a February 2022 Memorandum of Understanding between the Crown and the Māori Spectrum Working Group mean that 20% of commercial spectrum that is allocated using the Management Rights regime will be provided to Māori at no cost. Honouring this commitment will be an important part of final decisions on the 24 – 30 GHz spectrum range.
- 15 The recommendations I am making on the replanning of 24 – 30 GHz balance industry interests and maximise the spectrum to accommodate both mobile and satellite services. However, I expect there may be some dissatisfaction expressed by both the mobile and the satellite industry, given both have indicated their preference for exclusive use of the 28 GHz band.

Background

- 16 At a high level, the objective of radio spectrum management is to enable New Zealanders to choose and use the best wireless technologies for their needs. Doing this requires a balance to be struck between economic benefits, social benefits, and technical optimality (i.e. what is technically feasible and what is an efficient use of spectrum).
- 17 The decisions I am seeking today are initial decisions in a multi-year process to make 24 – 30 GHz radio spectrum available for use. These decisions will lay the foundation for work going forward and will provide clarity to the wider radiocommunications industry around our intentions for the 24 – 30 GHz radio spectrum. There will be more decisions required in future to make this spectrum available for use.
- 18 I am bringing these decisions to Cabinet due to the significance of these allocations, and the potentially contentious nature of their allocation due to conflicting industry interests.

Industry context of 24 – 30 GHz bands

- 19 In the case of 24 – 30 GHz, technological development has meant that these high frequency bands are increasingly useful to satellite and mobile operators. Satellite services and mobile offer different potential uses that will have economic and social benefits for New Zealand.
- 20 Enabling both services could provide strong opportunities for competition and growth in multiple markets of prime importance for providing connectivity in New Zealand. Access to this band would encourage and foster investment in and innovation for New Zealand consumers and industries.

21 Free and frank opinions

Cabinet's agreement with the recommendations made in this paper would give a mandate for future, long term certainty of access to this spectrum, which is intended to address this risk.

International developments and potential use-cases

Developments in mobile use

22 Different applications of 5G require access to various parts of the spectrum. MBIE officials have noted to me that other markets such as Japan, South Korea, Australia, the United Kingdom, and the United States have, or are intending to, allocate portions of 24 – 30 GHz for mobile use. Mobile use of the 24 – 30 GHz spectrum is projected to:

- 22.1 Enable services that require a greater amount of spectrum. For example, wireless broadband streaming in sports stadiums.
- 22.2 Provide an alternative network connection with wireless solutions that can perform comparably to fibre. This may be useful for rural connection solutions.
- 22.3 Improve technology integration for businesses, as they may be able to run innovative new technology.

Developments in satellite use

23 Satellite services are a growing competitor in the connectivity market, with a decrease in prices in recent years making them more affordable for consumers. This is especially important in those otherwise difficult to reach places such as connectivity to planes, ships, or isolated and rural areas. The satellite industry has requested more access to spectrum so it can increase its ability to provide faster, more resilient services to customers.

Public Consultation on 24 – 30 GHz

24 In April 2021, MBIE released a technical consultation document to seek feedback on what specific portions of the 24 – 30 GHz spectrum range should be allocated to which service. This consultation closed in June 2021, and 24 submissions were received. The responses highlighted industry disagreement on how 24 – 30 GHz should be replanned.

25 Concluding the consultation was delayed in favour of progressing the 3.5 GHz allocation. Given the amount of time between the release of the consultation document, international developments, and MBIE's completion of initial technical planning, it is timely to provide a response to industry by communicating the decisions in this paper.

Consultation responses highlighted competing interests in the mobile and satellite industries

- 26 Mobile providers indicated they want preferential allocation of the full 24 – 30 GHz range. Mobile providers argued that their spectrum use is more frequent and effective than satellite services. They claim that giving satellite sole or preferential access would not be an efficient use of radio spectrum.
- 27 The satellite industry noted the lack of substitute bands for satellite services when compared to mobile (which have a diverse range of bands available for use). For this reason, the satellite industry requested priority in the 28 GHz band. While there is not the same demand for spectrum from the satellite industry in 26 GHz band, there were some operators who wanted to be able to access the 26 GHz band at some specific remote locations as a lower-priority user.

Recommendations for high level band planning

- 28 Given the progress and shape of international developments, as well as initial feedback from industry through the 2021 consultation process, I consider that we should move forward with making high level decisions around future use of the 24 – 30 GHz spectrum.

I recommend the 26 GHz band (24.25 – 27.5 GHz) be primarily allocated for mobile use, with the option to include some satellite services in some areas under technical conditions

- 29 The major contributions to this recommendation are the:
- 29.1 international identification for mobile in the band at the World Radiocommunication Conference in 2019
 - 29.2 maturing equipment ecosystem in this band for mobile
 - 29.3 nature of mobile needing wide area coverage
 - 29.4 28 GHz band being in higher demand for satellite services.
- 30 The word ‘primarily’ reflects that mobile services will have priority access over satellite services in the 26 GHz band.
- 31 The phrase “with the option to include satellite services in some area under technical conditions” provides scope to include satellite services following further work by officials. This is so that, if it is possible (determined by technical planning work) the radio spectrum may be used to its full capacity.

I recommend a portion of the 28 GHz band (27.5 – 28.35 GHz) should follow a sharing model between mobile and satellite services

- 32 Given there is interest and strong use cases from both satellite and mobile, I have been advised by MBIE officials that spectrum sharing is technically feasible and a way to accommodate both services.

Confidential advice to Government

33

34

35

36 Developing the details of the spectrum sharing model will be informed by further technical work and industry consultation.

I recommend the other portion of the 28 GHz band (28.35 – 29.5 GHz) be primarily allocated for satellite services, with the option to include some mobile use under technical conditions

37 The word ‘primarily’ reflects that satellite services will have priority over mobile in this band and is intended to give the satellite industry security in their access to spectrum so they may invest in New Zealand.

38 To date, only 29.5 – 30 GHz has been made available for some satellite services. In expanding access to 28.35 – 30 GHz, we will be allowing for more bandwidth. This will result in faster data rates, and faster services for customers.

39 The phrase ‘with the option for mobile use under strict technical conditions’ is indicative of the future steps to be taken. Officials will undertake further analysis on whether, under certain technical conditions (like restricting mobile use to indoors only), mobile may also be able to access this band.

Potential industry response

40 It is important to note that these are high level decisions to provide the industry with clarity of direction, and there are still further decisions to be taken before this spectrum is available for long term use.

41 It is likely that the industry will be pleased that there is clarity on the future of 24-30 GHz spectrum. However, given the competition between satellite and mobile I expect that the industries will continue to voice their desire for more spectrum or preferential access. Further consultation for future decisions will provide for industry input; technical discussions are planned to commence in late 2023, with further public consultation intended to occur in late 2024.

Implementation

- 42 Making new spectrum available to service providers and operators is a complex process. This is because of the:
- 42.1 substantial interest from two industries (mobile and satellite) whose needs will need to be balanced
 - 42.2 complex and evolving technology relevant to this spectrum range
 - 42.3 Confidential advice to Government [REDACTED]
- 43 Our most recent allocation, focused on making the 3.5 GHz band available for 5G mobile use, saw initial Cabinet decisions in late 2018 [DEV-18-MIN-0311]. However, contracts for the mobile network operators to access this spectrum were not finalised until earlier this year. These lengthy timeframes are typical for radio spectrum allocations, due to the technical engineering work and consultation required.
- 44 MBIE have an initial work plan to make this spectrum available in May 2026. This includes Cabinet decisions around further consultation, which will likely be sought around the end of 2024, before final decisions in Confidential advice to Government 2025.
- 45 Further allocation work will also need to reflect the Memorandum of Understanding signed by the Crown and the Māori Spectrum Working Group in February 2022. This agreement commits to an allocation to Māori of 20% of all commercial spectrum that is allocated using the radio spectrum Management Rights regime.
- 46 Subject to the decisions in this paper, MBIE intends to offer satellite services longer interim licenses until May 2026 under MBIE's usual administrative licensing regime. This will be done so satellite services may continue in New Zealand while work progresses to make this spectrum available for longer term use.

Cost of Living Implications

- 47 At this point in the process, there are no direct cost of living implications.
- 48 Choices to come in future around allocation approaches will impact on competition in the satellite and mobile network markets. The nature of this band may also enable new technologies, which could have a positive impact on economic growth.

Financial Implications

- 49 At this point in the process, there are no financial implications.

- 50 Making spectrum available to industry can generate revenue for the Crown through resource charging or the sale of Management Rights. In the case of 24 – 30 GHz, the financial implications of various options will be considered at the time decisions are made in future. Generating revenue is not the primary objective of spectrum allocation.

Legislative Implications

- 51 The decisions sought in this paper have no legislative implications.

Regulatory Impact Statement

- 52 A Regulatory Impact Statement is not required as there are no legislative or regulatory implications arising from this paper.

Climate Implications of Policy Assessment

- 53 There are no significant climate change implications arising from this paper.

Population Implications

- 54 Making spectrum in the 24 – GHz bands available is intended to derive benefits for New Zealanders, including increasing connectivity options for rural and remote New Zealanders, and enabling innovative technology use. Specific population impacts will be determined by future decisions around policy objectives and allocation approaches.

Human Rights

- 55 There are no human rights implications arising from this paper.

Use of External Resources

- 56 No external resources were involved in the development of this advice. As this project progresses, MBIE expects that external legal expertise around competition will be required, particularly in relation to our work with the Interim Māori Spectrum Commission. MBIE also expects to commission input or services related to the market mechanisms when making this spectrum available (i.e., external auction method advice, auctioneer, spectrum valuations).

Consultation

- 57 The Commerce Commission, and DPMC were consulted on this paper, and no substantive changes have been made. The Interim Māori Spectrum Commission were consulted on the high-level recommendations reflected in this paper.
- 58 This paper was also shared with the New Zealand Intelligence Community. They were interested in any future updates, and no changes to this paper were made.

- 59 The New Zealand Space Agency were consulted and contributed to this paper. They raised the need to consider international partnerships (such as NASA's Artemis Programme) in a rapidly evolving industry. MBIE will stay connected to the Space Agency as this work progresses.
- 60 New Zealand Defence Force have been made aware of this work. These allocations will not impact the bands of radio spectrum allocated to Defence.

Communications

- 61 Officials will communicate these decisions through the existing channels used for publishing technical radio spectrum announcements, e.g. the MBIE website. Officials are in the process of developing a responsive communication plan.

Proactive Release

- 62 This paper, along with the Cabinet minutes and supporting documentation, is proposed to be released on the MBIE website within 30 working days of the final decision being made by Cabinet. The release of the information is subject to redactions consistent with the Official Information Act 1982.

Recommendations

The Minister for the Digital Economy and Communications recommends that the Committee:

- 1 note that there are competing industry interests in this spectrum.
- 2 agree to the following high-level spectrum allocations:
 - 2.1 24.25 – 27.5 GHz to be primarily allocated for mobile use, with the option to include some satellite services in some areas under technical conditions
 - 2.2 27.5 – 28.35 GHz to follow a sharing model between mobile and satellite services
 - 2.3 28.35 - 29.5 GHz to be primarily allocated for satellite services, with the option to include some mobile use under technical conditions.
- 3 note that a work programme including technical design work, industry consultation, engagement with Māori, and allocation and regulatory design, will occur in coming years, with a view to make this spectrum available to the market in May 2026.
- 4 invite the Minister for the Digital Economy and Communications to report back once technical work has progressed and ahead of any further public consultation.

I N C O N F I D E N C E

- 5 note that in the interim, temporary administrative licenses will be made available for some satellite operators through MBIE, while further work on long-term allocations is underway.
- 6 note that, given the technical nature of this decision, officials will communicate it directly to relevant parties and publish it using existing radio spectrum communications channels (such as the MBIE website).

Authorised for lodgement

Hon Ginny Andersen

Minister for the Digital Economy and Communications