MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

COVER SHEET

Minister	Hon Kris Faafoi	**Portfolio**	Broadcasting, Communications and Digital Media
Name of package	**Allocation of radio spectrum for 5G Mobile [Cabinet Paper]**	**Date of issue**	27/02/19

List of documents that have been proactively released		
Date	**Title**	**Author**
12/12/18	*Allocation of radio spectrum for 5G Mobile*	*Office of the Minister of Broadcasting, Communications and Digital Media*

Information withheld

Some parts of this information release are not appropriate to be released and, if requested, would be withheld under the Official Information Act 1982 (the Act). Where this is the case, the relevant sections of the Act that would apply have been identified and are listed below. Where information has been withheld, no public interest has been identified that would outweigh the reasons for withholding it.

Section of the Act	**Reason for withholding**
6(a)	[Where the making available of that information would be likely] to prejudice the security or defence of New Zealand or the international relations of the Government of New Zealand.
9(2)(i)	[Where withholding of the information is necessary to] enable a Minister of the Crown or any department or organisation holding the information to carry out, without prejudice or disadvantage, commercial activities.
9(2)(j)	[Where withholding of the information is necessary to] enable a Minister of the Crown or any department or organisation holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations).
9(2)(f)(ii)	[Where withholding of the information is necessary to] (f) Maintain the constitutional conventions for the time being which protect— (ii) collective and individual ministerial responsibility.
9(2)(f)(iv)	[Where withholding of the information is necessary to] (f) Maintain the constitutional conventions for the time being which protect— (iv) the confidentiality of advice tendered by Ministers of the Crown and officials
9(2)(g)(i)	[Where withholding of the information is necessary to] (g) maintain the effective conduct of public affairs through—

	(i) the free and frank expression of opinions by or between or to Ministers of the Crown or members of an organisation or officers and employees of any department or organisation in the course of their duty

Budget Sensitive

Office of the Minister of Broadcasting, Communications and Digital Media

Chair, Cabinet Economic Development Committee

ALLOCATION OF RADIO SPECTRUM FOR 5G MOBILE

Proposal

1. This paper seeks high-level decisions to allocate radio spectrum, to enable the implementation of fifth-generation cellular mobile technology (5G). The paper also seeks authorisation for a group of Ministers to make further decisions, on the details of spectrum allocation, without further reference to Cabinet.

Executive Summary

2. The fifth-generation of cellular mobile technology (5G) is now becoming available, and mobile network operators in New Zealand have indicated that they will implement it as soon as 2020 (other countries are also doing so).

3. 5G involves the transmission and reception of radio waves using the radio spectrum, and spectrum will need to be made available for implementation. The Ministry of Business, Innovation and Employment is responsible for management of the radio spectrum. By convention, Cabinet decisions are sought for significant allocations.

4. There is an outstanding Treaty of Waitangi claim over radio spectrum. There is a separate, parallel process for dealing with Treaty issues. This paper does not address Treaty issues, but the proposals in it have been designed, as much as possible, *not* to limit the options for considering Treaty issues. It is impractical to delay all planning for an allocation in 2020 until the separate process is complete.

5. I am seeking the Committee's agreement to allocate radio spectrum from 3.41 gigahertz to 3.80 gigahertz (the "3.5 GHz band"), partially for national 5G (or compatible) networks, and partially for regional service providers. The total amount of spectrum to allocate directly for 5G would be contingent on the outcome of the separate process for dealing with Treaty issues. [redacted]

6. The allocation would take place in early 2020, but the associated rights to use the spectrum would generally apply from November 2022, when existing rights to use the band expire. At least some network operators will want earlier access to the band. The expectation of officials, my preference, and the view expressed informally by some operators, is that operators will negotiate commercially with existing right holders for this early access, once they know what their post-2022 rights are. [redacted]

7. National rights would be allocated as management rights for an effective term of 20 years, by auction. Management rights are akin to ownership rights. They provide maximum certainty of access to spectrum and therefore incentivise investment in use of the spectrum. Auction is the standard method for allocating new cellular mobile spectrum rights in New Zealand, and is also commonly used overseas. Auctions are relatively transparent and, with careful design, should result in spectrum going to the highest-value use.

8. [redacted] Unlike management rights, which are national rights, spectrum licences can be limited to a particular geographical area. Spectrum licences otherwise provide many of the same rights as management rights. Administrative allocation is not a typical method of allocation, but would allow the government to give priority to current users of the 3.5 GHz band, which may help to facilitate early access for national 5G operators.

9. To maintain and promote competition in the mobile market, I propose that there be a limit on the amount of spectrum allocated to any single national operator. This will prevent stronger operators from shutting out weaker operators or potential new entrants.

10. I also propose that there be some post-allocation obligations on recipients of national and regional rights. These would require that the rights be used – networks built and transmissions commenced – within a given period of time. This ensures that a scarce resource (spectrum) is not wasted, and also discourages purely speculative purchases of spectrum.

11. The decisions I seek from the Committee today are high-level decisions. There will be many more decisions to be made about the detailed design of allocation (some of these are referred to in the body of this paper), so I also seek the Committee's authorisation for the Minister of Finance, the Minister of Research, Science and Innovation, the Minister for Māori/Crown Relations, and me to jointly make those decisions without further referral to Cabinet.

Background

12. Cellular mobile technology delivers the voice and data services used on mobile phones, as well as some home and business broadband services. The technology is constantly evolving. Stages in this evolution have been characterised as "generations". International standards for the fifth generation, 5G, were recently finalised.

13. Compared to earlier generations, 5G is expected to deliver significantly faster data services than current technology. It might also deliver other benefits, such as more reliable, low-latency connections needed by autonomous vehicles, or improved infrastructure for internet-of-things devices such as smart appliances.

14. 5G is expected to become widely available internationally from around 2020. Network operators in New Zealand have signalled that they are planning to begin deployment of 5G at around the same time. The lead times for deployment are

reasonably long; operators need to plan their networks, obtain security approvals, obtain equipment, and test their networks before they begin operating commercially.

15. Cellular mobile services involve the transmission and reception of radio waves at particular frequencies. Blocks of frequencies, loosely referred to as "spectrum", are set aside for this purpose. More spectrum will be required for 5G.

16. Under the Radiocommunications Act 1989, the Ministry of Business, Innovation and Employment (MBIE) is responsible for managing spectrum allocation. By convention, Cabinet's approval is sought for significant commercial allocations. Accordingly, this paper seeks approval to allocate spectrum for 5G and for some consequential purposes.

Treaty of Waitangi

17. In public consultation on the allocation of spectrum for 5G, submissions have been made on behalf of Treaty of Waitangi claimants, and by other Māori stakeholders. These sought meaningful negotiations between government and Māori on spectrum allocation and generally argued for a direct allocation of spectrum to Māori.

18. There is an outstanding Treaty of Waitangi claim over radio spectrum (WAI 2224). It is similar to an earlier claim (WAI 776), in which the majority of the Waitangi Tribunal found in favour of the claimants. Past governments, when allocating spectrum, have rejected the recommendations of the Tribunal in WAI 776, but have simultaneously provided some spectrum for Māori broadcasting and some funding for Māori economic development. It is of course open to this government to take a different approach.

19. **This paper does not address Treaty issues.** Those issues are being dealt with separately, but in parallel. [redacted] I will report back to the Māori/Crown Relations Committee after this consideration.

20. In the interests of timeliness, it is necessary to proceed with some planning for allocation without having finalised the government's position on Treaty issues and consulted with Māori stakeholders. The decisions I am seeking in this paper have been chosen, as much as possible, so as not to cut off options for responding to Treaty claims and to ensure that Treaty discussions can proceed in good faith.

21. In particular, the decisions in this paper do not rule out a continuation of previous governments' policies. Nor do they rule out the direct award of some spectrum to Māori (5G spectrum or other spectrum), or some form of co-governance of radio spectrum. However, by definition *any* unilateral Cabinet decisions will rule out some, purer forms of co-governance, at least for the particular allocation discussed here.

Decisions to be made

22. Before allocation can occur, high-level decisions need to be made about what spectrum will be allocated (which frequencies), the method for allocation (e.g. by

auction), whether there should be any restrictions on allocation (e.g. to prevent monopolisation of spectrum), and whether there should be post-allocation requirements (e.g. use-it-or-lose-it requirements). It is those decisions that I seek from the Committee today.

23. There will also be many decisions about matters of detail. For example, if an auction were used to allocate spectrum there would need to be decisions about the form of the auction and reserve prices. I am recommending that Cabinet authorise the Minister of Finance, the Minister of Research, Science and Innovation, the Minister for Māori/Crown Relations, and me to jointly make such decisions without further referral to Cabinet.

What spectrum will be allocated?

24. The 5G standards allow for many blocks of frequencies to be used, but it is only practical to use a block if equipment for that block is commercially available. In addition, different uses are better suited to some frequencies than others.

25. This paper deals with the block of frequencies near 3.5 gigahertz (for short, the "3.5 GHz band"). This is an "early adopter" band for 5G internationally, and equipment for it will be available by 2020. This block of frequencies is suitable for communication over moderately large distances (at higher frequencies the communication distance gets shorter). It is also possible to provide sizeable chunks of spectrum in this block, which allows more and faster connections (at lower frequencies there is more congestion and it is harder to find large chunks of spectrum). In short, this is a band which balances coverage and capacity reasonably well.

26. Existing national network operators have said, in consultation, that they will need 80 to 100 megahertz of spectrum each to realise the full benefits of 5G, though it is certainly possible to run a 5G network with less than this.

27. Officials have identified 390 megahertz of spectrum that could be allocated in the 3.5 GHz band, from 3.41 gigahertz to 3.80 gigahertz. In principle, this would be sufficient to meet the stated needs of up to four national network operators. However, not all of the 390 megahertz will be available for direct allocation to national 5G network operators: the amount of spectrum actually available will depend on Treaty policy and any allocations for regional services (see paragraph 28). There will also need to be a gap, or "guard band", between the blocks allocated to the national 5G network operators and any other services in the 3.5 GHz band to prevent interference. The required size of the guard band is still being worked out in consultation with industry.

28. The 3.5 GHz band is not used heavily in New Zealand, but it is home to a score or so of users including some regional wireless internet service providers (WISPs), who will need to move from locations scattered across the band to make room for national 5G networks. [redacted]

Timing of allocation and early access

29. I am proposing allocation of spectrum from late 2022, when most existing rights to use the 3.5 GHz band will expire. There could be some exceptions where rights cover parts of the band that are not currently occupied; in those cases rights could be granted sooner.

30. Some network operators will want access to the spectrum earlier than 2022. The expectation, and the informally expressed view of some operators, is that they will negotiate with current right-holders for this early access, once they know what their post-2022 rights will be. [redacted] If it is possible to allocate new spectrum for regional services (paragraph 28) this should further encourage early access because it would provide incumbents with an obvious alternative to their current rights.

Other 5G frequency bands

31. I have already discussed how the 5G standards allow for many blocks of frequencies to be used, not just the 3.5 GHz band. In particular, there has been relatively strong interest in frequencies from around 25 gigahertz upwards (the "millimetre wave band"), and in frequencies around 600 megahertz. The millimetre wave bands could be used to provide very high capacity over small areas, while the 600 megahertz band can be used to provide lower capacity over very wide areas.

32. As the next priority after the allocation of spectrum in the 3.5 GHz band, work will begin to allocate the millimetre wave bands for 5G. Some of this work could be done in parallel with work on the 3.5 GHz allocation.

33. There will also be work to assess the practicality of using the 600 megahertz band for 5G, but this is likely to be a longer term project because the band is currently heavily used by wireless microphone users.

What methods will be used to allocate spectrum?

National spectrum rights

34. I recommend that national 5G spectrum be allocated by auction.

35. Auction is the method that has been commonly used to allocate commercially valuable spectrum rights, including rights to cellular mobile spectrum, in New Zealand. It is also commonly used to allocate cellular mobile spectrum overseas.

36. An auction is a transparent process that should ensure that spectrum rights go to the party valuing them the most. In cases where private value might not match public value, conditions can be imposed on the auction to correct this. For example, conditions may be imposed to prevent speculation or hoarding of spectrum to lock out competitors. There is further discussion of such conditions later in this paper.

37. Other allocation methods have been used in New Zealand and abroad. These include first-in-first-served allocation, comparative tender (where officials use multiple

criteria to decide which bidders should receive spectrum), and allocation by lottery. Comparative tender can be time-consuming and may appear less transparent than auction. First-in-first-served allocation and lottery can encourage speculative behaviour and would not be expected to lead directly to an allocation of spectrum to those who value it the most.

38. As has been the case for blocks of cellular mobile spectrum in the past, national 5G spectrum rights would be allocated as *management rights*. The management rights would be granted for a period of 20 years.[1] Management rights give the holder rights, akin to ownership rights, over the relevant spectrum. Management rights give operators maximum certainty of access to spectrum, and this improves incentives for the operator to invest in use of the spectrum.

[redacted]

1 This could be a single management right for a period of 20 years, or two or more consecutive management rights for a combined period of 20 years.
2 The Crown itself would have a management right, and would issue the spectrum licenses under that management right.

Restrictions on allocation to any one party

46. There are three national cellular mobile operators in New Zealand: 2degrees, Spark, and Vodafone.

47. Since the entry of 2degrees, general measures of competition in the supply of mobile services in New Zealand have improved. Real prices for mobile phone services have fallen substantially; absolute prices have come down even as the "size" of services (free call minutes, data allowances) have gone up. There is significantly more calling between, and not just within, networks, and market shares of the different players have grown closer.

48. At the same time, recent analysis by the Commerce Commission has provided some possible indications that competitive conditions might vary in different parts of the market. For instance, prices for higher-usage mobile plans remain relatively high compared to those in Australia, and 2degrees has a relatively small share of the post-paid (on-account) and business markets. There are also few significant mobile virtual network operators (MVNOs) in New Zealand, although there is some evidence that wholesale competition for MVNOs has been intensifying.[3] MVNOs provide cellular mobile services to customers using the networks of other operators. In some other developed countries, MVNOs play a more significant role than in New Zealand.

49. On the basis of the evidence currently available, officials at MBIE consider that there have been benefits from the entry of 2degrees into the market [redacted]. I also want to avoid precluding the entry of a new service or new provider.[4] For these reasons, I recommended that there be a limit (a "cap") on the amount of national 5G spectrum given to any single operator, to prevent stronger players in the market from shutting out weaker incumbents or potential new entrants. For example, supposing that 320 megahertz could be made available for national 5G networks (this is hypothetical; see paragraph 27) then a cap of 80 megahertz per operator would allow for up to four operators.

50. I suggest that the level of any caps would be a detailed matter for later consideration by Ministers. The cap would not be higher than 100 megahertz; this is the maximum useful block size for 5G in the 3.5 GHz band, and officials consider that it is more than sufficient to realise the benefits of 5G.

51. Spectrum caps could also be used to conserve spectrum to address Treaty of Waitangi issues, if the government decided this was the way it wanted to proceed (as noted on page 3, Treaty issues are being dealt with in a separate but parallel process).

3 The Warehouse is one of the more prominent, though still small, MVNOs. It provides services over 2degrees' network.

4 There is potentially an inconsistency between recognising the relative fragility of some incumbents, and allowing for the potential entry of new services or providers. A new entrant, by increasing competition, could weaken an incumbent's position, particularly in a market as small as New Zealand's. The assumption in this paper is that new entry, while potentially disruptive to incumbents in the short term, would be good for consumers overall. However, there is some uncertainty here.

52. I note that the Commerce Commission is currently undertaking a study of competition in the mobile market that will provide a richer picture than has been painted here. However, preliminary findings will not be available until approximately April 2019, by which time the design of an allocation process will need to be well advanced if spectrum allocation is to occur by 2020. Any findings of the Commission might therefore be most useful for allocation of 5G spectrum in frequency bands *other* than the 3.5 GHz band (because these will occur later).

53. This paper is concerned with the allocation of spectrum, but I also note that there are some other (existing) regulatory interventions that support continued competition in the mobile market: mobile phone number portability, the ability to roam on other networks in areas where the primary operator has no coverage, and some mandated infrastructure sharing.

Post-allocation requirements

54. Spectrum is a scarce resource, and so it is desirable that when spectrum rights are issued they are actually used. It is common internationally to impose conditions on auctioned spectrum rights to ensure a minimum level of use. Such conditions have also been imposed on some spectrum rights that have been allocated in New Zealand.

55. These conditions have the additional benefit of discouraging spectrum hoarding and speculation, because right holders must have real business and incur significant capital expenditure to meet the conditions.

56. I propose that requirements to use allocated spectrum be imposed on all rights allocated in the 3.5 GHz band. These would require recipients of spectrum rights to implement a network within a given period of time:

    56.1. five years for a national network, extendable to seven years on payment of a sum to be decided

    56.2. two years for a regional or local network.

57. Five years for national networks and two years for regional networks are similar to time frames imposed for other New Zealand allocations. The two year extension for national networks recognises that there is some uncertainty about the availability of equipment for, and consumer adoption of, new services such as 5G. These factors could make it difficult for right holders, through no fault of their own, to meet conditions within the given period. The requirement to pay for the extension should provide some discouragement to deliberate delay. The amount of payment is a matter of detail that I propose should be delegated to Ministers.

58. It is also necessary to decide what constitutes "use". For example, does use require a particular level of coverage (by population or area) or a particular volume of network traffic, or both? Again, this is a matter of detail that I am proposing be delegated. Broadly speaking though, use requirements would be based on expectations of a reasonable commercial implementation. It is anticipated that a reasonable deployment of 5G would focus first on areas where use is high, because that is where the benefits of 5G for consumers and network operators will be most

easily realised. It is also expected that the rate of deployment will depend on availability of equipment, such as 5G-enabled cellphones, and the readiness of consumers to adopt 5G.

59. Imposing more onerous requirements, such as requirements for wide population coverage in a short time, could go beyond discouraging hoarding and speculation, and make the required investment unaffordable for some incumbents or potential entrants.[5]

Other matters

60. 5G technology could raise new security concerns. [redacted]

Next steps

61. Following this paper, and to the extent that the Committee agrees to its recommendations, officials will immediately begin working on the details of the allocation process. Consultation on the allocation design is expected to take place in the third quarter of 2019. Actual allocation by auction (if that recommendation is accepted) could then take place in the first quarter of 2020.

62. Work on Treaty of Waitangi issues will continue in parallel with this.

63. There will also be work to facilitate the departure of existing users from 5G bands as early as possible. Officials are already working with some existing satellite users to find alternative frequencies or locations and, [redacted]

Consultation

Public consultation

64. In March 2018, MBIE released a discussion document seeking views on the allocation of spectrum for 5G. Several hundred submissions were received. Most of these were concerned with the possible health effects of electromagnetic radiation or spectrum availability for radio microphones (see paragraph 33), but submissions were also received from mobile network operators and other radio service providers ("industry submitters").

65. **Industry submitters** were largely in agreement with the proposals in the discussion document to allocate spectrum in the 3.5 GHz band for 5G, and to allocate this before spectrum in other bands that can be used for 5G. Submitters sought more spectrum than was suggested in the discussion document. Officials have subsequently identified more spectrum that could be made available (this is reflected in the 390 megahertz mentioned in paragraph 27).

5 Alternatively, or additionally, it could reduce the price that network operators are willing to pay to the government for 5G spectrum.

66. Some industry submitters that are current users of the 3.5 GHz band were concerned about what would happen when their rights to use the band expire in 2022. MBIE has been working with some of these users to find alternative frequencies and develop transition plans. [redacted]

67. **Radio microphone users** were concerned that they would lose access to the 600 megahertz frequency band that they use at the moment, if that band were allocated for 5G. This paper does not make any recommendations about the 600 megahertz band, but officials are looking at the feasibility of any future allocation in that band and have met with some radio microphone users in connection with this.

68. The possible **health effects** of exposure to electromagnetic radiation generated by 5G were a concern to many submitters. The frequencies to be used by 5G cell sites and devices are similar to those that have been used by existing technologies for many years, and are covered by the limits recommended in the New Zealand radiofrequency field exposure Standard NZS 2772.1. The Resource Management Act requires that all cell sites, including those that eventually use 5G, comply with those limits. The Ministry of Health monitors research in this area and keeps up to date with developments in health-based exposure standards. The Ministry of Health has updated its website to include information about 5G.

Consultation with government agencies

69. The Treasury has been consulted about this paper. Treasury is broadly supportive of the recommendations of the paper, [redacted] Any expectation of government assistance would reduce incentives to make market-based arrangements.

70. The Department of Prime Minister and Cabinet has been informed about the proposals in this paper.

71. The Commerce Commission has been consulted about the proposal to impose spectrum caps. The Commission's comments are reflected in the body of this paper.

72. The Ministry of Health has been consulted about the references to health effects in this paper. The Ministry's comments are reflected in the body of this paper.

Financial Implications

73. No funding is sought in this paper. However, Budget bids are being separately prepared in relation to Treaty issues and early access to the 3.5 GHz band (paragraph 30).

74. Commercial allocations of cellular mobile spectrum have raised large amounts of government revenue. For instance, in 2013 there was $270 million raised by the auction of 90 megahertz of spectrum in the 700 megahertz frequency band. Revenue is recognised in the Crown accounts over the life of the spectrum right (in

the case of a 20 year right, the revenue would be apportioned over 20 years). As a result, the impact on the operating balance in any single year is relatively small.

75. At this stage it is difficult to predict the revenue from the auction of spectrum in the 3.5 GHz band. In other countries that have auctioned spectrum for 5G, revenue has been quite variable. Taking an average of publicly reported figures suggests that if 320 megahertz of spectrum were auctioned in a country of four million people, revenue would exceed $200 million, but this should be regarded as no more than a very general indication.[6]

76. If an auction is used to allocate spectrum and spectrum caps are imposed, the amount of winning bids can be significantly influenced by the reserve price, which is set by the government. A high reserve price boosts revenue as long as the auction is fully subscribed, but also increases the chance that the auction will not be fully subscribed (because only financially strong bidders can reach the reserve). If you agree to the recommendations of this paper, officials will undertake further work to provide advice to Ministers about an appropriate reserve price (or prices).

77. Revenue maximisation has not been a goal of spectrum allocation in New Zealand to date; the primary goal is to maximise the value of spectrum use for New Zealanders.

78. In some previous allocations of spectrum, governments have provided the option for recipients to pay by instalment, at a rate of interest commensurate with risk, in recognition of straitened circumstances. I will be considering the case for instalment terms for the 3.5 GHz allocation, as part of detailed design of the allocation. Because an offer of instalment terms is recognised as a loan, approval from the Minister of Finance would first be required under the Public Finance Act.

Legislative Implications

79. The proposals in this paper do not require legislation.

Impact Analysis

80. The proposals in this paper do not require an Impact Statement because they do not involve the potential introduction of new legislation (bills or regulations), or changes to/the repeal of existing legislation.

Human Rights

81. No human rights implications have been identified.

Publicity

82. [redacted]

6 This is based on reports of revenue in public sources, for Hungary, South Korea, Spain, the United Kingdom, Italy, and Finland, converted to dollars per megahertz per head of population. Auction design, regulatory settings, and commercial environments can differ widely across nations, so it is difficult to reliably generalise these results to other jurisdictions.

83. However, there is pressure to make public announcements about the government's plans for spectrum allocation for 5G. In particular, one mobile network operator, Spark, has publicly and repeatedly expressed a desire for the government to reveal how much spectrum will be available and when.

84. Contingent on the Committee's decisions today, I therefore propose to make some general announcements to indicate that the government plans:

- to allocate spectrum for 5G in the 3.5 GHz band
- by auction in or before the first quarter of 2020
- with the exact amount of spectrum to be determined later, following engagement with Māori and further consideration of the needs of other potential users of the band
- and with further consultation on the detailed design of the auction and other aspects of the allocation in the second half of 2019

Also, that the government is planning, as its next priority, to investigate the allocation of spectrum for 5G in the millimetre wave bands.

Proactive Release

85. [redacted]

Recommendations

The Minister for Broadcasting, Communications and Digital Media recommends that the Committee:

1. **Note** that the 5th generation of cellular mobile technology (5G) is becoming available and that New Zealand network operators are planning to implement it as soon as 2020.

2. **Note** that 5G will require additional radio spectrum, and that the band of frequencies near 3.5 gigahertz ("the 3.5 GHz band") has been identified as the best band to allocate for this purpose.

3. **Note** that there is an outstanding Treaty claim over radio spectrum, and that Māori stakeholders have requested further engagement with the government before spectrum is allocated for 5G.

4. **Note** that there is a process, separate from the proposals in this paper, to consider Treaty issues, and that the proposals in this paper have been designed so that they will, as much as possible, *not* narrow the range of options for addresses Treaty issues.

5. **Agree** that, subject to the outcome of the process for considering Treaty issues, the spectrum between 3.41 gigahertz and 3.80 gigahertz be *partly* allocated for national 5G (and compatible) networks.

6. **Note** that there are some existing users of the 3.5 GHz band, including regional wireless internet service providers (WISPs), with rights that mostly expire in late 2022.

7. [redacted]

8. [redacted]

9. **Agree** that the allocations referred to above would be from November 2022, with possible exceptions for portions of the spectrum that are currently unoccupied (these could be allocated earlier).

10. [redacted]

11. **Agree** that rights for national networks be allocated as management rights, by auction, for a term of 20 years, either as a single right or a series of consecutive rights.

12. [redacted]

13. **Authorise** MBIE to create the management rights necessary to enable these allocations.

14. **Agree** that a limit ("cap") will be imposed on allocations of national rights to any single operator, to maintain and foster competition in the mobile market.

15. **Agree** that post-allocation requirements be imposed on both national and regional allocations, to ensure that rights are used for their intended purpose and not for hoarding or speculation.

16. **Agree** that post-allocation requirements will require appropriate use of the rights within five years (national rights) or two years (regional rights), but that national right holders will have the right to purchase a two-year extension, in recognition of uncertainties about availability of equipment and consumer adoption of 5G.

17. **Note** that the decisions the Committee is being asked to make will set the high-level parameters for the allocation, but that there are many matters of detail that will require further decisions.

18. **Authorise** the Minister of Finance, the Minister of Research, Science and Innovation, the Minister for Māori/Crown Relations, and the Minister of Broadcasting, Communications and Digital Media, acting jointly, to make decisions on the detailed design of the allocations in the 3.5 GHz band, without further referral to Cabinet.

19. **Note** that [redacted] have been vocal calls for the government to clarify its plans for allocating 5G spectrum.

20. **Agree** that the government should make some general announcements about the portion of spectrum it intends to allocate (3.5 GHz band), how it will allocate it (auction for national rights), and when (early 2020), while making clear that it still needs to engage with Māori and consider the needs of other potential users of the band.

21. **Note** that allocations of 5G frequency bands other than the 3.5 GHz band will be considered as the next priority, beginning with the high-frequency "millimetre wave bands".

22. **Agree** that this paper not be proactively released, because many of the matters discussed here are still under active consideration and because disclosure of some matters could affect the government's negotiating position, leading to unnecessary costs.

Authorised for lodgement

Hon Kris Faafoi

Minister of Broadcasting, Communications and Digital Media