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To: Radio Spectrum Management Policy and Planning  
From: Wireless Internet Service Providers Association (WISPA.NZ)  
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## Preparing for 5G in New Zealand

Following is a submission from the Wireless Internet Service Providers Association of New Zealand ("WISPA.NZ") in response to the RSM document "Preparing for 5G in New Zealand."

WISPA.NZ is an industry group representing 24 regional businesses who collectively provide wireless ISP services to many tens of thousands of regional, rural and remote customers. Our members' businesses have been growing gradually for more than 20 years but have come to the forefront recently with the government and Crown Fibre Holdings recognizing them as an essential component of the telecommunications landscape by awarding them funding from the Rural Broadband Initiative.

WISPs have a well-earned reputation for delivering high quality, resilient connectivity rapidly, economically and sustainably in countless areas where mainstream national telecommunications companies are reluctant to venture.

Spectrum is the foundation of our business. Therefore decisions made by RSM and the government on the issue under review will be mission critical for our members. We appreciate this opportunity to comment and look forward to remaining engaged in this process.

**Q1. What are the likely uses for 5G in New Zealand initially and in the longer term?**

- 5G will initially be used for fixed mobile substitution - as a way for mobile network operators to compete on an infrastructure level with fibre-delivered services.
- In the longer term 5G will play an important role in mobility and IoT. It is entirely possible that in time WISPs themselves might build regional 5G networks.

**Q2. Do you consider competition should be encouraged at the infrastructure level or purely at the retail level for 5G? Why?**

- The majority of 5g band spectrum in urban and peri-urban areas should be reserved for wholesale-only infrastructure providers.

**Q3. What regulatory issues need to be considered from a 5G perspective in New Zealand?**

- Clarification and/or revision of the NESTF must be undertaken. The current standard is so unclear that some local authorities request extensive RF emissions testing be done each time a radio transmitter - even a Wi-Fi hotspot - is attached to a utility

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pole.

A determination on a process for utility pole access for telecommunications should be made to ensure the owners of utility poles allow for the best use of their unique and often irreplaceable real estate. It should assume that regional telcos might seek access.

**Q4. What aspects of these regulatory issues are most significant for 5G?**

Clarification of the NESTF and a process for utility pole access are most significant for 5G projects utilising Ka band spectrum.

**Q5. Do you agree that the 3.5 GHz band is the top priority for allocation for 5G?**

No. 3.5 GHz is an additive band for mobile network operators which will be used in much the same way 2.3 and 2.5 GHz bands are used. No changes in policy should reduce the utility of 3.5 GHz band to existing rural and remote providers while 2.3 and 2.5 GHz bands still have a large amount of unused or speculative spectrum.

**Q6. Do you have any comments on reallocating 3587 to 3690 MHz for 5G?**

The cost of using the extended C band for data services is likely to drop by more than an order of magnitude, making it a viable technology for use in New Zealand - but only if spectrum is reserved for the application. Reallocation should be hardware-agnostic, noting that 5g and LTE are not synonymous.

**Q7. Do you agree that the 26 GHz band is a high priority for allocation to 5G in New Zealand?**

5G is the most appropriate terrestrial use for the 26 GHz band.

**Q8. Would this band be of interest to your organization for trials for 5G services in New Zealand?**

Unlikely in the short term.

**Q9. Do you agree that the 31.8 to 33.4 GHz, 40.5 to 42.5 GHz and 42.5 to 43.5 GHz bands are a low priority for allocation to 5G in New Zealand?**

Yes.

**Q10. When do you think equipment is likely to become available in the bands identified in Q9?**

No comment.

**Q11. Do you have any comment on the possible allocation of 27.5 to 29.5 GHz to IMT?**

5G is the most appropriate terrestrial use for the 27.5-29.5 GHz band.

**Q12. Is there demand for alternative uses other than IMT of the 1400 MHz band? If so, what uses?**

Fixed wireless may become a viable use of the 1400 MHz band. It is already used for rural CMAR services.

**Q13. When is the demand likely to require consideration of reallocation of the 1400 MHz band for IMT, if at all?**

Existing L-band linking users should be prepared to migrate to L-band linking compatible with an IMT channel plan from 2019.

**Q14. Is there a need for more sub 1 GHz spectrum for IMT/5G?**

Yes.

**Q15. If so, how should we deal with radio microphones in the 600 MHz band?**

Sub 1 GHz spectrum could be reserved for rural and remote use, avoiding conflicts with the majority radio microphone users.

**Q16. When is the demand likely to require reallocation of the 600 MHz band to IMT, if at all?**

- Plans should be made to reallocate the 600 MHz band to IMT from 2019.

**Q17. Which allocation methodology should be used for allocating spectrum bands identified for use with 5G? Why?**

□ The majority of all Ka band 5g spectrum in urban and per-urban areas should be reserved for administrative allocation to a single wholesale-only national infrastructure provider. Some national rights blocks should be made available for auction should one or more operators prefer to compete at an infrastructure level.

Some blocks should be made available for administrative allocation on a regional basis.

□ 80MHz of 3.5 GHz spectrum should be retained for administrative allocation on a regional basis, harmonised with the other technologies, noting that regional operators can utilise this more efficiently than national operators. A portion should also be reserved for administrative allocation to a wholesale-only national infrastructure provider. Some blocks should be made available for auction should one or more operators prefer to compete at an infrastructure level.

□ The majority of all sub 1 GHz 5g spectrum on a national basis should be reserved for administrative allocation to a wholesale-only national infrastructure provider. 20MHz should be made available in 5MHz blocks for regional Managed Spectrum Park. Some national blocks could be made available for auction should one or more operators prefer to compete at an infrastructure level.

**Q18. Should different allocation mechanisms be used for rights for regional providers and national providers? Why?**

□ Providers wishing to acquire a national spectrum block for private use should compete via auction for that block. By winning, they have the long-term right to exclude others from using the spectrum, which they may choose to use only in areas where population density will support its commercial use.

□ Regional providers should be administratively allocated spectrum with criteria favouring providers with existing networks and revenue to support a build.

**Q19. Should deployment of 5G technology be specified for some or all bands? If not, why not?**

□ Technology or air interface should only be specified where not doing so would limit the utility of neighbouring spectrum blocks. In areas of low population density, regional providers should be able to use cost and power efficient technologies whatever their air interface as long as that use does not impact on users wishing to implement 5G.

**Q20. What implementation requirements should be specified and how should these be expressed? – time, extent, etc –.**

□ No implementation requirements should be specified for blocks sold at auction, provided significant blocks are also available for administrative allocation. Administrative allocation of spectrum should only be done for providers with existing networks, customer bases, and financial support to begin implementing a production network immediately. Administrative allocations that do not progress towards a pre-agreed build plan within eighteen months of allocation should be withdrawn.

**Q21. What should be the consequence of non-implementation – lose spectrum, additional payment, other**

□ Non-implementation of administratively allocated blocks should result in the loss of spectrum.

**Q22. Should the implementation requirements be different for regional and national providers? What should these be and why?**

Implementation requirements should be a condition of administrative allocations, but not of auction blocks, provided the majority of spectrum in each band is administratively allocated.

**Q23. Should acquisition limits be imposed on 5G bands? If so, what should these be and why?**

No retail provider should be allowed to acquire more than 25% of any band, and this should be subject to timely implementation. This will ensure that wholesale-only providers have adequate spectrum to offer robust urban & rural products without disadvantaging retail providers competing on cost.

**Q24. Should acquisition limits be imposed for regional providers? If so, what should these be and why?**

Acquisition limits should be applied to all retail providers proportionate to the number of operators in the region. The maximum for one operator should be 50% of regionally allocated blocks (or minimum of 1 TDD channel or 2 FDD channels @ 600MHz, 2 channels at 3.5GHz, 1 channel @ Ka Band).

**Q25. What term should be used for management rights suitable for 5G? Why?**

A minimum ten year term should be applied to 5G management rights to reflect the fast-moving technology.

**Q26. Should the 5G bands be replanned as TDD bands or some bands or parts of bands be retained as FDD? Why?**

- 10MHz of the 600MHz band should be assigned as TDD for IEEE 802 (a.k.a. Super-WiFi) in rural areas. The balance should be offered as FDD to match existing sub-GHz band plans.
- 3.5 GHz band should be replanned as TDD to most efficiently use the spectrum.
- Ka band should be replanned as TDD to most efficiently use the spectrum.

**Q27. What bandwidth should be used as the basis for allocation? Why?**

- 600 MHz band should be offered with a basis of 5 MHz bandwidth to match existing sub-GHz band plans.
- 3.5 GHz band should be offered with a basis of 10 MHz bandwidth to compromise between efficiency and fair distribution of spectrum.
- Ka band should be offered with a basis of 100 MHz bandwidth to compromise between efficiency and fair distribution of spectrum.

**Q28. What out of band emission limits should apply to management rights when first created for allocation? Why?**

Out of band emission limits to suit the 5G air interface should be applied to management rights to ensure the most efficient possible use of the spectrum.

**Q29. Should out of band emission limits be different if the band is technology neutral? If so, what out of band emission limits should be applied?**

No. Even in technology neutral bands, 5G compatible limits should be implemented to ensure the most efficient possible use of the spectrum.

**Q30. How should interference between adjacent frequency 5G TDD networks be managed? Should this be the same for all frequency bands?**

It should be up to providers with adjacent 5G TDD networks to manage their own interference.

**Q31. How should interference between different technologies within the same band be managed, if bands are technology neutral?**

Using 5G compatible (and most restrictive) out of band emission limits will eliminate the potential for interference between different technologies within the same band.

**Q32. Should regional uses be provided for in the 3.5 GHz band plan? Why?**

Yes. 3.5 GHz is an additive band for national mobile network operators which will be used in much the same way 2.3 and 2.5 GHz bands are used. On the other hand, 3.5GHz is currently

important to regional operators as a radio access technology. No changes in policy should reduce the utility of 3.5 GHz band to existing rural and remote providers while 2.3 and 2.5 GHz bands still have a large amount of unutilized (or vacant) spectrum.

**Q33. If allowed in the 3.5 GHz band, how could this be managed or facilitated?**

Some 3.5 GHz band allocations should be divided between national urban allocations and regional rural ones, with sufficient peri-urban buffer areas to ensure no significant coordination or interference mitigation is required between providers.

**Q34. Which alternative bands may be suitable for regional allocation? Why?**

Alternative bands are only suitable for regional allocation where equipment is widely available and inexpensive. The 2370-2395 MHz and 5060-5150 bands would be ideal for this purpose.

**Q35. Is early access to the 3.5 GHz band required for roll out of 5G networks prior to the expiry of existing rights in 2022? If so, why?**

No. 3.5 GHz is an additive band for mobile network operators which will be used in much the same way 2.3 and 2.5 GHz bands are used. This band is not a high priority.

**Q36. How could early access to the 3.5 GHz band be achieved?**

Allocated (non-auction) blocks of 3.5 GHz band could be issued immediately.

**Q37. Should the government be involved in early access arrangements for the 3.5 GHz band?**

Yes. Government should immediately claw back all speculative spectrum which has not been used to build significant regional or national networks. If the law permits this should be with no compensation.

**Q38. Is early access to the 26 GHz band required for roll out of 5G networks prior to the expiry of existing rights in 2022? If so, why?**

Yes. From a technical innovation standpoint, it's important that New Zealand businesses be able to use 5G networks as soon as a standard is issued.

**Q39. How could early access to the 26 GHz band be achieved?**

Government should immediately claw back all spectrum which has not been used to build significant regional or national networks, with no compensation. In the few cases spectrum has been used for microwave linking, government should offer to purchase existing links at their replacement value, providing a capacity matched link in an alternative band such as 23GHz.

**Q40. When is demand for the bands above 30 GHz likely to eventuate?**

Demand for Q band spectrum is immediate, and its reservation for 5G technologies has already held back innovation in New Zealand

**Q41. When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?**

Demand for 600 MHz spectrum is likely to eventuate immediately post WRC-19. MSS demand for 1400 MHz band is likely to eventuate within the next five years.



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