# Wireless Internet Service Providers Association NZ Incorporated

## 3.3 GHz Non-National Broadband Use in New Zealand

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# 1 EXECUTIVE SUMMARY

WISPA.NZ, representing wireless Internet service providers all over New Zealand, appreciates the opportunity to submit a response to the consultation document 3.3 GHz non-national broadband use in New Zealand.

Wireless Internet service providers provide internet and phone services mainly to rural New Zealand. Over the past 16 years some of our members have made extensive use of the 3.5-3.8GHz band mainly for mainly for fixed wireless access. These licences are expiring next year so we are very keen to ensure that the future management of this band has an allowance for rural broadband use to allow us to expand as customer usage grows.

We welcome the review of this process as a number of our members have indicated this as a key issue for their future.

Our response is based on the combined knowledge and experience of 28 WISPS throughout New Zealand who have been providing wireless services for up to 20 years. We have a well-deserved reputation of innovation and thinking 'outside the square' to provide unique and effective solutions for our customers.

# 2 INTRODUCTION

## 2.1 INTRODUCTION TO WISPA.NZ

WISPs – or wireless Internet service providers – are the key to broadband in rural New Zealand.

They provide Internet connectivity by fixed wireless, mostly in regional or rural areas where mainstream telecommunications companies don't bother going. WISPs connect to a fibre optic link at a central point (this is known as "backhaul"), install a series of fixed wireless receivers and transmitters on hilltops or high buildings, and bounce the wireless signal across a series of these sites to a cluster of end users in a rural area.

Here in New Zealand there are about 30 WISPs. Most of them operate in a single region. Nearly all are privately owned businesses run by an owner operator who is active in the business day by day. This makes them very accessible and responsive in terms of their customer service. There are no interminable waits for a call centre to answer in Asia; your local WISP is just down the road..The services, speeds and prices WISPs offer are highly competitive with urban suppliers.

Often the service quality is indistinguishable from the fibre-to-the-premises offered in big cities. And WISPs are as good as anyone for reliability – for example, during the Kaikoura earthquake in 2016 the local WISP, Amurinet, stayed on line uninterrupted, keeping the community connected during the recovery phase while every other fixed and mobile service provider went off line.

WISPA-NZ – or more fully the Wireless Internet Service Providers Association of New Zealand Inc – was established in January 2017. Our purpose is to be a unifying point for the WISPs, liaise with central and local government, provide a collective voice for members, negotiate collectively (eg for joint purchase or leasing of wireless spectrum) and do whatever else the members collectively decide.

For example, we have made representations to Radio Spectrum Management about future spectrum policy, submitted to the Commerce Commission's review of backhaul pricing, and entered negotiations with several parties about commercial arrangements that will advantage members' businesses and customers.

Issues continue to arise. Examples include collective liaison with various Retail Service Providers, the impact of the new legislation enabling lines companies to run fibre across existing power corridors, and the business model of the future for WISP businesses.

WISPA-NZ has 28 member companies. Details of these can be found on our Members page.


## 3 RESPONSE TO QUESTIONS SPECIFIC TO OPTIONS PRESENTED.

Q1. Do you agree that the 10 MHz between 3.40 – 3.41 GHz should be included with the 3.41 - 3.80 GHz band (the 3.5 GHz band) that will be made available for national use?

We would agree with this only if there can be synchronisation between adjacent users below 3.4GHz and those above 3.4GHz. We are proposing LTE Frame structure 2 special subframe 7 as the structure for synchronisation so this needs to be the case for users in both bands. If this is not possible, for example if the proposed 5G Numerology 1 DD DS UD DD SU DD DS UD DD SU frame structure that is currently proposed for 3.41 to 3.8GHz becomes the standard, then we suggest that the 3.4 to 3.41 frequency range is used as a guard band between the two bands for unsynchronised transmissions that cover up to 3.4GHz. Then only users who can synchronise with whatever standard is agreed on for 3.41 -3.8GHz could operate in this guard band.

Q2. What is your view on using the 3.3 - 3.4 GHz band for regional broadband and/or private networks? Are there other use cases of this band that should be considered?

We definitely agree with regional broadband as for primary use and private networks as secondary use. These use cases will ensure a high level of use due to demand of spectrum for both of these cases but especially regional broadband.

Q3. Do you agree with our assessment of current spectrum use and potential impacts?

Yes. We agree that it is greatly underutilized and that synchronisation is important to avoid guard bands and to make the most efficient use of the spectrum. We could look at non-synchronised traffic that cannot be geographically isolated to be limited to 3.300 to 3.350 to minimise interference.

Q4. Do you agree with the assessment that regional and local use will not be able to coexist in the same geographic area on the same frequency. If not, why?

Our first choice would be Scenario 3 and our second Scenario 1. We do not agree that regional and local use will not be able to co-exist in the same geographic area on the same frequency in all areas so would prefer that this is managed on a case-by-case basis. Synchronisation can make this much easier.

Q5. Do you agree that both regional and indoor use as well as local and indoor use could be manageable in the same geographic area on the same frequency. If not, why?

Yes – we agree that indoor use could be managed along with regional and local use.

Q6. Do you agree that the most effective way to manage spectrum in this band is to have contiguous services with a common frame structure and timing (synchronisation)? If not, why not?


Synchronisation offers the best use of the spectrum as it allows operators to have adjacent spectrum without interference and will allow operation right up to the adjacent 3.41-3.8GHz band providing that the same frame types are used. We are proposing LTE Frame structure 2 special subframe 7 because this is already in use in Europe and the USA and allows 4G LTE and 5G networks to synchronise. There could be an argument for non-synchronised operation however this would be better in the lower part of the band and a guard band would be necessary between synchronized and non-synchronised operators.

Q7. What are your preferred options for a band plan for the 3.3 - 3.4 GHz band? Are there other options we should consider, if so please explain what these are?

We agree that the primary use should be regional broadband and the secondary uses for local and indoor use.

Q8. How much spectrum is required for regional and uses and how much is needed for Local use?

100MHz of spectrum is the ideal requirement for regional use as four sectors of 20MHz carriers (80MHz) is the minimum required to meet the government's rural broadband requirements. Local use would not require more than 40MHz due to the lower bandwidth requirements of typical local applications.

Q9. What equipment options and standards should we consider for the 3.3 GHz band?

Although the vast majority of the usage in the band will be 4G LTE, 5G NR and DMRS the band should not be restricted to certain technologies. For example, the Cambium PMP450m uses this band for fixed broadband use and uses its own proprietary technology. However, all equipment may have to synchronise in the band and meet required adjacent channel leakage specifications so this will limit the technologies that can be used.

The 3.5GHz Technical Working Group proposed a TDD Frame structure 5G Numerology 1 DD DS UD DD SU DD DS UD DD SU. Unfortunately we have not been able to find a 4G equipment vendor that can synchronise with this structure. For that reason we strongly suggest that we adopt the TDD Frame Type 2, Special Subframe 7 as used in CBRS in the USA and extensively in Europe to support 5G and 4G co-existence.

Q10. If we adopt multiple standards how should we manage interference issues while minimising inefficient use of spectrum?

See our reply to Q.6: We suggest that synchronisation should be mandatory for the top 60MHz and optional for the lower 50MHz however synchronised operators should have priority over non-synchronised in the lower part of the band to ensure the most efficient use and no-synchronised users would need to use a guard band to avoid interference.


Q11. Do you agree that we should seek to permit all three use cases, indoor, local and regional uses in the 3.3 GHz band? Do you agree with our mix of use? If not which cases should we permit?

As in Q7 we agree that the primary use should be regional broadband and the secondary uses for local and indoor use.

Q12. What authorisation mechanisms should we use for indoor, local and regional use cases non-national access in the 3.3 – 3.4 GHz band? Are there any other mechanisms that should be considered?

We believe that a Spectrum Access System similar to what is being used for CBRS in the USA should be consider as it allows different tiers of access with different priorities and allows for very efficient use of the spectrum without interference. WISPA.NZ would be interested in considering managing a system.

Q13. What are sort of rules should be applied to the authorisation mechanisms to ensure compatibility and fair access?

For indoor use we would prefer first in time licences over a General Authorisation licence due to the possibility of interference caused by indoor users to regional and local users.
For local use we prefer First in Time with Interference co-operation mechanisms in place.
For regional use technically pre-planned licences available on a first in time basis would be the best system with priority being given to operators who have a proven record of using the 3.5 GHz spectrum in that region as these users will lose that spectrum in October 2022.

Q14. How should we prevent spectrum denial / hoarding/ speculating of licenses? Should we adopt one of the existing models that RSM already employs or what new model should we use in the 3.3 GHz band?

Spectrum hoarding can be addressed by having implementation dates that are enforced to ensure that it is used effectively. Speculating of licences can be addressed through organisations who have spectrum allocated having to have proven capability to build and use the spectrum. The RSM could consider allocating all or part of the spectrum, for example, to WISPA.NZ to manage on behalf of its members who provide rural broadband all over New Zealand.