From: Russ <russw@countrynet.co.nz>
Sent: Monday, 2 August 2021 5:41 PM
To: Radio Spectrum
Subject: "3.3 GHz use in New Zealand"

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?

From a spectrum allocation point of view I agree with the inclusion of
3400-3410 MHz in the national allocation.

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?

I agree that the services provided by WISP operators are important and those of the private utility services. In the utility network case this provides a suitable secure spectrum so that local utilities are accommodated and do not out bid for, and then under use managed spectrum park and other.

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

There are a huge number of impacts but pertaining to the above mentioned use cases Q2 there is sufficient equipment available or already in use to meet the synchronisation, frame coincidence in the time domain and bandwidth to happily coexist even although they may have completely different structures. There is no need to define those other modulation parameters as long as the bandwidth used, the transmit start time, the transmit stop time, any guard time, the receive start time, the receive stop time and any guard time is honoured. Indeed we have Cambium (formerly Motorola Orthogon) equipment which has just those characteristics to co-exist with LTE and other. It does not matter what the internal frame structure is as we have no interest in decoding or encoding such other modulations. The impact to Amateur Radio would suggest an allocation below 3.3 GHz following the example of Australia.

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?

Local authorities and utilities are particularly risk averse, particularly with loss of connectivity to remote plant and for good reason, where this might result in sewerage spills, risk of electric shock due to failure to disconnect and other. Their bandwidth requirements however are less so this might be in a number of narrower segments since they are not trying to deliver high bandwidth streaming to the masses. Possibly usable as guard bands since the level of investment in interference mitigation and quality is likely to be high.
It might also be possible for multiple utilities to agree to share a piece of spectrum for these reasons.

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?

It is uncertain that there is even a need for indoor use case since the extensive spectrum availability in the 5 GHz lan space can be used. The use of this spectrum indoors is going to have a serious problem of blinding both local and regional multi-point receivers in an unmanageable manner. The only possible co-incident use would be where the owner has both the indoor and outdoor rights so have the responsibility to self manage.

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?

To prevent misunderstanding only the bandwidth, sync and frame overview ie start/ stop / guard need to be defined not the specific modulation, as they can happily co-exist even if they cannot understand one another.

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?

Since there is only 100 MHz available a preferred structure might be 4 x 20 MHz regional channel with 4 x 5MHz local channels. With the use of massive muMIMO a 20 MHz channel provides a substantial throughput for internet use and the 5 MHz channels with one possible aggregation to 1 x 10 and 2 x 5 seems appropriate. It is to be encouraged by not offering excessive bandwidth to achieve the adoption of highly spectrum efficient devices, not the cheapest. The EIRP needs to be maintained the order of +40 dbmi so that multiple frequency reuse can be encouraged. The users might be able to split their spectrum in to 2 x 10 MHz which will be synced around each base station location. If 20 MHz channels are used in this mode then only 2 operators per region can be accommodated which is likely to generate perverse and outcomes.

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

As previously suggested 80 MHz for regional and 20 MHz for local with a 4 x 4 split.

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

Those which can meet the time domain, bandwidth and sync spec. The modulation discussion is spurious as it does not matter that these transmissions are not readable by others, only that they can happily co-exist.

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

The same misunderstanding. The modulation standards are irrelavant providing transmit start /stop , receive start / stop and any guard times are honoured. I am surprised that this question was even presented as the modualtion standard does not matter so long as the frame time domain, the sync and the bandwidth are the same.

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?

Indoor use would have to be to the coincident outdoor allocation so interference and blinding could be self managed. With different operator RSM would have to arbitrate when indoor and outdoor conflicts arise. ie poisoned chalice

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?

Unlike the national allocation where there are five or less providers certain to get 40 MHz of spectrum or more in this space there are tens of providers likely to be interested in 80 MHz with most likely to get

nothing and only the big pockets prevail meaning most will have to depend on existing GURL. The requirement to use technology exceeding 20 bits per Hz would be useful as would minimum multi-point antenna sizes. Co-incidently a tweak of the 5GHz GURL to require the use of minimum size of approved multi-point aerials could make a big difference.

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

In that this is a small drop in a big ocean..... good luck.

As I have said in the past the best way is a GURL with minimum multi-point antenna size rules, breath a sigh of relief and let it manage itself. The heat I have seen already suggests an endless bun fight.

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?

As previously mentioned there is a high possibility of all of these perverse outcomes and the small fry who are trying the hardest will be excluded and those remote locations will be out of the economic comfort zone of the big operators so many New Zealanders will miss out or have to use satellite service which are high cost and will congest as they can only use their frequencies once.

Let innovation and decent effort of NZ small business rule the day rather than the weighty pockets of the mighty who will only serve the low hanging profit.

I welcome further dialogue.

Regards,

Russ

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