

Cambium Networks

Response to Consultation paper: Preparing for 5G in NZ

30th April 2018

Roy Wittert
Regional Sales Director
roy.wittert@cambiumnetworks.com



© 2017 Cambium Networks. All Rights Reserved.

Cambium Networks values the opportunity to provide input to the consultation process.

General feedback/comments on the document:

“5G is the next generation of the global broadband multimedia international mobile telecommunication systems, known as IMT. 5G is not yet fully standardised but its key specifications and technological building blocks are being developed and tested. Trials of 5G technology are planned overseas starting in 2018 and are likely to begin in New Zealand prior to 2020.”

Cambium – Roy Wittert – Response/Comment

5G standards will be defined in IMT-2020. ALL IMT specification include use case for both FIXED and Mobile Broadband. The use case and allocation of spectrum to include the FIXED use case should not be ignored. Even today 4G(LTE) technology is being used to deliver Fixed services. Along with the use of standards based IMT solutions there are a number of solutions that will use proprietary radio/air protocols, but still implement common spectral models using ODFM, TDD and even use of Massive MU-MIMO. Spectrum planning should focus on the efficient and flexible allocation for the 3.5GHz band for TDD use and strong consideration for implementing Dynamic Spectrum Licensing Models (DSLIM) along the lines of CBRS in the US. The MAJOR requirement is not to allow the HYPE of 5G and mobile use case to overvalue the spectrum and make the Fixed Wireless use case economically impossible and hence impact the importance use of licensed spectrum in rural and regional areas to bridge the digital divide. I make specific reference to the 3.4-3.8GHz spectrum defined for 5G by the ITU in IMT-2020.

“The first systems able to meet the 5G technology specifications are likely to be enhanced 4G networks. Standalone 5G networks are anticipated to become available from 2020 onwards. Early 5G networks are expected to use existing 4G networks to manage device access to the network and functionality (i.e. to act as the control layer).”

Cambium – Roy Wittert – Response/Comment

The ITU-R is very specific about non 5G or Pre 5G implementation not being referred to as 5G, but only solutions that conform to the IMT-2020 specification being referred to as 5G. So enhanced 4G and so called 4.5G solutions are just that and not 5G. 5G will first be released as non-standalone and then later standalone 5G. In non-standalone, it seems the role of the 3.5GHz spectrum will be used for the control function, ie insuring the call is set up reliably and then e.g 28GHz mmWave 5G will be added. Given that mmWave will have very little application for longer distance fixed communication in regional and rural areas, this then indicates the use case for the 3.5GHz band will be very different for metro and regional/rural application and hence also its \$ value. The 3.5GHz band is already well proven for effective fixed application in rural areas but is limited by the current narrow split channel allocation (FDD) that was applicable for now defunct WIMAX solutions. Careful consideration should be given to effective TDD bands in 3.5GHz to support fixed wireless broadband use.

https://www.rcrwireless.com/20180425/5g/5g/5g/fixed-wireless-broadband-to-grow-30-in-2018_tag41 - an example of the importance and growth of fixed wireless use case. Also note many early “5G” trials are actually fixed eg. Verizon in the US and Telstra’s use on the Gold Coast at the Commonwealth Games.

Answers to questions are provide below and are specific to 3.5GHz spectrum.

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

Cambium – Roy Wittert> Fixed and Mobile Broadband, with fixed wireless be the primary initial use case and most mobile be experimental. I also note the fixed used case in 3.5GHz is not specific to 5G, but is applicable now and this includes the use of 4G. Later this year Cambium will deliver an 8x8 MU-MIMO solution the will deliver 5G like spectral efficiency and capacity in the 3.5GHz band. We will also see this same 8x8 capability be implemented in Fixed LTE-A.

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

Cambium – Roy Wittert> Yes, at the infrastructure level for sure, in rural and regional areas. The role of the WiSPS and tier 2 Telco’s cannot be forgotten. They are already making a significant contribution in RBI2 and with a more significant allocation of the funding could do a lot more. Having licensed 3.5GHz spectrum with TDD allocation at a cost effective price for rural application would also make a HUGE economic contribution in the medium and longer term. My thesis is there will be NO application for 3.5GHz (3.4-3.7GHz) for 5G in rural application for a good number of years. The allocation for fixed is also key driver for Agri business, so important to NZ and IIoT, Eg. CCTV backhaul for SMART City applications.

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

Cambium – Roy Wittert> The re-farming/planning of the 3.4GHz -3.7GHz band for TDD application, whether 4G, proprietary air interface or 5G should be undertaken as soon as possible. Note also serious consideration should be given to looking at 3.3-3.4GHz for fixed application at the same time with the value here being it does not impact larger telco 5G plans. The 3.303.4GHz band was designated for IMT application (Fixed and Mobile) at WRC-15. As per above the use case for the 3.5GHz band will be fixed in rural and perhaps only have application in non-standard 5G. The economic value of the spectrum for fixed rural use should not be confused with the application for 5G metro. Hence the value of DSLM mentioned above to cater for different use cases by geography and value.

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

Cambium- Roy Wittert> Yes, but also the higher 28GHz band? This will also be a key 5G band and as discussed in your paper below and based on feedback from ITU-R at a recent meeting last week is bring included in WRC-19. Perhaps some GURL allocation of the 28GHz band should be considered?

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

Cambium- Roy Wittert> MBIE correctly identify the challenge of valuing spectrum correctly and not over pricing to enable and to ensure appropriate investment. This is especially true in the case of fixed wireless for rural and regional deployments. The 40MHz 2.5GHz MSP spectrum is a good example of effective use of licensed spectrum for fixed application. Making 100MHz+ of spectrum available for rural use at a cost effective price is important to economic growth of rural NZ. The economic value will come to NZ in the use of the spectrum to build and deploy broadband services today and not via a one off spectrum auction. Using the current MSP methodology is an option but also serious consideration should be given to implementing a DSLM similar to that being used in the US for CBRS.

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

Cambium- Roy Wittert> Yes, to ensure best use and best value of the limited available spectrum. A DSLM process may be the best option, if careful thought is given to the tiers and geographic location value and use.

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

Cambium- Roy Wittert> Excellent insight and understanding as to the challenge of determining value is given in section 4.2, well done.

I note that 3.5GHz should be considered rather as TDD spectrum for use by 4G, proprietary fixed solutions, 5G-NR and 5G use. Its use case, for rural and regional will in the short, medium and probably long term, be used for fixed services.

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

Cambium- Roy Wittert> There must be a clear business/use case explained at the time of application and intended timeframe for use. Even if the intended timeframe is longer, perhaps required for strategic 5G investment and development and planning, the use case and intended plan for use MUST be provided as part of the application and to ensure accountability.

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

Cambium – Roy Wittert> Yes, after consultation and discussion to check for extenuating circumstances. The “reasonableness” test should be applied.

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

Cambium- Roy Wittert> Yes, as the use case for 3.5GHz will differ by geography.

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

Cambium- Roy Wittert> Yes, consideration should be given to the role of the WiSPs and Tier 2 Telco's in rural and regional areas, the application and use case of the solution for example 100MHz allocated to a single player for 5G in rural areas makes little sense. 2 x 20 or 2x40MHz channels would be a massive enabler and 8x8 MU-MIMO based solutions for fixed wireless would maximise the possible service offering speeds and allow rural players to achieve the 5G target of 100Mbps continuous service.

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

Cambium- Roy Wittert> Yes, as per above. The use case and application consideration is key. No spectrum should be held for potential use in 5-10 years' time, when it has application and use value NOW.

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

Cambium – Roy Wittert> 5 years for rural with first right of refusal to renew by incumbent for 3.5GHz.

Q26. Should the 5G bands be re-planned as TDD bands or some bands or parts of bands be retained as FDD? Why?

Cambium – Roy Wittert> Yes, 100%. TDD is applicable for 4G, 5G and the proprietary OFDM and Massive MU MIMO technology that Cambium offers for Fixed Wireless application today.

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

Cambium- Roy Wittert> 5, 10, 20, 30, 40 MHz – these are applicable for Fixed applications today.

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

Cambium- Roy Wittert> As example, using TDD Sync- Cambium requires no guard band between adjacent channels. This should be achievable by all similar solutions to achieve maximum spectral efficiency. At worst case 5MHz guard bands may be required.

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

Cambium- Roy Wittert> Yes, 100%.

1. 5G has a Fixed Wireless use case.
2. 4G Type technologies using TDD allocated spectrum and OFDM modulation are available today.

3. Cambium has many applicable technology that provide for regional and rural solutions today, it will be 5 years or maybe even more like 10 years before larger telco's will invest in 5G solutions. A competitive market environment is key and WiSPs must be catered for.

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

Cambium – Roy Wittert> Via DLSP or MSP model similar to today.

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

Cambium – Roy Wittert> Consideration for spectrum in bands from 2.3GHz to 2.7GHz and also in the 3.3-3.4GHz and 3.7-3.9GHz bands, but more in addition rather than in place of.

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?

Cambium – Roy Wittert> Yes, there is real opportunity for TDD based Fixed Wireless application today. Also careful consideration to the use case of 3.5GHz based on actual and proven 5G use case should be considered. The initial application of the 3GHz band seems only to be for non-standalone 5G to set up the call for higher band 26 or 28mmWave 5G?

There seems to be no we articulated or explained mobile use case for 3.5GHz 5G is rural and probably regional areas.

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

Cambium – Roy Wittert> Through sensible discussion. Even the incumbents require better allocations of 20MHz and 40MHz allocations for proper fixed TDD broadband services.

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

Cambium – Roy Wittert> Yes, there is real application and utility of this band today and there is little good reason to wait until 2020. Also the use case of the entire 3.3GHz to 3.9GHz band for Fixed application should be considered now and 3.3-3.4GHz should be added into the discussion as a very realistic band for Fixed Services to IIoT; IOT and broadband in Metro/Urban, Regional and Rural areas today. I note no mention is made of the critical need to licensed spectrum for IIoT applications today. This is all a Fixed Wireless use case.

Thank you again for the opportunity to provide input and we remain available to answer any questions MBIE may have or to provide further clarification on any comments and input provided.