Fixed Services in New Zealand Discussion Document

Submission | MBIE

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Contents

Introduction

1. Spark New Zealand welcomes the opportunity to comment on the Fixed Services in New Zealand Discussion paper (**discussion paper**).

2. The answers below reflect our best understanding of the Ministry's questions which, in some case, we have found difficult to respond to. Some of the questions refer to bands with letters, in some cases band limits are specified in other cases there is no mention of the band limits. Without a specific upper and lower band limit we consider it difficult provide meaningful responses to some of the detailed and prescriptive questions. We recognised and accept that bands are anecdotally referred by letters in New Zealand, but recommend that a more comprehensive glossary is added to future versions to provide clarity to all parties.

General comments

Digital Microwave radio applications

3. The discussion paper is about the ongoing and future use of fixed service bands. Amongst the variety of use in these bands is that of digital microwave radio (**DMR**) that was traditionally employed for fixed point to point linking. DMR is going through something of a resurgence, recognising that it can now be used for cellular backhaul and cellular front haul applications. DMR backhaul can also be used for the backhaul of small cells where fibre access is uneconomic or unavailable.

4. In the millimetre wave bands, there is very large bandwidth per band. Consequently very large data rate capacities (> 1 gbps/ band) can be provided by the mm wave bands. The cellular front haul applications link baseband units to remote radio units that may be mounted on the tower close to the antenna. The data rates of signals over the front haul links follow the CPRI rates and are usually of ultra high capacity due to up sampling of the I and Q rail signals. A popular application of the 71-76 and 81-86 GHz bands (widely known as "E-band") is for front haul. There is almost 10 GHz of spectrum available in these bands and this enables fibre-like gigabit per second (Gbps) and greater data rates that cannot be achieved at the bandwidth-limited lower microwave frequency bands.

5. The mm wave bands are also part of considerations for spectrum for IMT 2020 that might become the basis for a new WRC agenda item at WRC 15. However, which parts of the bands above 6 Ghz will have a mobile allocation will not become clear until there is clarity about candidate bands for IMT 2020. Spark NZ is seeking information from equipment vendors on their development programme for the various fixed radio applications. We will share any new information that comes to light with the Ministry.

Conversion to the MR regime

6. The Ministry has asked about converting some fixed service bands to the MR regime. The reasons offered to do so arise from spectrum congestion. The trigger to put a band in the MR regime is if there is significant competition (such as the cellular and broadcasting bands) and not spectrum congestion. The MR regime is then a fair way of balancing competition and efficient use of spectrum. Meantime if a band is converted to the management rights regime ahead of the

WRC issues mentioned above, it cannot take advantage of the new developments until the MR expire.

Spectrum Congestion and efficient use

7. The ministry is seeking to address spectrum congestion in some bands by requiring minimum spectrum efficiencies. We support the general principle of using spectrum efficiently but would caution the use of a minimum spectrum efficiency value enshrined in some regulation. Our response discusses the reasons behind this caution.

8. However, we also note that in some cases highly inefficient services continue to use premium spectrum. The use of STL's in spectrum adjacent to cellular bands is one such example. On the one hand operators have paid tens of millions of dollars (renewed every 20 years) to get spectrum in the 850/900 Mhz bands, but STL's occupy similar spectrum at a minute fraction of this cost using only an annual radio licence and have no regulatory incentive to use the spectrum efficiently. We consider that the Ministry should take steps to strongly discourage this type inefficient spectrum use.

Sharing calculations

9. The Ministry has put forward some new ideas of co-ordination (sharing calculations). This is welcomed but we wish to draw the attention of the Ministry to a wealth of inter-service sharing calculations and methodology contained in the outputs of the recently concluded JTG 4-5-6-7. Many reports of inter service sharing in various bands have been published by the JTG. We believe the Ministry should use these ITU R studies as guidance to make any changes to the sharing calculations methodology. Specific comments to the Ministry questions are contained in our response.

Response to discussion document questions

2.1. Digitisation

1. Should all or some sub 1 GHz fixed service bands be digital only? If so, are there particular bands that should be given priority to change to digital only services?

10. It is true that digital modulation schemes are spectrally efficient, but in New Zealand we also have many country set radio links that provide services to customers in far off areas. Converting these links to digital is probably not feasible while maintaining service requirements. Therefore the introduction of digital modulation schemes for all sub 1 GHz needs to be looked at on a case by case basis, and considered for situations where there is congestion.

11. On the other hand, studio transmitter links are currently analogue and occupy premium spectrum adjacent to the cellular bands. Sharing with these STL links puts an unnecessary encumbrance on the cellular operators. This encumbrance would be significantly eased if STL's were converted to digital and the STL operators made to realise that they are using premium spectrum in the range where operators have paid tens of millions of dollars for spectrum rights.

2. Should any requirement for digital services apply to new licences only or should existing analogue services be required to transition to digital? If all licences are required

to transition to digital services, over what time period should analogue licences be phased out?

12. As pointed out above STL's should be converted to digital as a matter urgency. In our vie wit would have been preferable if MBIE had imposed a digital requirement on STLs when the 850/900 UHF band review was recently done.

13. The notice to convert to digital for existing licences should be for a period of three years as this signals the urgency. New licences should all be digital.

14. Note the KK band is part suite of bands for PPDR services to be considered by WRC 15. The technologies to provide PPDR are LTE based. Therefore, the ministry should not introduce any new analogue licences in this band.

2.2. Spectral efficiency

3. Should the Ministry increase the minimum spectral efficiency of digital services from one bit to four bits per second per Hertz? If so, should this apply to some (please identify which ones) or all bands?

15. We do not believe a minimum spectral efficiency requirement specifying a particular number is the best way forward. We agree that higher spectrum efficiencies would result in a better utilisation of the band but this needs to be considered in the light of

    a. Uplinks

    b. Frequency band

    c. Interferences

    d. Data rate required

16. Take for example 4 bps/Hz this in effect means deploying 64 QAM based systems as the practical efficiency of 64 QAM is 4 bps/Hz even though it has a theoretical spectral efficiency of 6bps/Hz. The use of 64 QAM would then constrain hop length due to high SNR and high C/I requirements.

17. Modern radio system often use adaptive modulation schemes whereby the modulation and encoding scheme is automatically selected based on the instantaneous SINR and C/I. Mandating a spectrum efficiency minimum would impose on the design of these adaptive modulation schemes.

18. Another example is the millimetre wave bands that are currently finding a resurgence in interest for use by mobile, backhaul and front haul applications. There is almost 1 GHz per band available in the millimetre bands. Deploying low complexity modulation schemes is attractive here, as one would like to have as much range as possible, even with spectral efficiencies of 1 bps/Hz 1 Gbps data rates are possible.

19. That said we endorse the use of higher spectral efficiencies and the ministry to take a pro-active approach in deploy systems with higher spectral efficiencies.

4. Should any requirement for increased spectral efficiency apply to new licences only or should existing licences be required to transition to this standard? If so, over what time period should the lower standard be phased out?

20. If it is justified to use equipment with higher spectrum efficiencies then the ministry should phase out licences for existing equipment over reasonable and mutually agreed time.

2.3. Metropolitan site congestion

5. Should further areas be added to the designated DMAs and if so which areas?

21. In principle we consider that the need to treat DMAs differently to other areas is questionable. This implies that less stringent conditions can be used in areas outside of DMA's and assumes fixed links in metropolitan areas are suffering performance degradation due to band congestion. Take the case of backhaul and front haul needs for cellular base stations. Many of our rural sites also provide coverage on national highways and are therefore heavily congested in turn they will pose higher capacity backhaul requirements.

22. Our view is that the DMA's should not just be expanded but the requirements to plan within a metropolitan area should be applied everywhere.

6. Should further DMA rules be introduced? If so, what should the rules specify? Should these be tailored to each particular DMA?

23. See above

7. Should any DMA specific rules be applied to new licences only or also apply to existing licences? If existing licences become subject to the new rules, how should the transition be managed?

24. See above

2.4. Interference evaluation method for Digital Microwave Radio (DMR)

8. Should the current '1 dB interference threshold degradation' method prescribed in Section 4.3 'Co-channel interference threshold' of PIB 38 be retained or replaced with a carrier to interference method? Please provide information on why the method should be changed and the increased spectral efficiency over the current 1 dB threshold degradation method expected to result from the change.

25. This section is serious flawed and makes unproven statements and asks for commentary on issues which are neither defined in the standards or in the published literature. For example the carrier to interference method is stated to be more spectrally efficient than the 1dB method. However where is it shown that the C/I method is more spectrally efficient than the 1 dB method. Furthermore there are many vague and confusing criteria mentioned. For example:

26. There is a 1dB method that refers to the 1dB noise floor degradation by any interfering signal. However, it does not specify what to do with multiple interferers. Is each interferer allowed to degrade the noise floor by 1dB or the aggregated interferers allowed to degrade the noise floor by 1dB?

27. There is a 1dB interference threshold degradation method. There is no definition of what this is, yet there is a question addressing this.

28. There is a 1dB threshold degradation, there is also no definition of this threshold in this section.

29. We would like to refer the ministry to chapter 2: Interference basics from "Handbook ITU-R Propagation Prediction Methods for Interference and Sharing Studies" In this chapter aggregate interference is allowed to degrade the noise floor by 1dB. This is the most commonly used method in sharing calculations adopted by the ITU-R, indeed JTG 4-5-6-7 has done a lot of sharing studies in response to WRC agenda items 1.1, and these studies have involved a variety of services and bands. The common theme of all these studies is finding the minimum coupling loss requirement for a nominal degradation of the noise floor under interference.

9. If the method is changed to a carrier to interference method, how should this be implemented?

30. It is unclear to use what is meant by the term “carrier interference method”. Notwithstanding that. the discussion in section 2.4 and figure 1 seems to imply that 1dB threshold degradation and the C/I methods are different ways to do sharing calculations. Practically speaking there are no receivers in the world that do not experience any interference. Even in the radio quiet zone the solar noise is present. In urban area other sources of noise are ignition noise, power lines, fluorescent lights, corona discharge, electrical arcing, etc. Therefore the receiver is seeing the desired signal in the presence of noise plus interference (N+I). Typically I is much less than N, therefore S/(N+?) is approximately S/N. When I is much larger than N, then S/(N+I) is effectively S/I. In this case one could find the resulting noise floor degradation due to the large interference and model the degraded S/N in sharing calculations. When I is extremely large and I is dominant there may be interference floor in the BER versus SNR of the receiver. In that case improving the SNR does not result in an improvement in the error rate. One would like to think that the interference floor scenarios do not occur in practice when systems coexist.

31. As an example QPSK is a commonly used modulation scheme for fixed radio links. The SNR for a 10-3 BER is approximately 10dB and the C/I requirements are 20 dB. This means that the carrier is 10dB above the noise floor and the interference is 10 dB below the noise floor. This interference level only marginally degrades the noise floor by 0.4dB.

32. From the above discussion we conclude that the 1dB threshold method and the C/I method are the same. If this contrary to the Ministry's understanding then it would be good for participants to be on the same page.

33. There is yet another method that is based on a nominal degradation to the outage. For example if the outage requirements of severely errored seconds is say X seconds then in the presence of interference this X may not degrade beyond for example 1.05X (i.e. a 5% degradation)

34. Also see discussion above in question 8

2.5. Adjacent channel interference criteria

10. Are the Frequency Dependent Rejection values in PIB 38 appropriate? If not, what should these values be? Should there be different values for different bands?

35. No this is equipment dependent. For example a QPSK fixed link in band A and band B will have the same adjacent channel rejection ratio. Why would it be different?

36. We would like to know the source of numbers in table 2 as without this information we are unable to make a comment on the numbers. The exception is the cochannel case, this will definitely be below 0. The actual level will be this will be dependent on service.

2.6. Equipment standards

11. Should the Ministry implement equipment standards for fixed services above 1 GHz? If so, what standard should be specified?

37. We consider that the Ministry should not be involved in setting equipment standards. New Zealand is a small market and buys hardware developed for the international market. It would be hugely uneconomic to require vendors to develop equipment that meets a "special for you Kiwi" standard. The role of the Ministry as band manager for the fixed service bands should be focused on ensuring that competing users can coexist using the sharing principles specified in ITU-R documents.

2.7. Necessary bandwidth and channel widths for digital services

12. Should the Ministry adjust the general licencing conditions for digital services to ensure licences better reflect occupied bandwidth in the microwave bands?

38. This section assumes that transmitters are allowed to operate in channel widths larger than what is possible in the band plan. In that case there will be significant adjacent channel interference. Therefore this scenario should not be permitted to exist. Likewise receivers must also allow for signals to pass through in their allocated band and reject all reject all adjacent emissions. It can not reject co-channel emissions. Otherwise a legitimate transmitter could interfere with a receiver that has a "barn door" passband.

39. There are several bandwidths that need to be considered:

    a. Nyquist bandwidth. This is the minimum bandwidth occupied by the modulated signal.

    b. Raised Cosine filters commonly used in equipment increase the occupied bandwidth more than the Nyquist bandwidth due to roll off filtering, typically around 30%

    c. In addition PA nonlinearities result in legitimate out of band and spurious domain emissions.

40. The "natural bandwidths" of transmitters and receivers must match the channel bandwidths. If they don't there is a serious interference issue.

41. Therefore we conclude that transmitters and receivers must operate within their allocated channel widths.

2.8. Information on licence records

13. Is inaccurate information on licences a significant issue for AREs and ARCs and licensees? If so, how should the Ministry respond to the issue?

42. Inaccurate information is always an issue. For example if 2*2 is answered as 3 there is no mechanism in the Ministry to address this wrong answer.

43. This question should have also addressed if the information provided on licence information is adequate. We believe licence records should have the following information required to perform sharing calculations.

    a. Transmitter make and model

    b. Antenna make and model

    c. Additional Antenna Characteristic

    d. The rightholder and licensee should be contactable

2.9. Transition of spectrum to the management rights regime

14. Should the Crown consider creating management rights for bands where there is predominantly a single licensee? If so, are there other criteria that should be met before a management right is created for fixed service bands?

44. In addition to the traditional fixed service use, there is an increasing interest in the use of digital microwave radio to provide cellular backhaul and front haul to baseband pools. WRC-15 is likely to adopt an agenda item for WRC19 to identify spectrum for IMT 2020 in bands above 6 GHz. These bands are also used by the fixed service. Therefore, in the future all of the above could result in contention and making a case for creating management rights. Currently we do not foresee any requirement for management rights.

45. Perhaps we could revisit this after WRC 19, or earlier if new information comes to hand.

15. If spectrum is transferred into the management rights regime, should it be managed by the Crown or allocated to a private manager? If allocated to a private manager, should the allocation be by contestable means or to the predominant user?

46. See above

2.10. Channel widths

16. Should the Ministry apply consistent channel sizes across specified frequency ranges in fixed service bands? If so, what should be the basis for these channel sizes? Should channel sizes be based on the preferred channel width shown in Table 3?

47. We would like to refer the ministry to the F series recommendations, in particular see Recommendation ITU-R F.746-10 Radio frequency arrangements for fixed service systems. This recommendation gives multiple options of channel plans allocated to fixed services ranging from 400MHz to 94 GHz, see tables 1 and 2. These tables in turn refer to the specific F Series recommendations for the particular band. Principles of a fixed service band plan are described under fig1 under this recommendation. These rules must be followed when choosing channel widths in a fixed service band plan. The Ministry cannot arbitrarily choose a channel width in a band plan as this will result in manufacture of non-standardised hardware. That said there are options of different channel widths in different bands. It would be very difficult adopt the same

channel width or its multiples in bands 2.7 GHz and above as stated in table 3. Channel widths should be looked at on a band by band basis. We propose for each band that the Ministry seeks an industry consultation for the band plan to be adopted from amongst the ITU sanctioned options given in F 746-1 band.

48. We note that the migration to other band plans and channel widths in modern equipment is reasonably achievable with modern programming capability of equipment

2.11. Band renaming

17. Should the Ministry rename bands that are currently prefixed with letters, by numbers representing their approximate frequency of operation?

49. Having letters to represent bands is most confusing and is legacy. The Ministry document arbitrarily uses letters and frequency limits and in different places. For example the Z band is defined as 10.7 to 11.6 GHz, but there are no band limits for the X band. The ITU-R does not uses letters to identify bands. We should follow the same convention as the ITU-R.

50. We support renaming a band by frequency of operation.

3. BAND SPECIFIC PROPOSALS

3.1. ISTL, JKSTL, KL and K STL bands

18. Should digital services be permitted in STL bands? If so, should digital and analogue services be permitted or should all existing analogue services be required to transition to digital?

51. Please see our answer to questions in section 2.1. Digitisation

19. Should a minimum link distance be specified for STLs in some bands for current and / or future links? If so, which bands should have the minimum link distance specified?

52. A minimum link distance should not be applied, but the EIRP should be appropriately controlled to meet the requirements of the link distance.

20. Should no new dual mono STL services be allowed? If not, should the Ministry transition users from dual mono services to digital links?

53. STL equipment occupies premium spectrum. We strongly encourage the ministry to put a regime in place that efficiently utilises this spectrum instead of a use that is wasteful of bandwidth. Therefore a transition to digital links is mandatory.

21. If the Ministry allows digital licences in the STL bands, should any broadcaster that transmits more than 3 programmes between a studio and broadcasting site be required to use a 500 kHz channel digital STL and those broadcasting a single programme be required to use a 250 kHz channel digital STL?

54. Yes this should occur.

22. Should a limit of three STL licences (via a combination of analogue and digital transmissions) at any single location be introduced for any single licensee? If so, should

this be limited to congested sites only? If so, which ones? Should these limits apply retrospectively to current licences or should they only apply for new licences. Should the limits apply once any licence holder applies to make a change to any one licence at a site?

55. As mentioned above STL equipment uses spectrum that is regarded as premium spectrum real-estate. Therefore all STL use should be spectrally efficient. If this is not the case a nominal transition period of three years should be given, after which the licence should cease if the transition to digital does not happen. With regards to the prescriptive nature of this question we believe the ministry should use achieving spectrum efficiency as its overarching goal, instead of specific regulatory and site or region specific answers.

23. How should the Ministry manage the timing and introduction of any changes to STL services? How should each of the five proposals above be managed?

56. See above recommendations and all within a three year time frame.

3.2. EE Band

24. Are there any issues with the current band plan, use of, or future demands for the EE band?

57. No comment

3.3. I Band

25. Should the Ministry offer 100 kHz channels in the I band (Group G) which interleave with the current 50 kHz channel plan? If not, how should the channel plan be amended, if at all?

58. No comment

3.4. J Band

26. Should the Ministry offer 100 kHz channels in the J band (Group D) which interleave with the current 50 kHz channel plan? If not, how should the channel plan be amended, if at all?

59. No comment

3.5. JL band

27. Are there any issues with the current band plan, use of, or future demands for the JL band?

60. Without band limits we cannot answer.

3.6. KK Band

28. Are there any issues with the current band plan, use of, or future demands for the KK band?

61. This band and adjacent spectrum is being considered for PPDR services, which are aligned to LTE channel plans. The New Zealand Governments supports the above mentioned use of the band. Therefore to ask for future demands for the KK band is equivalent to asking the industry to restate government policy.

3.7. L Band

29. What services should L band be used for in the future? Why?

62. As discussed in the Ministry's document this is a candidate band for agenda item 1.1. of WRC-15 If this was successful at the WRC then this band will also support mobile services with an IMT designation.

3.8. 5 GHz Band

30. Are there any issues with the current band plan, use of, or future demands for the 5 GHz band?

63. There are multiple uses of the 5GHz band. These range from RLANs, radio trunking, candidate bands for mobile broadband bands under WRC -15 agenda item 1.1. Therefore without any band limits how are we supposed to answer this question?

64. No comment on the band plan but putting a private MR is not supported and why not continue with the current status. We also note that bands below 6GHz are subject to WRC15 agenda 1.1 considerations. We therefore caution the ministry inputting these bands in private MR schemes when their use could change after WRC. Regardless of the WRC outcome there is no case to put the 5GHz band in a private management right as contained in the discussion pertaining to this question.

3.9. P Band

31. Do you have comments on the current coordination process or possible future demands for services in the P band?

65. We do not know what the frequency limits of the P band are yet it seems to have a coordination issue with C band for satellite use. Unless we know the frequency limits we cannot answer this question.

3.10. R Band

32. Should the Ministry adopt 28 MHz channelling for the R band?

66. Recommendation 383 gives various options of channel widths for this band. They are 29.65 MHz, 40 MHz, and 28 MHz, 20, 10 and 5 MHz respectively. We should only use one of these bandwidths, we do not know if the derivative of 28 MHz, i.e. 7 and 14 MHz, and 56 MHz require any special manufacture of hardware. The ministry would need to seek industry consultation.

67. 29.65 should be dismissed, as formerly analogue FM. Should be aligned with standard channels.

33. If the Ministry is to adopt 28 MHz channelling, should this be applied to new licences only or should all existing licences be required to transition to the new channelling? How long a timeframe should be allowed for the transition?

68. Note 29.65MHz is a legacy channel width from analogue days and is not used in equipment today. The closest bandwidth is 28MHz which can be used in 29.65 MHz channel widths.

69. The ministry should give a nominal period to migrate to 28 MHz channelling and 29.65 MHz licences should cease to exist.

3.11. T Band

34. Is the N+1 designation still required for efficient use of T band?

70. This question is very puzzling indeed. We point the Ministry to the hand book and recommendation P - 530. Frequency diversity protection is commonly used in radio relay systems in various bands to guard against frequency selective fading. In addition N+1 switching is also used for scheduled maintenance on a desired link, and transferring the traffic onto the protection bearer. We are puzzled why these applications only restricted to only the T band.

35. Should the redundant TA channels be removed from the channel plan for the T band?

71. Yes as the interleaved channels aren't usable. In the older analogue world the use of ½ channels may have once been feasible, but no longer with modern digital implementations.

36. Should the Ministry consider rechanneling the T band to 14 MHz channel widths? If not, why not?

72. No because the traditional and modern equipment are aligned to 40MHz. Any subdivision wants to be a subdivision of 40 MHz. 14MHz is not an integer fit.

73. It is also unlikely that the demand for sub channels will ever be required and it is more likely that larger i.e. double 80 MHz channels are required. Please note the following:

    a. Recommendation F 384 gives the following channel widths 40,30,20,10 and 5 MHz respectively.

    b. F 384 Annex 1 gives 80 MHz

    c. F 384 Annex 2 gives 30,14,7, and3.5 MHz respectively.

74. We suggest the ministry chooses a channel width aligned with F384 and combined with industry consultation.

3.12. V Band

37. Should new 56 MHz channels V23A (7110.5 MHz) and V23A# (7341.5 MHz) be created? If so, could the new 56 MHz channels coexist with the TVOB channels currently in place? What would be an acceptable coordination policy if this were to occur? Should the new 56 MHz channels be available only on a non-interference basis?

75. It is difficult to coordinate 56 MHz channels with TVOB application. Note PIB22 has already allows for one 56 MHz channel. Note also:

76. Adjacent channel operation will be difficult regardless of 28 or 56MHz channels

77. This proposed channel overlaps with TVOB and is effectively only available for TVOB.

38. Can existing demand for the TVOB channels in V band be accommodated on other TVOB channels?

78. No Comment

3.13. U, W and Y bands

39. Do you have comments on the current coordination process or possible future demands for services in the U band?

79. The U,W and Y bands given under table 11 are covered under ITU recommendations F385 and F 386. The F385 recommendation has different options in the range 7.25 -7.90 GHz. F386 has various options in the range 7.725 to 8.275 GHz respectively. There is no option to merge F385 and F386 which would be required to produce the aligning given in table 11. Alternately we have not understood the Ministries question.

80. Note these are the most congested bands in the country and any link over 20km will utilise these bands. We expect demand to use these bands will grow, and good co-ordination practices will be required to manage the engineering issues.

40. Should W band be rechanneled to enable either 28 MHz, 40 MHz, or 56 MHz channelling to enable new services? Which channel size is preferred? Why?

81. We have observed in earlier similar questions that the channel bandwidths should be aligned with ITU-r documentation and industry consultation.

82. Note legacy channelling is 29.65MHz but most users, operate 28 GHz equipment. If rechanneling logical channels are 28/56 and not 40MHz

41. Should the Yx channels be disestablished from the Y band channel plan, enabling the current dominant channel plan (YxA) to become the single channel plan for Y band?

83. No comment we cannot give a specific answer because we do not know what the Yx channels are

42. Should the Y band have an additional 56 MHz allocation added to the current YxA 28 MHz channel plan?

84. See 40 above

43. Should the band boundaries be realigned to match ITU-R F.386, by adjusting the U / W boundary at 7.730 GHz down to 7.725 GHz, and by adjusting the W / Y boundary from 8.290 GHz to 8.275 GHz?

85. Same as 39 above. But we believe there is some scope for tweaking the band edges

3.14. H band

44. Should the Ministry offer a 14 MHz channel plan for H band and migrate users away from 21 MHz channelling?

86. Same as 40 above

87. Additionally we agree that users should be migrated away from 21MHz channels as they are not a scalable multiple, we want 7,14,28,56. It is likely 21MHz channelling came from analogue usage.

45. Should the band be reallocated to a different service or use? If so, what other services or uses should be allocated to the H band?

3.15. Z band

46. Should the Z band channel plan be changed to 28 MHz channels? If not, why not?

88. Yes the band should be changed to 28 MHz channels as modern equipment can do this. However, legacy 40 MHz use would need to be migrated first. Each 40 MHz right holder would need to be consulted on current equipment in use.

47. If a 28 MHz channel is adopted, should the Ministry also adopt a 56 MHz channel plan?

89. Note that 2 * 28 = 56 MHz, so what is the issue?

48. If the band is rechanneled, should incumbent licensees be required to transition to the new band plan?

90. Yes start implementing now.

3.16. G band

49. Are there any issues with the current band plan, use of, or future demands for the G band?

91. Don't know of any major issues. Already on standard channelling 3.5,7,14, 28. Would want to see 56MHz channels.

3.17. X band

50. Should the Ministry introduce an additional 56 MHz channel to the X band, or should it remain unavailable for assignment?

92. Yes open up final aggregation of X1 and X2, however was there a specific reason why this has not previously been aggregated? The performance of Ku satellite equipment needs independent assessment. There should be some sanity checking of satellite versus fixed usage for band edge sharing.

3.18. 18 and 23 GHz bands

51. Should the Ministry facilitate in any specific way the development of satellite services in the Ka band? For example, should the Ministry consider early clearances of some fixed services in either the 18 or 23 GHz bands?

93. No comment, as we are not a satellite operator. However we note that these bands are used for fixed services and this is likely to increase. Applications driving the increase are: Point to point fixed links, cellular backhaul and fronthaul.

52. Should the Ministry remove the underutilised 3.5 and 7 MHz channels from the 23 GHz channel plan?

94. First band edge sharing needs to be assessed. Potentially we could retain some 3.5 and 7 MHz channels for current demand and rechannel the rest.

95. We agree with MBIE that this band is underutilised.

3.19. 38 GHz band

53. Are there any issues with the current band plan, use of, or future demands for the 38 GHz band?

96. No issues perceived

3.20. 70 - 80 GHz band

54. Should the Ministry move the licencing regime for the 70 - 80 GHz band from administrative licencing to a New Zealand general user radio licence?

97. We should wait for WRC-19. If WRC-15 is planning to create an agenda item for 5G then some bands in this range might be candidates for IMT2020. This is the correct time to assess band. Putting this range in GURL would make it very difficult to clear later.

END