Dear Radio Spectrum Management,

Telco2 consults on wide area network strategy and design to users, providers, and policy makers in the telecommunications space. Current engagements are focused on rural and remote communications in agriculture, energy, and maritime safety across New Zealand and the Pacific Islands. Its principle, Jonathan Brewer, has designed hundreds of radio services, and was New Zealand's first broadband user of the 60 and 80 GHz bands.

Please find below Telco2's submission on some aspects of the Fixed Services Review. It is made recognising efficient use of shared resources requires change. Red Flag laws protecting horse-carts on common roads were inappropriate in the 19th century, and they are inappropriate today.

1. All sub-1GHz fixed service bands should be converted to digital-only service.

2. Existing analogue services should be required to transition to digital over a five year period.

3. The Ministry should increase the minimum spectral efficiency of digital services to at least four bits per Hertz across all bands.

4. Existing digital license holders should be required to transition to spectrally efficient technologies over a five year period.

5-7. No new DMA areas or rules should be created. Instead, specification of more stringent antenna performance requirements, and more robust, interference tolerant radio receivers should be applied across the entire country. Note that antenna performance requirements do not mean antenna size requirements.

8. The existing interference methods artificially restrict availability of radio spectrum, and should be changed to a c/i method. It is unlikely c/i method will result in an increase of EIRP unless that increase comes from antenna gain, which will result in more efficient use of the spectrum.

9. Implementation of a c/i method should follow existing c/i implementations such as that used by ACMA.

10. Adjacent channel interference criteria are present to account for poor recorded information on deployed equipment. The solution to this problem is to require complete and accurate equipment information in the register, and to eliminate generic values entirely.

11. The Ministry should require that equipment meets ETSI Harmonized Standard EN 302 217-3.

12. The Ministry should adjust general licensing conditions for digital services to ensure licenses better reflect occupied bandwidth in the microwave bands.

13. Inaccurate or missing information on licenses is a significant issue for AREs and ARCs planning new licenses. The Ministry should provide an easy method for AREs and ARCs to flag incomplete or inaccurate records (equipment types, antenna types, locations, bearings, etc.) for immediate correction by license holders.

14-15. The Crown should not create management rights for bands where there is predominantly a single licensee. In some cases (5GHz band) many more users will be able to take advantage of the

spectrum with a shift to c/i method for interference calculations. In other cases (R-band) existing licensees squat on licenses for paths they have not used for many years - thus excluding more users from the bands. Creating management rights would do nothing but exacerbate the problems faced by new entrants into the rural telecommunications market.

16. The Ministry should apply consistent channel sizes across specified frequency ranges, and should require non-compliant equipment to transition within five years - if that equipment is not already being transitioned for reasons of poor spectral efficiency or poor receiver performance. The basis for channel sizes should be taken from the ITU.

17. No answer.

18-23. There should be no bands specific to Studio to Transmitter links. Such application-specific assignment of what is essentially just another stream of data is an extremely inefficient use of limited shared resources.

24. No answer.

25. The Ministry should offer 100kHz channels in I band which interleave with the current 50kHz channel plan.

26. The Ministry should offer 100kHz channels in J band which interleave with the current 50kHz channel plan.

27-28. Minimal spectral efficiency across all bands, including JL and KK, should be raised to four bits per Hertz.

29. No answer.

30. Current 5GHz band regulations and protections artificially limit its utility to the single licensee who has used it for the last 15 years. This should change as discussed in answer 14-15 above.

31. Satellite services in C band are rapidly being supplanted by Ka band offerings. There are likely to be fewer coordination issues in the future.

32. The Ministry should adopt 28MHz channeling for the R band

33. All existing licenses should be required to transition to the new channeling within a timeframe of five years. Given the general availability of UFB services, it is likely users of old equipment will find a transition to fibre a better choice than replacing dated equipment.

34. N+1 designations are not required for efficient use of the T band.

35. Redundant TA channels should be removed from the T band channel plan.

36. The Ministry should re-channel T band to 14 MHz channel widths.

37. New 56MHz channels should be created in the V band. TVOB should shift to other bands or technologies.

38. Existing demand for TVOB can be accommodated either on other TVOB channels or using other more efficient technologies.

39. Future demands for services in the U band are likely to come from equipment with 28/56MHz channels.

40. W should be re-channeled to 28MHz due to standard equipment availability.

41. Yx channels should be disestablished.

42. Y band should have an additional 56MHz allocation added.

43. Band boundaries should be realigned to match ITU-R F.386.

44-45. The Ministry should dis-establish H band and instead look at enabling the use of TDD multi-access broadband equipment in the 10GHz band, as it is of great utility to rural broadband providers. Such equipment frequently uses frequencies between 10.3 and 10.6 GHz.

46. Z band should be changed to 28MHz channels.

47. 56MHz channels should also be allowed.

48. Incumbent licensees should be required to transition to the new band plan.

49. No answer

50. An additional 56MHz channel should be added to the X band.

51. The Ministry should consider early clearances of some fixed services in the 18 GHz band to facilitate Ka band satellite services.

52. The Ministry should remove under-utilised 3.5 and 7MHz channels from the 23GHz band plan.

53. There are no issues with the current 38 GHz band plan.

54. The Ministry should shift 70-80 GHz band to a New Zealand general user radio license.