

# **Kordia Submission on Preparing for 5G in New Zealand**

**8 May 2018**



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# 1. Introduction

Kordia would like to thank the Ministry for the opportunity to submit on the *Preparing for 5G in New Zealand Discussion Document*.

Kordia agrees that 5G is an important technology for New Zealand. While we acknowledge that spectrum should be allocated for uses including 5G we do not believe that all spectrum should be so allocated.

While 5G is an important new technology, there are numerous other important technologies currently using the radio spectrum and the standardisation of 5G must not jeopardise nor compromise such other technologies. Also the spectrum should not be dimensioned in a manner that forecloses its use for new technologies, as that would stifle innovation.

Kordia has actively deployed services in the 3.5 GHz band for many years. Our customers include key New Zealand infrastructure and primary industry providers. These customers require Kordia to provide managed services with prioritised low latency traffic components. Our contracts with such customers are long term through to the expiry of our current management rights in 2022, and there is an expectation that the services will be required long-term.

In assessing ongoing use of the 3.5 GHz band we are focused on the outcome of providing suitable managed services to our customers by whatever means is the best commercial solution, and this does not necessarily mean we have to have to achieve this by building our own network for these managed services.

There is no commercial service currently available nationwide that provides the high performance managed services that Kordia provides to its customers in the 3.5 GHz spectrum.

Kordia would only consider reviewing its ownership of the 3.5 GHz spectrum if Kordia was certain that a viable alternative to its current managed service product suite was available on 5G or alternative technologies, and there is appropriate compensation to meet spectrum, transition and incremental costs.

Any viable alternatives that could be made available to Kordia to meet our end customer needs have to be available for ongoing use, and not a temporarily available service that is withdrawn once our management rights expire in 2022.

As a more general point, we wish to stress that allocation of spectrum suitable for 5G use should be as neutral as possible: it should not be targeted or dimensioned in a way that favours current the mobile network operators or that is limited to 5G technology only. This would limit innovation and investment at a regional and broader level for New Zealand and would not be in the long term interests of end users.

Contact details for our submission are below:

Aaron Olphert  
Chief Digital Officer  
Email: [Aaron.olphert@kordia.co.nz](mailto:Aaron.olphert@kordia.co.nz)

We would be happy to meet with the Ministry to discuss our submission further.

## 2. Kordia Submission on the Specific Questions

### 1. INTRODUCTION

#### 1.2 What will 5G be used for?

- 1) *What are the likely uses for 5G in New Zealand initially and in the longer term?*

*Kordia submission:*

We have no comment on this question.

## 2 REGULATORY CONSIDERATIONS FOR 5G IN NEW ZEALAND

### 2.1 Network Competition

- 2) *Do you consider competition should be encouraged at the infrastructure level or purely at the retail level for 5G? Why?*

*Kordia submission:*

5G services should be made available as a commercially viable wholesale product which allows retail service providers to compete with adequate margin against the 5G mobile operator's own retail products and which enables innovators to use 5G as an input into future services.

### 2.2 Other Regulatory Issues

- 3) *What regulatory issues need to be considered from a 5G perspective in New Zealand?*

*Kordia submission:*

Kordia makes no comment on this question.

- 4) *What aspects of these regulatory issues are most significant for 5G?*

*Kordia submission:*

Kordia makes no comment on this question.

### 3 POSSIBLE FREQUENCY BANDS FOR 5G

#### 3.1 3.5 GHz Band

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

*Kordia submission:*

We accept that the 3.5 GHz band is likely to be a candidate band for initial deployments of 5G, while existing cellular bands are still used for 3G and 4G.

However, we disagree with the Ministry's comments in the discussion document that there is little or no use of the current 3.5 GHz band and the implication that there is a reluctance amongst incumbent operators to change to TDD.

Kordia currently has actively deployed services in the 3.5 GHz band and we have long term contracts out to 2022 with customers who provide New Zealand with vital utilities and services.

The 3.5GHz band is also the main one for cost effective managed wireless connectivity solutions due to the vast array of vendor products available globally.

Kordia has already deployed TDD services in this band and we were willing to help reconfigure the band to TDD.

Kordia would not wish to relinquish its interests in the 3.5GHz spectrum unless there was a viable commercial alternative available for Kordia's managed service customers prior to 2022 and the spectrum, transition and incremental (to existing) costs were compensated.

6) *Do you have any comments on reallocating 3587 to 3690 MHz for 5G?*

*Kordia submission:*

We agree that it is sensible to reallocate 3587 to 3690 MHz for 5G and related technologies, on the basis that this radio licence band is all but unused, and providing that there is spectrum available for the sole satellite operator in this band to relocate to.

#### 3.2 26 GHz Band

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

*Kordia submission:*

We agree that the 26 GHz band is a good band for 5G deployments, based on the large amount of spectrum available for very high bandwidth services. We make no comment on the priority of this band.

8) *Would this band be of interest to your organization for trials for 5G services in New Zealand?*

*Kordia submission:*

We would be interested in keeping a watching brief on any trials that are being undertaken and we would assess at the time whether these would be of interest to Kordia.

### **3.3 Other Extremely High Frequency Bands**

- 9) *Do you agree that the 31.8 to 33.4 GHz, 40.5 to 42.5 GHz and 42.5 to 43.5 GHz bands are a low priority for allocation to 5G in New Zealand?*

*Kordia submission:*

We have no comment on this question.

- 10) *When do you think equipment is likely to become available in the bands identified in Q9?*

*Kordia submission:*

We have no comment on this question.

- 11) *Do you have any comment on the possible allocation of 27.5 to 29.5 GHz to IMT?*

*Kordia submission:*

We have no comment on this question.

#### **3.4.1 1400 MHz Band**

- 12) *Is there demand for alternative uses other than IMT of the 1400 MHz band? If so, what uses?*

*Kordia submission:*

We have no comment on this question, other than to note that DAB should not be allocated in the 1400 MHz band.

- 13) *When is the demand likely to require consideration of reallocation of the 1400 MHz band for IMT, if at all?*

*Kordia submission:*

We have no comment on this question.

### 3.4.2 600 MHz Band

*14) Is there a need for more sub 1 GHz spectrum for IMT/5G?*

*Kordia submission:*

The three questions raised by the Ministry relating to the 600 MHz band do not address the initial issue of whether or not the 600 MHz band should be allocated to 5G.

The Discussion Paper infers that it has been automatically assumed that 600 MHz will be used for 5G, if it is required.

The need for more sub-1 GHz spectrum for 5G is not clear. Indeed, the allocation of 600 MHz to IMT at WRC-15 was only supported by the USA and a handful of small countries. This is clearly not broad support worldwide, noting that the USA has fewer mobile subscribers than China or India, and not many more subscribers than countries like Brazil, Russia and Indonesia.

In comparison, the 600 MHz band is actively used for DTT in many countries. More critically, there are no other spectrum bands allocated for DTT in most countries, and specifically in New Zealand. 500 to 700 MHz is the only option. Existing Freeview receivers do not support VHF Band III spectrum and this has been allocated to non-television applications.

Digital television broadcasters currently have theoretical access to approximately 180 MHz of spectrum for DTT from 510 to 686 MHz, but the mobile network operators already have at least 650+ MHz of spectrum below 4 GHz specifically allocated to IMT. Based on the Ministry's proposal in the discussion document this will increase to 900+ MHz. While IMT and 5G is an important technology, it should not get all of the spectrum.

The 600 MHz band should not be allocated to 5G.

*15) If so, how should we deal with radio microphones in the 600 MHz band?*

*Kordia submission:*

The 600 MHz band should not be allocated to 5G, and therefore radio microphones can stay with their GUSLs in the 500 and 600 MHz bands.

*16) When is the demand likely to require reallocation of the 600 MHz band to IMT, if at all?*

*Kordia submission:*

The 600 MHz band should not be allocated to 5G whether or not there is demand. Television broadcasters need access to the sole band allocated to DTT in New Zealand.



## 4 SPECTRUM ALLOCATION

### 4.1 Allocation Methodology

17) *Which allocation methodology should be used for allocating spectrum bands identified for use with 5G? Why?*

*Kordia submission:*

Spectrum should generally be allocated by auction. However, we recommend that a subset of the replanned 3.5 GHz TDD band is identified for existing active 3.5 GHz broadband wireless providers, and allocated at a fixed price to those providers and taking in account their investments to date. The broadband wireless spectrum could have conditions that the operators must not use it to provide cellular mobile services, to ensure that the 5G mobile operators' spectrum is not undermined.

18) *Should different allocation mechanisms be used for rights for regional providers and national providers? Why?*

*Kordia submission:*

There should be different allocation mechanisms, but not for regional vs national providers. Rather there should be different allocation mechanisms for existing broadband wireless providers in the 3.5 GHz band (whether national or regional) and for 5G national mobile providers. Kordia as a national fixed broadband provider would require access to 3.5 GHz spectrum across New Zealand in a similar manner to our existing management right and not have to fight over regional spectrum parks.

### 4.2 Implementation Requirements

19) *Should deployment of 5G technology be specified for some or all bands? If not, why not?*

*Kordia submission:*

The Ministry has traditionally been technology neutral, and the frequency bands discussed in this document should be technology neutral wherever there is the real possibility of other non-IMT uses. The spectrum should not be dimensioned in a manner which forecloses its use for new technologies (either within the IMT framework or outside it) as that would stifle innovation. Similarly, dimensioning should not favour the current national mobile network operators.

20) *What implementation requirements should be specified and how should these be expressed? – time, extent, etc –*

*Kordia submission:*

Suitable implementation requirements should be applied to all bands discussed in this document to ensure that the spectrum does not remain unused. However, these requirements should not demand a rapid rollout, given the new technologies being discussed and/or the difficulty of providing significant area or remote coverage at these higher frequencies.

21) *What should be the consequence of non-implementation – lose spectrum, additional payment, other*

*Kordia submission:*

Loss of spectrum would be the most effective consequence of non-implementation.

22) *Should the implementation requirements be different for regional and national providers? What should these be and why?*

*Kordia submission:*

We require clarification as to whether “regional providers” means existing regional providers in the 3.5 GHz band using the Crown’s FDD spectrum, and whether “national providers” means providers of new national 5G services.

If this is the correct interpretation, then there should be different implementation requirements. Regional providers already have networks built and the new licences should require this existing coverage to be largely maintained (albeit perhaps using new duplex methods). National providers will be building new 5G networks so some implementation requirements will be necessary to ensure a network is actually built.

### **4.3 Acquisition Limits**

23) *Should acquisition limits be imposed on 5G bands? If so, what should these be and why?*

*Kordia submission:*

Yes.

24) *Should acquisition limits be imposed for regional providers? If so, what should these be and why?*

*Kordia submission:*

As per question 22, if regional providers means existing regional providers in the 3.5 GHz band using the Crown’s FDD spectrum the acquisition limits could be imposed for regional providers equal to their existing holdings (or a pro-rata amount if there is more or less new spectrum available).

### **4.4 Duration of Allocated Rights**

25) *What term should be used for management rights suitable for 5G? Why?*

*Kordia submission:*

15 years.

## 5 MANAGEMENT RIGHTS FOR 5G

### 5.1 Band Planning

- 26) *Should the 5G bands be replanned as TDD bands or some bands or parts of bands be retained as FDD? Why?*

*Kordia submission:*

Technologies such as broadband wireless have for some time moved to TDD modes, and cellular technologies are now following this change. The bands discussed in this document should be technology neutral, and not described as “5G bands”. On the basis that draft 5G standards favour TDD and related technologies such as broadband wireless use TDD, the bands discussed in this document should be planned as TDD.

### 5.2 Bandwidth

- 27) *What bandwidth should be used as the basis for allocation? Why?*

*Kordia submission:*

5 or 10 MHz.

### 5.3 Out of Band Emissions

- 28) *What out of band emission limits should apply to management rights when first created for allocation? Why?*

*Kordia submission:*

Out of band emission limits should generally be set to the maximum realistically anticipated transmission bandwidth for each available band (not necessarily the maximum possible bandwidth). This will avoid the need for uncertainty caused by post-auction negotiations.

- 29) *Should out of band emission limits be different if the band is technology neutral? If so, what out of band emission limits should be applied?*

*Kordia submission:*

As discussed in question 19, we recommend that frequency bands discussed in this document should be technology neutral wherever there is the real possibility of other non-IMT uses. Out of band emission limits in technology neutral bands should be out of band emission specifications and the maximum realistically anticipated transmission bandwidth for the various technologies available in these bands.

## 5.4 Interference Between TDD Networks

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

*Kordia submission:*

A fixed guard band should be retained between adjacent TDD networks. Synchronisation of adjacent TDD networks may overly restrict management right holders' network flexibility.

A previous spectrum auction included a provision that a fixed guard band (e.g. 5 MHz) is included in each operator's spectrum allocation, and that this guard band could be reduced or removed altogether if there is mutual agreement between adjacent rights holders. While this provides flexibility, the prospect of a relatively small amount of additional spectrum may not be much practical value given the fixed and limited bandwidth options available in most technologies.

31) *How should interference between different technologies within the same band be managed, if bands are technology neutral?*

*Kordia submission:*

As described in question 30 above, a fixed guard band should be retained between adjacent TDD networks regardless of technology.

## 6 ACCESS TO SPECTRUM FOR REGIONAL PROVIDERS

32) *Should regional uses be provided for in the 3.5 GHz band plan? Why?*

*Kordia submission:*

The discussion document states:

*Regional wireless broadband providers operate in the 3.5 GHz band. When the Crown management rights in this band expire, these regional providers have a legitimate expectation they will be able to continue to operate a service.*

Why are regional wireless broadband providers recognised as having a legitimate expectation of continuation of service, yet national wireless broadband providers who have also been actively using 3.5 GHz spectrum are not similarly recognised as having a legitimate expectation of continuation of spectrum? There is no difference between the two groups. As described in question 6, Kordia has actively deployed TDD services in the 3.5 GHz band with long term contracts with utilities out to 2022, with an expectation from customers that the services will be available long term (for various reasons, including both network and network-operator diversity) and with the legitimate expectation that spectrum will continue to be available for such services.

If regional wireless broadband providers are provided for in any way in the 3.5 GHz band, then national wireless broadband providers must also be accommodated.

33) *If allowed in the 3.5 GHz band, how could this be managed or facilitated?*

*Kordia submission:*

We recommend that a subset of the replanned 3.5 GHz TDD band is identified for existing 3.5 GHz regional and national broadband wireless providers (and if this is not sufficient to meet existing uses, additional and technically appropriate spectrum should be allocated elsewhere). This spectrum should be allocated at a fixed price to the existing 3.5 GHz broadband wireless providers, taking in account their investments to date. The broadband wireless spectrum could have conditions that the operators must not use it to provide mobile services, to ensure that the 5G mobile operators' spectrum is not undermined.

34) *Which alternative bands may be suitable for regional allocation? Why?*

*Kordia submission:*

None of the bands suggested seem appropriate – the 25 MHz unused portion of the 2.3 GHz band is insufficient.

## 7 TIMING

### 7.1 3.5 GHz Band

35) *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?*

*Kordia submission:*

We do not agree that early access to the 3.5 GHz band should be provided, unless the issues with existing uses in that spectrum are sorted out first.

36) *How could early access to the 3.5 GHz band be achieved?*

*Kordia submission:*

We have actively deployed services in the 3.5 GHz band for many years and Kordia has long term contracts out to 2022 with significant utilities that need managed services with prioritised low latency traffic components. There is also an expectation of ongoing use. We need to honour these contracts out to 2022 and to provide early access to the 3.5 GHz band we would need to have a suitable managed service available from other providers. Any such service needs to be available for long term contracts beyond 2022, rather than only a temporarily available service that is withdrawn once our management rights expire in 2022.

There is not any commercial service currently available nationwide that provides the high performance managed services that we are providing our customers. Additionally, some Kordia customers also use lower performance services as a diverse network path for reliability. Any managed service Kordia uses for these customers in future must be separate from their existing diverse services. Kordia would need to be compensated for transition costs and any commercial impacts.

37) *Should the government be involved in early access arrangements for the 3.5 GHz band?*

*Kordia submission:*

We recommend that the Government is involved in any early access arrangements, provided the issues with existing uses in the band are sorted out first. This will be simpler, fairer and cleaner for all parties.

### 7.2 26 GHz Band

38) *Is early access to the 26 GHz band required for roll out of 5G networks prior to the expiry of existing rights in 2022? If so, why?*

*Kordia submission:*

We have no comment on this question.

39) *How could early access to the 26 GHz band be achieved?*

*Kordia submission:*

We recommend that the Government is involved in any early access arrangements. This will be simpler, fairer and cleaner for all parties.

### **7.3 Other Bands**

40) *When is demand for the bands above 30 GHz likely to eventuate?*

*Kordia submission:*

We have no comment on this question.

41) *When is demand for the 600 and 1400 MHz band likely to eventuate, if at all?*

*Kordia submission:*

We have no comment on this question.