Cross submission to the Ministry of Economic Development on the submissions by interest parties on the 700 MHz Digital Dividend Discussion Document dated August 2011

9 November 2011

Contents

1. EXECUTIVE SUMMARY

Introduction

1.1 Two Degrees Mobile Limited (***2degrees***) welcomes this opportunity to comment on the submissions filed by interested parties on 7 October 2011 in relation to the Ministry of Economic Development's (***MED***) draft proposal for the allocation of the Digital Dividend published in August 2011 (***Discussion Document***).

1.2 The fact that the MED has received 40 submissions on the Discussion Document highlights the importance of the Digital Dividend to both the industry and end users.

1.3 Spectrum is the key enabler of mobile operations and therefore of mobile competition, and while there are differences between submitters on how best to achieve a competitive mobile broadband market, the importance of ensuring rigorous competition over the long-term is the overriding theme across all submissions.

1.4 The Digital Dividend comes at a time when competition is increasing in New Zealand after decades of duopoly. However, it is critical that that the MED does not take recent competition advances for granted, with 2degrees remaining a late entrant and yet to complete its 3G network roll-out. Certain legacy barriers to competition remain which, absent direct resolution within the 700 MHz allocation process, threaten to inhibit the competitiveness of new 4G mobile broadband markets.

1.5 We urge the MED to be ambitious on behalf of all New Zealanders and seek the most pro-competitive outcome from the Digital Dividend and one which delivers the platform for a competitive market clearly sought by submitters.

Key findings from our review of submissions

1.6 In **Section 2**, we discuss the following key findings, identified from our review of the submissions by other interested parties, as they relate to the 2degrees' submission:

- The link between spectrum and competition is clear;
- Submitters largely agree that a further new entrant is highly unlikely;
- Digital Dividend spectrum should be used to rectify current spectrum imbalances;
- 2degrees has the most pressing need for additional spectrum;
- There is strong technical justification for 2x20 MHz allocation;
- There is a material risk of technical switching barriers occurring;
- Only one submitter suggested that spectrum caps were not required;
- Caps should be set for 700 MHz, sub-1 GHz and total spectrum holdings;
- Implementation requirements are broadly supported;
- The relationship between the Digital Dividend and that RBI has not been fully considered;
- Outstanding competition issues from the 2000 Ministerial Inquiry must now be resolved;
- Greatly improved tower sharing is required;

- Insufficient information and analysis has been provided to enable interested parties to consider alternatives to allocation by auction; and
- The current allocation timeframe is too rushed.

1.7 In **Section 3**, we make the following further comments in relation to Telecom's submission:

- Telecom acknowledges that spectrum provides a competitive advantage;
- End user experience and not theoretical maximum speeds are the key measures;
- Acquisition caps are necessary – the Commerce Act is insufficient;
- Allocating 2x20 MHz to one MNO is not discriminatory;
- Telecom understands the "blocking value" of spectrum; and
- Telecom appears to agree that the current allocation timeframe is too rushed.

1.8 In **Section 4**, we make the following further comments in relation to Vodafone's submission:

- It is misleading to present Germany as a precedent for rural New Zealand;
- The Swedish example presented by Vodafone is incomplete;
- An outside-in obligation would distort investment incentives and hinder competition;
- Vodafone is the key beneficiary of an early Digital Dividend allocation;
- By Vodafone's own analysis spectrum caps should be applied across the sub-1 GHz bands;
- UK sub-1 GHz spectrum caps have been misunderstood by Vodafone;
- Vodafone seeks an allocation timeframe that is inconsistent with New Zealand's small scale; and
- The benefits of extending the allocation timeframe into 2013 hugely outweigh the costs.

None of the submissions alter our original proposal other than to identify further consultation required

1.9 Having reviewed the submissions in detail, taking particular note of new information and concerns raised by parties that 2degrees had not considered in its original submission, we are confident that our original recommendation for the Digital Dividend allocation best strengthens competition in the New Zealand mobile broadband market.

1.10 We repeat our recommendation below:

(a) Allocation of the Digital Dividend to the three existing mobile operators by way of an administered allocation methodology using administered incentive pricing.

(b) Allocation of 2x20 MHz to 2degrees, 2x15 MHz to Vodafone and 2x10 MHz to Telecom.

(c) Implementation obligations requiring delivery of 4th generation mobile broadband services to 50% of the population within 5 years of spectrum becoming available.

(d) A spectrum cap in the 700 MHz band of 2x15 MHz, subject to a set-aside of 2x20 MHz for 2degrees.

(e) A spectrum cap in the sub-1 GHz range of 2x30 MHz.

(f) An overall spectrum cap in the sub-1 GHz, 1800 MHz, and 2100 MHz bands of 2x65 MHz, up until the point that there are further allocations below 2.1GHz.

1.11 If, contrary to our submissions, an auction is to be undertaken, the following *additional* competition safeguards are required:

(a) A minimum spectrum parcel of 2x10 MHz paired.

(b) Incremental blocks of 2x5 MHz paired.

(c) Participation in the auction by TelstraClear conditional on either it releasing or having deployed its 1800 MHz and 2100 MHz spectrum so as to provide mobile services to at least 50% of the population.

1.12 In our submission we also recommended in advance of the allocation:

(a) pursuit of an integrated telecommunications and competition policy; and

(b) completion by the Commerce Commission of a detailed competition and market analysis.

1.13 However, having considered the submissions, it is now clear that a number of additional issues require further consideration beyond those listed in paragraph 1.12 above.

1.14 2degrees requests that, in advance of the allocation, the MED seeks expert advice and consults with interested parties in relation to:

- The state of competition in the mobile market (paragraphs 2.10 and 2.70);
- Interference issues and technical switching barriers (paragraph 2.34);
- The relationship between the RBI and the Digital Dividend (paragraph 2.66);
- The switching barriers and demand side investigations currently underway (paragraph 2.78);
- Network deployment issues, including greatly improved 4G tower build and sharing obligations (paragraph 2.83); and
- All of the different allocation methodology options (paragraph 2.92).

1.15 We note that the MED has written to the Telecommunications Commissioner[1] inviting the Commerce Commission to comment on certain competition considerations raised in the Digital Dividend submissions as well as comment on the cross submissions. We welcome the formal request for expert advice from the Commerce Commission but note that there is no reference in the letter to a process whereby interested parties can comment on the advice received from the Commerce Commission by the MED.

[1] "*Consultation on the allocation of the Digital Dividend*" – Letter from the MED to the Commerce Commission dated 27 October 2011.

1.16 We repeat our request that such an opportunity to comment be provided.

The time should be taken now to reach an informed policy decisions as this will set the competitive landscape for the next 20 years

1.17 Ofcom recently announced that it will extend its consultation process on its assessment of future mobile markets and its proposal for allocation of the 800MHz and 2.6GHz spectrum bands. As Ofcom explains, decisions in relation to the Digital Dividend will shape the future of mobile markets and require careful consideration:

> We received a number of substantial and strongly argued responses to this consultation. We have been reviewing these responses over the summer, and refining our analysis as a result. In light of these responses, and the significance of the decisions that we need to take - decisions that are likely to shape the future of the mobile sector in the UK for the next decade or more - we have decided to undertake a further round of consultation on these issues.[2]

1.18 We urge the MED to follow Ofcom's lead and confirm that further consultation on the matters raised above will be undertaken. This consultation can be undertaken without delaying the launch of 700 MHz LTE in New Zealand and will ensure that the process of awarding the spectrum is robust and delivers an allocation which enhances competition for the benefit of all New Zealanders. The 2degrees' proposed timetable is set out in paragraph 2.99.

[2]Ofcom (7 October 2011), *Update on plans for award of 800MHz and 2.6GHz spectrum*, http://stakeholders.ofcom.org.uk/consultations/combined-award/update

2. COMMENTS ON SUBMISSIONS IN THE CONTEXT OF 2DEGREES' SUBMISSION

The link between spectrum and competition is clear

2.1 In our submission we highlighted the importance of spectrum as the key enabler of mobile operations, and therefore of mobile competition.

2.2 There is a general consensus from the submissions received by the MED as to the link between spectrum and competition and strong support for an allocation of the Digital Dividend which promotes competition. A spectrum allocation which builds on the increased competition recently enjoyed in New Zealand following the entry of the third mobile operator is a clear priority for a number of submitters. In these circumstances an allocation which supports robust three player competition should be one of the most, if not the most, important objectives of the MED in the current process.

2.3 Two key aspects of the link between the Digital Dividend and competition can be identified from submissions:

(a) New spectrum provides operators with additional capacity to compete in the rapidly increasing market for mobile broadband traffic; and

(b) The propagation characteristics of the sub-1 GHz bands provide operators with the ability to cater for indoor usage (where most mobile broadband usage occurs) in urban markets and to serve rural users better and more efficiently.

2.4 While there may be disagreement between 2degrees and the incumbent operators as to how best to achieve a more competitive mobile market, both Telecom and Vodafone acknowledge the link between spectrum and competition and the importance of promoting competitive markets. For example, Telecom made the following submissions highlighting the link between spectrum and competition:

> New Zealand will be better off if it fosters strong competition between MNOs than if it designs spectrum allocations in a way that can give one MNO a significant and enduring competitive advantage.[3]
>
> Parties would be able to most effectively compete if they had access to the same spectrum (band and bandwidth).[4]
>
> Given the inefficiency associated with unequal allocation of spectrum in the absence of known market shares, the most pro-competitive outcome over the 18-year period is for there to be an even allocation of spectrum between the parties to give them all an equal opportunity to compete.[5]

2.5 Vodafone similarly acknowledged the importance of promoting competition, commenting that:

> … the government must both promote competitive markets and promote infrastructure investment ... and allow the market to reach an efficient equilibrium over the long-term.[6]

[3] Telecom New Zealand Limited, "*Response to Ministry of Economic Development Discussion Document "Digital Dividend – Opportunities for New Zealand*", 7 October 2011 (**Telecom NZ Submission**), para 13

[4] Telecom NZ Submission, para 38

[5] Telecom NZ Submission, para 83

[6] Vodafone New Zealand Limited "*Vodafone New Zealand Limited Submission to the Ministry of Economic Development*", 7 October 2011 (**Vodafone Submission**), para 3, third bullet point

2.6 We note that submissions in favour of an even allocation of the 700 MHz spectrum on competition grounds ignore the current disparity in sub-1 GHz (and total spectrum) holdings between mobile operators. If equal allocation of 700 MHz spectrum is required on competition grounds it logically follows that current spectrum disparities are a barrier to competition. The Digital Dividend presents the opportunity for this barrier to be addressed, with the outcome being three mobile operators with near equivalent spectrum holdings and hence equivalent capacity to compete over the long-term.

2.7 Submissions from vendors also highlight the link between spectrum and the capacity needed to serve mobile broadband customers, with Huawei's submission highlighting mobile broadband traffic growth[7] and RIM referring to a pending "capacity crunch".[8]

2.8 Concern for ensuring a pro-competition allocation is also evident from many other submissions, notably those whose primary concern is with end-users:

> Rural Women New Zealand takes the view that spectrum allocation needs to result in urban-like competition and choice for rural customers too.[9]
>
> [FoMA] would expect that spectrum was allocated in a manner that ensured all players had equal capacity across the crucial spectrum bands so that our members were not constrained to one or two providers for data.[10]
>
> TUANZ also believes that competition in rural New Zealand is as vital as it is in urban areas, if not more so given the current state of service.[11]
>
> Hautaki states that 700 MHz is an important resource for the development of rural services, but that it must not be used to develop a monopoly and leave rural communities with little competitive choice.[12]
>
> NZCID considers that the principal objective of MED and the wider government through the release of 700 MHz spectrum to be the facilitation of long term competition between mobile broadband providers.[13]

2.9 It is clearly important to many submitters that the MED carefully and fully considers the impact of the 700 MHz allocation on competition, particularly in the context of the rapidly growing mobile broadband market.

2.10 We reiterate our submission that a rigorous competition assessment is a critical input for any spectrum allocation and urge the MED to obtain expert evidence from the Commerce Commission and to make this available for public comment by the industry in a further round of submissions.

2.11 In particular, expert advice should be taken on the issue of whether the 700 MHz allocation should be considered with or without reference to existing spectrum holdings, an issue raised by a number of submitters and discussed in more detail in sections 2.51 to 2.60 below (where we consider spectrum caps) below.

---

[7] Huawei Technologies Co., Limited "*Huawei Response to MED's paper: Digital Dividend – Opportunities for New Zealand*", (**Huawei Submission**) section 1.2

[8] Research In Motion Australia Pty Limited "*Digital Dividend: Opportunities for New Zealand – Comments of Research In Motion Australia Pty Limited*" 7 October 2011 (**RIM Submission**), section 3, p 2

[9] Rural Woman New Zealand "*Submission by Rural Woman New Zealand Regarding MED Consultation Document: Digital Dividend – Opportunities for New Zealand*", 7 October 2011, p 3

[10] Federation of Maori Authorities "*Submission: Digital Dividend discussion paper – Opportunities for New Zealand, August 2011*" (**FoMA Submission**), p 1

[11] Telecommunications Users Association of New Zealand, Submission on the MED's Digital Dividend discussion paper, (**TUANZ Submission**) p 6

[12] Hautaki Limited, "*Hautaki submission: Digital Dividend Discussion Paper, August 2011*" (**Hautaki Submission**), p 2

[13] New Zealand Council for Infrastructure Development " *NZCID Submission on the Digital Dividend*", 7 October 2011 (**NZCID Submission**), p 1

Submitters largely agree that a further new entrant is highly unlikely

2.12 While a small number of submissions consider the possibility of new entry, the far stronger indication is that like many other mature international markets where consolidation is now occurring, a new entrant in the New Zealand mobile market is highly unlikely.

2.13 The strongest indication that new entry is unlikely in New Zealand comes from the submission by TelstraClear. Despite their existing spectrum holdings, existing MVNO customer base and long presence in the New Zealand telecommunications market, TelstraClear does not believe that there is a case for a 4th mobile network operator, submitting:

> ... we consider that a 4th mobile entrant appears less likely and that any further competition at retail in the near term is likely to emerge from current operators and MVNOs.[14]

2.14 And, in response to question 8 regarding a potential spectrum set-aside for a new entrant, it says:

> TelstraClear does not consider that there is a need to set aside spectrum for a possible 4th entrant in the mobile market. Given NZ's small market size and the relatively recent entry of 2degrees, it is less likely that a 4th mobile operator would be sustainable on the basis of current technology.[15]

2.15 Many other submissions shared the MED's view expressed in the Discussion Document of the low likelihood of a 4th mobile network operator and either implicitly or explicitly acknowledged that new market entry in New Zealand is unlikely:

> The idea that New Zealand could sustain a fourth cellular network provider is difficult to sustain.[16]
>
> ...the practical reality remains that the barriers to entry are still significantly high for a mobile operator that the likelihood of a new mobile operator entering the market is low.[17]
>
> We think the best way for the MED to achieve its policy objective to allocate the 700 MHz band in a way that is economically and technically efficient and promotes competitive outcomes in a market for mobile broadband services is to allow parties the opportunity to purchase one of three "lots" of 15 MHz paired, contiguous spectrum.[18]
>
> While we cannot rule out the possibility of a new entrant, international evidence shows the continuing consolidation of mobile operators … Vodafone considers the reservation of spectrum for hypothetical future entrants is unnecessary. There is a real risk that such spectrum [that] is reserved for a fourth network operator is never used.[19]

[14] TelstraClear Limited, "*Submission on the Digital Dividend: Opportunities for New Zealand to allocate 700MHz band*", 7 October 2011 (**TelstraClear Submission**), para 4

[15] TelstraClear Submission, para 20

[16] TUANZ Submission, p 4

[17] Te Huarahi Tika Trust, "*Te Huarahi Tika Trust Submission – 700MHz spectrum*" 3 October 2011 (**THTT Submission**), p 3

[18] Telecom NZ Submission, para 11

[19] Vodafone Submission, para 98

2.16 We agree with the submissions of Vodafone, Telecom, TelstraClear and others that new entry in the New Zealand mobile market is unlikely and that no spectrum should be set aside for a hypothetical 4th entrant. We also agree with the submission by Telecom that it would be:

> …a perverse outcome if consumers were penalised and some investors, who have committed to invest, were to be disadvantaged in order to favour other investors who chose to reduce their risk by deferring investment.[20]

2.17 2degrees' shareholders have made a significant infrastructure investment in order to compete in the New Zealand mobile market. That investment has already delivered more than $2 billion in benefits to the New Zealand economy (see the Venture Consulting Report accompanying our submission) and has the potential with the right competition settings to deliver many more billions to the economy over the next decade.

2.18 In our view, any policy directed at encouraging future competition should be focused on stimulating the new competition brought to the market as a consequence of the significant investment already made by 2degrees.

Digital Dividend spectrum should be used to rectify current spectrum imbalances

2.19 2degrees recommended the following in relation to the allocation of spectrum and the application of spectrum caps:

(a) Allocation of 2x20 MHz to 2degrees, 2x15 MHz to Vodafone and 2x10 MHz to Telecom;

(b) A spectrum cap in the 700 MHz band of 2x15 MHz, subject to a set-aside of 2x20 MHz for 2degrees;

(c) A spectrum cap in the sub-1 GHz range of 2x30 MHz; and

(d) An overall spectrum cap in the sub-1 GHz, 1800 MHz, and 2100 MHz bands of 2x65 MHz, up until the point that there are further allocations below 2.1 GHz.

2.20 Our recommendation is based on the detailed arguments set out in our submission and the accompanying reports by Coleago Consulting and Frontier Economics. The reports analyse the current sub-1 GHz and overall spectrum imbalances between existing operators and conclude that together with explosive growth in mobile broadband these imbalances constitute an effective barrier to competition.

2.21 The need for new spectrum is driven by the need to provide sufficient capacity to meet exponential demand. There was clear support for the imminent need for further spectrum from a number of submissions. The point was clearly explained in the submission by GSMA:

> In mature markets we have already seen significant growth in mobile traffic stemming from uptake of mobile broadband services. This simply means that increased bandwidth or spectrum is required for mobile.[21]

[20] Telecom NZ Submission, para 72

[21] GSMA, "*GSMA Response to New Zealand consultation paper on Digital Dividend September 2011*", 30 September 2011 (**GSMA Submission**), p 2

2.22 Huawei concurs and emphasises that the need for more spectrum is most pressing in high density traffic areas, i.e. in cities:

> Data traffic is not uniform across the network but distributes towards hot zones. A subset of sites in high density areas carry far more traffic than the average for the network or overall geographic area. As these high traffic sites are in areas where it is both difficult and expensive to expand the number of sites, this is where the first and most pressure will occur for new spectrum.[22]

2.23 Capacity is provided by a combination of all spectrum holdings; sub-1 GHz and above 1 GHz. The capacity of a mobile operator to serve customers and therefore its future market share in the mobile broadband market is constrained by the total spectrum across all bands held by that operator. Therefore it is essential that the 700 MHz allocation process takes into account the total spectrum holdings of each mobile operator and sets caps to create a level playing field from a spectrum / capacity perspective over the long-term.

2.24 Neither sub-1 GHz nor overall spectrum caps can eliminate the significant spectrum inequality which currently exists in New Zealand, but caps can go some way towards delivering spectrum and competitive parity between operators.

2.25 The submissions made to the MED by other stakeholders largely support 2degrees' view that there ought to be an allocation that takes account of the competitive aspect of spectrum holdings. Even Telecom and Vodafone agree on this point, the only difference being that they see spectrum equality to be narrowly limited to the 700 MHz band.

2.26 Neither Vodafone nor Telecom ask for more than 2x15 MHz of 700 MHz spectrum. While this may on its face appear to demonstrate support for parity and equal ability to compete, it does not. Seeking to simply divide the Digital Dividend into three equal lots merely locks in current spectrum inequalities and the competitive disadvantage faced by 2degrees; a point on which both Telecom and Vodafone are noticeably silent.

2degrees has the most pressing need for additional spectrum

2.27 In addition to our own analysis with regards to current spectrum inequalities (see Coleago Consulting Report[23], chapters 3.5, 5.2, 5.3, 6.5 and Frontier Economics Report[24], sections 3.2.3 and 3.2.4), other submissions highlight spectrum inequality and its negative impact on competition.

2.28 The report by Network Strategies[25], filed as part of the submission by InternetNZ, illustrates this quite clearly as shown in Exhibit 1. Vodafone has more than twice the amount of spectrum compared to 2degrees, and Telecom has almost 2.5 times more spectrum than 2degrees.

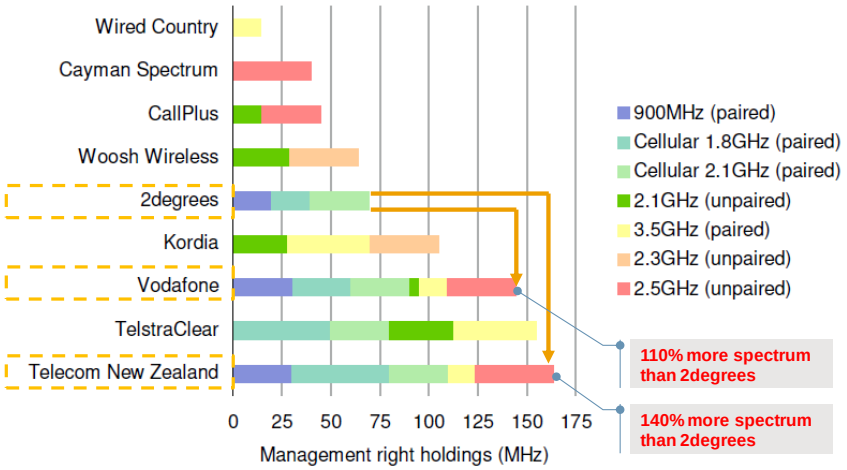
[22] Huawei Submission, p 3

[23] Coleago Consulting, "*Impact of 700MHz Allocation – Expert report on the potential long term impact on the market*", 7 October 2011, (**Coleago Report**)

[24] Frontier Economics Report, "State of Competition in New Zealand Mobile Market – A Report prepared for Two Degrees", October 2011

[25] Network Strategies, "*Final Report for Internet NZ – Digital Dividend Spectrum: key issues for New Zealand*", 21 September 2011, p 20

Exhibit 1: Spectrum Holdings



Source: Network Strategies, Exhibit 2.2.

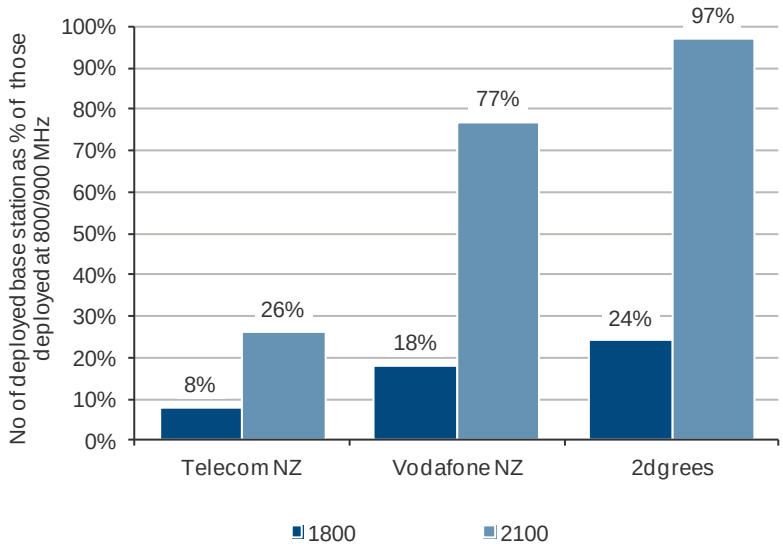
2.29 The submission by Netsmart also highlights the spectrum inequality between Telecom and Vodafone on the one hand and 2degrees on the other hand. Netsmart also points out that 2degrees makes far better use of its current spectrum holdings than either Vodafone or Telecom, providing an analysis of spectrum utilisation based on public data available in SMART and concluding:

> ... there appears to be little justification to allow either Telecom or Vodafone to acquire any more sub 1 GHz spectrum for network capacity reasons. This is especially so in the urban areas where the more favourable propagation characteristics of the sub 1 GHz spectrum are not required when providing network capacity.[26]

2.30 Exhibit 2 shows the data presented by Netsmart in graphic format. It shows the deployed number of 1800MHz and 2100MHz sites as a percentage of lower band (850/900MHz) sites. Operators can add more capacity by co-locating more 1800MHz and 2100MHz sites on 850/900MHz sites. 2degrees has gone very far down that route reaching 97% in the case of 2.1 GHz whereas Telecom's figure is only 26%. Telecom could therefore easily add capacity by deploying more 2.1 GHz sites.

[26] Netsmart Limited, "*Netsmart Limited submission to the Ministry of Economic Development on the on digital dividend discussion document*", p 6

Exhibit 2: No of deployed base stations as % of those deployed at 800/900 MHz



Source: Netsmart submission

2.31 The submission from Huawei cited above highlights that the lack of capacity is most felt in urban areas where traffic is served by sub-1 GHz and above 1 GHz spectrum. In this context the submission by Netsmart also highlights another important aspect. Given the much higher relative utilisation of spectrum, 2degrees' spectrum needs are materially higher than those of Vodafone and Telecom. As shown in Exhibit 2, 2degrees has already deployed proportionally many more 1.8 GHz and 2.1 GHz sites to provide capacity.

2.32 In order to grow in the mobile broadband market, 2degrees needs new spectrum much more than Vodafone and Telecom. Overall spectrum holdings in both the sub-1 GHz and above 1 GHz bands cannot be ignored when considering the competition impact of the Digital Dividend.

There is strong technical justification for a 2x20 MHz allocation

2.33 We have explained why the 700 MHz allocation should seek to rectify current spectrum imbalances by allocating 2x20 MHz to 2degrees on competition grounds.

2.34 In addition, there are also strong technical reasons for a 20 MHz allocation as well as a significant risk of the Digital Dividend allocation harming competition by introducing technical switching barriers between LTE providers once 700 MHz spectrum is deployed. These technical issues are discussed in this section and require further consideration and industry consultation by the MED.

2.35 Kordia's submission points to interference issues[27] and advocates a *"Maximum channel use of 15 MHz bandwidth adjacent to 703 MHz"*[28] and *"Maximum channel use of 10 MHz at the upper IMT boundary (748 MHz)."*[29] This would leave a 2x20MHz block at the centre of the band, i.e. there is a technical reason for a 2x20 MHz allocation to a single operator, and for the remaining spectrum to be allocated in 15 MHz and 10 MHz blocks.

[27] Kordia Group Limited, "Digital Dividend – Opportunities for New Zealand", 7 October 2011 (**Kordia Submission**), Reply to Q10, p 4

[28] Kordia Submission, Response to Q14, p 6

[29] Kordia Submission, Response to Q14, p 6

2.36 The proposal is to allocate 2 x 45MHz for mobile services using LTE in the band 698-806MHz, adjacent to the Digital Television broadcasting bands. In doing so it is essential that out of band transmissions for the LTE User Equipment (**UE**) do not give rise to unacceptable levels of interference to the digital television (**DTV**) service, given the likely proximity of UE to digital televisions and receiving antennas.

2.37 Kordia concludes that there may be potential interference to DTV at the bottom of the UE transmit band and to other LTE networks at the top, since there is a guard band of only 10MHz between UE transmit and receive bands. To minimise this interference, they suggest that the allocation at the top of the UE transmit band should not exceed 10MHz and the holding at the bottom of the band should not exceed 15MHz. As they make clear in their answer to question 11, this would leave 20MHz spectrum for the operator whose allocation was in the middle of the band.

2.38 Support for Kordia's view can be found in the Asia-Pacific Telecommunity (**APT**) Report "*Implementation Issues Associated With Use of The Band 698-806 MHz by Mobile Services*" (Report AWG-11/OUT-10) (**AWG-11 Report**). This report contains the results of deterministic and probabilistic studies predicting the levels of interference and loss of DTV service assuming given UE distributions and density.

2.39 The basis of the problem is clear: As the AWG-11 report states, the out of band interference from a UE increases with the operating channel bandwidth. The wider the band, the greater the out of band interference. For example, the results of deterministic study D2, Section 4.1.3.2 show 'additional attenuation' needed to reduce interference to acceptable levels for different scenarios. The out of band interference gets steadily worse as the channel bandwidth increases from 5MHz, to 10MHz, to 15MHz to 20MHz. This may be a natural consequence of the channel filters used. As the channel bandwidth increases the interference 'skirt' also spreads.

2.40 The results of probabilistic Study P5, in Section 4.3.2.5 claim a loss of coverage area for a given scenario increasing 0.5% to 1%. It is difficult to comment on this or any particular scenario given the number of variables (channel bandwidth, guard band, numbers of UE etc.).

2.41 However, the overall message is clear:

(a) One can conclude that if different operator holdings are involved, the largest holding (e.g. 20MHz) should be situated in the centre of the band, with the smaller holdings at either end.

(b) If three identical holdings are involved (15MHz per operator) then the problems of interference causing DTV outages will certainly be worse than the case where one operator has 10MHz and is situated at the bottom end of the band.

2.42 One could certainly argue that interference between mobile users should be resolved by the operators and that interference may not be entirely detectable by mobile data users given the natural variability of coverage and the bursty nature of mobile data communications. However, the impact on someone watching DTV in a fixed location may be considerably more disruptive, and from their point of view unexpected and unavoidable.

2.43 These issues require far greater consideration and technical band planning consultation with the industry by the MED.

There is a material risk of technical switching barriers occurring

2.44 There is growing regional concern that UEs may initially only be manufactured to work in either the top 2/3 or the bottom 2/3 of the 700 MHz band, and not across the entire band.

2.45 This concern has reached New Zealand and some global terminal vendors have indicated that they do not currently have plans to manufacture terminals with dual duplexer in the APT 700 MHz band.

2.46 A possible technical reason as to why some UE manufacturers have confirmed this is because in a UE, a duplexer connects the UE TX and RX to a single antenna system. The problem may be that currently duplexers cannot be created cost-effectively and in the right size to support only 10MHz separation between TX and RX bands. This may in the early stages lead to manufacturers having to make two device variants that work in (say) the top 2/3 or bottom 2/3 of the band.

2.47 This means that due to technical limitations, certainly at least in the initial stages, either handsets cannot operate across the entire band or, to achieve full band coverage, more expensive handsets will be required and these may only come later. This will result in a serious technical and economic switching barrier preventing subscribers of an MNO in the lower part of the band roaming on or switching to the network of an MNO in the upper part of the band. This risks repeating end-user switching barriers that existed in the 2G and 3G mobile markets until very recently whereby a new handset was required to change mobile operators.

2.48 This has serious spectrum valuation and competition implications and further work needs to be completed to fully understand:

(a) the technical limitations of UEs;

(b) chipset and terminal vendor roadmaps;

(c) the valuation differential between the lower, middle and upper parts of the band; and

(d) the impact on competition of a single UE not being able to roam across the entire 700 MHz band.

2.49 We urge that the MED to engage appropriate independent technical experts to investigate this issue as well as the interference issue described more fully above and to report back publically. We reiterate our comments from our submission that to date, band planning has failed to prevent interference issues, as evidenced by the launch of the XT network causing interference with both Vodafone and 2degrees' networks.

2.50 Further work on band planning and interference issues is clearly required. Technical switching barriers were a significant inhibitor of competition in New Zealand with virtually handset incompatibility occurring between the CDMA and GSM networks operated by Vodafone and Telecom stifling customer choice for a number of years. It would be a material step-back for New Zealand to re-introduce technical switching barriers into the mobile market and we urge that further analysis be undertaken in this area.

Only one submitter suggested that spectrum caps were not required

2.51 Among the 40 submissions received there is wide support for spectrum caps:

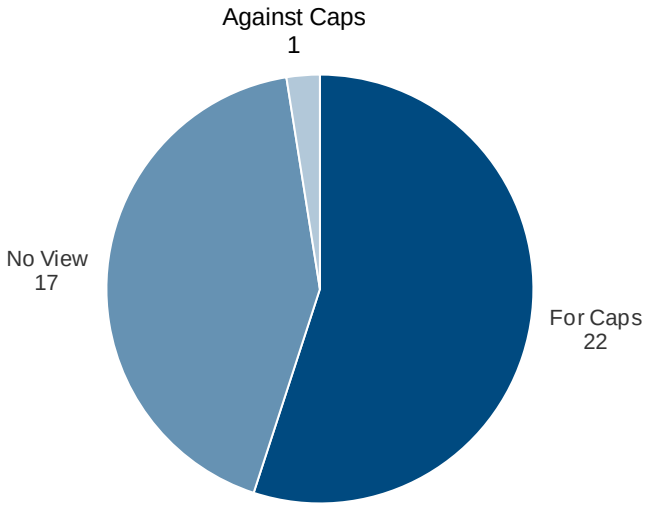
(a) 22 submitters favoured caps;

(b) 17 submitters expressed no view; and

(c) Only 1 outlier submitter (Telecom) suggested that caps were not required.

2.52 Of the 22 submitters who favoured caps, 14 supported a sub-1 GHz cap and several submissions advocated setting caps in relation to overall spectrum holdings.

Exhibit 3: Answers to Q9 Spectrum Acquisition Caps



Source: 700 MHz consultation submissions

2.53 Telecom is the only interested party who suggests caps are not required, submitting:

> In principle, we don't think that acquisition caps are necessary and a competitive allocation process and the protections that are already afforded by the Commerce Act provide sufficient protection.[30]

2.54 As shown in Exhibit 1 Telecom is the company that has the largest spectrum holdings in New Zealand, and as shown in Exhibit 2 Telecom underutilises this spectrum as compared to 2degrees. This illustrates that the imposition of 700 MHz, sub-1 GHz and overall spectrum caps are essential to:

(a) prevent further concentration in spectrum management rights; and

(b) ensure that spectrum is put to use.

[30] Telecom NZ Submission, Answer to Q9, para 79

Caps should be set for 700 MHz, sub-1 GHz and total spectrum holdings

2.55 As regards the level of caps, various views are expressed, but there is overwhelming agreement that neither Telecom nor Vodafone should be allowed to extend their competitive advantage through further spectrum concentration.

2.56 In relation to caps, a key question must be answered: Is it reasonable to consider setting caps in the 700 MHz allocation without taking into account existing spectrum holdings?

2.57 The answer is *"no"*, because:

(a) The combined 700/850/900MHz (sub-1 GHz) spectrum holdings determine the cost of rural coverage and the quality of urban and rural in-building coverage.

(b) Overall spectrum holdings determine the capacity an operator has to cater for mobile broadband traffic.

2.58 Below are examples of comments from other submitters on this point:

> Alcatel-Lucent considers that a cap over sub-1GHz bands would be reasonable.[31]
>
> CallPlus supports an acquisition cap for the 700 spectrum but also strongly supports an additional global cap as proposed by the Ministry on the less than 1GHz spectrum.[32]
>
> [In answering whether one party should be allowed to acquire 2x20MHz in the 700 MHz band]: Yes, but only if it is used to resolve the sub-1GHz allocation imbalance. TUANZ does not believe 700 MHz range should be viewed in isolation from the rest of the sub-1GHz range.[33]

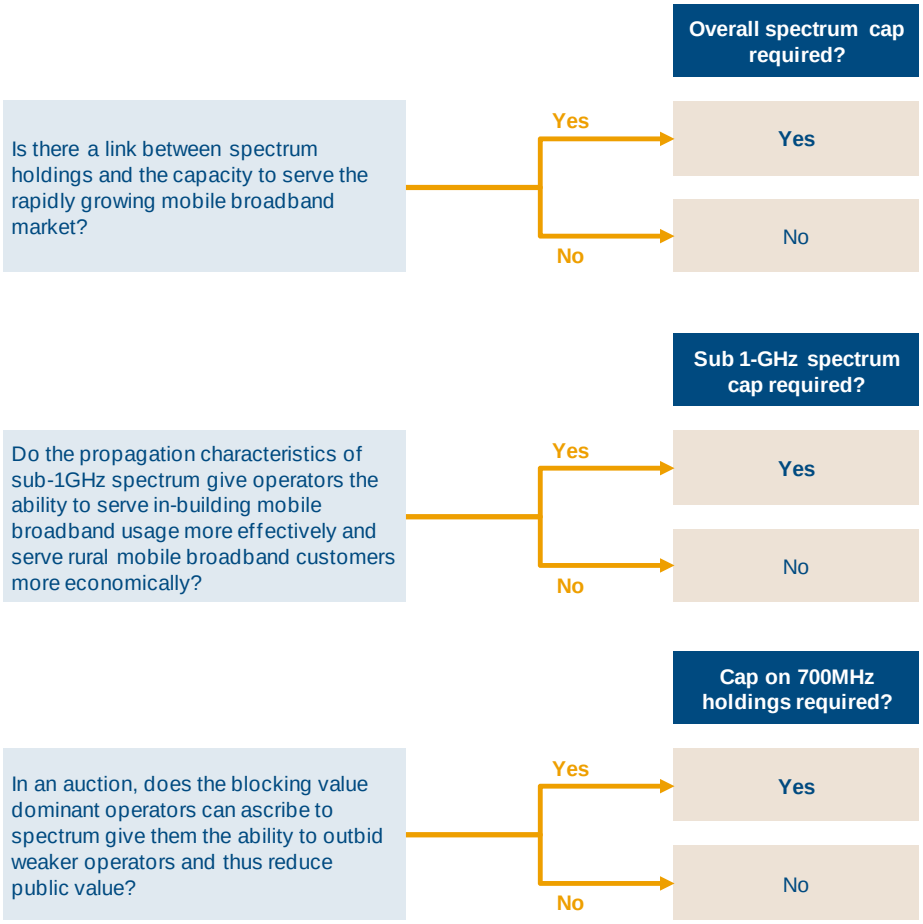
2.59 As discussed above the key issue is that there is a link between overall spectrum holdings and the capacity an operator has to serve mobile traffic. We summarise this link in Exhibit 4 below.

[31] Alcatel-Lucent, "*Digital Dividend – Opportunities for New Zealand – A Submission to the New Zealand Ministry of Economic Development*", 7 October 2011, Answer to Q10, p 6

[32] CallPlus Services Limited, "*Submission on the Digital Dividend Discussion Paper*", 7 October 2011, (**CallPlus Submission**) Answer to Q9, p 3

[33] TUANZ Submission, Answer to Q11, p 5

Exhibit 4: Analysis Framework for Spectrum Cap Requirement



Source: 2degrees analysis

2.60 On the above analysis spectrum caps must be set for 700 MHz, sub-1 GHz and also for total spectrum holdings. It would not be rational to proceed in any other way.

Implementation requirements are broadly supported

2.61 2degrees is in favour of an implementation requirement and this view is broadly shared by other stakeholders.

2.62 Of the 40 submissions received, 25 are in favour of some form of implementation requirement, 13 have no view and 2 come out against an implementation requirement (see Exhibit 5 below). One of the two submissions that are opposed to an implementation requirement is from Telecom who "... do not think these are necessary..."[34]

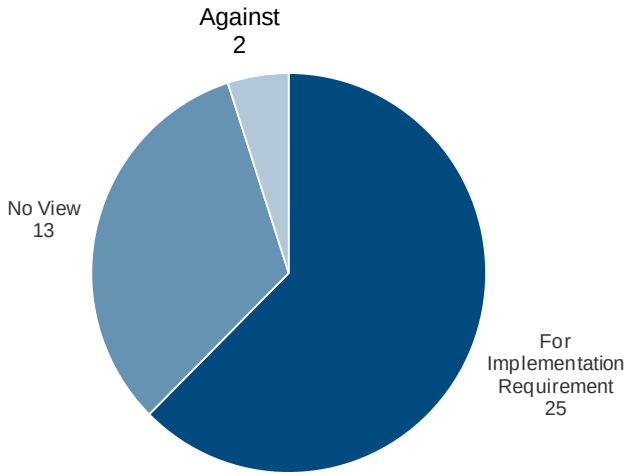
2.63 As shown in Exhibit 1 Telecom has the largest spectrum holdings in New Zealand and as shown in Exhibit 2, falls short of other operators in terms of implementation or use of that spectrum.

2.64 This illustrates the danger of allowing an allocation to go forward without implementation requirements. It also highlights the unique opportunity this 700 MHz allocation brings to attach implementation requirements to overall spectrum holdings. This would be an effective way to address the concerns raised by many stakeholders.

[34] Telecom NZ Submission, para 100

2.65 Perhaps predictably, TelstraClear who holds large amounts of unused spectrum, is the only other party which is opposed to an implementation requirement if this affects its existing unused spectrum.

Exhibit 5: Views on Implementation Requirements



Source: 700 MHz consultation submissions

The relationship between the Digital Dividend and that RBI has not been fully considered

2.66 2degrees had not previously commented on the 700 MHz allocation in the context of the Government's Rural Broadband Initiative (**RBI**). However, several submissions mention the RBI, and 2degrees agrees with other stakeholders that the relationship between the Digital Dividend and the RBI is an important issue that should be addressed in more detail in this consultation.

2.67 We discuss this in detail in our commentary on Vodafone's submission later in this cross-submission and note here only that Page 3 of the Discussion Document contains the only mention of the RBI by the MED.

2.68 This indicates that the MED has not given full consideration to all aspects of the 700 MHz allocation in the context of the RBI and therefore this consultation can only be described as preliminary in nature. A further, more informed, consultation including a detailed analysis of current Government rural broadband policy and initiatives is required before any allocation of the Digital Dividend can be made.

2.69 A large number of submissions reference the importance of the 700 MHz spectrum in rural areas. The need to consider spectrum of benefit to rural communities together with Government rural broadband policy is clear.

Outstanding competition issues from the 2000 Ministerial Inquiry must now be resolved

2.70 In our submission we highlighted further measures necessary to achieve the MED's policy objective of a competitive mobile market and above we have discussed the significant concerns raised by submitters with regards to the impact of the Digital Dividend on competition.

2.71 In order to achieve the objective of a competitive mobile broadband market, the allocation of the Digital Dividend must not be considered in isolation.

2.72 While considerable progress has been made through the work undertaken by the Telecommunications Minister, the MED and the Commerce Commission to open up the mobile market to increased competition, a number of key competition concerns remain unresolved. The Digital Dividend presents the opportunity for these to be finally addressed directly in the 700 MHz license conditions, allowing the new market for 4G mobile broadband services to develop from day one on a truly open and competitive basis.

2.73 It would, in our view, be a significant missed opportunity if barriers to competition, which have plagued 2G and 3G mobile markets for over a decade, were able to continue unresolved into next generation networks and markets.

2.74 Specifically, we note that the Ministerial Inquiry into Telecommunications, which reported more than a decade ago, in relation to the then Government's intention to conduct a 3G spectrum auction that:

> Bidders are particularly advised to note that the inquiry is giving consideration to the following issues:
>
> - Whether mandatory national roaming on compatible cellular networks or mandatory airtime resale should be considered as a means of reducing barriers to entry, and, if so, what terms and conditions would be appropriate;
> - Spectrum allocation policy, including use-it-or-lose-it provisions;
> - Whether mandatory co-location would be desirable for the building and upgrading of network facilities and how this would best be achieved.[35]

2.75 A clear signal was given that the above bulleted matters would be resolved before new spectrum was allocated. This did not occur.

2.76 Despite the above matters being revisited again in the Mobile Market Review conducted by the Commerce Commission in 2006[36] material competition issues remain unresolved today.

2.77 The allocation of new spectrum and imminent development of new 4G mobile broadband markets is the opportune time for outstanding barriers to competition to be resolved directly within the management rights for the 700 MHz spectrum.

2.78 The current Commerce Commission investigation into switching barriers in telecommunications markets should also be completed before new spectrum is allocated, with any barriers identified by the Commission resolved prior to the development of new mobile broadband markets.

2.79 We find that there is significant support from other stakeholders for these views. The opportunity presented by the Digital Dividend to ensure 4G mobile broadband markets commence on day one as open and competitive markets is one that must be taken for the benefit of the industry and all end-users.

[35] Ministerial Inquiry into Telecommunications, Final Report, 27 September 2000 (**Ministerial Inquiry**), para 8.3.1

[36] Commerce Commission, "*A Review of Cellular Mobile Market Entry Issues*", 10 October 2006

Greatly improved tower sharing is required

2.80 2degrees is particularly receptive to the views expressed with regards to mandated equal access tower sharing.

2.81 The suggestion put forward by the New Zealand Council for Infrastructure Development (**NZCID**) is highly relevant. The shared tower approach, particularly in rural areas, could be a solution to concern expressed by many stakeholders in their submissions:

(a) If a mobile broadband service in rural areas is offered by all operators, this increases choice for consumers in rural areas;

(b) Shared costs may lead to faster mobile broadband coverage of rural areas;

(c) Towers could not be used as a barrier to competition; and

(d) Sharing towers would reduce the overall number of towers and thus mitigate the environmental impact of mobile broadband infrastructure.

2.82 NZCID recognises the issue of the tower infrastructure in the context of competition, end-user benefits, and environmental impact:

> NZCID supports the immediate progression of work into the infrastructural requirements and implications of mobile broadband services and considers that this work and according regulation needs to be in effect before the 700 MHz spectrum is opened for use.[37]

2.83 2degrees supports the NZCID's call for an *"integrated cell tower policy"*. We recommend that the MED engages expert advisors familiar with international best practice and facilitates a workshop on the subject of an integrated cell tower policy, followed by an industry consultation. The outcome of this consultation should flow into the second round of the 700 MHz consultation. If warranted by the outcome of the consultation, provisions with regards to mandatory tower build and sharing should be attached to the 700 MHz spectrum management rights.

Insufficient information and analysis has been provided to enable interested parties to consider alternatives to allocation by auction

2.84 In our submission we recommended an administered allocation process rather than an auction.

2.85 Six of the other submissions received by the MED also stated that an auction is not the best method by which to allocate the 700 MHz spectrum. Of the other submissions, most do not explicitly support an auction, but many assume that there would be an auction.

2.86 The lack of informed and engaged discussion on allocation methodology highlights a material shortcoming in the Discussion Document, which proposes an auction without;

(a) a discussion of the drawbacks and benefits of an auction; and

(b) without a discussion of alternative methodologies and their advantages and disadvantages.

[37] NZCID Submission, p 2

2.87 The bias towards an auction in the Discussion Document leads interested parties, particularly those who are not familiar with spectrum allocations, to the conclusion that an auction is the only feasible allocation mechanism, which is not the case. Oddly the MED does not itself provide a good argument for an auction. The only reason cited is "transparency".

2.88 The method by which spectrum is allocated will have a material impact on competition and the future shape of the market. In these circumstances the Discussion Document should have included a weighing up of the different allocation mechanisms in order to allow interested parties to make informed comments and also to demonstrate that the MED did not have a pre-conceived view of the appropriate allocation methodology. This has not occurred.

2.89 Several submissions are concerned that an auction would not necessarily deliver the desired policy objectives. Hautaki Limited echoes 2degrees' concern with "blocking" and states:

> An auction is not required. Rebalancing spectrum in the sub 1 GHz range via an administered 700 MHz allocation is the most effective option. Hautaki does not consider that all effective allocation mechanisms have been suitably discussed and evaluated. There should be more consideration of further options before a decision is made.[38]

2.90 The NZCID firmly states its opposition to the auction approach stating that:

> ...this approach will directly lead to anti-competitive behaviour by better resourced parties who will be incentivised to prevent competitors obtaining spectrum.[39]

2.91 TUANZ also comments that:

> … holding an auction with the explicit aim of bringing in as much money as possible for the spectrum, might very well be counter-productive.[40]

2.92 We urge that the MED carries out a second round of consultation in which the various allocation methods are discussed in full, not only from a theoretical standpoint but also in the specific context of the New Zealand market. In particular, factors such as existing spectrum holdings, the blocking value likely to be ascribed to spectrum by incumbent operators, other barriers to competition and the low likelihood of a 4th MNO should be considered.

The current allocation timeframe is too rushed

2.93 In our submission we proposed an alternative timeframe which takes account of the uncertainties with regards to the APT band plan and equipment availability and which recognises New Zealand's position as a "technology taker", and which also met the Government's objective of a late 2013 date for digital switchover.

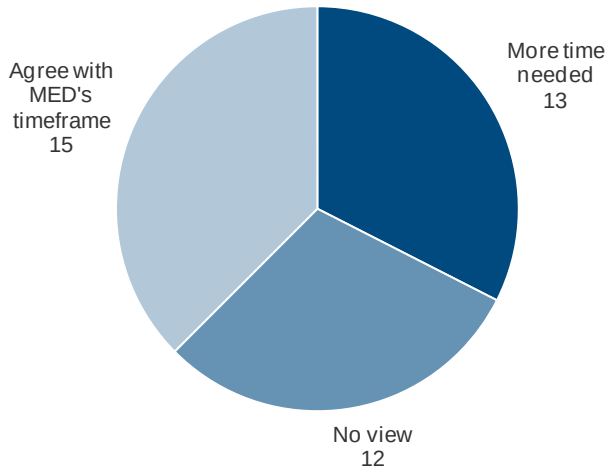
2.94 Of the 40 submissions made, 13 consider the MED's proposed timeframe too rushed and only 15 agree with the proposed timeframe as illustrated in Exhibit 6 below. However, of the 15 who express agreement, many do so with caveats that in effect amount to a rejection of the MED's timeframe.

[38] Hautaki Submission, p 5

[39] NZCID Submission, p 4

[40] TUANZ Submission, p 6

Exhibit 6: Views on Proposed Timeframe



Source: 700 MHz consultation submissions

2.95 Many submissions were concerned that the MED ensures that it does not rush ahead with the allocation of the Digital Dividend while critical inputs and facts are unknown. For example, submitters commented as follows:

> CallPlus do not believe that a timeframe should be set at this time. It is too early to form a view on band allocation and assess how the global ecosystem will evolve. ... CallPlus' view is that any benefit from an early allocation in terms of planning is minimal; however the risk of selecting the wrong band plan is that a scarce resource is configured and allocated inefficiently.[41]
>
> [ETSSG] do not agree with the Ministry's proposed timeframe as in [their] view it is too rushed.[42]
>
> Hautaki observes that the MED acknowledges that NZ is a technology taker. The band plan is not yet agreed, with a timetable for adoption unknown, and until standards are set it is difficult to value spectrum. ... Forcing the use of 700 MHz spectrum can have unintended consequences for the industry and community. Doing so in an environment of high uncertainty over the future of LTE in New Zealand would be unwise.[43]
>
> Kordia points out that the timeframe is heavily dependent on the adoption of either the APT's FDD plan by a large market, or the adoption of an acceptable TDD plan. The timeframe must have a clearer escape route in the event that neither of these overseas markets eventuate. There should therefore be further opportunities than currently identified for parties to comment in the timetable.[44]
>
> [Tait] believe that a further round of discussion should follow publication of all submissions along with the MED's draft analysis to ensure a fully informed outcome.[45]
>
> THTT observes that New Zealand is a small country that leverages off the investment and direction of the larger economies. In this sector we cannot afford to be at the leading edge.[46]

[41] CallPlus Submission, p 1

[42] Emergency Telecommunications Services Steering Group, "*Response to the Discussion Paper – Digital Dividend: Opportunities for New Zealand*", 6 October 2011, p 10

[43] Hautaki Submission, Answer to Q15, p 5

[44] Kordia Submission, Answer to Q15, p 7

[45] Tait Radiocommunications, "*Digital Dividend – Opportunities for New Zealand*", 6 October 2011, Answer to Q15, p 10

> TUANZ understands some of the technical issues are reliant on international cooperation and decisions being made outside New Zealand. We support a further round of consultation with industry prior to a final decision being made.[47]
>
> The WAI 2224 Claimants propose that [a] research programme would liaise with government, industry and Maori stakeholders, and is an essential pre-requisite to decision making in this area.[48]
>
> Woosh highlights that the uncertainty over the band plan adoption in other markets makes it impossible to assess whether the Band Plan proposed is the right one. Therefore [they] cannot assess the fair market value of the Spectrum. It would be preferable to delay the process for at least 12 months so more information on the intentions of China and India and many other countries will be clearer in the next 12 months.[49]
>
> WUNZ points out that the proposed timeframe is too short.[50]

2.96 Among those who agree with the MED's timeframe many sound a cautionary note or add caveats, i.e. the agreement with the MED's timeframe is conditional. For example:

> Telco2 recommends that the Ministry should delay the auction design until such time as either Australia, China, or India has made a decision.[51]
>
> We should keep an eye on international developments we have discussed above as the pace of these may impact on the Ministry's timeframe. We would also note that major changes in what is happening internationally may require a further round of consultation. (Telecom NZ)[52]
>
> Ericsson points out that if New Zealand wishes to seek to maximise the benefits of the reallocation of the digital dividend spectrum, alignment with the harmonized Region 3 arrangement is the only viable and realistic option to consider.[53]
>
> The proposed timeframe appears appropriate. However, we note that adjustments may be required for consultation on details of any spectrum caps and implementation requirements (use it or lose it, MVNO pass through); alignment with international developments; the Treaty of Waitangi claim (WAI 2234).(TelstraClear)[54]

2.97 In our response to Q15 we cite the MED's own long list of uncertainties that need to be resolved prior to allocation of the Digital Dividend. Given the MED's own statements and the views expressed by many stakeholders, it is clear that this consultation process is not only rushed but also flawed because it does not propose a second round of consultation or fully consider a number of complex issues.

---

[46] THTT Submission, Answer to Q15, p 4

[47] TUANZ Submission, Answer to Q 15, p 6

[48] Wai 2224 Claimants "*700MHz Consultation*", 7 October 2011, p 2

[49] Woosh Wireless Limited, "*Digital Dividend Submission*", 7 October 2011, Answer to Q15, p 4

[50] Wireless Users New Zealand, "Response to "Digital Dividend Opportunities for New Zealand - Ministry of Economic Development August 2011", Answer to Q15, p 3

[51] Telco2, *Submission in response to the Ministry of Economic Development's request for comments on the discussion document* Digital Dividend - Opportunities for New Zealand", 7 October 2011, answer to Q 15, para 15.1

[52] Telecom NZ Submission, paras 108 and 109

[53] Ericsson Australia and New Zealand Pty Limited, "*MED Spectrum Reallocation in the 700MHz digital dividend band in New Zeeland - Ericsson submission to MED Digital Dividend Discussion paper*", October 2011, Answer to Q3, p 4

[54] TelstraClear Submission, para 45

2.98 We urge the MED to adopt the timeframe proposed by 2degrees. This would have two clear benefits: without delaying the ultimate availability of spectrum, it would;

(a) substantially reduce the risks associated with technology choice; and

(b) likely accommodate the objections raised by other stakeholders.

2.99 We reiterate our proposed alternative timeframe below for ease of reference:

Date	Event
26 Aug 2011	Discussion document released
7 Oct 2011	Submissions close
9 Nov 2011	Cross submissions close
Nov 2011	ITU-R Study Group 5, decision taken on adoption of APT Band Plan
Mar 2012	3GPP confirms the frequency standards for the APT band plan
Jul 2012	Sufficient number of ITU member states adopted the APT band plan
Jul – Oct 2012	MED analysis, commissioning expert independent advice
Sep 2012	Draft proposal for 700 MHz allocation
Oct 2012	Response to draft proposal received from interested parties
Nov 2012	Cross submissions
Jan 2012	CAB report & decision
May 2013	Publication of award format and rules
Jun - Sep 2013	Amendments, Supplements and Clarification Questions
Sep 2013	Final allocation design & rules
Oct 2013	Award procedure (AIP or auction)
Nov 2013	Management Rights Assigned
Nov 2013	Digital Switch-over
Dec 2013	Spectrum available for use

3. COMMENTS ON TELECOM'S SUBMISSION

Telecom acknowledges that spectrum provides competitive advantage

3.1 In paragraph 12 of its submission, Telecom states:

> While we can only speculate about how the market will evolve over the next 18 years but one thing is clear: creating structural imbalances may weaken incentives to innovate and invest – and with it the level of competition and the benefits to New Zealand.[55]

3.2 And further, in paragraph 13, Telecom states:

> Over an 18 year time horizon, we believe New Zealand will be better off if it fosters strong competition between MNOs than if it designs spectrum allocations in a way that can give one MNO a significant and enduring competitive advantage.[56]

3.3 2degrees shares Telecom's view in relation to the dangers to competition of spectrum-related structural imbalances, however the views diverge in terms of how to mitigate the dangers. Telecom has almost 2.5 times more spectrum than 2degrees. *This* is the fundamental spectrum-related structural imbalance that needs to be addressed. Not closing this wide spectrum gap during the current allocation process runs the risk of "lock[ing] in an uneven playing field for 18 years".[57]

3.4 In paragraph 83, Telecom states:

> Given the inefficiency associated with unequal allocation of spectrum in the absence of known market shares, the most pro-competitive outcome over the 18-year period is for there to be an even allocation of spectrum between the parties to give them all an equal opportunity to compete.

3.5 Telecom goes on to explain that:

> 850 MHz is not used for LTE at least from the known plans of major operators as of today. Without 700 MHz we would be left with 1800 (& 2600) MHz where 2 to 4 times the number of sites would be needed to provide coverage to the same areas.

3.6 Telecom appears to make a claim that its 850MHz spectrum holdings are useless in the context of serving the mobile broadband market.

3.7 However, in the context of the launch of the LTE showcase on the 15th of September, Telecom stated something quite different, namely that the XT 850 MHz HSPA+ network will continue to be New Zealand's leading smartphone network in the short, medium and long-term:

> Our customers are already telling us that XT is the best network for smartphones in New Zealand, and recent independent testing showed XT out-performed the other NZ mobile networks in Auckland. We're committed to giving our customers the best possible mobile experience and will ensure XT maintains its market-leading performance, and continue to be New Zealand's smartphone network in the short-, medium- and long-term.[58]

3.8 Telecom actively promotes the speed of its 850MHz mobile broadband network as can be seen from Exhibit 7, which advertises the network to the New Zealand market.

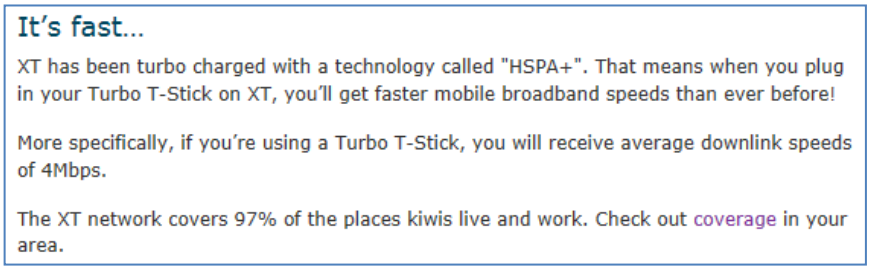
[55] Telecom NZ Submission, para 12

[56] Telecom NZ Submission, para 13

[57] Telecom NZ Submission, para 12

[58] Telecom Retail CEO, Alan Gourdie. http://www.3gamericas.org/index.cfm?fuseaction=pressreleasedisplay&pressreleaseid=3295

Exhibit 7: Telecom HSPA+ Mobile Broadband Description



It's fast...

XT has been turbo charged with a technology called "HSPA+". That means when you plug in your Turbo T-Stick on XT, you'll get faster mobile broadband speeds than ever before!

More specifically, if you're using a Turbo T-Stick, you will receive average downlink speeds of 4Mbps.

The XT network covers 97% of the places kiwis live and work. Check out coverage in your area.

Source: http://www.telecom.co.nz/internet/mobilebroadband/learnabout

3.9 Furthermore, Telecom can take advantage of deploying LTE at 1800MHz working in combination with the HSPA+ network at 850MHz, as is evidenced by the experience in Australia. On the 8th of August 2011, Telstra announced the launch of Australia's first commercial 4G/LTE device, working in dual 3G/4G mode with 1800MHz LTE and 850 MHz HSPA 3G:

> Telstra's first 4G product, the Telstra 4G USB, will use dual mode 4G/3G HSPA technology enabling it to operate across the 1800MHz and 850MHz spectrum bands, giving customers the benefits of 4G connectivity where it is available and switchover to high-speed HSPA technology across the Telstra Mobile Network which reaches 99 per cent of the Australian population.[59]

3.10 Telecom holds 2x25MHz of 1800MHz spectrum and 2x15MHz of 850MHz spectrum with a very wide population coverage. Thanks to its massive holding of 1800MHz spectrum (2.5x that of 2degrees) it can easily re-farm 2x10MHz to LTE. Hence Telecom is in a privileged position to launch a mobile broadband service with a combination of LTE capacity and HSPA+ capacity in higher density traffic areas and HSPA+ capacity in lower traffic density areas.

3.11 This demonstrates that thanks to its large and diversified spectrum holdings, Telecom already enjoys a structural competitive advantage. Telecom benefits from existing device availability right now.

3.12 For Telecom to ask for 1/3rd of the Digital Dividend is not justified because it will do nothing to reduce Telecom's spectrum advantage.

3.13 In its response to Q9 with regards to spectrum caps, Telecom writes:

> Given the inefficiency associated with unequal allocation of spectrum in the absence of known market shares, the most pro-competitive outcome over the 18-year period is for there to be an even allocation of spectrum between the parties to give them all an equal opportunity to compete.[60]

3.14 This shows that Telecom understands the clear link between spectrum holdings and the ability to compete effectively. Notwithstanding this, Telecom manages to paradoxically submit that the principle of *"even allocation of spectrum"* should only apply to the 700 MHz spectrum. This is an untenable viewpoint, for which there is no justification.

[59] Source: http://www.telstra.com.au/abouttelstra/media-centre/announcements/telstra-to-launch-australias-first-commercial-4glte-device.xml

[60] Telecom NZ Submission, para 83

3.15 In paragraph 84 of its submission, Telecom states: "*In addition we think any spectrum caps should only be applied on a band by band basis"*, yet it provides no supporting evidence or justification for this. The growth in mobile broadband traffic and the impending *"capacity crunch"* mean that to argue that total spectrum holdings do not matter is simply not tenable. MNOs take a holistic view of their spectrum holdings when deciding how they will deliver services to meet the market demand. The principle of "*even allocation of spectrum"* favoured by Telecom should apply across an operator's total amount of spectrum management rights measured in MHz.

3.16 In paragraph 87 of its submission, Telecom notes:

> In NZ due to both our challenging terrain and small and dispersed population, spectrum below 1GHz is of particular importance for mobile communications.

3.17 There is therefore an acknowledgement from Telecom that all sub-1 GHz bands are similar in terms of the ability to serve New Zealand's dispersed population and therefore should be treated as one. This is a sound argument for a sub-1 GHz cap, in addition to an overall cap.

3.18 We agree with the aim that the 700 MHz spectrum allocation should give operators an equal opportunity to compete. This means a key consideration for the 700 MHz allocation must be how the current spectrum imbalance can be reduced. This can only be achieved if Telecom does not receive more than the technically efficient minimum i.e. 2x10 MHz. Even this would still leave Telecom with a massive advantage in terms of overall spectrum holdings and hence a capacity advantage in the mobile broadband market.

End user experience and not theoretical maximum speeds are the key measures

3.19 In terms of actual end user access speed, the differences between the latest versions of HSPA+ and LTE are minimal. The differences are also not material from a customer experience view point because the user experience is governed by the number of users in a given cell and not by theoretical peak rates. The MED is aware of this and evidence can be found in the RBI contract with Vodafone.[61]

3.20 The RBI Agreement in Schedule 1, Part B, paragraph 2.3 focuses on the theoretical peak bit rate and stipulates:

> The RBI Broadband Service will initially be based on HSPA+ technology operating in the 900MHz band that is designed to provide the following peak speeds:
>
> 2.3.1 Downstream 21Mbps; and
>
> 2.3.2 Upstream 5Mbps.

3.21 In Schedule 1, Part B, paragraph 2.2, the RBI Agreement specifies that the RBI Broadband Service:

> ... consists of a single "best efforts" IP broadband service. The service is designed to have a peak throughput of at least 5Mbps downlink and 500Kbps uplink, and dimensioned to deliver a 99.9% probability of providing to any End User a minimum average throughput of 45Kbps downlink during any 15 minute period.

[61] Rural Broadband Agreement between Vodafone New Zealand Limited and Her Majesty the Queen (Ministry of Economic Development) (**RBI Agreement**)

3.22 This means that the rural broadband service is designed to provide a 45 kbps downlink speed in the busy hour compared to a theoretical 21 Mbps (21,000 kbps). i.e. the user experience in the busy period may only be 0.21% of what is theoretically possible. This clearly illustrates that what really matters is capacity to serve a number of users in a given area. The combination of new spectrum and the deployment of LTE in this spectrum will provide this additional capacity, but depending on the number of users in a cell, may or may not provide a better end-user experience.

3.23 In its submission, Telecom writes that *"850 MHz is not used for LTE at least from the known plans of major operators as of today."*[62] This may well be true but it is irrelevant because as stated above, HSPA+ delivers a similar user experience to LTE.

Acquisition caps are necessary – the Commerce Act is insufficient

3.24 Telecom's submission that the Commerce Act and the spectrum allocation process afford sufficient protections and that caps are not required does not withstand scrutiny.

3.25 It is well accepted that the Commerce Act is ill-suited to addressing issues in fast-developing high technology markets such as mobile telecommunications. As the Ministerial Inquiry into Telecommunications noted:

> The Commerce Act, and the case law that has developed around it, does not deal well with prospective markets or markets that are subject to rapid change.
>
> Conventional merger analysis may be particularly problematic when it comes to applying the new test to acquisitions of radio spectrum. Correct market definition is critical to such analysis but can be difficult in emerging markets such as 2½G and 3G telephony ... Assessing the effect of spectrum acquisition on future competition can also be difficult where entry is unlikely to occur for several years (as in the case of the 3G 2GHz spectrum) but nevertheless may be pivotal to how competition in a particular sector develops.[63]

3.26 As noted in the Commission's Mergers & Acquisitions Guidelines, "*market definition is an integral part of competition analysis"*.[64] However, defining the market in respect of downstream services which are not yet being provided is difficult.

3.27 For example, in its decisions on the Telecom and Vodafone 2GHz spectrum clearance applications,[65] the Commerce Commission defined a separate market for the provision of third generation mobile telephony services. The Commission noted that as 3G services were not being provided at the time of its decision, the proposed acquisitions did not result in any aggregation in that market.

3.28 Adopting the same approach for 4G services delivered over 700 MHz spectrum would ignore existing market structure issues: there would be no aggregation in 700 MHz spectrum, and therefore no competition issues identified. On that basis alone, it would be wrong to suggest that the Commerce Act was in an adequate tool to address competition issues arising from spectrum allocation. It is quite clear from the discussion above and the submissions received by the MED that there is a material link between spectrum and competition.

[62] Telecom NZ Submission, para 90

[63] Ministerial Final Report, section 3.6.3

[64] Commerce Commission, "*Mergers & Acquisitions Guidelines*", 2003, section 2.5

[65] Decision 413: *Vodafone / 2 GHz Spectrum*, 8 December 2000; Decision 423: *Telecom / 2 GHz Spectrum*, 15 March 2001

3.29 Further, analysis under the Commerce Act does not generally consider the longer term impacts of a proposed acquisition. The Commission has noted that when considering a clearance application, it generally adopts a two-year timeframe when analysing likely future effects.[66] In the authorisation context, the Commission goes further, generally weighing detriments and benefits over a five year period.[67]

3.30 The Commission recently noted that *"[B]eyond five years it is very difficult to forecast the effects of the proposed acquisition."*[68] The full effects of a 20 year spectrum allocation in rapidly developing markets cannot be properly analysed within the Commerce Act framework.

3.31 If parties choose to proceed with spectrum acquisitions without clearance, there are also delays and difficulties with enforcing the Commerce Act.

3.32 These delays are clearly evident from the more than 10 years taken to resolve the *Telecom 0867* case. Divestment is also only a remedy within two years after the acquisition, while other remedies are limited to within three years following the acquisition. It would therefore be both impossible from a practical perspective and outside the remedies provided in the Commerce Act to reverse a spectrum allocation once made should competition issues arise two to three years post allocation.

3.33 Imposing spectrum acquisition caps provides certainty and an ex ante safeguard mechanism for ensuring competition in downstream services that are vital to New Zealand's economic growth and productivity.

3.34 Proceeding without appropriate spectrum acquisition caps risks irreversibly damaging competition in 4G and broader mobile services. Spectrum holdings may become highly concentrated as a result of the problematic clearance regime and/or lack of effective and timely enforcement.

3.35 It may be some time before such a concentration of spectrum manifests in problems in the downstream retail markets and attract regulatory attention. By that time, those problems would likely need to be addressed through more blunt regulatory tools, which may still not be enough to overcome any market positions that have become entrenched in the meantime.

3.36 For these reasons it is wrong to suggest that the Commerce Act provides sufficient protection. As the majority of submitters stated, spectrum acquisition caps are required.

Allocating 2x20 MHz to one MNO is not discriminatory

3.37 In relation to the question of allocating a 2x20MHz block to one operator, in Paragraph 96 Telecom states:

> However, we believe allocation of 20 MHz to a single operator is discriminatory and creates a structural competitive disadvantage for the remaining MNOs.

[66] See Decision 613: *Transpacific Technical Services (NZ) / Medi-chem Waste Services,* 15 August 2007, para 177. We are aware of instances where the Commission has adopted longer timeframes, for example, in relation to forestry mergers (see for example, Decision 588: *Hancock Natural Resources / Carter Holt Harvey,* 27 September 2006) where it adopted separate markets for consecutive 4 year periods. However that was in relation to a slow moving market with very different characteristics

[67] See Decision 725: *Cavalier Wool Holdings / New Zealand Wool Services International*, 9 June 2011, para 218

[68] See Decision 725: *Cavalier Wool Holdings / New Zealand Wool Services International*, 9 June 2011, para 218

3.38 Both Telecom and Vodafone have a 2x15MHz in their sub-1 GHz blocks, whereas 2degrees only has 2x9.8MHz. Today, this spectrum is already used by 2degrees for UMTS900, HSPA and GSM900. In future some or all of this spectrum will be re-farmed to LTE/LTE Advanced. Therefore, by Telecom's own analysis, at present 2degrees is at a "structural competitive disadvantage" because Vodafone and Telecom both have >50% more spectrum holdings in the sub-1 GHz bands. Thus allocating 2x20MHz of the 700 MHz band to 2degrees is essential to reduce the current "*structural competitive disadvantage*" from which 2degrees suffers.

Telecom understands the "blocking value" of spectrum

3.39 In paragraph 103 of its submission, Telecom writes:

> The Discussion Document proposes using an auction mechanism to ensure that the spectrum is most likely to be allocated in the most economically efficient way possible. We agree that this is likely to be the best way to assign the 700 MHz band among stakeholders.

3.40 There is by now wide recognition among policy makers and academics that the hypothesis that an auction delivers the best outcome does not hold. The expert report provided by Coleago explains why it does not follow that an allocation of spectrum to a party that places the greatest private value on spectrum would also create the greatest public value.[69]

3.41 As one of the two dominant operators in New Zealand, Telecom would understand very well the "blocking value" of spectrum and would know that its dominance could be leveraged to block the recent new entrant 2degrees. Therefore, it is not surprising that Telecom favours the auction method and opposes caps. An unfettered auction without caps would lead to an outcome which further increases the spectrum inequality in New Zealand. This would reduce competition and thus the public value of the 700 MHz spectrum.

Telecom appears to agree that the current allocation timeframe is too rushed

3.42 In paragraph 101 Telecom notes that:

> The implementation requirements must take account of the fact that the necessary equipment may not be immediately available and that the economics of a roll out and the cost of new investments may mean that LTE isn't rolled out in every part of the country straight away.

3.43 It appears that Telecom share our view that the 700 MHz allocation process should not be rushed.

3.44 Telecom also evoked the need for a *"further round of consultation".*[70] 2degrees is in agreement with this view point.

[69] Coleago Report, section 7.3 and 7.4

[70] Telecom NZ Submission, para 109

4. COMMENTS ON VODAFONE'S SUBMISSION

It is misleading to present Germany as a precedent for rural New Zealand

4.1 Vodafone refers extensively to the RBI and the issue of providing rural coverage and advocates strict implementation requirements including an "outside-in" approach:

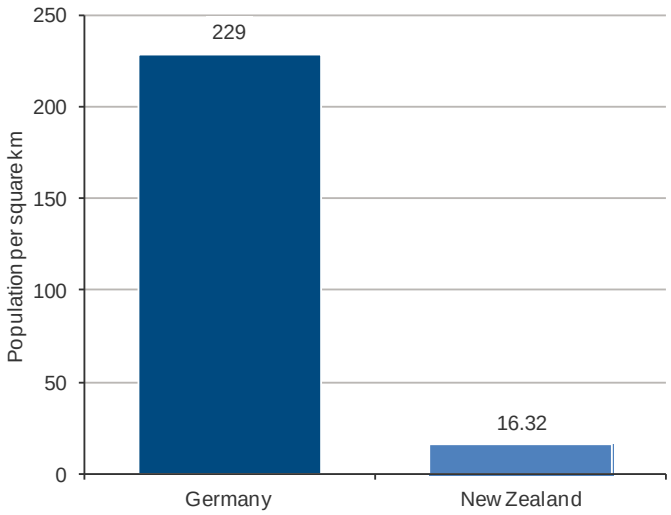
> While this spectrum has been identified as important to rural New Zealand, the current proposal does not deliver benefits there. The proposed 50% population coverage risks confining digital dividend benefits to major cities only. Vodafone recommends that the government give serious consideration to an 'outside-in' approach to coverage rollout.[71]

4.2 In support of its proposed "outside-in" approach Vodafone refers to coverage roll-out obligations attached to the German digital dividend licences. Drawing any conclusion from the "rural-first" coverage obligations in Germany for New Zealand is irrational.

4.3 Germany occupies rank number 35 of the world's most densely populated countries with a population density of 229 people per km^2 whereas New Zealand ranks 160 with a density of 16.2 people per km^2 (see Exhibit 8). Even the least populated of the German states, Mecklenburg-Vorpommern, has a population density of 71 inhabitants per km^2 (4.4 times that of New Zealand) and the villages to be covered in Germany are, with a few exceptions, connected by fibre.

4.4 In terms of population density, the least populated areas of Germany are comparable to suburban New Zealand. Therefore to use Germany as an example in the context of rural coverage in New Zealand is inappropriate.

Exhibit 8: Population Density Germany vs. New Zealand



Source: http://www.worldatlas.com/aatlas/populations/ctypopls.htm

[71] Vodafone Submission, para 3 (first bullet point)

4.5 Given the relatively high rural population density and ubiquity of existing cellular infrastructure and fibre, it took mobile operators in Germany only 16 months to fulfil the coverage obligation in the less populated "rural" areas before deploying the digital dividend spectrum in the main cities. The auction concluded in May 2010 and in September 2011 the regulator announced the fulfilment of coverage obligations.[72]

4.6 In contrast, an "outside-in" approach in New Zealand would take much longer to complete, thus substantially delaying New Zealand's urban population of access to 700 MHz LTE services.

4.7 Given that a large part of the economic benefit of the digital dividend is attributable to urban areas in New Zealand due to the high concentration of businesses in those areas, the outside-in approach suggested by Vodafone would substantially reduce the economic benefit of the Digital Dividend allocation.

The Swedish example presented by Vodafone is incomplete

4.8 In paragraph 34, Vodafone cites the further example of the coverage obligation Sweden:

> The Swedish regulator PTS has a list of homes and businesses that do not have adequate broadband. The rollout conditions specify that 75% of the PTS list is covered by the end of 2013. From 2014 onwards, PTS will annually produce a list and operators will be required to cover all the sites by 31 December of that year.[73]

4.9 What Vodafone fails to discuss is that this coverage obligation applies only to one out of the six 2x5MHz digital dividend licences in Sweden and therefore differs materially from the approach suggested by Vodafone. In fact, the Swedish approach more closely resembles the current situation in New Zealand where a single operator, Vodafone, is already obliged to deliver rural wireless broadband services through the RBI.

An outside-in obligation would distort investment incentives and hinder competition

4.10 It is clearly the case that mobile operators find it less economic to deploy their networks in rural areas than in urban areas. The reasons for this are obvious, and include challenging geographic terrain and lower population density. These challenges, along with similar challenges in relation to fixed broadband provision, led to Government intervention in the form of the RBI to encourage rural wireless broadband deployment.

4.11 The suggestion that all operators now undertake rural deployments in advance of urban areas is both unnecessary, in the context of the RBI, which guarantees rural wireless broadband access, and surprising, given Vodafone itself determined not to deploy rural 3G services in the RBI areas until recent Government incentives to do so were made available.

4.12 It is important to note that an outside-in obligation will not change the economics of providing services in less densely populated areas. It risks, however, reducing competition in both rural and urban areas as the lesser number of operators finding it profitable to *first* invest in rural areas will limit the number of operators ultimately willing and able to invest in urban areas.

4.13 If 2degrees is forced to roll out rural services in advance of urban areas it will also face much higher capital expenditure than Vodafone due to the fact that 2degrees currently has fewer rural sites (even if it can co-locate on the 154 new RBI-financed sites). Furthermore, having the lowest market share of all three networks, rural sites are even less viable for 2degrees than they are for the larger networks, meaning that an outside-in deployment requirement places a large financial penalty on 2degrees.

[72] Source Bundesnetzagentur: http://bit.ly/sdSrkP

[73] Vodafone Submission, para 34

4.14 Vodafone is therefore seeking to force a disproportionate and punitive capital cost onto a new competitor with the effect (and perhaps even the aim) of restricting competition.

4.15 While rural deployments are more challenging from an economic perspective, there remain strong incentives for mobile operators to provide coverage in rural areas, network coverage being one of the key criteria on which mobile operators compete. Increased coverage provides a competitive advantage in attracting customers who travel to or through rural areas. It also gives an important marketing advantage as many customers strongly value high coverage even if they actually make little use of it.

4.16 For these reasons we are confident that network deployment will take place in rural areas as a natural consequence of the increased competition which now exists in the mobile market. This will particularly be the case if the Digital Dividend allocation is made on terms that increase rather than inhibit rational 3 player competition. In the interim the Government's RBI initiative guarantees wireless broadband access to rural end-users. 2degrees is fully engaged with the RBI, having entered into the RBI Co-Location Agreement with Vodafone. We do continue to invest in our nationwide network, recently activating networks in Hamilton, Tauranga and Palmerston North, with further deployments in progress and planned for 2011 and 2012.

Vodafone is the key beneficiary of an early Digital Dividend allocation

4.17 In its submission Vodafone writes:

> The Government rural broadband initiative (RBI) will be one of the beneficiaries from early certainty around digital dividend spectrum availability. Vodafone's agreement with Government for RBI is based on 3G technologies. Early certainty of 700 MHz spectrum availability will enable Vodafone to use LTE instead of 3G for delivering the RBI service. As LTE is a superior technology compared to 3G, this will deliver a superior service to rural New Zealand.[74]

4.18 Vodafone's submission fails to acknowledge that Vodafone will be the greatest beneficiary of an early allocation of the 700 MHz spectrum. Vodafone is already obliged under the RBI agreement to build 154 new towers, upgrade a further 385 towers and deliver a minimum download speed of 45 kbps. Each of these objectives can be more efficiently delivered utilising LTE at 700 MHz than the contracted HSPA+ at 900 MHz.

4.19 Under Schedule 6 (Product Review Procedure) of the RBI agreement, Vodafone is able to seek to deploy the 700 MHz band instead of the 900 MHz band to deliver its RBI obligations.

4.20 While the MED may seek to negotiate an increase in end-user benefit as a condition of the substitution by Vodafone of HSPA+ technology for LTE at 700 MHz there is no requirement on Vodafone under the agreement to do so. This introduces the risk that in the event of a 700 MHz deployment the technology benefit under the RBI accrues to Vodafone without any guarantee of a corresponding increase in end-user benefit.

4.21 This would clearly be a perverse outcome.

[74] Vodafone Submission, para 49

By Vodafone's own analysis spectrum caps should be applied across the sub-1 GHz bands

4.22 Vodafone supports a cap for 700 MHz but not a sub-1 GHz band:

> Vodafone does not support the proposed sub 1 GHz cap. Spectrum caps should only be imposed where they are necessary to promote competition. Adoption of such a cap is not warranted in New Zealand. There is significant risk that such an approach will irrevocably damage the development of the market in the long term.[75]
>
> Instead, a simple 2x15MHz spectrum cap should be applied in the 700 MHz band for the auction, after which time it should be removed. Such an approach will ensure a competitive outcome in the auction, while ensuring that the market reaches an efficient equilibrium over the long-term.[76]

4.23 Vodafone does not provide any rationale as to why the cap should apply only to the 700 MHz band. This is because there is no such rationale. Indeed, in paragraph 21 of its submission Vodafone itself makes it clear that it considers the 700 / 850 / 900 MHz bands as equivalent, by stating that:

> [700 MHz] Coverage should be at least consistent with the 850MHz & 900MHz bands
>
> The discussion paper proposes a lower rollout requirement than currently applied to the 850MHz and 900MHz spectrum allocations. Vodafone submits that there is no justification for the population coverage requirement being inconsistent with current spectrum coverage requirements (in sub 1GHz bands), and recommends that the coverage requirement is restored to 65%.[77]

4.24 Therefore, by Vodafone's own analysis the spectrum cap should be applied across the sub-1 GHz spectrum.

4.25 Vodafone also argues for removing the caps after the conclusion of the allocation process. This may well be because Vodafone thinks it may be able to acquire spectrum from another entity who acquired 700 MHz spectrum in the hope to sell it on later. This has happened in some markets, for example Craig Wireless in Canada acquired spectrum for speculative reasons and made a good return on investment within a short period of time.

4.26 In its earnings release for period ending 31 May 2011, Craig Wireless reported:

> As at May 31, 2011 the Company [Craig Wireless] had cash reserves of approximately $24.0 million. The cash reserve was built from the sale of the Company's Canadian spectrum assets...[78]

4.27 The danger that this may happen in New Zealand is clear and present:

> On the 19th of September 2011, Craig Wireless announced: "Craig Wireless Enters into Acquisition Agreements for Secured Advances, Shares and Spectrum Rights of Woosh Wireless Limited in New Zealand."[79]

4.28 In order to prevent this, caps should be established across the sub-1 GHz band and across all spectrum holdings.

---

[75] Vodafone Submission, para 50

[76] Vodafone Submission, para 51

[77] Vodafone Submission, para 21

[78] Source http://www.craigwireless.com

[79] Source http://www.craigwireless.com

4.29 After all, if the conclusion is that there is a need for spectrum caps in the allocation of the 700 MHz band from a competition perspective, this reason does not suddenly disappear after the conclusion of an allocation. If the rationale for introducing caps remains in place, then the caps should remain in place.

4.30 There is no good reason for removing caps after the initial allocation and caps should be retained for the duration of the management right – as is the case in the recent MED announcement preserving the 2.3 and 2.6 GHz band caps for the duration of the contracted period:

> …the Ministry concluded that there was only weak evidence that removing the spectrum acquisition cap would improve investment in the 2.3/2.5GHz bands. There was also weak evidence that removing the acquisition limit might negatively impact on some proposed investments. Meanwhile, we saw no clear indication that competition would be detrimentally affected if the limit remains in place until its December 2012 expiry.
>
> As we did not see clear evidence of a net benefit to the market and competition we concluded that the case for removal had not been made. The Ministry therefore recommended to the Minister for Communications and Information Technology that, in the absence of a clear net benefit, the Crown should favour regulatory certainty by maintaining the status quo. The Minister has agreed to this approach.[80]

4.31 We welcome and support this decision by the MED.

UK sub-1 GHz spectrum caps have been misunderstood by Vodafone

4.32 As noted by the MED in its discussion paper, Ofcom has proposed to adopt the dual measures of: (a) spectrum floors; and (b) spectrum caps. In particular, it has proposed to apply:

(a) Spectrum floors that ensure four auction participants achieve at least:

(i) 2x5 MHz of sub-1 GHz spectrum and 2x20 MHz of 2.6 GHz spectrum; or

(ii) 2x5 MHz of sub-1 GHz spectrum and 2x15 MHz of 1800 MHz spectrum; or

(iii) 2x10 MHz of sub-1 GHz spectrum and 2x15 MHz of 2.6 GHz spectrum; or

(iv) 2x10 MHz of sub-1 GHz spectrum and 2x10 MHz of 1800 MHz spectrum; or

(v) 2x15 MHz of sub-1 GHz spectrum;

and

(b) Safeguard spectrum caps that limit each auction participant to have no more than 2x27.5 MHz of sub-1 GHz spectrum and 2x105 MHz of total mobile spectrum.

4.33 Ofcom's rationale for applying spectrum floors is to ensure that four national mobile networks are able to obtain sufficient spectrum to enable them to credibly provide high quality mobile data services. This will avoid risking the loss of competitive intensity through a reduction in the existing number of competing networks.

[80] Ministry of Economic Development statement by email to 2degrees on 2 November 2011

4.34 Safeguard spectrum caps were proposed by Ofcom in order to address the longer term risks of large asymmetries between operators in sub-1 GHz spectrum holdings. As Ofcom explains:

> While it is difficult to speculate about future possible developments, we consider it is possible that in the longer term there could be technological (e.g. beyond LTE) or market developments that meant that very asymmetric holdings of spectrum represented a risk to competition, especially for sub-1 GHz spectrum.[81]

4.35 Vodafone attempts to argue that a sub-1 GHz spectrum cap such as that proposed by Ofcom would not be warranted in New Zealand due to differences between NZ and the UK – in particular, because all NZ mobile networks already have rights to sub-1 GHz spectrum.

4.36 Vodafone makes the following statements regarding Ofcom's proposed approach:

> The spectrum cap set by Ofcom suggests that:
>
> - if Vodafone UK and O2 ended up with 2x27.5MHz sub 1GHz spectrum each, this outcome would not have a detrimental impact on the level of competition in the UK market; and
>
> - if one of the operators ends up with no sub 1GHz spectrum, this outcome would not have a detrimental impact on the level of competition in the UK market.[82]

4.37 Vodafone's conclusion that there would not be a detrimental effect on competition in the UK if one operator were to end up with no sub-1 GHz spectrum is completely at odds with Ofcom's proposal. Ofcom has specifically sought to ensure that **all** spectrum auction participants will receive at a minimum 2x5 MHz of sub-1 GHz spectrum through the application of spectrum floors. The sub-1 GHz spectrum floor can even be higher (2x10 or 2x15 of sub-1 GHz spectrum), depending on the operator's holdings of 1800 MHz and 2.6 GHz spectrum.

4.38 Furthermore, it would appear that Vodafone's claim that Vodafone UK and O2 could end up with 2x27.5 MHz sub-1 GHz is dependent on 2.6 GHz allocations.

4.39 Vodafone concludes that given the existing sub-1 GHz spectrum holdings in New Zealand:

> Applying the UK Ofcom competition analysis suggests that there is no basis for a sub 1GHz cap, nor would any competition concerns arise in the sub 1GHz range.[83]

4.40 This does not follow from Vodafone's flawed observations regarding Ofcom's approach. Although each New Zealand MNO currently holds at least some sub-1 GHz spectrum, allocation of 700 MHz spectrum still has the potential to result in substantial concentrations and inequalities of sub-1 GHz spectrum holdings. As a result Ofcom's concerns, that over that longer term it is important to ensure against large inequalities in spectrum, are equally applicable to New Zealand.

[81] Ofcom, "*Consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues", March 2011,* para 5.83

[82] Vodafone Submission, para 55

[83] Vodafone Submission, para 56

4.41 Vodafone proposes applying only a temporary 2x15 MHz cap to 700 MHz spectrum, with no sub-1 GHz cap. However, this will not address this important ongoing competition issue of spectrum concentration. For example, consider the case where: two networks acquire the maximum of 2x15 MHz of 700 MHz spectrum; one misses out entirely; and the remaining 2x15 MHz is acquired by another party that does not intend to deploy network in New Zealand. The latter party could later sell its 2x15 MHz allotment to one of the parties that already had acquired spectrum, meaning than the situation could arise where the 700 MHz allocations are:

(a) network 1 has 2x30 MHz;

(b) network 2 has 2x15 MHz, and

(c) network 3 has 0 MHz.

4.42 Even taking into account 850 MHz and 900 MHz holdings, the above situation would result in large inequalities in sub-1 GHz spectrum.

4.43 The approach recommended by Vodafone is therefore without precedent, high risk and potentially materially detrimental to competition.

Vodafone seeks an allocation timeframe that is inconsistent with New Zealand's small scale

4.44 Vodafone makes the case for a speedy allocation. However, Vodafone also states:

> Network operators will need at least 12 months from the time they acquire the spectrum, to the time they deliver new services over that spectrum.[84]

4.45 This statement is odd. In Germany, Vodafone obtained the digital dividend spectrum on 20 May 2010 and launched LTE in one location, Heiligendamm, on the 23rd of September 2010, i.e. within 4 months of obtaining the digital dividend spectrum.[85] On the 29th of October 2010, i.e. within 5 months of licence award, Vodafone Germany announced that LTE was now available in five of the German federal states[86].

4.46 In fact, the limiting factor is not network built but end-user equipment availability. Vodafone concedes that if the current timeframe is adopted "*New Zealand will be one of the first countries to use the 700 MHz band in the Asia Pacific region*."[87] This means New Zealand would need to be a technology leader, which is inconsistent with out small scale and the clear statement by the MED that New Zealand is a "technology taker".

4.47 Vodafone's motive for wishing to rush the allocation process is probably because it would enable Vodafone to stop delivering 900 MHz HSPA+ mobile broadband coverage build out under the RBI Agreement.

4.48 2degrees is not arguing for a "delay" in the allocation process but for a timeframe that is consistent with the reality of an uncertain evolution of the 700 MHz LTE technology eco-system. For New Zealand, the cost of making the wrong technology and band plan choice would be significant. This risk must be avoided.

[84] Vodafone Submission, para 37

[85] Source: http://www.vodafone.de/unternehmen/presse/pm-archiv-2010_174834.html

[86] Source: http://www.vodafone.de/unternehmen/presse/pm-archiv-2010_176191.html

[87] Vodafone Submission, para 43

The benefits of extending the allocation timeframe into 2013 hugely outweigh the costs

4.49 Vodafone expresses concern about the possibility of extending the period required for consultation on the Digital Dividend Spectrum. It estimates that the cost of delaying the spectrum allocation by 1 year is between NZ$180 million and NZ$260 million, and expresses the view that "*any purported benefit from delaying the auction will be small when compared to the benefits of early access.*"[88]

4.50 Vodafone's conclusions on this issue are deeply flawed as a result of a calculation error and a failure to recognise the impact that the spectrum allocation methodology can have on competition.

4.51 Vodafone calculates the cost of a one year extension to the allocation process by relying on the 2009 Spectrum Value Partners report produced for the ACMA which estimates the net benefit to the Australian economy of allocating the optimal UHF spectrum to mobile services. As explained by Vodafone:

> ... the value of the digital dividend in Australia arising from allocating the optimal mix of UHF spectrum to mobile operators was forecasted between $7 billion and $10 billion over 10 years. This equates to a yearly benefit of around $700 million to $1 billion.
>
> Taking the yearly benefit calculated for Australia and converting this for New Zealand population, we estimate that the yearly cost of delay to the New Zealand economy is conservatively worth between NZ$180 million and NZ$260 million.[89]

4.52 However, Vodafone's method of annualising the benefit by dividing the total net benefit by 10 is incorrect. The report by Spectrum Value Partners and Venture Consulting states:

> Throughout this study, all benefits are measured over a 20-year period between 2008 and 2028 with a terminal value applied.[90]

4.53 This implies that to derive an annual net benefit from the total of A$7 billion to A$10 billion would require subtracting the terminal value and then dividing the remaining amount by 20. Without access to further details on the size of the terminal value or the way it has been calculated it is not possible to adjust the total net benefit for it. As a result, the most that can be said using the Spectrum Value Partners report is that the loss in net benefit from a one year extension to the spectrum allocation timeframe is less than NZ$90 million to $130 million.

4.54 The Vodafone submission therefore overstates the cost of delay by at least 100%.

4.55 When considering the value of extending the allocation timeframe, what is relevant is not only the costs of doing so, but also the benefits. Vodafone expresses the view that:

> ... any purported benefit from delaying the auction will be small when compared to the benefits of early access. Any potential benefit to be extracted from delaying the auction is limited to greater certainty of technology choice and equipment supply. However, information from suppliers and vendors, and the current international LTE deployments, give confidence that technology and equipment will be available.[91]

[88] Vodafone Submission, para 46

[89] Vodafone Submission, paras 41 and 42

[90] Spectrum Value Partners and Venture Consulting "*Getting the most out of the digital dividend in Australia - Allocating UHF spectrum to maximise the economic benefits for Australia"*, April 2009, footnote 2

[91] Vodafone Submission, para 46

4.56 What Vodafone does not recognise is that an extended consultation period would allow for a more robust decision-making process on the optimal spectrum allocation process. As is widely recognised, access to sufficient spectrum is crucial to the ability of operators to sustainably compete effectively in mobile markets. Without a full consultation process that assesses in detail the implications of spectrum allocation alternatives for competition and other addressable barriers to entry, there is a significant risk that the digital dividend spectrum allocations will result in outcomes that will restrict the intensity of competition in the New Zealand mobile markets.

4.57 Venture Consulting estimated that the future benefit to the New Zealand economy of having a third mobile network totals $7.8 billion in direct and indirect investments and flow-on effects. It also noted that there would be sizable benefits to consumers in the form of price and non-price benefits. To the extent that a spectrum allocation method was administered that allowed blocking of the third network (as discussed in our submission) or there was a failure to address other barriers to entry, then some or all of these ongoing benefits to New Zealand consumers and the economy more broadly would be lost.

4.58 When the cost of a 1-year extension to the allocation process of delay (less than NZ$90m to $130m) is set against the benefits of establishing an allocation process that allows for and encourages intensive competition and investment by the third network ($7.8b), it is clear that the MED would be well-justified in altering the timetable in order to allow for an integrated approach for addressing spectrum and competition issues before spectrum allocation is carried out.

4.59 2degrees notes that Ofcom has recently decided to extend its consultation process on its assessment of future mobile market and its proposal for allocation of the 800 MHz and 2.6 GHz spectrum bands. As Ofcom explains:

> We received a number of substantial and strongly argued responses to this consultation. We have been reviewing these responses over the summer, and refining our analysis as a result. In light of these responses, and the significance of the decisions that we need to take - decisions that are likely to shape the future of the mobile sector in the UK for the next decade or more - we have decided to undertake a further round of consultation on these issues.[92]

-ends-

[92] Ofcom, "*Update on plans for award of 800MHz and 2.6GHz spectrum" 7 October 2011*, http://stakeholders.ofcom.org.uk/consultations/combined-award/update