

Spectrum Submission Paper

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Introduction

Good Morning, my name is Toa Greening from Manurewa, Auckland. I have 20 years of New Zealand Information Technology experience and have worked in a number of senior technical roles across the Government and Corporate sectors.

Overview

Over the years I have written numerous technical reports, commercial documents, contracts, legislative submissions, council submissions/policies/resolutions and advocacy documents.

As with all resource management issues a principled approach needs to be taken with the management and allocation of the Spectrum of High Frequency Electromagnetic Fields. Therefore I have prepared a very brief explanation of High Frequency Electromagnetic Fields to provide an understanding before applying some basic principles and expanding into this document.

I have briefly read the "Radio Spectrum Five-Year Outlook -Draft - 19-10-12.pdf" and was unsure as to the value of this document as it lacked critical analysis of the Mobile Telecommunications area and had made some incorrect conclusions which I will point out.

Electromagnetic Fields

Electromagnetic Fields occur both in nature and artificially. Ultra High Frequency Electromagnetic Fields (UHF EMF) are predominately artificially generated, although solar flares and lighting storms can also produce UHF EMF. The energy of UHF EMF is measured in Watts per meter squared. Frequency which is another measurement of EMF is measured by the number of pulses per second (Hertz - Hz). Various devices use the combination of energy and frequency of UHF EMF for benefits ranging from communications, data transfer, navigation, surveillance, medicine and even weather manipulation.

Each device generates pulsed bursts of electromagnetic particles of energy called photons into the environment. The following are the main usages:

- The number pulses per second (Frequency or Hz) of the photons is used for communications, data transfer and new advances in medicine (accelerated healing)
 - Note the World Health Organisation in 2011 determined that there was adequate research to categorise HF EMF as a class 2B carcinogen or possibly cancer causing

- The reflection of photons off distant objects is used for navigation and surveillance (Radar)
- The energy of the photons being absorbed by an object is used for medicine (rapid heating) and new advances in weather manipulation (atmospheric particle charging)

The New Zealand Government is preparing to sell off the 700MHz (700 million pulses per second) to the Telecommunications industry for the purposes of communications and data transfer. This means that alternative uses like advances in medicine and weather manipulation may be impacted in the future. Therefore when developing a set of principles for the management of the 700MHz spectrum it is important to understand that there are other uses and effects that need to be considered than those of the Telecommunications industry.

Partnership

On 30th of October I attended a National Hui on the Spectrum. One of the founding principles as defined by the Waitangi Tribunal is the establishment of a partnership and the duty to act reasonably and in good faith.

[http://www.waitangi-tribunal.govt.nz/doclibrary/public/Appendix\(99\).pdf](http://www.waitangi-tribunal.govt.nz/doclibrary/public/Appendix(99).pdf)

(2) The Treaty established a partnership, and imposes on the partners the duty to act reasonably and in good faith.

The principle that the Treaty established a partnership and imposed on the partners the duty to act reasonably and in good faith was independently agreed to by all five members of the Court of Appeal, though it was expressed differently by each. Justice Cooke characterised this duty as 'infinitely more than a formality'. He stated that, 'If a breach of the duty is demonstrated at any time, the duty of the Court will be to insist that it be honoured.'

Land, waterways and forests can be territorially defined by Iwi, Hapu, right down to individuals in some cases. The Spectrum has no territorial definition for either the Crown or Maori therefore its usage must be principled based with duties to act reasonably and in good faith.

Principles

To proceed you clearly need a set of guiding principles, therefore I have proposed the following for consideration.

- **Beneficial**
The technological benefits gained through the allocation of the 700MHz spectrum should be applied in a manner that all New Zealanders benefit as that will ensure that Maori also benefit
- **Efficient**
The 700MHz spectrum must be allocated for efficient usage. Commercial operators of the spectrum must not be able to accumulate spectrum or use spectrum in a way that disadvantages other operators or users of the spectrum.
- **Responsible**
The 700MHz spectrum must be allocated in a way which is socially and environmentally responsible. This means that it used in a responsible precautionary way to minimise effects to the environment and people.

Presently the New Zealand Government has assumed the rights to the management of the 700MHz telecommunications spectrum. In all three principles it is my opinion that Government has performed from below average on the benefit principle to very poorly on the efficiency and responsibility principles.

The last time there was any real benefit through allocation of the telecommunications spectrum was when an allocation was made to Maori and subsequently 2 Degrees entered the market. This proved that Government departments do not make good decisions to attract new business and that Maori participation can benefit all New Zealand.

Government has allowed spectrum to be hoarded, not be used and used inefficiently by allowing a small number of telecommunications companies to own large portions by international standards of the telecommunications spectrum (this will be covered in the next section).

Government has totally failed on the responsible usage of the spectrum. It has ignored increasing scientific studies showing non-thermal biological changes when exposed to High Frequency Electromagnetic Fields. It has ignored a 2011 World Health Organisation 2B carcinogen categorisation of all High Frequency Electromagnetic Fields. It has ignored the founding principle of the Resource Management Act which stipulates a precautionary approach.

On page 9 of the consultation document it is stated that *“The Ministry of Economic Development believes that the model of turning the spectrum into a tradable property right is the most efficient model to continue to implement.”*

Here in lies the crux of the problem with Governments thinking. Government views the 700Mhz Telecommunication spectrum purely as property that it owns and therefore can subsequently sell. It views the scarcity of the resource purely in terms of its sale value. There is little evidence of Government being concerned with the efficient use and responsible use.

Government has essentially shown itself to be a very poor manager of the Telecommunications spectrum. At present government is failing the New Zealand public on several accounts with the management of the Telecommunications spectrum. By not partnering with Maori government has also proven that it is acting unreasonably and in bad faith.

When I have discussed these issues with non-Maori colleagues in the ICT Industry, they have understandably been concerned over Maori claims to ownership over the spectrum. However when I explain how poorly government has performed, the successes that Maori have had for all New Zealanders and that it should be managed in partnership, then even the most critical opponent has become supportive of the principle.

Having worked professionally in the New Zealand ICT industry for over 20 years we have some major challenges and opportunities to accelerate New Zealand into the digital age. Unfortunately the Ministry of Economic development is too constrained and industry influenced to understand how to drive the country forward.

The argument that Maori would be a beneficial, efficient and responsible manager of the Telecommunication spectrum now has over 30 years of spectrum management history to back it. A Maori partnership of the 700 MHz telecommunications spectrum is overdue.

Too not partnership will mean that New Zealand will continue to wallow in bureaucratic and stifling industry influenced thinking that is really holding this country back. A legislated Maori partnership of the Telecommunications spectrum will provide the type of critical and entrepreneurial input required to drive New Zealand into the digital age.

Technical Analysis

There is a paired block of 45MHz of the 700MHz of spectrum that is planned to be sold off by auction next year. Presently the three mobile companies have deployed telephony, texting and broadband services over their existing spectrum allocations.

A mobile device technology termed Fourth Generation Long Term Evolution (4G LTE) for mobile ultra fast broadband internet access is currently being implemented internationally. For the three New Zealand mobile companies, to deploy this technology the mobile companies will argue that they need the 700MHz spectrum allocated so that they can migrate users from their existing services to the new services. Referring to the below statement on page 32 of the Radio Spectrum Five Year Outlook it appears that this argument has been accepted by the Ministry.

“Most significantly for the Ministry, the switchover to digital television frees up a significant amount of radio spectrum in the 700 MHz band for new uses (“the digital dividend”). The government has previously agreed that following DSO, spectrum in the 694-806 MHz band will be primarily allocated to new mobile broadband services. The allocation of this band for mobile broadband use is consistent with the demand for additional spectrum to satisfy the increasing use of mobile data services.”

However it does not take much analysis to realise that this is incorrect as 4G LTE has been developed for the 1800/1900MHz range and only recently for the 700 MHz range. Therefore the three telecommunications companies can start to deploy 4G LTE now over their existing 1800/1900 allocations. In fact Telecom is currently trialling this as per the below announcement.

<http://www.telecom.co.nz/mobile/mobile/ournetwork/buildinga4gfuture/>

4G LTE requires 20MHz to obtain speeds of 100 Mbps. Less spectrum can be used but that means slower speeds. There are three Mobile companies in NZ are all vying for 45MHz.

The below articles demonstrates the lack of competition between the mobile companies and the poor approach taken by the Ministry of Economic development. It is likely the auction price for the spectrum will be low as there are not enough bidders for real competition. The auction price will be minimal however the spectrum will be unavailable for the next 20 years with rights of renewal making this almost a perpetual ownership.

<http://computerworld.co.nz/news.nsf/news/telecom-ambivalent-on-700mhz-spectrum-auction> - 10/8/11

The 700MHz band has 45MHz (paired) available and while there has been some suggestion it could be allocated three ways – effectively giving 15MHz to each carrier – neither Vodafone nor 2degrees agree with this idea. Vodafone wants a spectrum cap of 20MHz (which could mean just two mobile operators get spectrum) and that spectrum should go to the highest bidder. 2degrees says it's entitled to 20MHz, which it should have to pay a fair (not the highest) price for and that the remaining 20MHz should be divided up amongst the other players.

<http://www.stuff.co.nz/dominion-post/business/technology/7768645/Iwi-allocation-could-delay-4G-roll-out> - 4/10/12

A "straw man" proposal put forward by the Economic Development Ministry in December would allow Vodafone, Telecom and 2degrees to each secure 10MHz of the 45MHz of paired spectrum on offer, while letting one of the three carriers grab 20MHz and another 15MHz. 10MHz is generally considered the minimum block required to build an efficient 4G network.

Under an auction or split allocation it is likely that there will be only moderate revenue generated from the sales and once allocated it will be unlikely that new competition will enter the market. The Ministry of Economic Development should be investigating options other than only the immediate financial benefits of the sale of the spectrum. It should be considering the principles of Beneficial, Efficient and Responsible allocation of the Spectrum as proposed.

The Ministry of Economic Development paper titled "Radio Spectrum Five Year Outlook 2012-2016" which is currently up for consultation demonstrates the narrow criteria as per the below operational objectives (page4).

The key operational objectives of spectrum management in New Zealand are to enable productive radio applications and minimise harmful interference between uses. The current approach to spectrum management emphasises:

- *the flexible use of allocation methods and licence types*
- *the use of tradable spectrum rights for high-demand spectrum allocations*
- *the certification of licences by private sector engineers*
- *transparent and responsive engagement – particularly through increasing online functionality.*

The Ministry of Economic Development believes that the model of turning the spectrum into a tradable property right is the most efficient model to continue to implement (page 9).

2.1. Management rights regime

The management rights regime treats spectrum as a tradable property, enabling it to be assigned to those who value it most. Few countries have gone as far as New Zealand in promoting a rights model combined with technology neutrality. This is in contrast to centrally-planned models of spectrum management where technology changes are often delayed until the government completes the replanning of spectrum bands.

A spectrum management right is a private property right to manage and use a defined band of the radio spectrum over the whole of New Zealand for a period of up to 20 years. With this right comes considerable technical flexibility.

The key weakness is that once a property right is allocated then this is virtually a perpetual right provided the owner can prove usage of the spectrum in its services. Whether the usage is efficient was unfortunately beyond the scope of the discussion paper, however inefficient usage of spectrum by owners can lead to the perpetual hoarding of the spectrum.

Spectrum Allocation

The process for allocation of the 700MHz spectrum has still not been finalised therefore this is an opportunity to advise government of two types of allocations and the one which offers the most benefit, efficiency and responsibility. There are two main types of spectrum allocation used internationally.

These are to split the spectrum into blocks which are then sold to companies; the second model is a shared allocation.

Split Spectrum - Auction

The spectrum is split into blocks via an auction system where the highest bidder attains the block. The bidder must be a qualified company able to use the spectrum and is limited to a certain amount of spectrum to prevent companies from hoarding and limiting competition. However as mentioned there are no tests to ensure that spectrum allocations are used efficiently therefore hoarding can occur by the inefficient use of spectrum. I will expand upon this later in the discussion document.

Split Spectrum - Preferential Allocation

This is termed the "Beauty Contest" where the allocation is made on a prescribed set of criteria to qualifying companies for a certain price. This can mean that providers who meet the criteria may get the most spectrum allocated to them, while those who do not qualify miss out. In this scenario an infrastructure provider for a shared spectrum may be the qualifying criteria.

Split Spectrum - Issues

By splitting the spectrum we create multiple issues of spectrum hoarding through inefficient usage of spectrum and competition based upon who can provide infrastructure and coverage. The issue of spectrum hoarding through inefficient usage of spectrum means it is unlikely that new competitors are ever able to enter the market. Under this scenario the spectrum would have been allocated to the two Telecommunications providers and put to an inefficient use (hoarded) to prevent future competitors from entering the market. The allocation of the previous spectrum to Huarahi Trust enabled a third competitor to enter the market.

The issues of competition based upon who can provide infrastructure and coverage is an important topic. Essentially this means infrastructure may be deployed in a rapid manner but can have the effect that coverage is only provided in areas of greatest populations (to obtain market share) with more remote locations being slow to benefit. Also the rapid deployment of infrastructure can be problematic as a result of implementation issues and resiliency (as per the early XT rollout issues). Another downside of separate infrastructure is the duplication of Cell Phone Towers in areas where clusters of towers appear in inappropriate locations such as schools, ECEs and homes.

Competition of mobile services should only be on services not spectrum hoarding, infrastructure deployment and coverage.

Spectrum Hoarding

To develop a 4G LTE mobile services at least 5MHz of spectrum is required, however 20MHz is ideal. Therefore the three mobile companies would require between 15-60MHz of paired spectrum to roll out 4G LTE mobile networks. Below is a list of spectrum allocations to all three mobile companies (Hautaki Limited included as part of 2 Degrees).

<http://www.rsm.govt.nz/smart-web/smart/page/-/smart/domain/managementright/SearchManagementRight.wdk>

Management Search (<2500MHz)

Telecom	60MHz
Vodafone	95MHz
Hautaki Limited	30MHz
Two Degrees	45MHz
TelstraClear NZ	104.5MHz
Total	334.5 MHz

Telecom 60MHz

MR Number	▲	Commencement	▲	Expiry	▲	Status	▲	Manager	▲	Low Freq (MHz)	▲	High Freq (MHz)	▲
288		30-Apr-2012		08-Sep-2017		Current		TELECOM NEW ZEALAND LIMITED		825.015000		840.000000	
289		30-Apr-2012		08-Sep-2017		Current		TELECOM NEW ZEALAND LIMITED		870.015000		885.000000	
140		20-Dec-2001		31-Mar-2021		Current		TELECOM NEW ZEALAND LIMITED		1950.000000		1965.000000	
141		20-Dec-2001		31-Mar-2021		Current		TELECOM NEW ZEALAND LIMITED		2140.000000		2155.000000	

Vodafone 95MHz (<2500MHz)

MR Number	▲	Commencement	▲	Expiry	▲	Status	▲	Manager	▲	Low Freq (MHz)	▲	High Freq (MHz)	▲
253		02-Feb-2009		28-Nov-2016		Current		VODAFONE MOBILE NZ LIMITED		899.800000		915.000000	
257		02-Feb-2009		28-Nov-2016		Current		VODAFONE MOBILE NZ LIMITED		944.800000		960.000000	
136		27-Sep-2001		31-Mar-2021		Current		VODAFONE MOBILE NZ LIMITED		1710.000000		1725.000000	
137		27-Sep-2001		31-Mar-2021		Current		VODAFONE MOBILE NZ LIMITED		1805.000000		1820.000000	
197		13-Feb-2004		31-Mar-2021		Current		VODAFONE MOBILE NZ LIMITED		1920.000000		1935.000000	
118		11-May-2001		31-Mar-2021		Current		VODAFONE MOBILE NZ LIMITED		2015.000000		2020.000000	
196		13-Feb-2004		31-Mar-2021		Current		VODAFONE MOBILE NZ LIMITED		2110.000000		2125.000000	
291		30-May-2012		31-Dec-2014		Current		VODAFONE MOBILE NZ LIMITED		2555.000000		2575.000000	
293		30-May-2012		31-Dec-2014		Current		VODAFONE MOBILE NZ LIMITED		2675.000000		2690.000000	
149		01-Nov-2002		31-Oct-2022		Current		VODAFONE MOBILE NZ LIMITED		3445.000000		3452.000000	
160		01-Nov-2002		31-Oct-2022		Current		VODAFONE MOBILE NZ LIMITED		3545.000000		3552.000000	
211		22-Mar-2007		31-Oct-2022		Current		VODAFONE MOBILE NZ LIMITED		24549.000000		24885.000000	
210		22-Mar-2007		31-Oct-2022		Current		VODAFONE MOBILE NZ LIMITED		25557.000000		25893.000000	

Two Degrees 45MHz

MR Number	▲	Commencement	▲	Expiry	▲	Status	▲	Manager	▲	Low Freq (MHz)	▲	High Freq (MHz)	▲
229		08-Dec-2008		29-Oct-2012		Current		TWO DEGREES MOBILE LIMITED		840.000000		841.000000	
228		24-Apr-2008		29-Oct-2012		Current		TWO DEGREES MOBILE LIMITED		885.000000		890.000000	
224		28-Mar-2008		24-Nov-2022		Current		TWO DEGREES MOBILE LIMITED		890.000000		899.800000	
270		25-Nov-2022		28-Nov-2031		Registered		TWO DEGREES MOBILE LIMITED		935.000000		939.000000	
295		18-Sep-2012		24-Nov-2022		Current		TWO DEGREES MOBILE LIMITED		935.000000		944.800000	
64		19-Apr-2001		31-Mar-2021		Current		TWO DEGREES MOBILE LIMITED		1725.000000		1735.000000	
84		19-Apr-2001		31-Mar-2021		Current		TWO DEGREES MOBILE LIMITED		1820.000000		1830.000000	

Hautaki Limited 30MHz

[MR Number](#) [▲Commencement](#) [▲Expiry](#) [▲Status](#) [▲Manager](#) [▲Low Freq \(MHz\)](#) [▲High Freq \(MHz\)](#) [▲](#)

[131](#) 18-May-2001 31-Mar-2021 Current HAUTAKI LIMITED 1965.000000 1980.000000

[135](#) 18-May-2001 31-Mar-2021 Current HAUTAKI LIMITED 2155.000000 2170.000000

TELSTRACLEAR LIMITED 104.5MHz (<2500)

MR Number Commencement Expiry Status Manager Low Freq (MHz) High Freq (MHz)

308 30-Oct-2012 31-Mar-2021 Current TELSTRACLEAR LIMITED 1760.000000 1770.000000

306 30-Oct-2012 31-Mar-2021 Current TELSTRACLEAR LIMITED 1855.000000 1865.000000

310 30-Oct-2012 31-Mar-2021 Current TELSTRACLEAR LIMITED 1935.000000 1945.000000

119 11-May-2001 31-Mar-2021 Current TELSTRACLEAR LIMITED 2020.000000 2025.000000

98 19-Apr-2001 31-Mar-2021 Current TELSTRACLEAR LIMITED 2025.000000 2053.000000

312 30-Oct-2012 31-Mar-2021 Current TELSTRACLEAR LIMITED 2125.000000 2135.000000

104 19-Apr-2001 31-Mar-2021 Current TELSTRACLEAR LIMITED 2200.000000 2236.500000

50 15-Jan-1998 14-Jan-2018 Current TELSTRACLEAR LIMITED 26400.000000 26550.000000

51 15-Jan-1998 14-Jan-2018 Current TELSTRACLEAR LIMITED 26550.000000 26700.000000

52 15-Jan-1998 14-Jan-2018 Current TELSTRACLEAR LIMITED 26700.000000 26850.000000

53 15-Jan-1998 14-Jan-2018 Current TELSTRACLEAR LIMITED 26850.000000 27350.000000

54 15-Jan-1998 14-Jan-2018 Current TELSTRACLEAR LIMITED 27350.000000 27850.000000

55 15-Jan-1998 14-Jan-2018 Current TELSTRACLEAR LIMITED 27850.000000 28350.000000

What is apparent is that currently 334.5 MHz is allocated for existing mobile services. The existing allocation of spectrum could accommodate up to 66 (at 5MHz) 4G LTE mobile services. Therefore it is conceivable that the current three of the four holders of 334.5MHz of spectrum are using it inefficiently and therefore hoarding the spectrum for anti-competitive usages.

The fact that TelstraClear has been allowed to recently (30/10/12) rollover 30MHz of spectrum for another 10yrs and that since 1998 it has not used the Telecommunications spectrum proves my point that Government is a poor manager of the Telecommunications spectrum.

The Ministry of Economic Developments paper "Radio Spectrum Five Year Outlook 2012-2016" should be concentrating on identifying the existing usages of the allocated 334.5MHz that is already allocated to the existing four telecommunications companies.

By international standards 334.5MHz is a massive block of spectrum to be allocated to only four telecommunications companies.

Shared Spectrum

In this scenario the whole spectrum is shared by all qualified telecommunication companies and infrastructure companies. The spectrum is licensed to those companies who wish to operate on the shared infrastructure.

Shared Spectrum Solution

The 45Mhz paired spectrum should not be split and sold on March 2013. It should be shared with a license arrangement to those providers of services and infrastructure who wish to use it. The government has already provided the backhaul infrastructure in the form of the ultrafast broadband initiative via Chorus. All that is required is the Mobile infrastructure.

Therefore it is conceivable that a shared spectrum with shared infrastructure could yield the greatest benefits as follows:

- Efficient use of the allocated spectrum
 - This means that potentially more competitors could make better use of the full spectrum instead of it being hoarded away and inefficiently used
 - Those operators who are hoarding spectrum should be required to return spectrum which is then be reallocated to the shared spectrum pool. The larger block of shared spectrum would encourage more competitors to enter the market
 - The larger block of shared spectrum would encourage the rapid rollout of newer technologies that are able to make use of all the available spectrum
- Efficient use of Mobile infrastructure
 - This means no more large clusters of Cell Phone Towers as a single tower is only required in each geographic location
 - 4G technology over 700Mhz can travel further and through thicker objects therefore Cell Phone Towers can be placed into remote locations which in part may address community concerns of location and the current World Health organisation evidence on health effects
 - 4G technologies can host over 3000 callers on 45MHz per Cell Phone Tower, 3G technology hosts up to 200 callers. If regulations are placed on mobile broadband usage and voice calls are guaranteed priority (ie 111 calls) then less Cell Phone Towers may be required. It will also ensure that investment is directed towards fibre for the Ultrafast Broadband and not Mobile broadband being portrayed as Ultrafast broadband.
 - As more spectrum becomes available then that could be reallocated to the shared spectrum which may be used to increase broadband services. Although it is unlikely that any of the existing providers will voluntarily give up the Spectrum allocated to them, therefore regulatory measures may need to be developed to ensure the return of hoarded spectrum.
 - This does not force the existing three Telecommunications onto the new platform. They will be able to provide 4G technologies using their existing 1800/1900 Mhz spectrum allocations
- Efficient use of Backhaul infrastructure
 - A single provider of backhaul infrastructure could take care of all the end to end packet switching for the Mobile services providers. Regulatory measures may need to be taken to ensure reasonable pricing of infrastructure services
 - The costs for new competitors to provide Mobile services will be greatly reduced, which will encourage more opportunity for competition
- With coverage and infrastructure provided by a third party/s all providers of mobile services are able to compete on services

- Essentially there could be a lot more Mobile service providers in the market place as the start-up costs would be reduced

EU – “Promoting the shared use of radio spectrum resources in the internal market”

http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/document_storage/com/com-ssa.pdf

On September 3rd 2012 the European Union Parliament announced the following paper on the shared use of the radio spectrum.

“The EU regulatory framework for electronic communications seeks to facilitate access to spectrum, based on the least onerous authorisation system possible. It favours the use of general authorisations, except where individual licences are clearly necessary, e.g. to ensure protection against harmful interference. It establishes the principles of efficient use and effective management of spectrum, as well as technology and service neutrality. The RSPP extends these principles to all relevant EU policy areas. To enhance efficiency and flexibility, it requires Member States, in cooperation with the Commission, to foster, where appropriate, the collective use and shared use of spectrum.”

The EU recognises that the spectrum is a finite and valuable resource which would be more efficiently used under a shared spectrum regulatory framework. It notes the current complexities of the block allocations and resulting inefficiencies. New Zealand has an opportunity to learn from overseas experiences and produce a far more efficient framework that is beneficial to all.

Ultra Fast Broadband

\$1.3B was committed by the tax payers of New Zealand to provide an ultrafast broad band platform and fibre connections to all households. It is my view that the Ultrafast Broadband initiative should not be undermined by Mobile broadband providers. In the future Mobile broadband providers could offer high speed 4G LTE wireless services by deploying large numbers of broad band Cell Phone Towers connected to the new Ultrafast broad band platform.

Mobile providers can offer 4G broadband connections of up to 100MB, however as more people use the service then the slower the speed. For example 10 connections will have a maximum of 10MB, 20 connections 5 MB. When distance, interference and signal strength is factored in it is more than likely the speeds will be much slower. While users may on occasion get high speed connections in most cases they will get a fraction relative to the number of connections. The only way in which Mobile broadband can offer guaranteed Ultrafast broadband is if Broadband Towers are installed outside everyone’s home (which is cost prohibitive).

Therefore regulation needs to be put into place to ensure that investment is directed into fibre for the Ultrafast Broadband and not Mobile broadband being portrayed as Ultrafast broadband.

Emergency Services

Recently legislation was changed to allow Cell Phone Towers onto road side facilities with further changes removing the lease costs of roadside facilities to local councils. Mobile providers have argued the safety fact of Mobile technology enabling people to call 111 emergency services from

areas of coverage as a reason for deregulation. However if the Mobile networks are congested with Broadband traffic by example people watching high definition movies on their Smart phones then there is an issue with the reliability of access to 111 emergency.

All Mobile providers should provide evidence that their existing services protect voice calls so that 111 emergency services have a maximum availability. As a consequence all Mobile providers should be regulated ensure high availability to 111 emergency services.

Any new Mobile technology deployed such as 4G LTE must put in place the prioritisation of Voice traffic over the Broadband traffic. This is so that broadband traffic does not cause localised congestion that result in voice connections dropping out or being unable to make calls.

Health Impacts

In 2011 the World Health Organisation determined that there was adequate research to categorise HF EMF as a class 2B carcinogen or possibly cancer causing. The unnecessary proliferation of Cell Phone Towers opposite homes, schools and early childhood centres should be of major concern. This was driven by a 2008 a National Environmental Standard which allowed Mobile operators to place Cell Phone Towers onto lamp posts in the grass verge without consultation.

I have worked with residents to try and have Cell Phone Towers located into more appropriate areas. However in most cases Mobile operators have proven to be inflexible and only interested in the bottom line than any potential for harm to their customers. The recent 2011 the World Health Organisation class 2B carcinogen classification has not convinced Mobile operators to be more sensitive of where they place their Cell Phone Towers.

This was recently demonstrated where Two Degrees installed a Cell Phone Tower directly in front of three early child hood centres and one primary school in an impoverished part of my community. A petition was raised, protests and meetings. I obtained the full support of the Manurewa Local Board – Auckland Council and worked with Auckland Council officers to investigate alternative site. We came up with an alternative site at the back of a nearby sports field far away from residents.

Unfortunately Two Degrees turned down the alternative site and stated that it would not provide the coverage into the area where the signal was weakest. Upon further investigation of their published coverage maps I found out that this was a false statement as the alternative site was right in the middle of the area where coverage was weakest. The conclusion is that Two Degrees had already invested money into the planned site and did not care what residents or the local City Council thought about the placement near so many children. I have since measured the HR EMF and found that two of the early childhood centres are in the maximum ground level exposure.

This is a repugnant and unnecessary outcome for the community, but is one that is repeated throughout New Zealand on a regular basis.

Conclusion

While in the past selling off the spectrum property rights may have been appropriate there is now growing international evidence as well as local evidence that this model is clearly flawed by inefficient spectrum use and hoarding.

The following recommendations provide the most benefit, efficient and responsible allocation of the spectrum.

- There should be a thorough investigation into the usages of the existing 230MHz of spectrum allocated to the Telecommunications companies to determine whether it is being efficiently used.
 - The fact that TelstraClear has been allowed to hoard 104.5MHz of spectrum starting from 1998 is evidence of Governments poor record.
- Those Telecommunications companies who are identified as using existing allocations inefficiently will not be allowed to purchase more spectrum and may be required to release that spectrum in future for re-allocation to the shared spectrum.
- A shared spectrum model should be developed as per the European Union with the newly released 700MHz spectrum being licensed to the shared spectrum model.
- Under the Governments Ultrafast Broadband Initiative Chorus has already developed the third party infrastructure to provide backhaul services which will be the basis of the shared spectrum model.
- New Mobile operators will lease bandwidth off the third party infrastructure provider to resilient mobile services. The bottleneck of mobile services will occur at the HF EMF spectrum level therefore infrastructure bandwidth will be minimal by comparison. However as more spectrum becomes available then more can be allocated to the shared spectrum.
- Chorus or Telecommunications companies may provide the road side shared Cell Phone Tower infrastructure under a shared licensed agreement.
- The placement of the new shared Cell Phone Towers will include public consultation and avoid sensitive areas such as homes, schools and early childhood centres.
- Voice services needs to be prioritised over Mobile Broadband services to ensure that emergency calls have high availability and voice users have quality of service above broadband services.
- Regulation needs to be put into place to ensure that investment is directed into fibre to homes for the Ultrafast Broadband and not Mobile broadband being portrayed as Ultrafast broadband.
- Government should investigate a legislative partnership with Maori on the management of the Spectrum to ensure that the spectrum is managed reasonably and in good faith for all New Zealanders.

Prepared by
Toa Greening