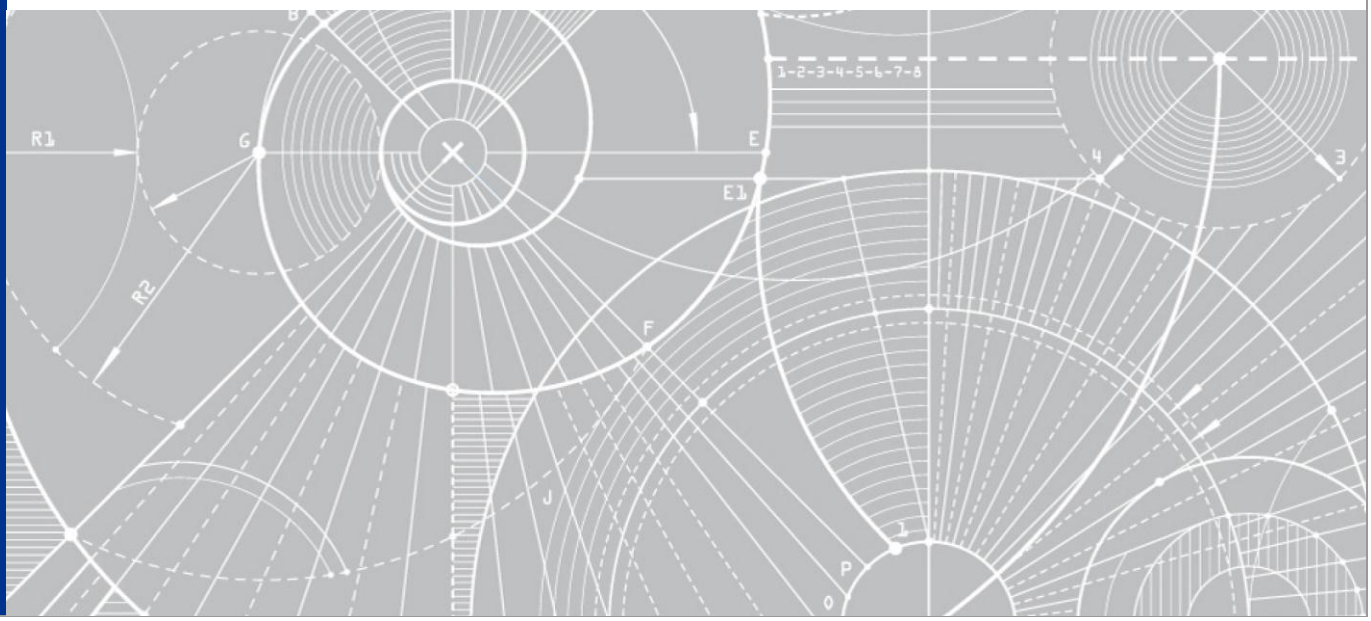
Environmental Effects of Implementing Ultra-Fast Broadband and Mobile Infrastructure

MINISTRY OF BUSINESS, INNOVATION AND EMPLOYMENT

Final Report

6 May 2014



JACOBS SKM

Environmental Effects of Implementing Ultra-Fast Broadband and Mobile Infrastructure

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The sole purpose of this report and the associated services performed by Jacobs SKM is to undertake an assessment of effects and review district plan regulation of telecommunications cables and mobile network antennas and installation in accordance with the scope of services set out in the contract between Jacobs SKM and the Client. That scope of services, as described in this report, was developed with the Client.

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1. Introduction

The National Environmental Standards for Telecommunications Facilities (NESTF) became operative in 2008 and provides for:

- The planning and operation of a telecommunication facility (such as a mobile phone transmitter) that generates radiofrequency (RF) fields as a permitted activity provided it complies with the New Zealand Standard (NZS 2771.1: 1999 Radiofrequency Fields Part 1: Maximum Exposure Levels 3 kHz to 300 GHz);
- The installation of telecommunication equipment cabinets in the road reserve as a permitted activity, subject to specified limitations of their size and location;
- Noise emitting from telecommunication equipment cabinets located in the road reserve as a permitted activity, subject to specified noise limits; and
- The installation of replacement masts and antennas on existing structures in the road reserve as a permitted activity, subject to specified limitations on height and size.

The NESTF may be amended to cater for changes to telecommunications technology to keep up with consumer expectations regarding coverage and performance.

The Ministry of Business, Innovation and Employment has requested that Jacobs SKM prepare a report summarising the environmental effects associated with telecommunications infrastructure and their construction/installation. In addition the report outlines the application of the Resource Management Act 1991 to the rollout of this telecommunications infrastructure; in particular telecommunications cables and mobile network antennas.

The structure of this report is as follows:

Work Package 1

- Section 2 of this report is the project description. This outlines the proposed infrastructure and installation methods; and
- Section 3 of this report identifies the potential environmental effects associated with the subject infrastructure and installation activities. This looks at the degree of effects for these structures and installation activities in isolation as well as cumulative effects.

Work Package 2

- Section 4 of this report overviews how the Resource Management Act (RMA) and different councils regulate the relevant infrastructure and installation activities. This overview incorporates district plan rules of the 75 council plans reviewed.

Work Package 3

- Section 5 looks at five councils and reviews plan changes (current and historic) and resource consent decisions that relate to the subject telecommunications' infrastructure. This section summarises the consent decisions and plan changes made, the reasons, and the public concerns relating to the plan changes and consents.

2. Project Description

This section outlines the type of infrastructure that is proposed and the various installation methods. This Section provides the scope for the analysis undertaken for the rest of the report, including the environmental effects assessment in Section 3 and regulatory assessment in Section 4.

2.1 Telecommunications Cables

Telecommunications cables can be provided for via aerial cables and/or underground cables (direct burial or in ducts that are generally 100mm in diameter), or in combination depending on how the existing network was developed. Installation of telecommunications cables can be delivered via a number of methods. Utilisation of ducts by installing fibre through the ducts where they are available is the most efficient and cost effective method. There is already an extensive electricity and telecommunications aerial network in most areas. The opportunity to use the existing aerial networks and extend them is potentially a preferred option over other methods due to reduced environmental impacts and being cost effective. The current and proposed infrastructure specifications and installation methods are described below.

2.1.1 Aerial Cables

Aerial cables are made of existing copper and/or fibre. They are or proposed to be suspended on electricity and telecommunication network poles, which are generally made from cement, wood or metal (likely steel). The minimum post/cable height is 5.5m, or in areas of road on designated over height route, the minimum height over the carriageway will be 6.5m. The typical pole ranges in height between 5.5m to 7.5m. Generally the poles for fibre are located in the road reserve and are often owned by the electrical network provider. Typically the main distribution cables for fibre and electricity will be on one side of the road and lower poles on the opposite to support smaller feeds/lines that are strung across the road and connected to buildings. Depending on the build method some poles will have a Fibre Access Terminal (FAT). While this infrastructure will primarily be located in the road reserve, it will have links to private properties.

There will be some sag in the cable lines. Cables are recessive in colour, generally black. The standard diameter of the fibre cable is typically 15mm but can be up to 30mm. In environments with trees, fibre will have a protective sheathing. A typical 15mm cable with sheathing will be 23mm.

Activities Associated with Installation

Some earthworks and tree removal/trimming will be required associated with the installation of posts and aerial cables. Earthworks are likely to be minimal. It is anticipated that holes for posts will be drilled and these holes could be 3m deep and 800mm in diameter. Ongoing maintenance of trees via trimming will also be required.

2.1.2 Underground Cables

Underground cables will consist of fibre or existing copper within a duct. They will be laid underground via shallow trenching or directional drilling. If ducting already exists the cables will be dragged through these existing ducts. Access to underground infrastructure is via a feeder breakout point (a type of underground cabinet, which is usually 845mm long x 510mm wide and 610mm deep, with a lid at ground level).

From the underground ducts, cables may be run up poles (either inside or outside the pole) and connected to buildings. These poles are shorter than standard power poles, with an average height of approximately 4.5m. Alternatively, lead-ins can be underground.

Trenching

Trenching is a deployment technique involving the excavation of a trench for installing underground utility infrastructure. This is within the road corridor, plus lead-ins to private property. Backfilling of the trench will occur within 24 hours of duct installation.

The two key dimensions that are unique to shallow trenches are width and cover depth.

- Width = 50mm – 300mm
- Cover depth = 300mm – 500mm

Micro trenching is a form of small scale trenching which will possibly be used. Micro trenching involves excavating a trench width of 50-80mm wide and to a depth of approximately 300mm. This method has been trailed, but not yet used in New Zealand.

Directional Drilling

Directional drilling involves excavating an underground bore for installing underground utilities infrastructure. A rig is used to drill a bore, so the duct can be inserted. Generally the duct or cable will be laid at 450mm (normal lay depth) to 1.0m deep. The depth depends on site constraints, for example it needs to be deeper where there are trees.

Directional drilling requires minimal earthworks and/or vegetation clearance. There may need to be sufficient space at works sites for temporarily storing/placing the pipes that are to be pulled through the bore hole. Directional drilling cannot occur where there are existing underground services (such as power).

2.2 Mobile Networks

Installation of mobile network infrastructure is an ongoing process for mobile providers to cater for consumer demand, growth and expectations. The current NESTF provides for such infrastructure within the road reserve where it meets permitted activity rules, particularly performance standards. However, there is no national consistency in the provision for this infrastructure outside of road reserves. The NESTF does not provide for mobile infrastructure that relates to 700MHz frequency technology, rural mobile technology or co-location of mobile infrastructure.

2.2.1 Antennas

There are various infrastructure options to cater for mobile technology. A primary piece of infrastructure is the antenna (500mm wide to support additional spectrum bands such as the 700MHz band). An antenna can be fixed to structures in various formations, such as stacked above masts, on circular frames supported by masts, or on the side or top of buildings. Where antenna are located on street posts, the posts may need to be strengthened, which may require a slightly wider post. The NESTF allows for the structure's diameter to be increased by 50%. Networks are built around macro sites with infill of smaller sites. Macro sites could be a 25m high mast with antenna. Smaller urban / suburban macro sites can be a series of smaller posts, approximately 13m tall.

Slim-line poles are proposed where there is not existing suitable infrastructure to locate antenna on. The site of such infrastructure varies, and could include on ridgelines and hilltops.

Earthworks and vegetation clearance will be required at the site location. For sites not within the road reserve, it is assumed access tracks may need to be formed. It is also assumed that ongoing maintenance of this infrastructure and ongoing access will be required.

2.2.2 Cabinets

Cabinets are another primary piece of infrastructure required. Cabinetry is modular. With the addition of new technology (such as for the 700MHz frequency) modules can be added to increase size. Cabinets link to the mobile network via underground cables or microwave radio backhaul. Additionally, cabinets are also widely used for the telecommunications cables and fibre to the node in the more rural areas. It is assumed that noise levels generated from these cabinets are within the noise limits covered in the NESTF.

2.2.3 Rural Mobile

Existing macro sites in rural areas will need to be upgraded to accommodate additional spectrum bands, in particular the new 700 MHz band. This will require larger antennas. In addition, new towers 25m tall will be required to improve or extend network coverage and in some cases will need to be up to 30m tall.

Rural infrastructure often requires stock fences of approximately 1-1.2m in height around the mast and cabinets. Access tracks may be constructed over private or conservation land to provide access for installing infrastructure. This will require associated earthworks and vegetation clearance. Maintenance of infrastructure is required, but will be infrequent. In remote locations, helicopters may be used for access and transportation.

Rural masts could be located on private land, Crown land (such as Department of Conservation land), or council land (such as council owned recreational reserves).

2.2.4 Mobile Co-location and Co-siting

There are currently three mobile network providers. Each company requires sufficient infrastructure in order to provide for customers. Elements of the infrastructure can cause radio interference with other network operators if located incorrectly. Accordingly, elements of infrastructure must be located at a sufficient distance from others, or needs to be designed in such a way they work together/do not interfere. To reduce the overall amount of infrastructure (and associated effects), co-location or co-siting of infrastructure is sometimes used.

Co-location is where one main structure is used to serve multiple functions or multiple operators. This can be achieved by having various parts of associated infrastructure located horizontally off a central mast or stacked vertically. To achieve co-location, the main structure or associated infrastructure may need to be larger than that required for independent infrastructure (for example, up to 5 metres higher than the mast otherwise would be, and therefore up to 30 metres).

Co-siting is where there are various pieces of infrastructure that sit in close proximity to each other. For example, various network operators may each have an antenna on the same roof-top.

2.3 Other Infrastructure and Future Technologies

Where Wi-Fi pockets or micro cell sites are proposed, small cell sites, which are about the size of a desktop PC device and have a short antenna, are installed. These will be located on buildings, light poles and new poles. There will be associated power and transmission cables located within the poles. This technology is also currently utilised as temporary infrastructure to provide additional Wi-Fi services, for example, at popular summer holiday destinations or at sports events. Micro infrastructure is expected to be a growing trend in mobile networks, the small Wi-Fi infrastructure (above) is likely to provide an indication of the nature and scale of effects caused by this infrastructure.

Additionally, the micro Wi-Fi sites and similar radio systems are used by small rural operators to provide broadband. These may be located on private sites or installed within the road reserve.

3. Potential Environmental Effects

Based on the Project Description in Section 2, this Section identifies potential environmental effects that are typically associated with the infrastructure and methods of installation. We have not addressed the radiation risk and effects because the NESTF already addresses this.

There may be situations where the receiving environment is more sensitive and the effects are more pronounced. While these would typically be assessed through a site specific impact assessment we have identified the activities and environmental aspects where this deviation from the norm may occur. Additionally, this section addresses only the adverse effects, and not the positive ones created from the installation of this infrastructure.

The effects have been identified based on the Resource Management Act (RMA) Section 3 Meaning of Effect:

> *In this Act, unless the context otherwise requires, the term effect includes—*
>
> *(a) any positive or adverse effect; and*
>
> *(b) any temporary or permanent effect; and*
>
> *(c) any past, present, or future effect; and*
>
> *(d) any cumulative effect which arises over time or in combination with other effects—*
>
> *regardless of the scale, intensity, duration, or frequency of the effect, and also includes—*
>
> *(e) any potential effect of high probability; and*
>
> *(f) any potential effect of low probability which has a high potential impact.*

We have assumed that standard controls and mitigation measures outlined in the project description will be implemented. These mitigation measures include, but are not limited to:

- Utilising existing power line poles where possible,
- Locating poles in practical locations,
- Standard earthworks controls such as dust suppression, staging of works, covering stockpiles, etc.,
- Traffic management (in line with relevant NZS standards),
- Avoiding trees/roots where possible,
- Keeping to appropriate hours of operation,
- Complying with NZS noise standards,
- Using sheathing to protect cables and prevent cutting trees,
- Locating cabinets sensibly, e.g. close to buildings or fences.

The use of further mitigation measures could further reduce some effects.

The typical effects of these activities are summarised in Tables 1 and 2 below. The extent of effects from isolated structures and events are in Table 1, and the cumulative effects considered in Table 2. Each effect is given a high (H), medium (M) or low (L) rating, as per the criteria in the key below. The main effects are then summarised below. Additionally, this section outlines environments that are considered more sensitive and consequently the degree of effects generated could be more significant.

Key	
	Negligible or nil effect
L	Less than minor environmental effect; is generally within legal requirements but could still be improved; is cheap/relatively easy to mitigate; or effect is temporary to the instillation period of works
M	Has an environmental effect that is minor to moderate in nature; could result in public concern
H	Has a significant environmental impact; likely to results in public complaint; is expensive or impossible to mitigate

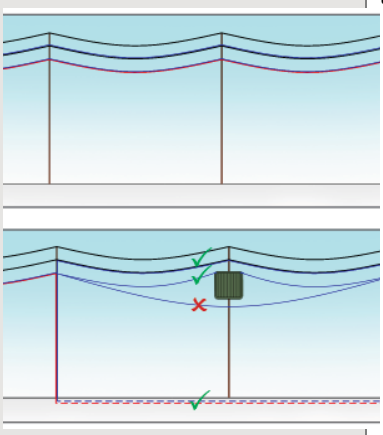
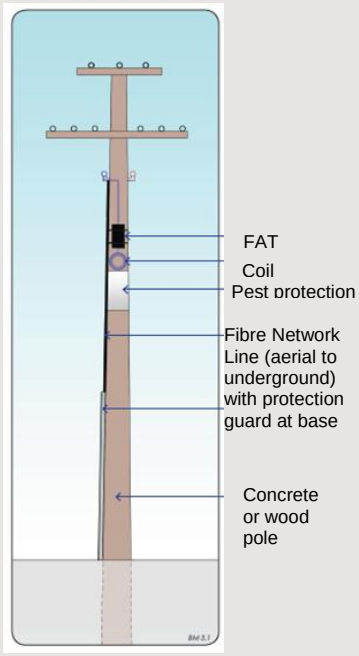
Table 1: Environmental Impacts from Broadband and Mobile Infrastructures and Installation – Single Structures and Events

	Environmental Impacts from Single Structure / Activity													
Structure or Activity	Visual / amenity	Dust	Slope Stability	Noise	Vibration	Flora and fauna	Disturbing tree roots	Water Quality / Stormwater	Vulnerable to seismic activity	Traffic disruption	Access	Obstruction to road reserve / land	Public Safety	Interference with other infrastructure
Telecommunications Cable														
Above ground cables	L													
Above ground poles and coils	L											L		
Underground cables									L					L
Trenching	L	L	L	L	L		L	L		L	L		L	
Micro-trenching		L		L			L	L		L	L		L	
Drilling		L		L	L		L			L		L	L	
Vegetation removal / trimming	L					L								
Cabinets	L											L		
Mobile Networks (Urban)														
Cabinets	L											L		
Antenna (on streetlights, rooftops, etc.)	L													
Micro cells (on streetlights, bus stops, signs, bridges, etc.)	L													
Urban slim line monopoles	L											L		
Construction (new poles)		L					L			L		L	L	
Mobile Networks (Rural)														
Cabinets	L													
Rural mast and antenna	M													
Safety and stock fences	L													
Earthworks	L	L	L	L				L						
Vegetation removal / trimming	L													
Access tracks earthworks	M	L	L	L										
Access tracks vegetation clearance	L					L								

Table 2 Environmental Impacts from Broadband and Mobile Infrastructures and Installation – Cumulative

	Environmental Impacts - Cumulative													
Structure or Activity	Visual / amenity	Dust	Slope Stability	Noise	Vibration	Flora and fauna	Disturbing tree roots	Water Quality / Stormwater	Vulnerable to seismic activity	Traffic disruption	Access	Obstruction to road reserve / land	Public Safety	Interference with other infrastructure
Telecommunications Cable														
Above ground cables	M													
Above ground poles and coils	M											L		
Underground cables									L					L
Trenching	L	L	L	L	L		L	M		L	L		L	
Micro-trenching		L		L			L	M		L	L		L	
Drilling		L		L	L		L			L		L	L	
Vegetation removal / trimming	M					L								
Cabinets	L											L		
Mobile Networks (Urban)														
Cabinets	L											L		
Antenna (on streetlights, rooftops, etc.)	M													
Micro cells (on streetlights, bus stops, signs, bridges, etc.)	L													
Urban slim line monopoles	M											L		
Construction (new poles)		L					L			L		L	L	
Mobile Networks (Rural)														
Cabinets	L													
Rural mast and antenna	M													
Safety and stock fences	M													
Earthworks	M	L	M	L				M						
Vegetation removal / trimming	L													
Access tracks earthworks	M	M	L	L										
Access tracks vegetation clearance	L					L								

3.1 Telecommunication Cables

Structure / Activity	Effect	Extent of Effect - Single	Extent of Effect - Cumulative	Comment
Above ground cables 	Visual amenity	L	M	Cables are an anticipated part of many urban environments. The effects of a set of overhead wires itself is generally low; however the cumulative amenity effects of fibre cables and electricity lines can be more significant. The degree of effect differs with location. On the likes of ridgelines, the visual prominence of this infrastructure could be far more significant.
Above ground poles and coils 	Visual amenity	L	M	Poles are an anticipated part of many urban environments. However the cumulative effects reduce visual amenity. Utilising the existing power poles instead of erecting additional poles will strongly help mitigate this effect. Coils can appear untidy and can increase the degree of visual effect.
Underground infrastructure (cables and underground cabinets) and access pit.	Vulnerable to seismic activity	L	L	There could be a significant effect on telecommunication if these underground facilities are damaged. However the likelihood of such damage occurring is low.

				
Trenching 	Dust, sediment, erosion and stability	L	L	These effects can be high, but if sufficiently managed these effects are low.
	Noise	L	L	The extent of noise and vibration generated from earthworks depends on rock/ground type.
	Traffic disruption and property access	L	L	Can cause significant disruption to traffic and affect site access. However the effects are temporary and can be managed.
	Water quality	L	M	Once rehabilitated, the effects on stormwater quality will be nil. However, during a rain event, there could be runoff into the stormwater network. The cumulative effect of this is significant if not appropriately managed.
Micro-Trenching 	Dust, sediment, erosions and stability	L	L	Micro-trenching significantly reduces the effects typically generated by earthworks. This method can lead to erosion over time if not properly sealed. However we have assumed the ground will be sufficiently reinstated. However, the material produced is fine and if it enters the stormwater network there could be significant effects on stormwater. Control measures need to considered to ensure the dust and silt is contained and managed.
	Water quality	L	M	
Directional Drilling	Dust, sediment, erosion and stability	L	L	Measures can be put in place to sufficiently manage these effects.
	Noise	L	L	The extent of noise and vibration generated from earthworks depends on rock/ground type, but will be temporary and can be

 				managed.
	Traffic disruption and property access	L	L	Can cause significant disruption to traffic and affect site access. However the effects are temporary and can be managed.
	Disruption to the road reserve / land	L	L	Substantial land space may be required during the installation phase to store the cables. They could cause disruption to traffic, pedestrians or land owners / occupiers. However these effects are only temporary to the drilling phase.
Associated vegetation removal / trimming	Visual Amenity	L	M	Sheathing should be used where possible to prevent requirement for vegetation clearance or uniformly tree pruning.

Overall, the effects for telecommunications cable infrastructure tend to be low. For underground cables, the effects are concentrated at the installation stage. These effects are temporary and can be managed through the likes of appropriate earthworks controls and traffic management. The effects from micro-trenching are significantly less than from trenching. These effects can be managed, however, thorough mitigation measures need to be included for trenching activities in order for the effects (for example on stormwater) to be low. Directional drilling is the most appropriate method for ensuring effects are low, as it is a mitigation method in itself.

The installation of overhead cables will generate fewer effects during the construction phase. Overhead cables can, however, cause a greater and permanent visual effect. While it is anticipated to see infrastructure in the built environment, the web of lines from fibre cables along the road reserve; across road corridors; and to individual buildings, in combination with existing power lines, could break up the urban canvas and generate a greater cumulative effect.

3.2 Mobile Infrastructure

Structure / Activity	Effect	Extent of Effect - Single	Extent of Effect - Cumulative	Comment
Urban Infrastructure				
Cabinets	Visual amenity	L	L	Cabinets already form part of the built environment and are anticipated in many urban areas. Cabinets can generate an adverse visual effect, and contribute to cumulative effects of infrastructure. The cabinet size to provide for sites to operate additional technology over additional

				spectrum bands are slightly larger than most exiting ones, however, not enough to generate a more significant visual effect.
Urban slim line monopoles 	Visual amenity	L	M	The slim line poles are non-obtrusive in design, which helps mitigate visual effects. However they do contribute to cumulative visual effects of infrastructure and their height can make them visible from a wide area, making the effect more significant.
Antenna (on streetlights, rooftops, etc.) 		L	M	Antennae located on existing infrastructure are sympathetic to the existing environment. They are designed in a way to reduce the visual prominence and effect. However a high density of antennae created from co-sitting on buildings, or having numerous antennae in a slightly wider area can have a cumulative effect on visual amenity.

				
Micro cells (on streetlights, bus stops, signs, bridges, etc.)   	Visual amenity	L	L	Micro cells can be discrete when appropriately located, reducing their level of effect.

Rural Infrastructure				
Rural mast and antenna 	Visual amenity	M	M	The proposed rural and industrial masts are tall and have antennae and other equipment located high on the mast structure. Consequently they are visually prominent and generally have a minor-moderate environmental effect. However the higher masts cater for co-location, potentially reducing the overall number of mast required in rural areas. Consequently a lower visual effect may be generated from fewer but higher masts. The extent of effects is highly location specific. View lines are important, as the effect is different from structures viewed against the topography, to those that break the skyline.
Cabinets and safety/stock fences *(see rural mast image above)*	Visual Amenity	L	L	Cabinets and fences are generally low in height, and consequently are not visually prominent from a distance. However if located on a ridgeline of prominent area they can generate a greater visual effect.
Associated earthworks	Visual Amenity	L	M	Some locations may require earthworks e.g. to provide a level platform for cabinets and other equipment, or to set cabinets and fences at a height below a ridgeline or hilltop. Cuts will have to be stabilised or retained. Both earthworks areas and retaining could have a visual effect.
	Water Quality	L	M	There could be a moderate effect on water quality from the cumulative effect of runoff from earthworks.
Associated vegetation clearance	Visual Amenity	L	L	Vegetation clearance may be required at infrastructure sites. This could generate a visual effect, but will be contained to a small area.

Access tracks	Earthworks – visual amenity	M	M	Access to rural sites could require the formation of new tracks. Associated earthworks could create noticeable scars in the landscape. In many rural areas, tracks are anticipated and therefore effects will be low. However in some rural and conservation areas the modification of the landscape will generate a greater visual effect. Adequate soil and erosion controls will help mitigate the extent of visual effects from tracks. There is little requirement for maintenance of infrastructure, and as such there may be no need for maintenance of access tracks and they can be re-grassed or re-vegetated.
	Vegetation clearance – visual amenity	L	L	

Overall, the effects of mobile network infrastructure in the urban environment will be low. Much of the infrastructure is small and located appropriately with existing infrastructure. However cumulative effects of poles and/or antennae could increase the degree of effect.

The rural masts will have a more significant visual effect. However, one mast can serve a large area of the community (catchment area varies), and as such these towers are assumed to be dispersed throughout the rural landscape. The co-location of such infrastructure will reduce the number of masts required, reducing the degree of visual effect. The character of different rural environments varies, and therefore the effects generated from infrastructure and access tracks may vary with location.

3.3 Sensitive Environments and Features

There are particular environments and features that are more sensitive than the 'typical' urban or rural area. Many of these areas are more heavily regulated by various District Plans nationally. Consequently, the extent of effects in these areas may be more significant than stated in the effects assessment matrix. These sensitive environments and features include, but are not necessarily limited to:

- Environments more sensitive to telecommunications infrastructure,
- Environments more sensitive to earthworks/trenching activities,
- Heritage features / areas,
- Scheduled trees, and
- Arterial roads.

Environments Sensitive to Telecommunications Infrastructure

Environments that may be more sensitive to telecommunication infrastructure include:

- Classified landscapes/areas of high visual value (outstanding natural landscapes, etc.),
- Public and Crown land (Department of Conservation land, council reserves, etc.),
- Areas of ecological significance, and
- Ridgetops and hilltops.

These environments have high value placed on natural character and visual amenity. Consequently, visual amenity and natural character is highly impacted by development in these environments. Some measures can be taken to provide relief from the visual effect generated by rural mobile infrastructure; for example the use of bunding or planting to screen cabinets and stock fences or making infrastructure recessive in colour. Limited relief can be provided to mitigate the visual effects of masts and antennae in these locations.

Earthworks and vegetation clearance associated with track formation will be required over private property and Crown land to provide access to subject sites. This can create scars in the landscape with a potentially significant visual effect. Alternative measures could be used such as using helicopters to access more sensitive locations, or rehabilitating access tracks to help provide relief from visual effects.

Environments Sensitive to Earthworks / Trenching

Environments that can be more sensitive to earthworks and trenching activities include:

- Areas of ecological significance,
- The coastal marine area,
- Steep slopes or low stability soil/rock types, and
- Mana Whenua land or taonga land.

Additionally, contaminated land is an area where more care is required.

These environments have varying values and issues making them more sensitive to earthworks. If earthworks are necessary or proposed in these locations, specific measures will be needed to manage works to avoid impacts on ecological or cultural values, or to prevent effects from cross-contamination.

Heritage Features / Areas

Works may be located adjacent to heritage sites or within heritage character or archeologically significant areas, particularly in urban areas, In these cases, special attention may need to be given to the design and location of infrastructure to prevent, avoid or mitigate effects on the heritage value and character of the area.

Additionally, unexpected archaeological finds may occur, that will need to be managed at the time

Schedules / Significant Trees

The health and stability of scheduled trees is generally highly valued. Therefore trimming, removal or earthworks within the root zone of these trees will generate greater effects than that on other trees in the road reserve.

In some areas, all trees are considered significant / placed at a higher value. For example, ecological areas or areas where trees above a certain height are considered significant.

Arterial Roads

Potential traffic disruption will have a more significant effect on key routes and arterial roads. More stringent traffic management provisions can provide relief to these effects.

3.4 Summary

We have assessed the general risk and anticipated effects of the proposed infrastructure and its installation. In sensitive environments, effects may be more significant. For example, infrastructure and associated access tracks in classified landscapes.

Effects associated with underground cables occur during installation, however, there are very few effects once installed, provided that appropriate earthworks management controls and re-instatement is carried out.

Overhead wires will have a more significant and permanent visual effect. In many areas, the extent of effect will be tolerable as effects will be within levels anticipated by the community. However in higher amenity residential areas or commutatively with electricity wires, the degree of effect will be more significant.

The proposed mobile network technology in the urban environment is relatively tidy in design and location, and as such the visual effects are generally low. The rural masts could be visually prominent and out of character with rural areas, however, this infrastructure is likely to be sporadic, reducing the overall degree of effect.

With the exception of infrastructure in sensitive environments, most of the infrastructure and activities proposed will have a low effect. However it is important to be mindful of the cumulative effects of infrastructure.

4. Regulatory Assessment

The environmental effects associated with the installation of telecommunications cables and mobile network infrastructure and technology are generally managed through the Resource Management Act 1991 (RMA) using the following mechanisms:

- The National Environmental Standard for Telecommunication Facilities;
- District plans;
- Regional plans, and;
- The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

Policy documents such as national policy statements and regional policy statements may also be relevant, however, as these are less direct mechanisms for applying controls they have not be reviewed in this report. District plans are the primary means of managing the environmental effects identified in Section 3. District plans comprise of a set of policies, objectives and rules that specify which land use activities can and cannot be undertaken as permitted activities and which require resource consent. For the purposes of this project a review of 75 district plans has been undertaken, which relate to the Councils identified by the Ministry of Business, Innovation and Employment as covering the subject telecommunications utilities, with an overview of relevant consenting requirements provided for each. A list of these councils is provided in Appendix A. Forty-five of these councils have been reviewed in relation to telecommunication cables because the Ministry noted these areas where ultra-fast broadband has or will be located. These forty-five councils have also been reviewed in regard to urban mobile infrastructure. However, all the listed councils have been reviewed in relation to rural mobile infrastructure (masts, etc.)

4.1 National Environmental Standard for Telecommunication Facilities

As stated in the introduction above, the National Environmental Standards for Telecommunications Facilities (NESTF) provides for:

- The operation of a telecommunication facility that generates radiofrequency fields as a permitted activity, subject to radiofrequency exposures levels;
- The installation of telecommunication equipment cabinets in the road reserve as a permitted activity, subject to specified limitations of their size and location;
- Noise emitting from telecommunication equipment cabinets located in the road reserve as a permitted activity, subject to specified noise limits; and
- The installation of replacement masts and antennas on existing structures in the road reserve as a permitted activity, subject to specified limitations on height and size.

Most of the facilities and associated installation activities required for the telecommunications cables and mobile network technology outlined in Section 2 of this report are not currently covered by the NESTF.

4.2 District Plans

Section 9 of the RMA restricts any use of land that contravenes a district plan rule unless expressly allowed by resource consent. The RMA provides for each local authority (most commonly a district council) in New Zealand to decide what rules it wishes to include in its plan. The rules regulate land use primarily through activity based rules within a hierarchy of activity statuses. Activities are either permitted (often subject to meeting minimum standards/controls) and therefore can be done as of right, or resource consent is required before it can be undertaken. Table 3 presents the range of activity statuses.

Table 3 District Plan Activity Status

Activity Status	Consent Requirements
Permitted	Can do activity as of right without resource consent.
Controlled	Activity requires resource consent, however, the consent authority has specific matters which they have control over and they must grant consent.
Restricted discretionary	Activity requires resource consent, however, the consent authority can only consider specified matters that they have discretion over.
Discretionary	Activity requires resource consent and the consent authority has full discretion.
Non-complying	Activity requires resource consent where the consent authority has full discretion and the activity is subject to a more stringent 'test'.
Prohibited	The activity is prohibited and cannot attain consent.

All buildings/structures and construction/installation methods relevant to telecommunication infrastructure are considered to be 'activities' under the RMA.

The activity statuses create a hierarchy which determine the level of intervention by the district council; from controlled where there is little discretion and consent must be granted, through to non-complying where the council is unrestricted in its discretion and consent may be refused.

District plans generally categorise the district in 'zones'; for example areas could be in a 'residential zone', a 'central zone' or a 'rural zone'. There are different standards and consenting requirements that apply to each zone. For example, the maximum permitted height for structures may differ between zones.

4.2.1 Consent Requirements under District Plans

Sixty five councils' district plans (75 plans in total) were reviewed to identify the consent requirements relating to the proposed infrastructure and associated installation. This review is based on operative plans, and not current and proposed plan changes. Of the first 45 councils reviewed, which were looked at in terms of the telecommunications cables and other mobile infrastructure, it was identified if they are currently undertaking a proposed plan change of utilities provisions. The outcomes of this are listed in Appendix C.

A summary of the typical consent requirements for each council, relevant to the telecommunications cables and mobile network infrastructure and installation activities, is provided in a Table attached in Appendix B. A summary from this table is below in Table 4, showing the total number of councils that require consent for each activity.

Table 4 and the associated information is based on a broad review of district plans and primarily through phone conversations with a duty planner from each of the councils. The high level review is intended to give an indication of the status of the activities within the districts and is not a detailed analysis of the specific provisions. Furthermore, as there are different requirements for different areas within each district, the table in Appendix B captures the prominent areas including central, residential and rural zones. There may be other zones, overlays and features with tighter provisions (note, a list of these overlay areas is provided in Section 4.2.4 below). This has been provided for the Ministry of Business, Innovation and Employment to help them understand the regulatory framework as it relates to the NESTF and is not intended for the use by utilities providers and other persons to determine when consent is required. Further analysis of the rules should be undertaken on a case by case basis to determine if each proposal complies with relevant district plan rules.

Table 4 District Councils that require consent for mobile and broadband structures and installation activities

	Structure / Activty																				
	Telecommunication Cables	Above ground cables	New poles and overhead cables	Underground cables	Trenching	Micro-trenching	Drilling	Vegetation removal / trimming	Cabinets (road reserve)	**Mobile Networks (Urban)**	Cabinets	Antenna (on streetlights, rooftops, etc.)	Micro cells (on streetlights, bus stops, signs, bridges, etc.)	Urban slim line monopoles	**Mobile Networks (Rural)**	Cabinets	Rural mast and antenna (20m)	Rural mast and antenna (25m)	Rural mast and antenna (30m)	Earthworks	Access tracks earthworks	Vegetation clearance (installation site and access tracks)
Total Councils		54	54	54	54	54	54	54	54		54	54	54	54		73	73	73	73	73	73	73
Total: Consent Required		18	20	0	0	0	0	1	3		4	5	1	30		4	19	41	69	0	0	2
Total: Permitted Subject to Conditions		11	16	2	20	15	14	15	33		33	30	12	9		47	28	22	3	37	49	31
Total: Permitted		25	18	52	34	39	40	38	18		17	19	41	15		22	26	10	1	36	24	40

4.2.2 District Plan Controls, Conditions and Assessment Matters

The following district plan methods are important to understand the consent requirements of the Councils reviewed:

- Controls/conditions for permitted activities;
- Matters of control for controlled activities;
- Matters of discretion for restricted discretionary activities; and
- Assessment matters for all consents.

The above methods outline what is permitted and what the council can look at when processing consent applications. Consequently these methods provide a mechanism to ensure that significant adverse effects of that activity are not generated and guide what the consent authorities consider when processing consents as controlled or restricted discretionary.

4.2.2.1 Permitted Activity Controls

In many cases, the structure or installation activity is permitted subject to controls (as shown in Table 4 above, and the full table attached in Appendix B). Table 5 sets out typical types of permitted activity controls related to the proposed structures and installation activities.

Table 5 Permitted Activity Controls

Permitted Activity	Conditions / Controls
Earthworks	- Maximum volume, area, height of cut / depth of fill - Minimum distance from a waterbody (e.g. 5m or 20m) - Require erosion, dust and sediment control measures - The maximum timeframe in which the ground must be reinstated (e.g. 48hrs)
Vegetation clearance (trimming or removal)	- The tree must not be indigenous - The tree must not be specified / listed - Vegetation must be reinstated / replaced - The height of the tree (e.g. can remove any tree under three metres) - The extent of pruning (e.g. can prune up to 30% of the tree) - Maximum circumference of the tree
Mast and antenna	- Requiring landscaping - Mast and/or antenna height - Maximum number of antenna per building - Maximum antenna dimensions - Specified minimal setbacks from dwellings, watercourses and zone boundaries
Other structures	- Requires screening (e.g. solid fences or landscaping) - Maximum size (heights, width, depth, area) - Colour restrictions - Minimum setback (of cabinets, new poles, etc.) from property boundaries

Many of the controls are standard across districts, but the number of controls per district does vary and some districts have more specific controls.

4.2.2.2 Consent Matters of Control or Discretion

When an activity requires consent as a controlled or restricted discretionary activity, the matters that council considers are limited. The matters of control or discretion are specified within the district plan. Alternatively the matters of control/discretion may be in regard to the effects generated from that activity that consent is required for (for example earthworks). Table 6 sets out examples of matters of control/discretion in plans relevant to the works in this project that require resource consent.

Table 6 Matter of control and discretion for various activities requiring resource consent

Consent Activity	Matter of Control / Discretion
Earthworks	- Earthworks stability - Erosion, dust and sediment control - Visual amenity - The transport of material
Mast and antenna	- Location - External appearance - Access - Landscaping
Other structures	- Scale, bulk and form - Amenity and streetscape values - Public health and safety

4.2.3 Trends and Inconsistencies

From the district plan rules, as illustrated in the table in Appendix B, there are both common trends and inconsistencies in the way councils regulate each structure and activity. The table indicates the trends and inconsistencies for consenting requirements between different district councils. The table captures when consent is and is not required. However there are also many variations in how the rules provide for these activities that cannot be captured in the consent table. For example, a proposed 3m high antenna requires consent in many districts, or may require consent if it exceeds controls (such as a maximum of one antenna per building). Variations around the permitted antenna height include:

- Maximum height allowed above the height of the building / structure it is located on,
- Maximum height allowed above the maximum zone height requirements for buildings in that zone,
- Maximum height must be within the maximum zone height requirements for buildings in that zone,
- Maximum height allowed above a specified altitude,
- Maximum height, width and/or area of the antenna themselves.

Other key observations made from the review of the plans, include:

- In most districts, 30m high masts are not permitted and require consent. Many district councils allow masts up to 25m.
- Generally underground cables are permitted, however, there is a lot of variation regarding if aerial cables require consent.
- Some councils, including Nelson, the North Shore and Hauraki, have rules limiting co-siting of antennae; whereas others take co-siting into account through assessment matters. Co-siting is not addressed in all district plans.
- Horowhenua District Council has a maximum mast height per zone, but allows for masts to be higher if co-located.

- Works in the road reserve are managed by councils through districts plans and/or the roading authority. Likewise, alteration, removal and replacement of trees within the reserve can be managed through district plan rules and/or the parks and reserves authority. Therefore not all district plans capture works within the road reserve, and in these cases the works are not regulated by the RMA.

4.2.4 Sensitive Areas

We identified areas and features included in the district plans that have different, more onerous resource consent requirements. For example, an activity might be permitted unless it is in a sensitive area where it would then require resource consent. Each of these areas and features have different values and consequential environmental effects associated with them. District plans usually still try to provide for utilities in these areas, however, works are generally subject to more onerous activity rules to reflect the values.

Areas may be referred to in the plans as overlays, precincts or be a more specialised zone. These specified areas include:

- Outstanding and Amenity Landscapes Areas;
- Cultural and Heritage Sites (including sites of significance to Tangata Whenua and Archaeological Sites);
- Open Space, Recreation and Conservation Areas;
- Significant Natural Areas and Ecological Areas;
- Foreshore Reserves and Coastal Marine Areas;
- Ridgelines and Hilltops;
- Volcanic Cones;
- Natural Hazard and Flood Plain Areas;
- Airport Protection Overlays;
- Land Stability Areas;
- Character Areas.

Features are usually notations on the plan and include:

- Wetland, River and Water Bodies and their margins;
- Significant trees;
- Landscape features;
- Heritage buildings or structures.

4.3 Regional Plans

We have not reviewed any regional plans. However, the proposed structures and installation activities are unlikely to require consent under regional plans, as these plans deal predominantly with effects on water, soil and air. In some cases, earthworks activities from trenching, drilling and excavation associated with new infrastructure and access tracks may trigger regional rules in particular environments, including:

- If they are near a waterbody;
- If they are in a soil protection area; or
- If they are in a coastal management area.

4.4 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES for Contaminated Land) regulates works on HAIL sites (Hazardous Activities and Industries List, 2011, MfE). Activities covered by this NES include:

- Removal or replacement of fuel storage systems;
- Soil disturbance;
- Change of land use; and
- Subdivisions.

Soil disturbance is relevant to the UFB and mobile installations. Up to $25m^3$ per $500m^2$ of earthworks is permitted at any one time providing it meets other requirements in relation to duration, disposal etc. Any amount of earthworks beyond this requires consent.

The extent of earthworks required for installing the proposed infrastructure is likely to be small in scale and within the permitted levels of the NES for Contaminated Land. However, there may be HAIL sites where the likes of trenching or earthworks for the formation of access tracks could exceed these limits.

4.5 Summary

Overall, the main RMA mechanism for regulating environmental effects associated with UFB and mobile network structures and installation activities is through district plan rules.

A high level review of all 76 district plans identified that the rules and controls regulating these utilities primarily relate to the size and location of the structures. Earthworks and vegetation clearance (up to a specified scale) are generally permitted subject to controls that ensure that the earthworks are well managed and the ground and vegetation is reinstated.

Particular environments can be more sensitive to environmental effects, and these environments are identified in plans as specified areas (via zones, overlays or precincts) or features. This includes the likes of hilltops and ridgelines, amenity landscapes, sites of cultural significance and heritage trees. In these areas, the regulations can be more onerous.

We have summarised how the different plans regulate the infrastructure and installation activities. Further analysis of the activity controls and assessment matters could provide an indication of what councils' specific concerns are regarding environmental effects; which could help identify why these infrastructure regulations are in place.

5. Policy Changes, Consenting Decisions and Associated Concerns

There are a range of environmental effects resulting from the installation and operation of utilities infrastructure as discussed in Sections 3 and 4 of the report. Councils regulate these effects through district plans and through resource consents.

Under the RMA, councils are required to update their district plans at least once every ten years. The first operative district plan for each district is generally referred to as the 'first generation' district plan. When the first generation plans are reviewed and updated through the plan change process, they become 'second generation' plans. Some councils are operating under their first generation plan, and some the second generation plan. Many are currently in the process of working on their second generation plans (refer to plan changes listed in Appendix C).

The purpose of this section of this report is to gain a broad understanding of the specific issues and concerns, both of submitters and councils in relation to telecommunications activities. This analysis should assist with policy development when modifying the NESTF. We have reviewed a number of plan changes relating to telecommunications rules, proposed or operative, and resource consent and certificate of compliance decisions involving the relevant telecommunications infrastructure. This review provides a snapshot of the matters being considered in these types of decisions. The review has been undertaken with a specific focus on overhead cables, masts and antenna, to identify key issues and concerns raised that relate to the subject infrastructure. This review specifically seeks to identify the following:

- The key issues of concern for both telecommunications providers and the public in undertaking telecommunications activities;
- The key issues of concern for councils when regulating new telecommunications infrastructure; and
- How these concerns have been addressed through plan changes and resource consent decisions.

This section therefore reviews relevant current and past plan changes, as well as resource consent and certificate of compliance decisions from a group of five councils. These five councils have been specifically selected as a result of being known to have had undertaken, or be in the process of undertaking, plan changes relating to utilities and/or to have processed contentious resource consents for telecommunications infrastructure in their district. The councils included are:

- Wellington City Council;
- Horowhenua District Council;
- Matamata-Piako District Council;
- Tauranga City Council; and
- Whangarei District Council.

The following sections present our key findings from these reviews with an overall summary provided for in Section 5.7.

5.1 Overview of Relevant Plan Changes and Submissions

Following a review of proposed and operative plan changes of relevance to telecommunications infrastructure, a summary of our findings is presented in Table 7. A detailed summary of our findings is presented in Appendix D. Regarding the status column, 'O' denotes that the plan change is operative (or effectively operative) and 'P' denotes that the plan change is proposed.

Table 7 Summary of Plan Changes – drivers, changes and concerns

Council	Plan Change	Status	Driver(s) of Change	Summary of Key Changes	Summary of Key Responses from Submitters
Wellington City Council	Plan Change 14	O	• Public opposition to overhead cables as a permitted activity, for example in Saturn Cable case	• All cables are to be underground • Any overhead cables now require resource consent	• Few submissions – reflects the fact that the change was implemented to address public concern
	Plan Change 74	O	• Need to align utility provisions with NESTF • Need to change provisions around siting and size of masts and antennae, particularly in sensitive areas • Need to remove disincentives for co-location	• Permitted activity conditions added to direct infrastructure to appropriate locations i.e. not on identified ridgelines/hilltops, seaward site of identified coastal roads next to coastal marine area or on land which is listed as a heritage item • More restrictions around provisions for masts and antennae in Residential zone and Open Space zone A. In Open Space A this includes: - Permitted mast height reduced from 20m to 15m; - Masts shall not be located within 5m of any residential boundary (increased from 1m). • The construction, alterations and addition to above ground utilities structures is no longer permitted in Open Space B or Open Space C areas • Cumulative effects of co-location to be considered as matter of discretion and assessment criteria	• 14 submissions received, overall mainly in support • Key point of opposition was in relation to distance of antenna from boundaries – industry wanted 3m, public wanted more, e.g 100m • Industry opposed restrictions in Open Space zone as viewed these sites as appropriate locations for such infrastructure

Council	Plan Change	Status	Driver(s) of Change	Summary of Key Changes	Summary of Key Responses from Submitters
Horowhenua District Council	2nd Generation Plan Change	O	• Reflect the NESTF as it relates to infrastructure in the road reserve • To manage provisions for necessary infrastructure on private land and balance with amenity expectations throughout different zones • Need to address technological advancements since development of first generation plan i.e. telecommunications, cabinets, replacing copper wire with fibre-optic cables • Plan change submissions from Telecom NZ Limited and Chorus NZ Limited	Changes to size and height of mast and antenna: • Max permitted height increased from 20m to 25m in Industrial zone and 13.5m to 15m in Commercial zone, outside of Pedestrian Area overlay • Dimensions of antenna and aerials that can exceed above height limits amended slightly • Permitted activity rule added to allow for max permitted height of mast of 25m in Commercial Zone in Pedestrian Area overlay and Rural zone, where antennae from more than one network utility are co-located on same mast	• Minimal issues raised on discussion documents • No feedback/concerns from general public • Industry providers concerned with permitted height of masts and wanted provision for co-location. (Note: the key changes were principally as a result of these submissions)
Matamata-Piako District Council	Plan Change 44 - Works and Network Utilities	P	• Need to resolve conflicts between existing District Plan rules and NESTF	• New rule permitting co-location of telecoms lines onto existing electricity infrastructure • Changes to rules regarding overhead lines • New rule specifying that a max of 2 antennae can be attached to any building/structure providing it does not exceed 1.2m² area or 1.2m diameter • Minor changes to permitted height of masts and associated antennae • Reduction in permitted gross floor area of small buildings/cabinets from 30m² to 10m²	• No feedback from general public • Feedback from industry around rules being too onerous for minor infrastructure, too restrictive around number of antennae that can be co-located on a mast, need for a rule which exclude telecom infrastructure from earthworks and vegetation removal rules, minor equipment should be allowed in yard area and no consideration of network activities in flood hazard areas

Council	Plan Change	Status	Driver(s) of Change	Summary of Key Changes	Summary of Key Responses from Submitters
Tauranga City Council	2nd Generation Plan Change	O	• Need to align plan with requirements of NESTF	• Increase in setback distances of masts from any site boundary or sensitive zone, Outstanding Natural Feature, Important amenity landscape and Special Ecological Areas from 1m to 5m. This excluded the road reserve	• Public concerns regarding visual impact of infrastructure • Public argued that masts should not be located in residential areas or near education facilities • Public infrastructure in public areas should be controlled to minimise impacts on the reserve and consideration should be given to co-locating cell phone towers
Whangarei District Council	Plan Change 123A - Network Utilities – Electricity Transmission	O	• Existing District Plan lacked consistency with NESTF	• New district wide utilities chapter (from previous zone by zone approach) • New rules to control development of land within existing transmission corridors • Cross referencing to NESTF • New rules to manage operation and maintenance of electricity infrastructure	Public concerns: • Development of new lines could occur without landowners being aware • Restrictions on land use in electricity transmission buffer zone would be too restrictive and onerous and would give the Council the right to remove economic potential from land without compensation Industry concerns: • Need to include restricted discretionary rules to control earthworks around poles, towers and within transmission corridors

5.2 Consent Decisions

5.2.1 Wellington City Council

Wellington City Council has had a number of contentious resource consents and certificates of compliances for utilities infrastructure, including:

- A certificate of compliance for network of overhead cables from Telsta Saturn Limited (referred to as ‘Saturn Cable’);
- A certificate of compliance for a mast and antenna at Ariki Road, which is in a residential areas and close to Hataitai School; and
- A resource consent for a mast and antenna in the Residential Zone along the waterfront at Marine Parade.

These consents and certificates of compliance are summarised below.

Saturn Cable

Telstra Saturn Limited ('Saturn') attained Certificates of Compliance from Wellington City Council in the mid to late 1990s to construct a cable communications network throughout urban areas in the Wellington District. While this was for cable television, it influenced the way cables were viewed and regulated in the City.

A rule in the first generation plan permitted the addition of one overhead cable affixed to an existing overhead line. Saturn utilised this rule to establish its overhead line network and Council supported this approach.

There was strong community opposition to these cables due to the visual effects generated from the thick cables. The erection of these cables as a permitted activity was challenged by the community primarily on the grounds the cables were bundled and therefore could be considered to be more than one cable. Consequently the Coalition of Residents Associations Incorporated appealed the decision of Wellington City Council to the Environment Court in 2001.

As a result of this court case, the Council recognised the strong public opposition to overhead wires. This became a driver of a plan change, resulting in plan change 14.

Ariki Road

A certificate of compliance was granted in 2010 under the NESTF for a Vodafone New Zealand Limited (Vodafone) telecommunications facility at Ariki Road, Hatatai. This included a 10.4m high mast with a streetlight and antenna.

After this certificate of compliance decision was issued, the community raised concerns with the mast. They were concerned with both the visual effects and the effects of the masts radiofrequency levels on human health, and were especially concerned with the mast being located close to Hataitai School. The Citizens Against Transmission Towers (CATT) group was a key party objecting to the tower. This group engaged various stakeholders, including Vodafone, the Council, the media, Hataitai School, politicians, the Human Rights Commission and the Ministry of Health. The main concerns were a lack of consultation with the community in determining the location of the equipment and the radiofrequency levels / perceived effect on human health; rather than visual effects.

The radiofrequency levels were within the permitted levels set in the NESTF and as a result, the mast was permitted. Consequently, the Council's decision to issue the certificate of compliance was robust. A community meeting was held to inform the public of this and to reassure them that the radiofrequency levels identified in the NESTF are safe.

Marine Parade

A resource consent was granted in 2003 on a non-notified basis to Vodafone for a telecommunications tower on legal road (being Council owned road reserve) within the Residential Zone. The mast was along the waterfront, on the seaward side of the road and was adjacent to Seatoun Wharf, which is a heritage object. The mast is 8m tall and the antenna is 0.22m^2. Consent was required as the mast was within 5m of a mean high water spring.

After consent was granted, there were complaints to the Council from the local community. The concerns of the community were in regard to there being no consultation with the public on the location of the structure, the visual effects of the mast along the beach and health and safety effects.

Council justified its decision, noting that public consultation was not required when environmental effects were no more than minor and that the mast complied with the safe radiofrequency levels standards. Regarding visual effects, the mast was replacing a legal existing power pole, and the existing environment set a permitted baseline. The additional visual effects created from the mast were not deemed more than minor.

This said, this consent decision raised that there was public opposition to utility structures along the waterfront, and consequently a new provision was added as part of Plan Change 74 to direct structures away from the seaward side of the road along the waterfront.

5.2.2 Horowhenua District Council

The Horowhenua District Council identified one contentious resource consent that was for a Vodafone telecommunication mast. This resource consent was granted in 2013 for a Vodafone mast in rural Levin. This mast is 25 metres tall and has the capacity for co-location. The tower is located on a flat property in the Rural Zone that is used as a market garden. The submitters' concerns were regarding visual effects for the mast and health effects from radiation, including effects from consuming the crops grown on the property. The mast complied with the radiofrequency requirements of the NESTF and as such, the concerns regarding health could not be considered. No mitigation was offered to reduce the visual effects and the landscape architect advising the Council was of the view that there were no mitigation options that would effectively mitigate visual effects.

5.2.3 Matamata-Piako District Council

Matatmata-Piako District Council has not processed any contentious consents for telecommunications infrastructure in recent years. However, up to four consents have been processed for the erection of new cell phone towers within the last two years, only one of which was limited notified. This application was not contentious and did not proceed to a hearing. All of these towers were proposed on farmland with large separation distances between the nearest sensitive receptors and no concerns were raised by landowners or members of the general public. Council's main concerns with developments of this nature are the resulting visual effects. All four of these resource consent applications were accompanied by visual assessments which demonstrated that the impacts would be less than minor.

5.2.4 Tauranga City Council

Tauranga City Council highlighted one contentious resource consent for a monopole in the Commercial Zone. In 2010, the Council granted consent for a monopole with associated antennae in the Commercial Zone. Consent was required as the pole was located within 5m of a boundary adjacent to the Residential Zone with no landscape strip provided. Council issued this consent on a non-notified basis.

The surrounding residential properties became aware of the application at the time of construction. They raised concerns to Council with having this pole located close to their properties. Their concerns were the perceived health issues and the stigma of having that infrastructure in close proximity to their residential properties. Their concerns did not extend to landscaping or amenity effects, which are the matters Council's discretion was restricted to, and therefore Council could not give effect to their concerns.

5.2.5 Whangarei District Council

Whangarei District Council has highlighted a number of contentious consents for telecommunications infrastructure which have been granted in the last few years. These consents are summarised below.

In September 2011, consent was granted to Two Degrees Mobile Limited (Two Degrees) to establish a co-located telecommunications facility comprising three panel antennae with a shroud and one 300mm microwave dish attached to an existing telecommunications monopole at a height of 15.14m on a site at 159 Kiripaka Road, Tikipunga. Associated cabinets were also proposed. Restricted discretionary consent was required as the height of the telecommunications pole exceeded the permitted 15m height for the Business 3 Environment zone that it was situated in. The application was limited notified to two affected properties. One submitter opposed the application on grounds of the visual prominence of the aerial and concerns about the effect the aerial may have on their TV reception. Council, whilst recognising their point regarding visual prominence was valid, considered that overall the visual effects would be acceptable. The issue regarding TV reception did not fall within the scope of the matters to which Council had restricted its discretion and therefore could not be considered as a

relevant resource management matter. The second submitter was neutral to the proposed development, but noted there were recorded archaeological sites in the vicinity and requested the inclusion of a standard archaeological advice note if consent was granted.

Also in September 2011, a further consent was granted to Two Degrees for a similar development to establish a co-located telecommunications facility comprising three panel antennae with a shroud and one 300mm microwave dish attached to an existing Vodafone telecommunications monopole at a height of 18.4m on a site at 1 Tui Crescent. Again, Restricted discretionary consent was required as the height of the telecommunications pole exceeded the permitted 15m height for the Business 3 Environment zone that it was situated in. This application was also limited notified to 20 affected properties in accordance with the recommendations of the applicant's landscape architect. Only two submissions were received, both initially objecting to the proposed development, but which were later withdrawn following discussions with the applicant's agent. Their concerns related to potential health impacts resulting from radiofrequency.

A contentious consent was granted in September 2013 to install a telecommunications facility as part of the Rural Broadband Initiative. The site involved erection of a 25m high monopole with an attached lightening rod, supporting one antenna platform (at the height of 23m) with 12 panel antennas mounted on the platform, one 0.6m diameter dish antenna (at the height of 18m) and 18m^2 of associated cabinetry located at ground level, at Matapuri Road, Woolleys Bay within the Coastal Countryside zone. The wider margins of the site are also partially Flood Susceptible and partially lie within a Notable Landscape Area.

The application was limited notified to a number of parties who were identified as being potentially affected in the localised environment on landscape and visual grounds. Council received six submissions, one in support of the scheme and five in opposition requesting that the application be declined on the following grounds:

- Visual amenity from private properties will be destroyed;
- Concerns with impact on landscape character of a popular coastal area;
- Opposition to construction of a tower on a bare, exposed hilltop when there are many alternative hilltops which are not so exposed and many of which have vegetation to partially obscure the lower part of the tower;
- Opposition to the size of the tower at 25m with a crowns nest platform on top; and
- No alternative methods for broadband services were included in the application.

As a result of the above concerns, the applicant was proactive and made some amendments to their scheme with regards to landscape mitigation and also undertook negotiation with the landowner for an extension to their lease area to enable further planting to take place.

A further resource consent application has recently been lodged with Whangarei District Council by Vodafone for the development of a 25m high monopole. The pole will accommodate one working antenna platform at a height of 23m, twelve panel antennae to be attached to the platform, one 1.2m diameter dish antenna to be attached to the pole at a height of 18m, six equipment cabinet areas to be located near to the base of the mast and a stock fence surrounding the lease area. The development is proposed to be located in the Countryside Environment zone at 109 Hutchison Road, Pataua. The applicant has requested that the application be publically notified.

5.3 Summary

Our review of the proposed and operative plan changes relevant to telecommunications infrastructure for the five identified councils revealed that the key driver behind the majority of the proposed plan changes was a result of the need to ensure that their existing district plan was consistent with the requirements set out in the NESTF. All of the first generation plans for the five Councils had been made operative in advance of the

publication of the NESTF, therefore there were evident conflicts between the rules set out in the NESTF and the relevant telecommunications rules set out in the district plans.

There were two exceptions to this. Wellington City Council's Plan Change 14 was instigated by the nature of public opposition to overhead cables being a permitted activity in the Saturn Cable case. While the Horowhenua District Council's second generation plan changes were principally a result of plan change submissions from two telecommunications providers, along with a recognised need to address technological advancements since the first generation plan was developed i.e. telecommunications, cabinets, replacing copper wire with fibre-optic cables etc.

The plan changes that were reviewed varied in terms of their nature and scope. The following key points provide an overall summary of the nature of the plan changes:

- More focus has been given to the co-location of telecommunications infrastructure. Wellington City Council now considers the cumulative effects of co-location as a matter of discretion or assessment matter. Matamata-Piako District Council is proposing a new rule permitting the co-location of telecommunications lines on existing electricity infrastructure and a new rule allowing up to two antennas to be attached to any mast or building as a permitted activity. The Horowhenua District Council has included a permitted activity rule whereby masts in certain zones are allowed to be 5m higher if collocated.
- Generally greater attention has been given to directing telecommunications infrastructure to 'appropriate' locations to help manage the visual effects of such infrastructure. Wellington City Council altered its permitted activity conditions in Plan Change 74 to direct infrastructure to appropriate locations ie not in Open Space areas, on identified ridgelines/hilltops, on the seaward site of identified coastal roads next to coastal marine area or on land which is or has a listed heritage item. The Council also required masts to be setback a greater distance from residential areas, increasing this distance from 1m to 5m. Likewise, Tauranga City Council in its second generation plan, increased the setback distances of masts from any site boundary in a sensitive zone (i.e. residential), Outstanding Natural Feature, Important Amenity Landscape and Special Ecological Areas from 1m to 5m. This setback distance excluded the road reserve.
- Whilst some councils have placed more height restrictions for masts and antennae in particular zones, others have made the permitted activity rules for certain zones more lenient. Wellington City Council in its Plan Change 74 has placed more restrictions around provisions for masts and antennas in the Residential zone and Open Space Areas. Horowhenua District Council has, however, increased the maximum permitted height of masts in the Industrial zone and Commercial zone, outside of the Pedestrian Area overlay and also allows for greater height of co-located masts in the Commercial Zone in Pedestrian Area overlay and Rural zone.

Depending on the nature of the plan changes, the number and scope of submissions from both telecommunications providers and members of the general public also varied. These responses are summarised in Table 8.

Table 8 Summary of submissions received on plan changes

Council	From Telecommunications Providers	From the Public
Wellington City Council	• Setback distances from site boundaries are too onerous – should be 3m not 5m • Opposed to restrictions in Open Space Areas as sites in these zones are perceived by them as more suitable than sites in other zones	• Setback distances from boundaries are too generous – e.g. should be 100m
Horowhenua District Council	• Minor issues only	• No feedback/concerns from general public

Council	From Telecommunications Providers	From the Public
Matamata-Piako District Council	• Rules are too onerous for minor equipment installation • Maximum of two antennas is unduly restrictive and should be changed from 2 to 3 antennas, or more than 3 antennas, as a permitted activity whilst retaining the restrictions on area/diameter • Provision should be included relating to earthworks and vegetation trimming which allows for the exclusion of telecommunications infrastructure from earthworks and vegetation clearance rules • The location of minor equipment in the yard area should be a permitted activity; • No provisions for the consideration of network activities in flood hazard areas. Network activities should be provided for as permitted activities where Waikato Regional Council has given its authorisation • No provision is made for an increase in height of support structures. The relevant rule should be amended to allow for the replacement of support structures up to 1m higher, in all zones	• No feedback/concerns from general public
Tauranga City Council	• No issues raised	• Concerns regarding visual impact of infrastructure • Masts should not be located in residential areas or near education facilities • Public infrastructure in public areas should be controlled to minimise impacts on the reserve and consideration should be given to co-locating cell phone towers
Whangarei District Council	• Need to include restricted discretionary rules to control earthworks around poles, towers and within transmission corridors	• Development of new lines could occur without landowners being aware • Restrictions on land use in electricity transmission buffer zone would be too restrictive and onerous and would give Council the right to remove economic potential from land without compensation

For the consenting decisions reviewed for this report, there is a clear correlation in the concerns that were raised by the public across the various districts. These concerns predominantly related to:

- Impact on visual amenity;
- Impact on landscape character of rural/coastal area;
- Perceived effects on human health resulting from mast radiofrequency;
- Inappropriateness of proposed location for infrastructure i.e. on exposed hilltops, in coastal zone, and an absence of demonstrable consideration of alternative locations; and
- Lack of consultation with community regarding location of infrastructure.

In some instances the applications were limited notified or fully notified, but in others where they were non-notified or involved a certificate of compliance, the public were only able to raise concerns at the time when construction of the infrastructure commenced, which was when they first became aware of the development taking place in the vicinity of their property.

In some cases, the councils were not able to consider the concerns that were raised because they were either matters which did not fall within the scope of those matters which the Council had restricted its discretion; or where concerns regarded health impacts from radiofrequency, the radiofrequency levels were within the prescribed limits set out in the NESTF. In another case where concerns were raised regarding visual amenity and impact on landscape character, the applicant was proactive and amended its proposed planting scheme and negotiated with the relevant landowner to extend the lease area enabled planting to take place.

6. Conclusion

The Ministry of Business, Innovation and Employment is seeking to understand the general environmental effects, regulatory provisions and public concerns in relation to new telecommunication cables and mobile infrastructure, and their installation activities. This report provides an assessment of the general risk and anticipated effects of this infrastructure.

Regarding cables, environmental effects associated with underground cables predominantly occur during installation and are mainly in relation to the earthworks required. However there are very few effects once installed as long as appropriate earthworks management controls and re-instatement is carried out. Overhead wires have a more significant and permanent visual effect. In many areas, the extent of effect will be tolerable as it will be within levels anticipated by the community. However in higher amenity and residential areas or commutatively with electricity wires, the degree of effect will be more significant.

The proposed mobile network technology in the urban environment can be relatively tidy in design and location, and as such the visual effects are generally low. The rural masts are generally larger in scale and can be visually prominent and out of character with rural areas. Rural infrastructure is, however, likely to be sporadic, reducing the overall degree of effect. In sensitive environments, effect from infrastructure and its installation may be more significant. For example, infrastructure and associated access tracks in classified landscapes.

With the exception of infrastructure in sensitive environments, most of the infrastructure and activities proposed will have a low effect in isolation. However the cumulative effects of infrastructure and installation methods can be much higher.

How the relevant infrastructure and installation activities are regulated has been reviewed. This review was based on the rules in 76 District Plans around the country. A high level review of these plans identified that the rules and controls regulating these utilities primarily relate to the size and location of the structures. Earthworks and vegetation clearance (up to a specified scale) are generally permitted subject to controls that ensure that the earthworks are well managed and the ground and vegetation is reinstated.

It is recognised that particular environments can be more sensitive to environmental effects, and these environments are identified in plans as specified areas (via zones, overlays or precincts) or features. This includes the likes of hilltops and ridgelines, amenity landscapes, sites of cultural significance and heritage trees. In these areas, the plan rules can be more onerous.

We then reviewed five councils, looking at the proposed and operative plan changes relevant to telecommunications infrastructure to determine what changes have occurred to district plans, the reason for this change, and what concerns were raised by submitters. In this review it was found that the majority of the proposed plan changes were to address the requirements set out in the NESTF. All of the first generation plans for the five councils had been made operative in advance of the publication of the NESTF, therefore there were evident conflicts between the rules set out in the NESTF and the relevant telecommunications rules set out in the district plans.

The plan changes that were reviewed varied in terms of their nature and scope. The following key points provide an overall summary of the nature of the plan changes:

- A focus has been given to the co-location of telecommunications infrastructure.
- Greater attention has been given to directing telecommunications infrastructure to ‘appropriate’ locations to help manage the visual effects of such infrastructure.
- Changes have been made to the permitted height and size for masts and antenna in particular zones. In some cases these have become more onerous, in others they have become more lenient.

Concerns raised by the public were primarily in relation to the visual effects and not wanting utilities structures located close to sensitive areas, including residential properties. Industry operators were also concerned with

the location of infrastructure, and wanted to have less restrictions on where these structures can be located. For example, they wanted structures to be permitted closer to residential boundaries and permitted in Open Space areas.

Contentious utilities structures, which attained resource consent or certificates of compliance were identified by the five councils and that matters of public concern were summarised in this report. The public concerns were predominantly related to:

- Impact on visual amenity;
- Impact on landscape character of rural/coastal area;
- Perceived effects on human health resulting from mast radiofrequency;
- Inappropriateness of proposed location for infrastructure i.e. on exposed hilltops in coastal zone and an absence of demonstrable consideration of alternative locations; and
- Lack of consultation with community regarding location of infrastructure.

Overall, telecommunications infrastructure is a contentious issue, primarily due the visual effects associated with these utilities. Councils have worked towards managing these visual and other effects, while trying to cater for telecommunications infrastructure. The plan provisions have changed over time as technology changes, various public concerns are raised and new policy (such as the NESTF) is created. Issues raised by the public from the likes of contentious resource consents highlight that community has concerns about telecommunications infrastructure.

Appendix A. Operative District Plans Reviewed

North Island	South Island
Far North District	Nelson City
Kaipara District	Tasman District
Whangarei District	Marlborough District - Marlborough Sounds Plan
Auckland Council (Unitary) - Note: the Unitary Plan is not fully operative	Marlborough District - Wairau/Awatere Plan
North Shore	Kaikoura District
Waitakere	Hurunui District
Franklin	Christchurch City
Rodney	Selwyn District
Auckland City -Central	Waimakariri District
Auckland City - Hauraki Gulf	Ashburton District
Auckland City - Isthmus	Timaru District
Manukau	Mackenzie District
Papakura	Waimate District
Hamilton City	Buller District
Thames – Coromandel District	Grey District
Hauraki District	Westland District
Matamata-Piako District	Queenstown-Lakes District
Otorohanga District	Central Otago District
Waikato District	Waitaki District
Waipa District	Dunedin City
South Waikato District	Clutha District
Tauranga City	Gore District
Western Bay of Plenty District	Invercargill City
Opotiki District	Southland District
Whakatane District	Chatham Islands
Rotorua City	
Kawerau District	
Waitomo District	
Taupo District	
Ruapehu District	
Wairoa District	
New Plymouth City	
Stratford District	
South Taranaki District	
Gisborne District	
Napier City	
Hastings District	
Manawatu District	
Palmerston North City	
Wanganui District	
Rangitikei District	
Central Hawkes Bay District	
Tararua District	
Horowhenua District	
Kapiti Coast District	
Porirua City	
Wairarapa District (South Wairarapa, Masterton and Carterton)	
Upper Hutt City	
Hutt City (Lower Hutt)	
Wellington City	

Appendix B. Consent Requirements Table

Table showing when resource consent is required for various District Councils for mobile and broadband structures and instillation activities

	Structure / Activty																				
District Council	**Telecommunication Cables**	Above ground cables	New poles and overhead cables	Underground cables	Trenching	Micro-trenching	Drilling	Vegetation removal / trimming	Cabinets (road reserve)	**Mobile Networks (Urban)**	Cabinets	Antenna (on streetlights, rooftops, etc.)	Micro cells (on streetlights, bus stops, signs, bridges, etc.)	Urban slim line monopoles	**Mobile Networks (Rural)**	Cabinets	Rural mast and antenna (20m)	Rural mast and antenna (25m)	Rural mast and antenna (30m)	Earthworks	Access tracks earthworks	Vegetation clearance (installation site and access tracks)
North Island																						
Far North Disitrct																O	G	R	R	O	O	O
Kaiapara District																O	R	R	R	G	G	O
Whangarei District		G	G	G	G	G	G	G	O		O	O	O	R		O	R	R	R	O	G	G
Auckland Council (Unitary)		R	R	G	G	G	G	G	G		G	O	G	O		G	O	O	R	G	O	G
North Shore		R	R	G	G	G	G	G	O		O	O	G	R		G	R	R	R	G	O	G
Waitakere		R	R	G	O	G	G	O	O		O	R	O	R		O	R	R	R	O	O	O
Franklin		O	G	G	G	G	G	G	O		O	O	G	R		O	O	O	R	G	G	G
Rodney		G	G	G	G	G	G	G	G		G	R	G	O		G	O	O	R	G	G	G
Auckland City - Central		G	R	G	G	G	G	R	R		R	G	R	O		NA	N/A	N/A	NA	NA	NA	NA
Auckland City - Hauraki Gulf		G	O	G	O	O	O	O	O		O	O	O	R		O	R	R	R	O	O	O
Auckland City - Isthmus		R	R	G	G	G	G	O	O		R	O	O	O		NA	N/A	N/A	NA	NA	NA	NA
Manukau		O	O	G	G	G	G	G	O		O	O	G	R		O	R	R	R	O	O	G
Papakura		G	G	G	O	G	G	G	G		G	G	G	G		O	O	O	R	O	O	O
Hamilton City		G	O	G	G	G	G	G	G		G	O	G	G		G	O	O	R	G	O	O
Thames-Coromandel District																O	R	R	R	O	O	O
Hauraki District																R	G	R	R	G	O	G
Matamata-Piako District		R	R	G	O	O	O	O	O		O	G	G	R		O	G	R	R	O	O	O
Otorohanga District		G	O	G	O	G	G	G	O		O	O	G	R		O	G	R	R	O	O	G
Waikato District		O	O	G	G	G	G	G	O		O	R	G	R		O	G	R	R	O	O	G
Waipa District		G	G	G	O	G	G	G	G		G	O	O	O		G	G	O	R	O	O	G
South Waikato District		G	G	G	G	G	G	G	O		O	G	G	R		O	O	O	R	G	G	G
Tauranga City		R	R	G	G	G	G	G	O		O	G	G	R		O	O	R	R	G	O	G
Western Bay of Plenty District		G	G	G	O	O	O	G	O		O	O	G	R		O	O	R	R	O	O	G
Opotiki District		O	O	G	G	G	G	O	G		G	O	G	R		G	G	R	R	G	G	O
Whakatane District		G	G	G	G	G	G	G	G		G	O	O	O		G	O	R	R	O	O	G
Rotorua City		R	R	G	G	G	G	O	O		O	O	O	R		O	R	R	R	G	O	O
Kawerau District																O	O	O	R	G	G	G
Waitomo District																O	G	G	R	G	O	O
Taupo District		G	O	G	G	G	G	G	O		O	O	G	R		O	G	R	R	O	O	G
Ruapehu District																O	O	O	R	O	O	O

Some structures and installation activities, as outlined in the project description . For consistency, this table relates to the following;

Activity	**Scale**
Trenching	0.5m wide and 0.3m deep
Drilling	1m deep
Antenna	0.7m wide and 3m high
Micro Cells	0.7m high, 0.5m wide and.3m deep
Slimline Poles	13m high
Rural Masts	20m, 25m and 30m high

District Council	Telecommunication Cables	Above ground cables	New poles and overhead cables	Underground cables	Trenching	Micro-trenching	Drilling	Vegetation removal / trimming	Cabinets (road reserve)	Mobile Networks (Urban)	Cabinets	Antenna (on streetlights, rooftops, etc.)	Micro cells (on streetlights, bus stops, signs, bridges, etc.)	Urban slim line monopoles	Mobile Networks (Rural)	Cabinets	Rural mast and antenna (20m)	Rural mast and antenna (25m)	Rural mast and antenna (30m)	Earthworks	Access tracks earthworks	Vegetation clearance (installation site and access tracks)
Wairoa District																G	R	R	R	O	O	O
New Plymouth City		G	G	G	O	O	O	O	G		G	O	G	R		G	R	R	R	O	O	O
Stratford District																O	G	R	R	G	G	O
South Taranaki District		R	R	G	G	G	G	G	O		O	O	O	R		O	R	R	R	O	O	G
Gisborne District		G	G	G	G	G	G	G	G		O	G	G	G		O	G	R	R	G	O	G
Napier City		O	O	O	G	G	G	G	G		G	O	G	R		G	O	O	R	G	O	G
Hastings District		R	R	O	O	O	O	O	O		O	G	G	G		G	G	G	R	G	G	O
Manawatu District		G	G	G	G	G	G	G	G		G	G	G	R		G	G	R	R	G	G	G
Palmerston North City		R	R	G	G	G	G	G	G		G	G	G	R		G	R	R	R	G	O	G
Wanganui District		R	R	G	O	O	O	G	O		O	G	G	R		O	O	R	R	G	O	G
Rangitikei District																O	O	O	R	G	G	G
Central Hawkes Bay District																O	G	G	R	G	O	G
Tararua District																G	G	R	R	O	G	O
Horowhenua District		R	R	G	G	G	G	O	O		O	O	G	G		G	G	R	R	G	O	O
Kapiti Coast District		O	O	G	O	O	O	O	R		R	O	G	R		R	R	R	R	O	O	O
Porirua City		R	R	G	O	O	O	O	G		G	G	G	G		G	R	R	R	O	O	O
Wairarapa District (South Wairarapa, Masterton and Carterton)		G	G	G	O	O	O	O	O		O	O	G	R		O	G	O	R	O	O	O
Upper Hutt City		R	O	G	G	G	G	G	O		O	G	G	G		O	R	R	R	O	G	G
Hutt City (Lower Hutt)		R	R	G	G	G	G	G	O		O	O	O	R		O	R	R	R	O	G	G
Wellington City		O	O	G	G	G	G	G	O		O	O	O	G		O	O	O	R	O	G	G
South Island																						
Nelson City		G	G	G	G	G	G	O	O		O	O	G	R		G	G	G	R	O	O	O
Tasman District		O	O	G	G	G	G	G	G		G	R	G	R		G	O	O	R	G	O	G
Marlborough District - Marlborough Sounds Plan		G	O	G	O	G	G	O	O		O	G	G	G		O	G	G	R	G	G	O
Marlborough District - Wairau /Awatere Plan		G	G	G	G	G	G	O	O		O	G	G	G		O	G	G	R	G	G	O
Kaikoura District																O	G	G	R	G	G	O
Hurunui District																O	O	O	O	O	O	O
Christchurch City		R	O	G	G	G	G	G	O		O	G	G	R		O	O	R	R	G	O	R
Selwyn District		R	R	G	O	O	O	G	G		G	O	G	G		G	O	R	R	O	O	G
Waimakariri District		G	G	G	G	G	G	G	G		G	G	G	G		G	O	O	R	G	O	G

District Council	Telecommunication Cables	Above ground cables	New poles and overhead cables	Underground cables	Trenching	Micro-trenching	Drilling	Vegetation removal / trimming	Cabinets (road reserve)	Mobile Networks (Urban)	Cabinets	Antenna (on streetlights, rooftops, etc.)	Micro cells (on streetlights, bus stops, signs, bridges, etc.)	Urban slim line monopoles	Mobile Networks (Rural)	Cabinets	Rural mast and antenna (20m)	Rural mast and antenna (25m)	Rural mast and antenna (30m)	Earthworks	Access tracks earthworks	Vegetation clearance (installation site and access tracks)
Ashburton District		O	R	G	O	O	O	G	O		O	R	G	G		O	O	O	R	O	O	G
Timaru District		R	R	G	O	O	O	G	O		O	O	O	O		O	O	O	O	O	O	G
Mackenzie District																O	O	R	R	O	O	O
Waimate District																O	G	G	R	O	O	O
Buller District																G	G	R	R	G	G	O
Grey District		G	G	G	G	G	G	G	O		O	G	G	G		O	G	G	G	G	G	G
Westland District		O	O	G	G	G	G	G	O		O	G	G	G		O	G	G	R	G	G	G
Queenstown-Lakes District		G	G	G	G	G	G	G	G		G	O	G	R		O	R	R	R	O	O	G
Central Otago District																O	O	R	R	G	G	G
Waitaki District		G	R	G	G	G	G	G	G		G	O	G	R		R	O	O	R	O	O	G
Dunedin City		G	R	G	O	O	G	G	R		R	O	G	O		R	R	R	R	O	O	R
Clutha District																O	O	O	R	G	O	G
Gore District																O	O	O	O	G	G	O
Invercargill City		O	O	G	O	O	O	G	O		O	O	O	O		O	O	O	R	O	O	G
Southland District		G	G	G	O	O	O	G	O		O	G	G	R		O	G	R	R	O	O	G
Chatham Islands																G	R	R	R	G	G	O
Total Councils		54	54	54	54	54	54	54	54		54	54	54	54		73	73	73	73	73	73	73
Total: "R"s		18	20	0	0	0	0	1	3		4	5	1	30		4	19	41	69	0	0	2
Total: "O"s		11	16	2	20	15	14	15	33		33	30	12	9		47	28	22	3	37	49	31
Total: "G"s		25	18	52	34	39	40	38	18		17	19	41	15		22	26	10	1	36	24	40

Key		
G		Green light - permitted
O		Orange light - permitted subject to controls/conditions
R		Red light - consent required

Appendix C. Proposed Plan Changes

The following table summarises plan changes and policies that were identified during the regulatory review as potentially relevant to telecommunications technologies. This relates to active plan changes, not ones that have been undertaken in the past and are now operative.

Table 9: Proposed plan changes as at April 2014

District	Plan Change/Policy Potentially Relevant to telecommunications cables and mobile infrastructure
Far North District	PC15 – Rural Provisions (Hearing held in February).
Kaipara District	DP made operative November 2013. No relevant changes identified.
Whangarei District	No relevant changes identified.
Auckland Council (Unitary)	Proposed Auckland Unitary Plan released in 2013, some rules have legal effect (including those related to water, air, soil, significant indigenous vegetation and heritage).
Hamilton City	Proposed plan was reviewed in Section 4 and a decision is due soon.
Thames-Coromandel District	Proposed DP has been notified and submissions received. Includes utilities and biodiversity chapters of relevance.
Hauraki District	Proposed DP is currently going through the final stages of appeals.
Matamata-Piako District	Proposed Plan Change 44 – Works and Network Utilities was recently notified.
Otorohanga District	DP review is complete. However, a minor variation is required to increase the height of the poles allowed from 7m as this is too low.
Waikato District	No relevant plan changes – plan was made operative in 2013.
Waipa District	No relevant plan changes/policies.
South Waikato District	Proposed plan is at an advanced stage and was reviewed in Section 4.
Tauranga City	No relevant changes identified.
Western Bay of Plenty District	No relevant changes identified.
Opotiki District	No relevant changes identified.
Whakatane District	Proposed district plan is going through hearings commencing April 2014. Contains a revised set of telecommunications rules in Chapter 20.

Rotorua City	Proposed DP has been notified, hearings are currently being held.
Kawerau District	No relevant changes identified.
Waitomo District	No relevant changes identified.
Taupo District	No relevant changes identified.
Ruapehu District	Proposed DP is largely operative with two sections under appeal. No relevant changes identified.
Wairoa District	No relevant changes identified.
New Plymouth District	No relevant changes identified.
Stratford District	DP was made operative in 2014. No relevant changes identified.
South Taranaki District	DP under review, aiming to notify end of 2014. Telecommunications will be reviewed as it is recognised that the section is currently too restrictive.
Gisborne District	No relevant changes identified.
Napier City	Proposed plan change notified and due for hearing includes rules to align with NESTF and with Hastings.
Hastings District	Proposed plan change notified and due for hearing mid 2014 includes rules to align with NESTF and with Napier.
Manawatu District	DP currently undertaking a sectional review of the plan. A number of sections have been notified and review continues in others. Earthworks and tree protection rules are to be strengthened and will form part of the next stage of review.
Palmerston North City	Rolling DP review is being carried out. At some point this will include a review of the utilities section, however, the timing of this has not been confirmed.
Wanganui District	Proposed Plan Change 31 – Protected Trees (decision making in process). Upcoming reviews of Rural, Hazards and Archaeology.
Rangitikei District	DP made operative in October 2013. No relevant changes identified.
Central Hawkes Bay District	Reviews of rural, coastal and urban sections currently underway.
Tararua District	No relevant changes identified.
Horowhenua District	No relevant changes identified.
Kapiti Coast District	A full review of the KCDC Plan has been notified, however concerns about the plan have resulted in an independent review of the proposed plan which is currently being carried out.
Porirua City	Plan Change 16 – Network Utilities – Notified and submissions received.

Wairarapa District (South Wairarapa, Masterton and Carterton)	No relevant changes identified.
Upper Hutt City	No relevant changes identified.
Hutt City	No relevant changes identified.
Wellington City	No relevant changes identified.
Nelson City	No relevant changes identified.
Tasman District	No relevant changes identified.
Marlborough District	Plan being developed to combine both Marlborough Plans, to be notified at the end of the year.
Kaikoura District	No relevant changes identified.
Hurunui District	DP review currently underway
Christchurch City	No relevant changes identified.
Selwyn District	No relevant policies/plan changes
Waimakariri District	Rolling review of DP due in 2015, telecommunications is likely to form an early part of this review.
Ashburton District	No relevant changes identified.
Timaru District	DP review currently in early stages.
Mackenzie District	No relevant changes identified.
Waimate District	No relevant changes identified.
Buller District	No relevant changes identified.
Grey District	No relevant changes identified.
Westland District	A review of the utilities section is underway, but is at an early stage – has not been notified and consultation with industry has not begun.
Queenstown-Lakes District	No relevant changes identified.
Central Otago District	No relevant changes identified.

Waitaki District	Full DP review is planned for late 2014.
Dunedin City	Complete second generation review is underway, not yet notified.
Clutha District	No relevant changes identified.
Gore District	A number of proposed plan changes, including to the Utilities section (PC17).
Invercargill City	Proposed DP was notified in 2013 and a hearing is due mid-2014.
Southland District	Proposed DP was notified in 2012, hearings to commence March 2014.
Chatham Islands	No relevant changes identified.

Appendix D. Review of Proposed and Operative Plan Changes

The following sections provide further details of our review of the proposed and operative plan changes of relevance to telecommunications infrastructure for the following councils:

- Wellington City Council;
- Horowhenua District Council;
- Matamata-Piako District Council;
- Tauranga City Council; and
- Whangarei District Council.

Wellington City Council Plan Changes

Wellington City Council has made operative two plan changes of relevance to telecommunications infrastructure including:

- Plan Change 14, 2002, which relates to overhead cables; and
- Plan Change 74, 2010, which relates to all telecommunications infrastructure.

These plan changes are summarised below.

Plan Change 14

Plan Change 14 was initiated due to strong public opposition to overhead cables, which was highlighted in the Saturn cable case. Plan Change 14 was solely on cables and resulted in changes to the District Plan to require cables to be underground. Resultantly, all new overhead cables then required resource consent. There were few submissions on this plan change; which was presumed to be because the plan change was undertaken to address the public concern.

Plan Change 74

Plan Change 74 was a revision of the utility provision in the District Plan and was notified in 2010. The fundamental changes were to align the provision with the NESTF and to change the provisions around the siting and size of masts and antenna, particularly where they are located in the Residential and Open Space Areas and areas of special values such as the coastline. The scope of this plan change was limited to issues relating to telecommunications structures, and not to other utilities.

The key changes include:

- Under the first generation plan, the construction, alteration and addition to above ground utilities structures was permitted subject to controls. This permitted activity rule remained, however the plan change excluded Open Space B and C Areas and Conservations Sites from this rule. Open Space Area are public parks and recreation spaces within Wellington.
- Permitted activity conditions were added so that no above ground utility structure would be located on an identified ridgeline or hilltop, or on the seaward side of identified coastal roads next to the coastal marine area.
- Permitted activity conditions were added so that no above ground utility structure can be is located on land where the site is, or contains, a listed heritage item. In respect of listed heritage areas, no utility structure can be located on a site with a heritage area or any area of legal road within that heritage area.
- A permitted activity condition was changed in the Residential zoned areas and Open Space A zoned areas, making provisions for masts and antennas in these areas more restrictive. In the Open Space A area, this includes a condition that no mast shall be located within 5m from a boundary in the Residential Area.

- Permitted mast height in the Residential and Open Space A areas changed from 20m to 15m.
- A permitted activity condition was added to allow the replacement of an existing pole in the Open Space A with a mast/antenna that is no more than 3m above existing pole height.
- The permitted distance of masts and antenna from residential boundaries increased from 1m to 5m.
- A matter of discretion for antenna and masts requiring consent as a restricted discretionary activity was added so that the cumulative effects associated with co-siting and co-location can be considered. Additionally, assessment matters were added to consider co-location of utilities and existing masts and micro antenna on existing structures as a mitigation method to visual effects. This was aimed at removing disincentives to co-location on existing masts.

These plan changes were established to protect harbour values, ridgelines and hilltops, heritage values and the coastal environment. It also allowed Council to have greater control over masts in the Residential and Open Space A areas, to protect amenity values.

Fourteen submissions were received on Plan Change 74. Overall, the provisions were supported. A key point of opposition to the plan change related to the distance of antenna from boundaries. An industry provider wished for the requirement to be 3m to allow for more flexibility in options, whereas a member of the public sought that the distance be at least 100m to reduce (perceived) risk to human health. An industry provider opposed to the new restrictions to the Open Space A areas, as this was seen as a reasonable location for such infrastructure with less effects than other sites. Other submissions were primarily in regard to amateur radio infrastructure, which is not directly relevant to the telecommunications infrastructure covered in this report.

Horowhenua District Council Plan Changes

The Horowhenua District Council notified its second generation District Plan in 2013. The utilities provisions were amended from the previous plan (1999).

Plan Change

The changes to the plan were in relation to the size and height of masts and antenna. Rule 22.1.8(a), which related to the maximum height of masts, pylons, towers, aerials and other utilities structures was altered as follows:

- The maximum permitted height of these structures changed from 20m to 25m in the Industrial Zone and 13.5 to 15m in the Commercial Zone, outside of the Pedestrian Area overlay in Levin (where the permitted height is up to 20 metres).
- The dimensions of antennas and aerials that can exceed this height have been modified slightly. The 1999 Plan stated in the definition of height that antennas and aerials are excluded from the height requirement, provided that they do not project more than 2m in a horizontal plane or more than 1.5m above the maximum permitted height of the building. The 2013 plan added to the rules to state that the maximum height of the structure can be exceeded by antennas and aerials where they do not exceed 1m2 in area on any one site or, 2 metres above the building or structure to which it is attached or, 600mm in diameter.
- A permitted activity rule has been added whereby the maximum permitted height of a mast is increased by a further five metres (to 25m) in the Commercial Zone in the Pedestrian Area Overlay in Levin and the Rural Zone, where antennas from more than one network utility are co-located on the same mast.

The changes to Rule 22.1.8(a) that resulted in the change of permitted height and the inclusion of antenna in the rule framework (as opposed to definitions) outlined above, appear to be a response to the submissions from Telecom NZ Limited (submission 78) and Chorus NZ Limited (submission 79) as these companies directly requested the extra five metres permitted height for masts with co-located antenna, and requested the height increase in industrial and commercial zones.

The section 32 report for the plan change states that changes to the utilities provisions were to address technological advancements since the development of the first generation plan in the 1990's. This primarily relates to telecommunication masts, cabinets and replacing copper wire with fibre-optic cables. The changes to provisions were to:

- Reflect the NESTF as it relates to infrastructure in the road reserve; and
- To manage provision for necessary infrastructure on private land and balance with the amenity expectations throughout the different zones.

Overall, the utilities provisions remain largely unchanged as a result of this plan change. For example, both the 1999 and 2013 plans required telecommunication cables to be underground. As a result, there were minimal issues raised from the discussion documents (there were two consultation documents produced prior to the plan change being finalised and notified) or from submissions on the plan change. There was no feedback or concerns raised from the general public.

Matamata-Piako District Council Plan Changes

Matamata-Piako District Council has commenced a rolling review of its first generation District Plan and in October 2013 notified the proposed 'Plan Change 44 – Works and Network Utilities'.

Proposed Plan Change 44 – Works and Network Utilities

The proposed changes to the telecommunications rules set out in Proposed Plan Change 44 have resulted from the recognised need by the Council to resolve any potential conflicts between the existing District Plan rules and the Resource Management (National Environmental Standards for Telecommunications Facilities) Regulations 2008, the latter which came into force after the existing District Plan became operative in 2005.

All previous utilities rules are proposed to be deleted and a new set of rules implemented. In summary, the following changes have been proposed to utilities rules relevant to telecommunications infrastructure:

- The co-location of telecommunications lines onto existing electricity infrastructure is now proposed to be a permitted activity in all zones. Currently there are no rules that specifically refer to 'co-location' and the addition of overhead telecommunications lines to existing infrastructure is a permitted activity only in the rural zone;
- The extension, addition and upgrading of overhead telecommunication lines and associated utility structures where the existing line network is above ground, there is an increase in the number of utility structures that support the overhead lines, and/or there is an increase in the height of the utility structures that support the overhead lines, is proposed to be a Permitted activity in the rural zones and a Discretionary activity in all other zones apart from the road reserve. In the road reserve these activities will have the same activity status as applies to the adjacent zone. Currently, new overhead telecommunications lines and the extension in length of overhead lines is a permitted activity only in the Rural Zone and is either a controlled or discretionary activity in other zones;
- The installation of new overhead telecommunications lines and the extension in length of existing overhead lines where the existing line network is underground, is proposed to be a Permitted activity in the Rural Zone and a Discretionary activity in all other zones apart from the road reserve. In the road reserve these activities will have the same activity status as applies to the adjacent zone. Currently there is no corresponding rules for this activity;
- Insertion of a new rule which specifies that a maximum of two antennas attached to any building or structure where the face of each antenna does not exceed 1.2m², or 1.2m in diameter for dish antennas is a permitted activity in all zones apart from the road reserve. Currently there are no specific provisions around the number of antennas that can be attached to a building. There is, however, an existing rule which specifies that antenna not exceed 5m in diameter and attached to a telecommunications mast is a Permitted activity in the Business, Industrial and Rural zones and a Discretionary activity in all other zones;
- Insertion of a new rule which specifies that more than two antennas attached to any building or structure where the face of each antenna does not exceed 1.2m², or 1.2m in diameter for dish antennas (excludes private television antennas and satellite dishes), is a Permitted activity in the Business, Industrial and Rural zones and a Discretionary activity in all other zones. Currently, the District Plan specifies that one telecommunications aerial not exceeding 1200mm in height mounted to comply with Section 3 of the District Plan and one satellite receiving dish up to 120mm diameter mounted to comply with Section 3 is a Permitted activity in all zones. The District Plan also allows antenna not exceeding 5m in diameter to be

attached to telecommunications mast as a permitted activity in the Business, Industrial and Rural zones and discretionary activities in all other zones:

- Insertion of a new rule which specifies that radio and telecommunication masts with a maximum diameter of 1.5m (currently 1.35m) and a maximum height of 25m metres and associated antennas and dishes fitting within a cylindrical shape not exceeding:
  - 5m in diameter when measured along the centreline of the mast;
  - A vertical dimension not exceeding a height of 25m above ground level (currently 26m);
  - Weather radar;
  - Guy wires;
  - Lightning rods;
  - Wooden or steel support poles; and
  - Small buildings/ cabinets not exceeding 10m² of gross floor area (currently 30m^2)

  are permitted activities in the Business, Industrial and Rural zones and discretionary activities in all other zones.

Currently, the District Plan specifies the following activities which have the same activity status in the various zones as the proposed rules:

- a maximum height for the mast alone of 20m
- total vertical height of the mast and associated equipment not exceeding 26m
- maximum diameter of the mast is 1350mm
- small buildings are not allowed to exceed a gross floor area of 30m^2 (does not specify cabinets).

Radio and telecommunication ancillary equipment shelters up to 3m in height and 4m^2 gross floor area is also currently a permitted activity in all zones apart from the Kaitiaki (Conservation) and Identified Significant Features zones where it is a discretionary activity.

Summary of Submissions Relating to Proposed Plan Change 44

Submissions specifically relating to the proposed telecommunications rules were only received from telecommunications providers and none from landowners or other members of the general public. The submissions received from both Telecom NZ Limited and Chorus NZ Limited raised similar concerns with the proposed plan change and can be summarised as follows:

- Proposed Rule 8.1.1.11 will capture all minor equipment installation and is overly onerous. Amend to be permitted in all zones with the exception of the road reserve which is not applicable;
- Proposed Rules 8.1.1.13.1 and 8.1.1.13.2 – the maximum of two antennas is unduly restrictive and should be changed from 2 to 3 antennas, or more than 3 antennas, as a permitted activity whilst retaining the restrictions on area/diameter;
- A new provision should be included in Section 8.1.1 relating to earthworks and vegetation trimming which allows for the exclusion of telecommunications infrastructure from earthworks and vegetation clearance rules;
- Performance Standard 8.1.2 should be amended to allow for the location of minor equipment in the yard area;
- Rule 3.8 does not provide for the consideration of network activities in flood hazard areas. Network activities should be provided for as permitted activities where Waikato Regional Council has given its authorisation; and
- Rules 8.1.1.4 and 8.1.1.7 – no provision is made for an increase in height of support structures. Rule 8.1.1.4 should be amended to allow for the replacement of support structures up to 1m higher, in all zones.

Tauranga City Council Plan Changes

Tauranga City Council notified its second generation plan in 2009. This second generation plan included changes to the utilities provisions.

The changes to the telecommunications utilities provisions were predominantly to align the plan with the requirements of the NESTF. There were no other changes to cables, which were already required to be underground.

There were also no changes to the height and dimension requirements of masts and antennas. The setback requirements for telecommunication masts from any site boundary of any sensitive zone, Outstanding Natural Landscape of Feature, Important Amenity Landscape and Special Ecological Areas increased, however, from 1m to 5m. This increase excluded activities in the road zone that are provided for by other legislation and where the site adjoins the residential zone. This change resulted from the outcomes of public consultation whereby the community identified that telecommunications towers should not be located in residential areas or near educational facilities. They raised concerns on the visual impacts of this infrastructure.

During consultation, the community also raised comments that public infrastructure in public areas should be controlled to minimise impacts on the reserve, and consideration should be given to co-locating cell phone towers.

Whangarei District Council Plan Changes

Whangarei District Council (WDC) is in the process of undertaking a rolling review of its first generation District Plan. In December 2013, Plan Change 123A: Network Utilities – Electricity Transmission became operative. Although not directly relevant to telecommunications infrastructure, understanding the issues raised during the consultation process specifically regarding changes to rules for the installation of overhead electricity lines can assist with pre-empting the nature of any future consultation responses to proposed changes to rules relating to overhead telecommunications lines.

WDC has undertaken a review of its District Plan rules for the rural (including coastal) zone, which includes provisions relating to telecommunications infrastructure. This proposed plan change is due to go out for pre-consultation in the next 2 to 3 months and so details of the proposed changes to telecommunications rules are not yet in the public domain.

It is understood that as a result of the consultation responses received on ‘Plan Change 123A’ and the nature of the issues raised, WDC has now changed its approach to undertaking a review of the District Plan. From the original plan of undertaking a review of the district-wide rules on a topic by topic basis, WDC is now proposing to undertake more holistic reviews on a geographical area basis, focussing on reviewing rules in areas of the district where the most change is expected to occur over the next ten years. Therefore, telecommunications rules will be reviewed on an area by area basis and proposed rule changes may vary across each area.

It should also be noted that there are added complexities which may influence rules for telecommunications infrastructure relating to overlays. WDC is currently preparing proposed ‘Plan Change 100: Sites of Significance to Maori’ which is likely to include for provisions around telecommunications infrastructure which may affect a Site of Significance of Maori. This proposed plan change is being advanced on a hapu basis and it is understood that the nature of resource management intervention therefore may be different within each zone.

Northland Regional Council is also in the process of developing a new Regional Policy Statement (RPS) to replace the existing RPS which became operative in July 2002. The proposed RPS includes a number of new provisions relating to natural character areas and outstanding landscape and features which will have an impact on potential future changes to district plan rules relating to telecommunications infrastructure. Some of the provisions of the proposed RPS are currently under appeal by WDC although none which are relevant to telecommunications infrastructure.

Plan Change 123A: Network Utilities – Electricity Transmission

This Plan Change was proposed as a result of recognition that the Operative District Plan lacked consistency with the National Policy Statement on Electricity Transmission and the National Environmental Standards for Electricity Transmission and as such, this needed to be remedied.

Regarding the implementation of overhead electricity lines, some of the key plan changes involved:

- The creation of a district wide network utilities chapter to be located within the Services section of the District Plan;
- Insertion of new rules that control the development of land within existing transmission corridors and the designation of Electricity Transmission No-build Areas and Assessment Areas; and
- Provisions relating specifically to the elements of Electricity Infrastructure
    - Cross referencing of National Environmental Standards for Electricity Transmission Activities Regulations 2009.
    - Rules that control the development of buildings and subdivision of land within Transmission Corridors of the National Grid (consequential deletion of Operative District Plan rules titled 'Electricity Transmission Lines').
    - Rules that manage operation and maintenance of electricity infrastructure (consequential deletion of references to electricity in the Network Utility provisions of the Operative District Plan).

A number of concerns were raised during the consultation process relating specifically to the regulation of installing electricity transmission lines. Key concerns from landowners included:

- The development of new lines could occur without landowners being aware and consequential restrictions could be placed on landowners in terms of use and development of their land. It was suggested that all lines should be required to go through a resource consent or designation process;
- The proposed extension of the Electricity Transmission Line Buffer zone would lead to restrictions to land use being too onerous, unfair and inequitable. This was particularly relevant to areas where the infrastructure is existing and landowners had been living and undertaking land use activities beneath and near to that infrastructure for a period of time. As a result of the proposed plan change, there were concerns that these undertaking activities would be restricted even if no new infrastructure was proposed in that area;
- Preventing opportunities for landowners to negotiate with developers would place restrictions on land use that are too onerous, unfair and inequitable;
- Changes to existing line areas would limit the use of existing horticultural land, place considerable uncertainty around land use and grant Council the right to remove economic potential from the land without compensation;
- Concerns with the assessment area being so wide and the associated restrictions that would therefore be placed on building under the transmission lines along with the environmental eyesore and detraction from land values as a result of installing these lines.

Key relevant concerns from providers included:

- Insufficient provisions in the rules to manage the effects of land use activities and subdivision on all critical electricity lines. Provisions should be inserted to manage effects of land use activities and subdivision on all critical electricity lines;
- Need to amend the electricity policies and objectives to incorporate additional concepts around security of supply, management of sensitive activities, recognition of existing under build situations, the management of subdivision and land use activities in close proximity to infrastructure can address health, safety, nuisance and amenity effects, the need to protect access, recognition that some activities are more appropriate under lines than others and opportunities to facilitate good amenity and urban design outcomes; and

- Need to include restricted discretionary rules to control earthworks, including standards around poles, towers and within transmission buffers as earthworks can result in the raising or lowering of ground levels, thus reducing vertical safety clearance distance between transmission lines and the ground. Uncontrolled earthworks can also undermine or destabilise support structure, which can create safety hazards.