Proposed National Environmental Standards for Telecommunications Facilities

Discussion Document

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Executive Summary

In this document the Ministry for the Environment proposes for consultation new national environmental standards for radio-frequency fields and low-impact telecommunications facilities in the road reserve.¹

A national environmental standard is a legally enforceable regulation. The exact wording of any standards will be legally drafted after government decision following this consultation. In essence, the proposed standards will say that:

- an activity (such as a mobile phone transmitter) that emits radio-frequency fields will be a permitted activity provided it complies with the existing New Zealand Standard²
- the installation of telecommunications equipment cabinets alongside roads or in the road reserve will be a permitted activity, subject to specified limitations on their size and location
- noise emitting from telecommunications equipment cabinets located alongside roads or in the road reserve will be a permitted activity, subject to specified noise limits
- the installation of masts and antennas alongside roads or in the road reserve will be a permitted activity, subject to specified limitations to height and size.

This discussion document provides more detail on the proposed standards to help people prepare formal submissions. Any person can make a submission on the proposed standards. Submissions must be received by the Ministry for the Environment no later than **5.00 pm on 10 August 2007**. Further details on making a submission are included in section 6.

¹ Please see the Glossary for definitions of 'road reserve' and other technical terms.

² NZS2772.1: 1999. *Radio-frequency Fields Part 1: Maximum Exposure Levels 3 kHz – 300 GHz.*

1 Introduction

1.1 Background

In September 2004 the Government approved a comprehensive package of measures designed to improve the working of the Resource Management Act 1991 (RMA). Part of this review led to the decision to explore greater use of national policy statements and national environmental standards to help local government decide how competing national benefits and local costs should be balanced.

In June 2005 the Ministry of Economic Development completed a stocktake and analysis of regional and district plans and policy statements prepared under the RMA. The aim of the study was to determine the extent to which existing planning documents consider the national benefits of network infrastructure. The study found that such benefits are not always provided for, and that national environmental standards have the potential to improve planning consistency.

The following month, the Government approved an industry-led approach to scoping national environmental standards for telecommunications. A Telecommunications Industry Reference Group was convened, with representatives from Telecom, Vodafone and TelstraClear, Local Government New Zealand, and the Ministry for the Environment, Ministry of Health and Ministry of Economic Development. After considering several options for national instruments, the reference group proposed four national environmental standards for radio-frequency fields and low-impact telecommunications facilities.

These proposals were submitted to the Ministry for the Environment, which is now leading the process for developing the proposed standards for telecommunications facilities. This discussion document contains the Ministry for the Environment's perspective on the industry proposals.

Before preparing this discussion document, the Ministry for the Environment undertook a review of all district plans. The aim was to examine how district plans currently provide for radio-frequency fields and the telecommunications facilities identified by the Industry Reference Group as being suitable for national environmental standards. The review found that:

- provisions for telecommunications facilities in existing district plans are inconsistent across the country
- many district plans do not have clear provisions relating to infrastructure within the road reserve
- some district plans do not contain any rules for radio-frequency fields or rely on out-ofdate standards.

The Ministry for the Environment also completed an initial economic appraisal of the proposed standards to provide an indication of the costs and benefits of implementing the standards. The results of this appraisal are summarised in section 4.

What are national environmental standards?

National environmental standards are regulations made under **sections 43 and 44** of the Resource Management Act 1991. Standards can be numerical limits, narrative statements or methodologies that are in a legally enforceable form. These may include (but are not limited to) standards relating to:

- land-use
- noise
- contaminants
- water quality, level or flow
- air quality
- soil quality in relation to the discharge of contaminants
- prescribing the methods of implementing such standards.

A national environmental standard may allow an activity. If an activity has significant adverse effects on the environment, a national environmental standard must not state that the activity is a permitted activity.

What are low-impact telecommunications facilities?

For the purpose of these standards, 'low-impact telecommunications facilities' refers to small-scale equipment, routinely deployed in the road reserve, of a size that is considered to have minimal adverse effects on the road or adjoining properties.

Further definitions are provided in the Glossary of this document.

1.2 Purpose of this document

This discussion document has been prepared to:

- help you understand the proposal and its potential costs and benefits
- help you prepare questions and feedback for the consultation workshops (see section 6)
- guide you in making a submission.

To help you put together a submission, questions are posed on various aspects of the proposed standard that we specifically want you to consider, but you are welcome to provide feedback on any aspect of the standard that has not been covered by a specific question.

1.3 The process for developing national environmental standards

An outline of the process for developing a standard, including the informal and formal submission process, is shown in Figure 1.

Following Cabinet approval, the Telecommunications Industry Reference Group scoped the proposed standards. The Ministry for the Environment received the industry proposals in June 2006 and has analysed them to prepare this discussion document. Cabinet approval to initiate public consultation was received in December 2006. We are now in the formal public submission period, as indicated in Figure 1.



Figure 1: Developing a national environmental standard

The public consultation period is your opportunity to make a formal submission on the standards. An eight-week submission period is provided to enable people to have formal submissions approved by committees or boards, if required.³ Details on how to make a submission are included in section 6. A summary of submissions will be published by the Ministry after the closing date.

1.4 When should a national environmental standard be developed?

The great majority of decisions made under the RMA are made at a local level (which is entirely appropriate), and deal with environmental effects (both positive and negative) that are experienced locally. However, local decision-making may not give appropriate weight to effects experienced more widely.

National environmental standards are instruments that can apply nationally in circumstances where it is considered that national positive or negative environmental effects are not being fully addressed by local decision-makers. National environmental standards can capture those wider benefits that may not be fully internalised in decision-making at a regional or local level. Such benefits include providing consistency of controls across the country, providing more certainty, and simplifying the process of policy formulation, monitoring and review. It is more likely that decisions about significant investments – particularly those that occur across several local authority boundaries – will be made when there is the certainty provided by national regulation at a national level.

Network infrastructure such as telecommunications is considered to be appropriate for considering the application of national environmental standards. A characteristic of network infrastructure is that the benefits conferred by the network are more widely dispersed than the costs. By capturing the wider benefits, the full implications of infrastructure development proposals for promoting sustainable management can be taken into account.

The case for developing national environmental standards for telecommunications infrastructure is made in the following section.

³ Note that developing a national environmental standard differs from other processes under the RMA (such as preparing statutory plans or processing resource consents) in that there are no hearings or appeal provisions.

2 Why Do We Need National Environmental Standards for Telecommunications?

2.1 Infrastructure and economic transformation

Effective infrastructure, such as telecommunications, is crucial to New Zealand's productive capacity and growth. Shortages in supply or volatility in prices have major economic and social effects, which can be exacerbated by our challenging geography and widely dispersed population.

In May 2005 the Government released the Digital Strategy (New Zealand Government, 2005), which sets out the Government's aspirations and priorities for ensuring all New Zealanders get the benefits of telecommunications. Through the Digital Strategy, the Government has recognised not only the direct benefits of better access to modern telecommunications, but also broader indirect environmental benefits that will assist sustainable development, such as improving the efficiency of energy use and supply (eg, flexible working styles, such as working from home, which result in reduced dependence on private motor vehicles to travel to places of employment).

In March 2006 the Government agreed that economic transformation would be one of the key priorities for the next decade. Two sub-themes of economic transformation relevant to telecommunications are world-class infrastructure and environmental sustainability. The Government's objective is to ensure telecommunications services (including broadband) are in the top half of OECD performance by 2010.

The critical issues for telecommunications are limited competition and investment in telecommunications infrastructure, low levels of telecommunications capability, and the lack of affordable high-speed telecommunications infrastructure, all of which are constraining the development and introduction of advanced technology and business applications.

2.2 Legislative and policy context

The RMA is not the only legislation applicable to the deployment of telecommunications infrastructure. When considering whether to establish a national environmental standard, the effect of other relevant legislation needs to be taken into account. In particular, where a national environmental standard is being proposed to facilitate the erection of structures alongside roads, there are several statutes that need to be considered (Simpson Grierson, 2003).

Telecommunications Act 2001

The Telecommunications Act 2001 provides a right of tenure for certain infrastructure in roads, subject to a process being undertaken with the relevant road-controlling authority. Telecommunications service providers have a statutory right to install lines and cabinets in roads pursuant to sections 135 and 142 of the Telecommunications Act. What is not clear is the full range of structures that telecommunications service providers are entitled to install. There are legal opinions suggesting that antennas and supporting poles (structures that are the subject of the proposed national environmental standards) can be installed alongside roads pursuant to the Telecommunications Act.

Despite the Telecommunications Act providing for telecommunications structures alongside roads, such structures can still be required to obtain resource consents under RMA planning instruments. The scope of the Telecommunications Act, which deals with rights of access, is different from the scope of the RMA, which deals with managing the environmental effects of establishing the structures. Consequently, there is scope for establishing national environmental standards that do not duplicate the purpose and functions of provisions under the Telecommunications Act.

Local Government Act 1974 and 2002

The majority of statutory powers and rights relating to the ownership and control of local roads continue to be those set out in Part XXI of the Local Government Act (LGA) 1974, which have been carried over by the LGA 2002. For the purposes of allowing access to roads for utilities, however, it is *control* of the road rather than *ownership* that is important. Section 317 of the LGA 1974 prescribes control over roads, and states that all roads in a district shall be under the control of the council, except state highways, which are under the control of Transit New Zealand.

Section 319 of the LGA 1974 sets out the general powers of local authorities relating to roads under their control. This section has the potential to influence the access to and operation of utilities within roading corridors, but such matters are typically dealt with under the relevant utilities legislation (eg, the Telecommunications Act 2001).

There are no provisions in the LGA 2002 that offer an alternative way to addressing the matters which are proposed to be addressed by the national environmental standards for telecommunications equipment.

Building Act 2004

The Building Act 2004 introduced the term 'network utility operator' (NUO). Under the Building Act, in specified circumstances NUOs are not required to obtain building consents. However, the Building Act does not exempt such structures from any requirement for consents under the RMA. Consequently, although the Building Act has helped simplify the deployment of network infrastructure, including some telecommunications structures, it does not offer an alternative means of dealing with the matters the national environmental standards for telecommunications equipment is intended to address.

2.3 Providing for telecommunications infrastructure through the RMA

Telecommunications infrastructure affects – or potentially affects – more than one region: it may involve the introduction or use of a new technology or process that affects the environment generally. In June 2005 the Ministry of Economic Development completed a stocktake and analysis of regional and district plans and policy statements (Beca Carter Hollings and Ferner, 2005). The study examined all district and regional plans and policy statements to determine the extent to which these documents have regard for the national benefits of network infrastructure. The analysis identified some key trends:

- benefits at a local and regional level are more commonly noted than that at a national level
- network infrastructure is often considered generically
- there is a high degree of consistency in the general approach of existing planning documents, but the detail differs in its emphasis and approach to regulation
- avoiding, remedying and mitigating any adverse effects of network infrastructure is a key concern in existing planning documents.

The stocktake completed by the Ministry of Economic Development found that the extent to which telecommunications activities are specifically referred to in any issues, objectives and policies in planning documents is extremely limited. The majority of planning documents rely on the generic network utility provisions in their issues, objectives and policies for telecommunications. In district and regional plans, telecommunication activities are most commonly provided for by either designation or by activity-based rules. In total, 66 (77%) regional and district plans contain rules relating to telecommunication facilities, with activity classifications ranging from permitted to discretionary.

The 2005 Ministry of Economic Development stocktake report considered that national environmental standards have the potential to add significant value by providing for consistency among planning documents. Shortly after this analysis was completed, and as part of the wider RMA review process, the Government approved a work programme for scoping potential national policy statements and national environmental standards for telecommunications infrastructure.

A Telecommunications Industry Reference Group was convened in July 2005, which was tasked with scoping possible national environmental standards for telecommunications. The Group delivered the final industry proposals to the Ministry for the Environment in June 2006 (Telecommunications Industry Reference Group, 2006). The report stated that the desire of the major telecommunications network providers is to roll out services using standardised equipment across the country, but that the considerable variation between territorial local authority district plans in how they address and control telecommunications infrastructure makes the deployment process time-consuming, expensive and inconsistent.

The Ministry for the Environment undertook a review of every district plan from across the country to examine how they currently provide for radio-frequency fields and telecommunications facilities (Incite, 2006). This review confirmed that provisions for telecommunications facilities in existing district plans are inconsistent, many do not have clear provisions relating to infrastructure within the road reserve, and some do not contain any rules for radio-frequency fields or rely on out-of-date standards.

The Telecommunications Industry Reference Group considered a range of possible policy options to address these inconsistencies in district plans, including doing nothing, legislative change, non-statutory methods, national policy statements and national environmental standards. After considering the various options, the Industry Reference Group considered that national environmental standards would be the most appropriate RMA-based mechanism to address the problem currently being faced, because they would be able to achieve national consistency and a greater level of certainty for both local government and the telecommunications industry.

The Industry Reference Group recommended developing a suite of four standards to provide for specific elements of the telecommunications infrastructure. The following section describes the four proposed standards in more detail.

3 The Proposed Standards

This section details the proposed content of the standards and what the standards would require in practice. The Ministry for the Environment is investigating a supporting package to help implement any standards. This is outlined in section 5.

3.1 Objective of the standards

The objective for the telecommunications industry, as expressed in the Industry Reference Group report,⁴ is:

To provide for consistent and certain regulatory planning provisions that apply on a national basis, to assist in network and equipment design and equipment sourcing for roll outs, and a reduction in compliance costs and timeframes.

3.2 Detail of the standard

Proposed subject matter of the proposal

A national environmental standard is a legally enforceable regulation. The exact wording of these standards will be legally drafted after government decision following this consultation. A national environmental standard may allow an activity. However, if an activity has significant adverse effects on the environment, a national environmental standard must not state that the activity is a permitted activity.

In essence, the proposed standards say:

- an activity (such as a mobile phone transmitter) that emits radio-frequency fields will be a permitted activity provided it complies with the existing New Zealand Standard⁵
- the installation of telecommunications equipment cabinets alongside roads or in the road reserve will be a permitted activity, subject to specified limitations on their size and location
- noise emitting from telecommunications equipment cabinets located alongside roads or in the road reserve will be a permitted activity, subject to specified noise limits
- the installation of masts and antennas alongside roads or in the road reserve will be a permitted activity, subject to specified limitations to height and size.

⁴ Proposed National Environmental Standard for Radio-frequency Exposure and Low Impact Telecommunications Structures in Road Reserves – An Industry Perspective (Telecommunications Industry Reference Group, June 2006).

⁵ NZS2772.1: 1999 Radio-frequency Fields Part 1: Maximum Exposure Levels 3 kHz – 300 GHz.

The RMA details the relationship between national environmental standards and rules in plans, resource consents and bylaws. For all of the above standards, the Ministry for the Environment proposes that they be 'absolute' standards, whereby rules in plans, resource consents and bylaws may not be more stringent than the standards.

3.3 Exposure to radio-frequency fields from wireless telecommunications infrastructure

Industry proposal for radio-frequency fields exposure

The Industry Reference Group recommends a standard for radio-frequency field exposure from wireless telecommunications infrastructure based on a permitted activity rule.

Permitted activity

An activity that emits radio-frequency fields is a permitted activity provided the following conditions are met.

- 1. Exposures comply with NZS2772.1: 1999 *Radio-frequency Fields Part 1: Maximum Exposure Levels 3 kHz 300 GHz* ("the New Zealand Standard").
- 2. Prior to commencing any radio-frequency emissions, the following are sent to and reviewed by the [XXX Department of the] Council:
 - a. written notice of the location of the facility or proposed facility; and
 - b. a report prepared by a radio engineer/technician or physical scientist containing a prediction of whether the New Zealand Standard will be complied with.
- 3. If the report provided to the Council under condition 2(b) predicts that exposures will exceed 25 percent of the exposure limit set for the general public in the New Zealand Standard, then, within three months of radio-frequency emissions commencing, a report from the National Radiation Laboratory [or XXX being an appropriately qualified person/organisation specifically identified in this rule] certifying compliance with the New Zealand Standard, based on measurements at the site will be provided to the [XXX Department of the] Council".

Ministry for the Environment comments

The Ministry for the Environment supports the industry proposal for a national environmental standard for exposure to radio-frequency fields.

What are radio-frequency fields?

Like television and AM and FM radio, wireless telecommunications infrastructure for mobile phones uses radio waves, formed from radio-frequency electric and magnetic fields. Unlike the fixed-wire systems used for conventional phones, wireless telecommunication technologies need no physical link (eg, a wire or fibre-optic cable) between the sending and receiving points. All these systems need transmitters, from which the radio waves are transmitted to the receiving equipment. (Source: Ministry for the Environment and Ministry of Health, 2000.)

The industry proposal for a permitted activity rule is reproduced from the existing national guidelines for radio-frequency fields (Ministry for the Environment and Ministry of Health, 2000). The national guidelines were issued to provide direction for local authorities, the public and resource consent applicants on how the effects of radio-frequency transmission facilities can be appropriately addressed under the RMA.

The national guidelines are based on the relevant New Zealand Standard, NZS2772.1: 1999 *Radio-frequency Fields Part 1: Maximum Exposure Levels 3 kHz – 300 GHz.* The New Zealand Standard is based on international guidelines produced by the International Council for Non-Ionising Radiation Protection (ICNIRP). The New Zealand Standard has been confirmed through case law as being relevant to the RMA.

The proposed permitted activity rule allows councils to maintain a record of the location of radio-frequency transmitters. Where exposures are predicted to exceed 25% of the New Zealand Standard limit, the requirement through the permitted activity rule for an additional report of actual exposures after construction provides certainty that the transmitter complies with the New Zealand Standard.

The national guidelines recommend that where a facility does not meet the requirements of the New Zealand Standard, the activity should be treated as a non-complying activity under the resource consent process. A national environmental standard would need to clarify how non-compliant activities are to be addressed.

What would this standard mean for district plans?

The proposed standard would introduce more restrictive provisions for exposure to radiofrequency fields for approximately 51% of district plans. Approximately 25% of the district plans refer to the out-of-date New Zealand Standard for radio-frequency fields (NZS6609 rather than NZS2772). A number of district plans do not contain any rules relating to radio-frequency fields at all.

Auckland and Christchurch City Councils have more restrictive district plan provisions than are proposed by the standard. Auckland City Council also has a bylaw for radio-frequency that is more conservative than the New Zealand Standard. This bylaw is due for review in accordance with the Local Government Act 2002; if not renewed, it will expire on 1 July 2008.

No plans refer explicitly to the national guidelines. This is to be expected given that almost all district plans were developed before the guidelines were introduced in 2000. However, some plans have used the national guidelines as a base for preparing their provisions (eg, Christchurch City Council uses similar wording to the national guidelines, but with some additional constraints).

The proposed standard would enable exposure to radio-frequency fields to be controlled in a manner consistent with the national guidelines and the most recent New Zealand Standard. There would be no immediate need for plans to be reviewed as a result of the standards being introduced because a national environmental standard overrides existing plan rules. However, over time councils may choose to alter their plans to reflect the existence of the standards when going through their next plan review.

A comparison of the national environmental standard provisions with existing district plan provisions for radio-frequency emissions shows that the national environmental standard is:

- less restrictive than 22% of plans
- consistent with 27% of plans
- more restrictive than 51% of plans.

Potential health effects from exposure to radio-frequency fields

Potential health effects from exposure to radio-frequency fields have been extensively researched by organisations such as the International Council for Non-Ionising Radiation Protection (ICNIRP). International guidelines developed by the ICNIRP are based on a careful analysis of the scientific literature and offer protection against all identified hazards of radio-frequency energy, with large safety margins. Both measurements and calculations show that radio-frequency signal levels in areas of public access from base stations are far below international guidelines, typically by a factor of 100 or more. Radio-frequency exposure levels to a user from mobile phones are considerably larger, but still below international guidelines (World Health Organisation, 2000).

The World Health Organisation advises that none of the recent reviews have concluded that exposure to the radio-frequency fields from mobile phones or their base stations cause any adverse health consequence. However, there are gaps in knowledge that have been identified for further research to better assess health risks (World Health Organisation, 2000). Ongoing studies relating to health effects include the World Health Organisation international electromagnetic fields project (note that this study covers electromagnetic fields, of which radio-frequency fields are only a small part).

The New Zealand Standard (NZS2772:1999) was adopted after a comprehensive investigation, including an international review of other standards and guidelines. The New Zealand Standard sets limits for public exposure that are 50 times lower than the level at which health effects may start to occur. The Environment Court has concluded that there are no adverse health effects arising from radio-frequency fields that comply with the New Zealand Standard. The Environment Court has also rejected arguments relating to psychological effects.

Leading RMA case law on the effects of radio-frequency transmitters includes:

- North Shore City Council v Vodafone, A206/03 (October 2003)
- Shirley Primary School v Christchurch City Council, C136/98 (December 1998)
- *McIntyre v Christchurch City Council*, A015/96 (March 1996).

It was acknowledged in the *Shirley* case that this decision may be referred to by communities elsewhere in New Zealand.

3.4 Telecommunications equipment cabinets within road reserves

Industry proposal for cabinets

The Industry Reference Group recommends a standard for equipment cabinets within the roads or in the road reserve based on a permitted activity rule.

Permitted activities

Telecommunication cabinets in road reserves shall be permitted activities subject to the following restrictions.

Limitations on cabinet size and location (above ground level)	Adjacent area type
Maximum height: 1.8m Maximum volume: 2.5m ³ Road lay position restriction: nil Maximum number of cabinets per separate property frontage exceeding 900mm in height: 1	Residential, open space/ reserve
Maximum height: 2m Maximum volume: 3.5m ³ Road lay position restriction: nil	Rural, business, mixed- use

Provided that any rule in a district plan shall take precedence over this standard in the following circumstances:

- where the cabinet is located in a road reserve directly adjoining a site containing a building listed as having heritage value (this provision shall apply where a site containing the heritage building is located on the same side of the road reserve centre line as the cabinet)
- where a cabinet is located in a road reserve contained within or directly adjacent to any heritage precinct or area of landscape importance identified in a district plan (where the road reserve itself is not contained within the identified precinct or area, this provision shall apply where a site identified as being within a heritage precinct or area of landscape importance is located on the same side of the road reserve centre line as the cabinet)
- where any excavation work to install the cabinet is undertaken within the drip line or branch spread of any tree or vegetation, where a resource consent would otherwise be required by a district plan to undertake such excavation.

It is important to note that the above standard is the recommendation of the Industry Reference Group. If approval is given to continue developing the proposed standards, the above wording may be altered as a result of submissions and the drafting process.

The industry report describes what an equipment cabinet is (see text box below), and Figure 2 provides an example of cabinets in the road reserve.

Cabinet – means an equipment casing, usually set on a concrete foundation plinth, that may contain telecommunications equipment, batteries, line terminals, and cooling systems such as heat exchangers and fans, and other such devices and equipment that are required to operate a telecommunications network (Source: Telecommunications Industry Reference Group, 2006).

Figure 2: Telecommunications equipment cabinets in the road reserve



Large cabinet

Height: 2.01m Area: 1.44m² Volume: 2.89m³

Smaller cabinet (excluding power box)

Height: 1.41m Area: 0.36m² Volume: 0.51m³

Note: the large cabinet would not be permitted under the proposed standard and would require resource consent.

Ministry for the Environment comments

The Ministry for the Environment would be interested in hearing your views on the industry proposal.

Appropriate siting and location will be vital to the effective implementation of the proposed standard (eg, avoiding areas of high amenity value). The proposal has addressed siting in relation to heritage, landscape and trees. However, waahi tapu and areas of high amenity or design control that are not specifically identified in plans may also need to be included in any standards (eg, pedestrian malls in business areas).

However, the industry report has not addressed the potential conflicts between telecommunications cabinets and other equipment cabinets (eg, gas and electricity) in the road reserve and associated potential clustering. Also, the proposal does not promote the appropriate use of screening, colour or other ways to avoid potential adverse effects on visual amenity. The Ministry for the Environment is interested in your views on appropriate heights, volumes (or areas) and locations for cabinets in residential and other areas.

Although the proposal addresses district plan restrictions, it does not affect processes under the Telecommunications Act 2001, such as road-opening notices.

Broadband and unbundling of the local loop

Broadband is a high-capacity, high-speed telecommunications service with a greater bandwidth (capacity) than a standard telephone call connection. Broadband access links, depending on the speed, can carry one or more services such as video, voice and data simultaneously. In May 2006 the Government announced a telecommunications package that included unbundling of the local loop (copper circuit access) and sub-loop copper-wire lines between telephone exchanges and homes and businesses, allowing other internet service providers to compete fully with Telecom to provide faster, cheaper broadband.⁶

The unbundling decision was made after the Ministry for the Environment received the industry proposals for telecommunications facilities, so the Ministry sought advice from the Telecommunications Industry Reference Group on the implications of unbundling on the proposals. Members of the Group advised that there is likely to be increased demand for cabinets in the road reserve. Telecom advised that with its move towards a "Next Generation Network", it will become increasingly important to have equipment cabinets closer to customers. Space in Telecom's existing cabinets is constrained, meaning that other operators will need to install new cabinets for their networks.

No problems are anticipated for rural, business and mixed-use areas given the maximum size of cabinets and no limit on the number of cabinets per property frontage. However, the proposal for residential areas limits the number of cabinets (over 900mm in height) to one per separate property frontage. It has been suggested that this could be amended to allow more than one cabinet to be installed as a permitted activity provided that:

- a) the combined height and volume dimensions of the cabinets do not exceed the dimensions of a single cabinet (ie, height 1.8m and volume 2.5m³)
- b) the cabinets are only separated by 50mm from each other.

The Ministry for the Environment is interested in views on this suggestion.

In some locations, the volume and height might need to be allocated carefully among all possible service providers to ensure the standard does not act as a barrier to new providers entering the market. The Ministry for the Environment is interested in your views on how the standard could include a process for allocating maximum height and volume dimensions among all service providers and encourage co-location.

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⁶ Source: www.beehive.govt.nz/ViewDocument.aspx?DocumentID=25636

Hardened DSLAMS

A DSLAM (digital subscriber line access multiplexer) is a device located in a cabinet (or a telephone exchange) which allows telephone lines to make faster connections to the internet. Smaller service providers, in particular, may want to employ hardened DSLAMS, which can be buried in the ground, or attached to lampposts or other freestanding structures. It might be useful for the standard to include hardened DSLAMS, which are inherently less intrusive than cabinets. Likewise, smaller providers in particular may want to use small pedestal cabinets, and it may be useful for the standard to specifically mention such cabinets.

The Ministry for the Environment is interested in your views on whether it should refer to small pedestal cabinets, and if so, how.

Roadside cabinets and traffic safety

Network utility operators have statutory rights to use the road corridor (or road reserve) to locate and maintain network utilities, subject to the ability of the road-controlling authority to impose reasonable conditions to protect the safe and efficient functioning of the road and the assets invested in it. These rights are also subject to common law rights and Resource Management Act controls (New Zealand Utilities Advisory Group, 2004).

When it comes to telecommunications infrastructure, the rights of network utility operators are specified in the Telecommunications Act 2001. The Ministry for the Environment notes that under that Act, road-controlling authorities (such as the local authority or Transit New Zealand) can set reasonable conditions on works on the road relating to, for example, the safe and efficient flow of traffic (whether pedestrian or vehicular), and the need to lessen the damage that is likely to be caused to property (including structural integrity of the roads) as a result of work on the road. The proposed standards will not affect any of the processes under the Telecommunications Act.

What would this standard mean for district plans?

The vast majority of district plans (82%) are more permissive with respect to cabinet size when compared with the proposed standard. However, some of the larger cities are currently more restrictive, such as Waitakere City (1.5m high, $2m^2$ area) or have proposed plan changes that would be more restrictive (eg, Auckland City Isthmus Section, 0.9m high, 0.4m² area).

Most plans restrict cabinets to a maximum height and gross floor area. Although the proposed standard also restricts cabinets to a maximum height (which is more restrictive in most respects), it controls dimension via a maximum volume rather than gross floor area.

In many cases it is difficult to determine whether district plan setback/location requirements ('yards' and recession planes) apply specifically to structures within the road reserve. The proposed standard does not prescribe any setbacks.

There would be no immediate need for plans to be reviewed as a result of the standards being introduced, because a national environmental standard overrides existing plan rules. However, over time councils may choose to alter their plans to reflect the existence of the standards when going through their next plan review.

A comparison of the national environmental standard provisions with existing district plan provisions for cabinets shows that the national environmental standard is:

- less restrictive than 9% of plans.
- consistent with 8% of plans.
- more restrictive than 82% of plans.

3.5 Noise from telecommunications equipment located within road reserves

Industry proposal for cabinet noise

The Industry Reference Group recommends a standard for noise from equipment cabinets alongside roads or in the road reserve based on a permitted activity rule.

Permitted activities

Noise from telecommunication cabinets located in road reserves shall be a permitted activity provided that the following noise limits are not exceeded.

Assessment point

For the purposes of this standard, the measurement point shall be located 3m inside the boundary of the site under consideration (ie, the site adjacent to the road reserve in which the cabinet is located).

Residential, mixed-use, rural and open space/reserve areas

All days	Noise limit
Daytime (07.00–22.00)	50dBA L _{Aeq (5 min)}
Night-time (22.00–07.00)	40dBA L _{Aeq (5 min)} 65dBA L _{max}

Business and industrial areas (and any other non-residential zones)

All days	Noise limit
Daytime (07.00–22.00)	60dBA L _{Aeq (5 min)}
Night-time (22.00–07.00)	60dBA L _{Aeq (5 min)}

Noise shall be measured in accordance with NZS 6801:1999 *Acoustics – Measurement of Environmental Sound*, and the basis for assessment shall be NZS 6802:1991 – *Assessment* of *Environmental Sound*. This includes provision for averaging during daytime such that a maximum daytime noise level of 55dBA L_{Aeq} (5 min) in residential, mixed-use and rural zones at the measurement point is allowed, provided that the average noise level over the full day (07.00 to 22.00) does not exceed 50dBA L_{Aeq} . No averaging is allowed at night-time.

Definition of terms

 L_{eq} is the energy equivalent noise level. It is a time-averaged sound level, a singlenumber value that expresses the time-varying sound level for the specified period as though it were a constant sound level with the same total sound energy as the timevarying level. It is expressed over a set period of time (eg, 5 minutes, 8 hours, 24 hours etc), known as the 'time base'. (Source: Quality Planning website www.qualityplanning.org.nz)

 L_{max} is the maximum noise level measured with a sound-level meter having a 'fast' response, or an equivalent method. L_{max} noise limits are normally only set where sleep protection is an issue and therefore usually only apply during night-time. (Source: Standards New Zealand)

Ministry for the Environment comments

The proposal is largely based on the voluntary New Zealand Standards for noise (NZS 6801:1999 *Acoustics – Measurement of Environmental Sound* and NZS 6802:1991 – *Assessment of Environmental Sound*). The New Zealand Standards were commissioned by the Ministry of Health and prepared by a committee of noise experts and representatives of key organisations.

NZS 6802:1991 was revised in 1999 to become NZS 6802:1999 Acoustics – Assessment of Environmental Noise; however, the 1991 version is still widely used. NZS 6802:1991 uses the acoustical metric L_{10} , whereas 6802:1999 uses L_{eq} . The Ministry of Health advises that referring to 6802:1991 and L_{eq} without reference to L_{10} is incorrect. The wording of the proposal could be amended to allow for averaging and ensure that the two different metrics (L_{10} , and L_{eq}) can be referenced accurately, without changing the general concepts or noise limits.

The Ministry for the Environment supports the general intent of those aspects of the proposal that are based on the New Zealand Standards. The New Zealand Standards give a range of noise levels as a guideline for the reasonable protection of health and amenity for land used for residential purposes. The proposal is within the recommended range of noise limits for residentially zoned sites. Noise limits for less sensitive areas (business and industrial) are typically less stringent, as reflected by the proposal.

It should be noted, however, that the proposed assessment point for measuring noise varies from the New Zealand Standards and existing district planning approaches. NZS 6802:1999 recommends that the noise limits not be exceeded at any point within the boundary required to be protected. The proposed assessment point of 3m inside the boundary would not be appropriate for buildings that are not set back from the road boundary. An appropriate assessment method may be to set an assessment point that can be altered if the dwelling on the adjoining property is located closer than 3m to the road boundary. Alternatively, noise may be measured indoors, according to NZS 6802:1999 indoor noise limits.

Measuring noise at the property boundary is also used for traffic noise. The Ministry of Transport and Standards New Zealand are developing a New Zealand Standard for noise emissions from roads. Officials note that any standards for noise from telecommunications equipment cabinets should be consistent with any standards for traffic noise.

The Ministry for the Environment is interested in your views on the most appropriate assessment point, and associated noise limits, for measuring noise from equipment cabinets.

What would this standard mean for district plans?

The proposal is generally more restrictive than 51% of district plans. This is due to the differing assessment points for existing district plans and the proposal, with district plans typically requiring noise to be measured at the property boundary or notional boundary. Noise levels in some district plans, however, are more restrictive than the New Zealand Standards and set very low limits (eg, 40dBA at night-time in commercial areas).

The two key differences between existing district plans and the proposed standard are the assessment point and the acoustical metric (L_{eq} or L_{10}). These differences make it difficult to describe what adjacent landowners may experience.

There would be no immediate need for plans to be reviewed as a result of the standards being introduced, because a national environmental standard overrides existing plan rules. However, over time councils may choose to alter their plans to reflect the existence of the standards when going through their next plan review.

A comparison of the national environmental standard provisions with existing district plan provisions for noise shows that the national environmental standard is:

- less restrictive than 30% of plans
- consistent with 19% of plans
- more restrictive than 51% of plans.

3.6 Masts and antennas for wireless telecommunications networks within road reserves

Industry proposal for antennas and masts

The Industry Reference Group recommends a standard for masts and antennas alongside roads or in the road reserve based on a permitted activity rule.

Permitted activities

Antennas and their associated support structures in road reserves shall be permitted activities subject to the following restrictions.

Road reserve support structures and antennas	Adjacent area type	
The replacement of, or addition to, any existing utility structure in the road reserve, for telecommunication purposes, whereby the new or altered structure does not exceed the maximum diameter of the structure it replaces or modifies by more than 50%, and in the case of antennas or any associated covering shroud, the antennas and/or shroud do not extend more than 3m above the highest point of the existing structure.	Residential, business, mixed-use, rural, open space/reserve	
Panel antennas to maximum dimensions of 2.3m (I) x 450mm (w) x 200mm (d).	Residential, business mixed-use, rural open space/reserve	

Provided that any rule in a district plan shall take precedence over this standard in the following circumstances:

- where the support structure or antenna(s) is/are located in a road reserve directly
 adjoining a site containing a building listed as having heritage value (this provision shall
 apply where a site containing the heritage building is located on the same side of the road
 reserve centre line as the support structure or antenna(s))
- where the support structure or antenna(s) is/are located in a road reserve contained within or directly adjacent to any heritage precinct or area of landscape importance identified in a district plan (where the road reserve itself is not contained within the identified precinct or area, this provision shall apply where a site identified as being within a heritage precinct or area of landscape importance is located on the same side of the road reserve centre line as the support structure or antenna(s)).

Antenna means any device that receives or transmits radio-communication or telecommunication signals. (Source: Telecommunications Industry Reference Group, 2006)

Mast means any pole, tower or similar structure designed to support antennas to facilitate telecommunications, radio communications and broadcasting. (Source: Telecommunications Industry Reference Group, 2006)

It is important to note that the above standard is the recommendation of the Industry Reference Group. If approval is given to continue developing the proposed standards, the above wording may be altered as a result of submissions and the drafting process.

Figure 3 illustrates an example of panel antennas attached to an existing streetlight.



Figure 3: An example of panel antennas attached to an existing street light

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Ministry for the Environment comments

The Ministry for the Environment generally supports the intent of this proposed standard, and would be interested in hearing your views.

The Industry Reference Group report notes that the main concern in placing masts and antennas is when this occurs within residential areas or areas of high amenity value. The proposed standard addresses areas of landscape and heritage, and should also include waahi tapu. Large antennas can have visual effects when situated on prominent sites such as a ridge. In contrast, small panel antennas may have minimal visual effects when situated on, or attached to, existing structures (ie, co-located). The proposed standard for antennas promotes co-locating with existing structures within the road reserve (eg, traffic light pole, streetlight) as a potential solution to amenity concerns. New freestanding masts are not included in the proposal, and the Industry Reference Group report notes that additional new masts may create additional clutter in the road reserve, resulting in effects that are more than minor.

A number of Environment Court cases relating to amenity effects (see, for example, *Telecom New Zealand Limited v Christchurch City Council* W165/96) show that masts and antennas can, potentially, have effects on visual amenity. These effects will vary according to the type, height and design of the antenna or mast, its location, and the characteristics of the surrounding environment.

The Ministry for the Environment notes that the proposed maximum size for panel antennas as permitted activities is the largest size currently used by telecommunications companies. Antennas of the maximum size proposed are usually only required where it is very hard to get a signal (eg, in hilly terrain) or where the antenna is required to transmit over large distances, such as in rural areas. A smaller maximum antenna size may be more appropriate as a permitted activity to ensure there are no significant adverse effects on the environment.

The proposed additional mast height of 3m above an existing structure may not be appropriate in all areas, and a lesser height may be more appropriate to ensure that any effects are minimised. The proposal does not appear to have a maximum height limit for additions to existing structures; an overall maximum height limit would be required as part of any standard. Furthermore, an antenna mast should be no higher than is required to be effective for transmitting in a specific location, provided it is within the maximum height specified in the standard.

The Ministry for the Environment sought comments from the Industry Reference Group on dish antennas, which are not specified in the proposals but appear in many district plans. Members of the Group supported the inclusion of dish antennas located on structures in the road reserve, with a suggested maximum diameter of 300mm. Group members noted that, depending on where a dish antenna is being installed, it may protrude approximately 450mm from the side of the support structure. This protrusion would need to be taken into account if any standard were to include dish antennas.

To support the deployment of wireless broadband it may also be desirable to have the flexibility for service providers to attach antennas up to a certain size onto cabinets.

What would this standard mean for district plans?

There are significant differences between the proposal and existing district plan provisions. While most district plans take a more general approach to infrastructure, the proposed standard is more specific and tailored to structures within the road reserve.

District plans generally provide for new freestanding structures and specify a maximum height and antenna diameter, often at heights generally less restrictive than the proposed standard for masts and antennas. Most district plans set maximum height limits and antenna dimensions for different areas that generally apply district-wide, not specifically to the road reserve. The proposal makes specific mention of panel antennas in three dimensions, whereas district plans refer to antennas in general and usually only restrict the diameter (implicitly referring to dish antennas, which are not covered by the proposal).

Only 7% of the current district plan provisions are broadly consistent with the proposal with respect to anticipated heights and antenna dimensions. The proposed standard is more restrictive than 54% of the district plans and less restrictive than the remaining 39%.

There would be no immediate need for plans to be reviewed as a result of the standards being introduced, because a national environmental standard overrides existing plan rules. However, over time councils may choose to alter their plans to reflect the existence of the standards when going through their next plan review.

A comparison of the national environmental standard provisions with existing district plan provisions for masts and antennas show that the national environmental standard is:

- less restrictive than 39% of plans
- consistent with 7% if plans
- more restrictive than 54% of plans.

3.7 What the standards do not involve

The proposed standards do not apply to:

- telecommunications equipment or structures outside the road reserve
- new freestanding mobile phone transmitters or masts
- over-ground or underground wires
- permission for leasing the road reserve or opening the road to install new telecommunications facilities.

4 Costs and Benefits

The Ministry for the Environment has commissioned a Section 32 analysis of the standards. The analysis will be reported in two parts – a scoping report and a full analysis. This section is based on the scoping report, with fuller quantification during the next phase (see section 6.3). It:

- describes the current situation for telecommunications operators, local government and other groups
- identifies the types of costs and benefits that will be incurred as a result of the standards
- examines the costs and benefits by affected group and by the situations in which they will be encountered
- identifies key information that could be researched during the consultation phase.

What is a Section 32 analysis?

Section 32 of the RMA requires that before a regulation (such as a national environmental standard) is made, an evaluation must be carried out. The evaluation, or Section 32 analysis, involves considering the following.

Appropriateness – the suitability of any particular option in achieving the purpose of the RMA. To assist in determining whether the option (whether a policy, rule or other method) is appropriate, the *effectiveness* and *efficiency* of the option should be considered.

Effectiveness – how successful a particular option is in addressing the issues in terms of achieving the desired environmental outcome.

Efficiency – comparison of the benefits and costs (environmental benefits minus environmental costs compared to social and economic costs minus their benefits).

4.1 Costs and benefits of the standards

A cost-benefit analysis compares the likely effects of introducing the proposed standards against continuing with the status quo. This means trying to compare the likely progression of industry development with the standards against what would otherwise occur without them. The main effect of the proposed package of standards is to enable works that meet the standards to avoid the need to apply for resource consent.

Why are standards being examined?

The principal telecommunications technologies currently available in New Zealand are:

- conventional landlines, generally based on copper cable, but being progressively replaced by fibre-optic cable with greater capacity
- cellular networks (mobile phones)
- wireless local loops (eg, WiMax), which are emergent systems that provide a local access network through establishing local cell sites.

Current trends in telecommunications are being driven by a combination of changing technologies and service possibilities, and commercial considerations. These include a convergence in technological capabilities between fixed-line and mobile services, voice services and data transmission, and between telecommunications and media, with transmission of broadcast content over phone connections. These trends give telecommunications operators a strong incentive to increase their network capacities. Increased use of roadside cabinets and associated works would facilitate this increase in capacity, and also enable new operators to establish networks and increase the competition and choice of services.

Telecommunications facilities are currently subject to resource consenting processes that differ widely between councils. This creates costs and uncertainty for telecommunications operators seeking to extend their networks and improve the capacity and quality of their services. The Telecommunications Act 2001 grants network operators approved under that Act a right to occupy the road reserve in providing utility services. The telecommunications industry views facilitating the placement of equipment cabinets and antennas along roads as crucial for both improving coverage of mobile and wireless telecommunications, and improving the quality of landline services.

How was the cost-benefit analysis conducted?

The cost-benefit analysis was conducted in two stages. First, information of likely trends in telecommunications was collected from existing sources and by canvassing the views of selected telecommunications operators. Interviews were also conducted with a number of councils to establish how the standards would affect the implementation of their functions under the RMA. Second, the quantitative information gathered in this process was used to conduct a simple cost-benefit model, reflecting views on the extent to which expected rates of roll-out of new telecommunications investment would be affected by the standards, and the associated costs of going through resource management procedures, with and without the standards. The difference between the anticipated situation with the standards and without the standards is the basis for the calculated net benefit in the analysis.

What benefits and costs are expected from the proposed standards?

Without the proposed standards, roll-out of new telecommunications services and enhanced capacity will face the cost of resource consent application processes, increasing costs to the industry, and a potentially slowing of the rate of roll-out (and therefore availability) of new services across the community. With the proposed standards the main costs and benefits are likely to be:

- reduced costs for industry in obtaining resource consents and assessing each district's particular requirements, and reduced uncertainty about the acceptability of particular roadside solutions in different areas
- reduced costs in processing resource consents for councils (over and above what is recovered from applicants through charges)
- benefits for consumers from faster roll-out and access to new services, and from more choice and competition among operators
- costs to government in supporting the introduction of the standards
- potential costs for the community in loss of local control over environmental effects in the roadside
- benefits through providing certainty for public health concerns associated with exposure to radio-frequency fields from wireless telecommunications infrastructure.

The cost-benefit analysis has only been able to quantify the first, second and fourth of these bullets. Some councils expect costs in adjusting planning documents to avoid confusion with the standards, although there is no legal requirement for them to do this. Any such costs incurred by councils as a consequence of introducing the standards were considered appropriate to include in the cost-benefit analysis. Excluding such costs would increase the net benefit.

Results of the analysis

The quantified analysis compared the costs and benefits of the roll-out of facilities in road reserves nationwide under the current status quo of local planning controls through district plans, and under the alternative with the proposed standards. There is likely to be a substantial net benefit from the proposed standards, if the rate of roll-out is anywhere near what the telecommunications operators suggest it will be in the next 10 years (see Table 1). Because the quantified net benefit is so large, the result of the quantified analysis withstands substantial changes in the input assumptions used.

'Typical' base assumptions		Community disbenefit \$500 per site	Community disbenefit \$10,000 per site	Community disbenefit \$11,975 per site	
Discounted at	10%	8%	10%	10%	10%
	Total	Total	Total	Total	Total
PV benefits \$k	84,721.7	95,404.7	84,721.7	84,721.7	84,721.7
PV costs \$k	4,837.3	5,212.4	8,172.8	71,547.3	84,722.6
PV net benefit	79,884.4	90,192.3	76,548.9	13,174.4	-0.9
Benefit:cost ratio	17.51	18.30	10.37	1.18	1.00

Table 1:	Cost-benefit a	nalysis results

PV = present value

There are, however, unquantifiable effects on both the cost and benefit side of the ledger. In particular, there are unquantified costs to residents from the potential of visual intrusion, proliferation of street clutter, and losing their ability to influence decisions on the road outside their properties through the resource management processes embodied in district plans. There are also potential benefits to telecommunications consumers from improved services and new technology, which have not been feasible to quantify in the analysis. The extent to which such new services create flow-on effects and stimulate new activity and innovation, contributing to dynamic efficiency across the economy and community at large, has also not been quantified.

The size of the quantified net benefit suggests that unquantified costs, particularly from loss of community control, would have to be large to overturn the result. There is no ready means of valuing these unquantifiable effects. However, the cost from loss of local consenting controls needs to be viewed in perspective, because the proposed standards limit roadside cabinets to one per property frontage, and councils have other means of managing street clutter through their functions as road-controlling authorities.

The cost-benefit analysis identified some factors that may reduce the net benefits of the proposed standards. Some types of telecommunications facilities, such as 300mm dish antennas, are not included in the proposals analysed, and therefore would remain subject to existing RMA controls. Another factor that may reduce net benefits is how each council exercising its functions as the road-controlling authority in its jurisdiction affects network operators' ability to exercise their statutory rights to use the road corridor. This may benefit the community if some aspects of concern (such as proliferation of roadside facilities) are still controllable. However, this would not assist those telecommunications operators who report difficulties in dealing with some local authorities in their road-controlling role to the point where they avoid using the road reserve.

While there will be further refinement of the standards in future consultation with stakeholders, this analysis indicates that adopting the proposed national standard is likely to result in positive net benefits, as illustrated by Table 1.

Some cautions on interpreting the quantified analysis

There are limitations in the quantified analysis due to the information available on a relatively small part of total telecommunications activity (roadside facilities) and council resource consenting activity. The principal parts of the quantified analysis are resource cost savings for telecommunications operators in obtaining consents, and for councils in processing them, and resourcing costs incurred by government in supporting the introduction of the standards.

The principal effects outside of the quantified analysis are:

- the economic benefits for both consumers and producers arising from increased telecommunications service use, due to improved quality and/or reduced price of services
- the value to the community of the loss of local control over environmental effects arising from activities in the road corridor.

Although the analysis omits some unquantifiable costs, it also omits some probable benefits, such as benefits to consumers and associated innovation. The figures in the analysis as shown in Table 1 above should be regarded as indicative rather than definitive, and the analysis framework can be revised to use improved information if it becomes available. Such improved information would be required, for instance, to assess changes in the proposed standards (inclusion of new items or exclusion of existing items), because the incremental shifts in costs and benefits caused by such changes would need to be carefully identified.

5 Supporting Information

The Ministry for the Environment is investigating a supporting package to help implement the proposed standards. This may include:

- implementation workshops for local authorities
- guidance material.

5.1 Workshops

The Ministry for the Environment intends to run technical workshops that will cover the detail of the standards and the implementation package. More information will be available on the workshops if the standards are finalised.

5.2 Guidance material

The Ministry for the Environment will prepare a plain-English users guide if the standards are finalised. This will outline what the regulations mean, and how we anticipate they will be implemented.

6 What Next?

6.1 Making a submission

Any person can make a submission on the proposed standard. Please include the following information:

- 1. your name and postal address, phone number, fax number and email address (if applicable)
- 2. the title of the proposed standards you are making the submission about
- 3. whether you support or oppose the standards
- 4. your submission, with reasons for your views
- 5. any changes you would like made to the standards
- 6. the decision you wish the Minister for the Environment to make.

You must forward your submission to the Ministry for the Environment, PO Box 10362, Wellington, or by email to standards@mfe.govt.nz, in time to be received no later than 5.00 pm on 10 August 2007.

6.2 Questions

Your submission can address any issue relating to the standards. However, the Ministry for the Environment would greatly appreciate specific comment on the following questions.

- 1) Do you have any concerns about the proposed standard for exposure to radio-frequency fields?
- 2) Do you agree with or oppose the proposed standard for equipment cabinets? Does the proposal promote the most appropriate size and height for each area (residential, business, mixed-use)?
- 3) Do you agree with or oppose the proposed standard for noise from equipment cabinets? Is the proposal the most appropriate form of measurement for each area (residential, business, mixed-use)? Is the proposed measurement point appropriate?
- 4) Do you agree with or oppose the proposed standard for masts and antennas? Does the proposal represent the most appropriate height and size for each area (residential, business, mixed-use)?
- 5) If the proposed standards are implemented, what resource consent activity status do you think should be applied to equipment that fails to meet the standards (controlled, restricted discretionary, discretionary or non-complying)?
- 6) Do you agree with the analysis of where costs and benefits of the proposal will fall?

6.3 What happens after you have made your submission?

The Ministry will prepare a summary of submissions, which will be available through the Ministry's website. Hard copies will be available on request.

Once submissions have been compiled, they will be considered during the development of the final policy and in preparing the regulations. The Ministry will prepare a report with the recommendations for the final policy to the Minister for the Environment, including the full Section 32 analysis. If approval is given to continue developing the proposed standards, the final wording will be drafted and the proposed standards made into regulations.

Glossary

Noise: 'unwanted' sound. Humans are very sensitive to sound and can hear sounds that vary in acoustic energy from the whining of a mosquito's wings to the racket of a jackhammer. Sound levels vary so greatly in magnitude that it is impractical to describe their sound pressures in familiar linear units. Sound pressures are therefore measured on a logarithmic decibel (dB) scale. A weighting of the sound level is widely used in measurements of environmental sound to ensure electronic instruments match the sensitivity of the human ear across the audible spectrum, hence the notation 'dBA'.

Noise as defined in the RMA includes vibration, which in most cases is associated with high levels of noise. In environmental assessments it is usually the noise effects that are of most concern. However, specific vibration effects can arise from some types of commercial activities, and these may require specialist investigation outside the scope of this guidance note. The effects of environmental noise are usually expressed in terms of:

- annoyance
- speech interference high levels of noise can make normal speech difficult to hear
- performance some noises can make concentration difficult and interfere with tasks such as learning, checking fine details (such as any job with a large mathematical component or where the meaning of words is critical), or work where small, precise, movements or intense concentration is required
- mental health (including noise-induced stress-related effects)
- sleep disturbance in addition to fatigue and mental health effects, disrupted sleep patterns can leave people irritable, change their behaviour, and reduce their ability to work or perform tasks.

(Source: Ministry for the Environment, 2005)

Radio-frequency fields: any frequency used for radio transmissions, normally 0.1MHz to 300,000 MHz. Radio signals are composed of linked electric and magnetic fields, which travel away from the transmitter as an electromagnetic wave. The electric and magnetic fields can be referred to as radio-frequency fields, and the energy they carry as radio-frequency radiation. (Source: Ministry for the Environment and Ministry of Health, 2000)

Road reserve and road corridor: 'road corridor' refers to all roads defined under section 315 of the Local Government Act 1974 (which still has effect under the Local Government Act 2002), and under section 43 of the Transit Act 1989. It means all land between the legal boundaries, customarily referred to as 'road reserve', and typically includes the carriageway, footpaths and other accessways, berms and other unpaved areas. Where roads have not been formed, it also refers to so-called 'paper roads'. It includes all roads for which the road-controlling authority (either Transit New Zealand for state highways or the territorial local authority for all other roads) is responsible for management, maintenance and development. The term 'road corridor' is used to emphasise that not only is it the entire area of land within the road reserve that must be considered, but also that this land represents a corridor or conduit, for vehicles, people, services and facilities. (Source: *Network utilities within the road corridor – the role of the Resource Management Act – A guide to best practice* (New Zealand Utilities Advisory Group, 2004)

Telecommunications equipment cabinet: an equipment casing, usually set on a concrete foundation plinth, that may contain telecommunications equipment, batteries, line terminals, and cooling systems such as heat exchangers and fans, and other such devices and equipment that are required to operate a telecommunications network. (Source: Telecommunications Industry Reference Group, 2006)

Telecommunications masts and antennas: an antenna is any device that receives or transmits radio-communication or telecommunication signals. A mast is any pole, tower or similar structure designed to support antennas to facilitate telecommunications, radio communications and broadcasting. (Source: Telecommunications Industry Reference Group, 2006)

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