

FACTSHEET

10 May 2010

New road traffic noise Standard NZS 6806:2010 – frequently asked questions

What is the purpose of the new road traffic noise Standard?

NZS 6806:2010 *Acoustics – Road traffic noise – New and altered roads* aims to help with the design of new and altered roads by setting criteria for road traffic noise from those roads, as well as providing a consistent methodology for the assessment and mitigation of that noise. The noise criteria contained in the Standard have been developed taking into account health issues associated with noise; the effects of noise levels on people and communities; affordability considerations; and the potential benefits of new and altered roads to people and communities.

Why is the Standard being introduced now?

Road traffic noise can have an impact on people and communities, causing general interference with everyday activities to more significant effects such as sleep disturbance.

Previously there has been no nationally agreed standard for addressing the effects of road traffic noise from new or altered roads. The closest document is the [Transit] NZ Guidelines for the Management of Road Traffic Noise, originally published in 1994.

Development of NZS 6806:2010 is part of a package of work approved by the Government in 2006 that is intended to address land transport noise in a more integrated manner.

Completion of this Standard is identified as a key short-term action in the New Zealand Transport Strategy 2008. NZS 6806:2010 will help contribute towards achievement of the following target in the Strategy: 'Reduce the number of people exposed to health-endangering noise levels from transport'.

What noise criteria are included in the Standard?

Section 6 of NZS 6806:2010 describes the noise criteria that should be applied to road traffic noise from new and altered roads received at 'protected premises and facilities' (that is, noise sensitive activities such as residential activities which exist, or for which building consent has been obtained, at a specified time).

There are two sets of criteria in the Standard: one set for altered roads and new roads with an estimated traffic flow greater than 75 000 AADT (Annual Average Daily Traffic), and another set for new roads with estimated traffic flows of between 2000 and 75 000 AADT.

The criteria for new roads are split according to traffic flow in order to reflect different noise environments, particularly where new roads with estimated traffic flows greater than 75 000 AADT might be constructed. Typically, roads carrying 75 000 AADT are generally only found in very large urban areas in New Zealand. General environmental noise levels in these areas often already exceed the

noise criteria for new roads carrying between 2000 and 75 000 AADT. In these circumstances noise mitigation options, which could reduce noise levels to those provided for in the criteria for new roads with lower traffic flows, are very limited and generally uneconomic.

The main reason for the noise criteria is the concept that the best practicable option (BPO), as contained in the Resource Management Act 1991, should be used to mitigate road traffic noise effects. Both sets of criteria include three categories – Category A, which provides the best option for reducing noise, and Categories B and C, which allow higher levels of noise.

Wherever possible, Category A should be achieved. Where this is not possible then Category B should apply, and where achievement of neither Category A or B is possible, then Category C should apply.

How do the criteria in NZS 6806:2010 compare to noise criteria set by the World Health Organization?

The World Health Organization's (WHO) environmental guideline values for outdoor living areas is 50-55 dB LA_{eq} measured over a 16 hour time period. This guideline value is set at the level of lowest adverse health effect and is intended to address various sources of environmental noise including annoyance effects, speech intelligibility and communication interference, disturbance of information extraction, sleep disturbance and hearing impairment caused by various sources of environmental noise, including road traffic noise. The Category A criteria included in NZS 6806:2010 for new roads with a traffic flow of less than 75 000 is 57 dB measured over a 24 hour time period

There is a need to explain the difference and the rationale for this difference between the criteria in the Standard and the quoted WHO environmental noise criteria for outdoor living. The health of people and communities is part of sustainable management enabled by the application of the Resource Management Act 1991. Introduction of noise criteria in this Standard recognises the WHO concern about increase in traffic noise and that growth in urban environmental noise pollution is unsustainable, because it creates adverse effects on health. Increase in traffic noise also adversely affects future generations by degrading residential, social and learning environments, with corresponding economical losses.

The noise criteria in NZS 6806:2010 have been selected to limit adverse effects of road traffic noise on people above a reasonable level and health criteria, recognising as does WHO that the evaluation of control options must take into account technical, financial, social, health, and environmental factors. WHO calls for precautionary action in any environmental planning situation because traffic noise is a global health problem. Precautionary measures in this Standard such as emphasis on land use planning, and isolation of buildings from traffic noise sources and the selection of LA_{eq}(t) to quantify traffic noise are also consistent with WHO advice.

In addition WHO has set guideline values for industrial, commercial and traffic areas at 70 dBLA_{eq} measured over a 24 hour time period over a lifetime. This criterion is intended to identify long-term exposures which will not result in hearing impairment. All of the external noise criteria in NZS 6806:2010 (the criteria in Categories A and B) are lower than the WHO environmental noise criteria for industrial, commercial and traffic areas.

Who was on the NZS 6806:2010 Standards committee?

A Standards New Zealand committee has been working on the Standard since February 2007. The committee is made up of representatives from a wide range of organisations that include Local Government New Zealand, Ministry of Health, Ministry of Transport, NZ Transport Agency (formerly Transit NZ and Land Transport NZ), Road Controlling Authorities NZ, Department of Building and Housing, NZ Acoustical Society, NZ Institute of Environmental Health, Roading NZ, and Ingenium.

Who should use the Standard?

The main users of NZS 6806:2010 are expected to be local authorities and road controlling authorities to address road traffic noise on new or altered roads, as well as developers who are constructing or altering roads as part of a subdivision or land use development.

The Standard will be of interest to land use and transport planners, road designers, traffic engineers, urban designers, and environmental managers as well as noise professionals.

What are the cost implications of the Standard?

The NZ Transport Agency has tested the implications of applying NZS 6806:2010 to a range of recently completed and current roading projects. This includes State highway and local road projects, new roads and alterations to existing roads. The testing has involved a comparison against the same projects being assessed using the [Transit] NZ Guidelines for the Management of Road Traffic Noise (Transit Noise Guidelines).

The testing suggests that it is possible, using the Standard, to develop noise mitigation packages for any project where the benefits will outweigh the cost of implementing noise mitigation (that is, for every \$1 spent on noise mitigation, \$2 or more in equivalent noise benefits is derived). By contrast, application of the [Transit] Noise Guidelines to the same projects gives more mixed results with some mitigation costs being more than double the benefits.

The testing also shows that, based on the definition of 'altered road', NZS 6806:2010 is unlikely to require expenditure on noise mitigation for the bulk of 'typical' roading projects such as minor intersection upgrades or the construction of new passing lanes. Such projects do not generally cause the 'noise effect thresholds' to be triggered. There will, however, still be costs associated with preparing an appropriate assessment report to demonstrate that this threshold is not exceeded. Costs of noise assessments undertaken in accordance with the Standard are not expected to differ significantly from those currently incurred when applying the [Transit] Noise Guidelines.

The most significant noise mitigation costs are likely to arise when applying the Standard to new roads. Even so, these costs are generally less than the equivalent costs when applying the [Transit] Noise Guidelines to similar projects. This, in part, is due to the inclusion of performance criteria in the Standard for noise mitigation measures such as noise barriers. This means ineffective, costly controls should not be implemented.

What are the proposed benefits of using the Standard?

One of the main benefits aimed to be provided by NZS 6806:2010 is nationally consistent decision-making about the management of road traffic noise effects associated with all types of new and altered roads. The Standard has been developed with input from a wide range of stakeholders with contrasting views. This has the advantage of ensuring that the content is reasonably balanced and avoids undue bias.

The Standard provides a framework that enables a flexible approach to be adopted when developing noise mitigation solutions so that project specific circumstances can be taken into account. Multiple noise mitigation options can be considered for the same project. This allows decision makers to make an informed choice when determining what solution represents the 'best practicable option' for the particular project being assessed.

Unlike the [Transit] NZ Guidelines for the Management of Road Traffic Noise, the Standard does not set absolute noise limits that must always be complied with in specified circumstances. Applying the Standard does not require road controlling authorities (or developers) to implement mitigation works that

are unlikely to achieve noise reductions of at least 3dB $L_{Aeq(24h)}$. This will avoid money being spent on mitigation works which do not achieve any clearly noticeable noise reduction and which could potentially have a range of other effects, such as adverse visual effects or effects on property access.

What about existing roads? How is exposure to elevated levels of road traffic noise from existing roads managed?

Local exposure to road traffic noise is managed through land use planning and the Resource Management Act 1991 (RMA). Land use planning options attempt to address noise in a strategic manner by controlling the effects of road noise from a national, regional or local perspective.

Land use planning processes can be used to address the noise effects by restricting how noise sensitive land uses are developed near existing or planned transport corridors.

Complementary measures such as bylaws (for example, restrictions on engine braking) and urban design can also support land use planning approaches to noise.

The NZ Transport Agency's [ex Transit] Environmental Plan provides a mechanism for retrofitting noise mitigation measures to the existing State highway network according to a weighted set of criteria, provided adequate funding is available.

Are there any National Environmental Standards or National Policy Statements relating to the management exposure to road traffic noise?

There are currently no National Environmental Standards (NES) or National Policy Statements prepared under the Resource Management Act 1991 relating to the management exposure to road traffic noise. The Ministry of Transport (MoT) and Ministry for Environment (MfE) jointly considered the feasibility and need to develop a NES in 2006.

At that time, both Ministries recommended that alternative approaches were more appropriate. As a result a work package consisting of three components was agreed by the Government. This involved:

- Development of this Standard (NZS 6806: 2010).
- Investigating the possibility of introducing new controls on noise emitted by heavy vehicles. This work was subsequently deferred for future consideration by MoT.
- In conjunction with MfE, investigating the use of land use controls to prevent unprotected noise sensitive areas being established in noise affected areas. Both Ministries subsequently reported that there was no need to amend the Resource Management Act 1991 for this purpose and that better use of existing tools would be a more effective way of dealing with the issue.

How does NZS 6806:2010 compare with the [Transit] NZ Guidelines for the Management of Road Traffic Noise (Transit Noise Guidelines)?

There is a range of differences and similarities between the Standard and the [Transit] NZ Guidelines for the Management of Road Traffic Noise.

The most significant difference is that the Standard is based on a flexible set of noise criteria for new and altered roads. In comparison, the criteria included in the [Transit] Noise Guidelines set absolute levels which must be met in specified circumstances.

The Standard applies to all new and altered roads as defined in the Standard whereas the [Transit] Noise Guidelines only apply when changes are made to the designation of a State highway project.

Both the Standard and [Transit] Noise Guidelines use the 24-hour average sound level ($L_{Aeq(24h)}$) metric to describe road traffic noise. They also both use a noise prediction methodology that is based upon the UK Calculation of Road Traffic Noise calibrated to NZ conditions.

Will the Standard replace the [Transit] Noise Guidelines?

The NZ Transport Agency (Transit NZ's successor) has resolved to apply NZS 6806:2010 to all relevant State highway projects from the date of publication. The Standard will be applied on an interim basis for 2 years alongside the [Transit] Noise Guidelines, which are currently included in the NZTA's 'Planning Policy Manual'. During this 2 year period, the value for money delivered by the Standard, relative to the [Transit] Noise Guidelines, will be monitored and assessed. At the end of the 'trial' period, the NZTA will determine whether or not to formally replace the [Transit] Noise Guidelines with the Standard when addressing traffic noise issues associated with new and altered State highways.

How does this Standard relate to the content of District Plans?

District Plans prepared by Territorial Local Authorities (TLAs) under the requirements of the Resource Management Act 1991 can include provisions for addressing the effects of road traffic noise.

A report produced for Land Transport New Zealand in 2006 found that of the 74 TLAs in New Zealand, eleven authorities had District Plan provisions relating to the control of noise impacts on noise sensitive activities. Only three of these eleven authorities had District Plan rules specifically aimed at addressing road traffic noise.

TLA's could consider changing their District Plans to include reference to the Standard or compliance with NZS 6806:2010 in those plans.

What approaches are used overseas to address noise from new and altered roads?

Internationally, many approaches are used to address noise from new and altered roads. Some jurisdictions have comprehensive road traffic noise management policies. Others have specific criteria that apply to different classes of road or requirements that are implemented if road traffic noise effects exceed certain thresholds. Overseas examples include:

- In the UK the 'Noise Insulation Regulations 1975 (amended 1988)' are applied to new and altered highways that meet specific qualifying criteria relating to the noise effects of the project.
- The New South Wales Environmental Protection Agency (NSW EPA) has developed 'Environmental Noise Criteria' that apply to different types of road and land use developments.
- The 'Traffic Noise Analysis Protocol' used by the California Department of Transport provides a mechanism for compliance with USA Federal and State statutory requirements. It is intended to ensure that appropriate noise mitigation is implemented on highway projects where there are significant noise effects.

The Ministry of Transport 2004 report 'Noise Impacts of Land Transport – Stage 3' provides a useful overview of overseas road traffic noise management practice by the OECD, European Union, USA and UK. In addition the NSW EPA 'Environmental Noise Criteria' includes an overview of road traffic noise criteria used in Europe and the USA.

Will NZS 6806:2010 help to control 'peak' noise events from individual vehicles?

This Standard does not provide for the control of 'peak' noise events from individual vehicles. These events include noise caused by truck engine brakes and noisy car exhausts. Control of peak noise is

beyond the direct control of road controlling authorities and developers who are required to demonstrate compliance with the Standard.

The Ministry of Transport administers regulations that seek to control noise emitted from individual vehicles. The maximum sound level (L_{max}) is often used for describing the effect of peak noise events associated with individual vehicles. The Standard does not use the L_{max} metric.

Will this Standard be able to be used to control noise from road construction and maintenance activities?

NZS 6806:2010 does not provide for the control of noise from road construction or maintenance activities. Control of such noise is largely addressed by NZS 6803:1999 *Acoustics – Construction Noise*. In addition many District Plans include specific rules relating to the management of noise from construction and maintenance activities.

What metric is used to describe and assess road traffic noise in the Standard?

NZS 6806:2010 uses the 24-hour average sound level ($L_{Aeq(24h)}$) noise descriptor as the metric for describing the effect of noise from the general flow of vehicles using a road.

What does the Standard consider to be a ‘new’ road?

The Standard defines a new road as any road to be constructed where no previous formed legal road existed.

What does the Standard consider to be an ‘altered’ road?

NZS 6806:2010 should be consulted for a formal definition but effectively considers an altered road to mean any existing road that is subject to alterations of the horizontal or vertical alignment and the alterations cause a change in the noise environment that is in excess of one of the following thresholds at any one or more protected premises or facilities: (‘Protected premises and facilities’ is defined in the Standard to include a range of noise sensitive activities, such as residential activities.)

- the level of noise at least 10 years after the alterations are complete would be greater than or equal to 64 dB $L_{Aeq(24h)}$ and if no specific noise mitigation was undertaken, the alterations would cause an increase in road-traffic noise of at least 3 dB $L_{Aeq(24h)}$ or more; or
- the level of noise at least 10 years after the alterations are complete would be greater than or equal to 68 dB $L_{Aeq(24h)}$ and, if no specific noise mitigation was undertaken, the alterations would cause an increase in road-traffic noise of at least 1 dB $L_{Aeq(24h)}$ or more.

The Standard does not consider maintenance works such as resurfacing and rehabilitation to be altered roads.

As a general rule, a change in noise of 3 dB $L_{Aeq(24h)}$ or more would occur if there was a doubling of the traffic flow, or the distance between the existing road and any protected premises and facilities was halved as a result of alterations.

To simplify the process of understanding whether or not alterations to an existing road constitute an altered road as defined in the Standard, the NZ Transport Agency has developed a web-based screening tool which can be accessed on the website www.acoustics.nzta.govt.nz under the ‘Tools’ tab. The tool is aimed at ‘non-acousticians’ and generally takes a few minutes to complete.

What does the Standard consider to be an 'existing' road?

NZS 6806:2010 defines an 'existing' road as a road that is a formed legal road at the time when the noise effects of a new or altered road are first assessed in accordance with the Standard. It does not include unformed legal roads or 'paper' roads.

What kind of buildings and land use does the Standard seek to protect from road traffic noise?

The Standard seeks to protect sites used for noise sensitive activities and includes: residential properties, early childhood education centres, schools, hospitals, and marae. NZS 6806:2010 defines buildings and land uses covered by the Standard as 'protected premises and facilities'. For a given project, the Standard requires that the premises and facilities that are to be protected from the noise effects arising from that project are to be listed in the relevant RMA approval.

What is a New Zealand Standard?

New Zealand Standards are agreed specifications for products, processes, services, or performance. They are developed by an expert committee using a consensus-based process that allows the public to provide input.

New Zealand Standards are used by a diverse range of organisations to enhance their products and services, improve safety and quality, and meet industry best practice.

What is the status of a New Zealand Standard?

New Zealand Standards are generally voluntary, but can be mandatory when cited in legislation, regulations, or conditions of resource consents or designations. They may also be cited in regulations as one means of compliance with those regulations, without being mandatory.

As Standards are developed independently, and involve industry representatives, they are often more workable and more accepted among industry than prescriptive regulation.

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Helping users to implement the new Standard – guidance and tools

NZ Transport Agency Senior Environmental Specialist Rob Hannaby says a website has been developed to provide supplementary guidance and tools to help people to understand and apply NZS 6806:2010. 'The NZ Transport Agency is also preparing an e-learning package to guide people through NZS 6806:2010 and to help them to understand how to use the Standard on their roading project,' says Rob.

- For more information please visit www.acoustics.nzta.govt.nz or email info@nzta.govt.nz.

Rob says 'NZS 6806:2010 is intended to be used together with the Resource Management Act 1991. The Quality Planning Website will include model provisions relating to the Standard that local authorities can use when developing their plans and policies.'

- Visit the Quality Planning Website at www.qualityplanning.org.nz.

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Where to get more information

The Standard

Order or download NZS 6806:2010 from www.standards.co.nz (enter keyword '6806' into the search panel), or email enquiries@standards.co.nz, or call 0800 782 632 during business hours.

Workshops

The NZ Transport Agency is organising workshops to be held around New Zealand in mid-2010. Details will be made available on the acoustics website (www.acoustics.nzta.govt.nz) when the workshops are finalised. If you would like to register your interest in attending a workshop please email info@nzta.govt.nz.

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Related Standards

- NZS 6801:2008 *Acoustics – Measurements of environmental sound*
- NZS 6802:2008 *Acoustics – Environmental noise*
- NZS 6803:1999 *Acoustics – Construction noise*
- NZS 6805:1992 *Airport noise management and land use planning*
- NZS 6807:1994 *Noise management and land use planning for helicopter landing areas*
- NZS 6808:2010 *Acoustics – Wind farm noise*
- NZS 6809:1999 *Acoustics – Port noise management and land use planning*

Order these Standards from www.standards.co.nz (enter the number into the search panel), or email enquiries@standards.co.nz, or call 0800 782 632 during business hours.