

TECHNICAL  
MEMORANDUM

Noise and Vibration No.3

**To** All suppliers

**Prepared by** Stephen Chiles

**Endorsed by** Rob Hannaby

**Date** 13 December 2013

**Subject** State highway noise and vibration management

## 1 Introduction

The NZ Transport Agency has obligations under the Resource Management Act 1991 and the Land Transport Management Act 2003 to manage noise and vibration from the state highway network. There are no National Environmental Standards, or other mandatory regulations, prescribing how the Transport Agency must meet these obligations. The Transport Agency has therefore developed policies and guidelines, which are summarised in this technical memorandum with respect to:

- Noise and vibration from vehicles on new and altered state highways affecting nearby Protected Premises and Facilities<sup>1</sup> (PPFs),
- Noise and vibration from vehicles on existing state highways affecting nearby PPFs,
- New PPFs being affected by noise and vibration from existing and designated future state highways, and
- Noise and vibration from state highway construction and maintenance affecting nearby PPFs.

These relate to objectives set out in the Transport Agency *Environmental Plan*<sup>2</sup>.

---

<sup>1</sup> As defined in NZS 6806:2010 *Acoustics – Road-traffic noise – new and altered roads*

<sup>2</sup> [www.nzta.govt.nz/resources/environmental-plan/index.html](http://www.nzta.govt.nz/resources/environmental-plan/index.html)

## 2 New state highways

### Noise

For new and altered state highways the Transport Agency assesses road-traffic noise in accordance with the Transport Agency *Guide to assessing road-traffic noise using NZS 6806 for state highway asset improvement projects*<sup>3</sup>. This guide sets out an assessment process based around the New Zealand Standard NZS 6806:2010 *Acoustics – road-traffic noise – New and altered roads*<sup>4</sup>. Where required, the assessment process involves the determination of the best practicable option for noise mitigation. The Transport Agency has produced guides on the three main forms of noise mitigation:

- *State highway noise barrier design guide*<sup>5</sup> (and case studies<sup>6</sup>)
- Draft *Guide to state highway road surface noise*<sup>7</sup>
- Draft *State highway guide to acoustic treatment of buildings*<sup>8</sup>

### Vibration

Vehicles on new and altered state highways generally cause negligible adverse vibration effects. The Transport Agency does not routinely assess vibration for specific new and altered state highway projects, unless, for example, there are PPFs immediately adjacent to a new traffic lane.

There are no applicable New Zealand Standards for vibration from road-traffic. When the Transport Agency does assess road-traffic vibration from new and altered state highways, where practicable it seeks to comply with the Class C levels set out in Norwegian Standard NS 8176E:2005 *Vibration and shock – Measurement of vibration in buildings from landbased transport and guidance to evaluation of its effects on human beings*<sup>9</sup>.

---

<sup>3</sup> [www.nzta.govt.nz/resources/guide-to-assessing-road-traffic-noise/](http://www.nzta.govt.nz/resources/guide-to-assessing-road-traffic-noise/)

<sup>4</sup> [shop.standards.co.nz/catalog/6806%3A2010%28NZS%29/view](http://shop.standards.co.nz/catalog/6806%3A2010%28NZS%29/view)

<sup>5</sup> [www.acoustics.nzta.govt.nz/noise-barrier-design-guide](http://www.acoustics.nzta.govt.nz/noise-barrier-design-guide)

<sup>6</sup> [www.acoustics.nzta.govt.nz/case-studies](http://www.acoustics.nzta.govt.nz/case-studies)

<sup>7</sup> [www.acoustics.nzta.govt.nz/surfaces](http://www.acoustics.nzta.govt.nz/surfaces)

<sup>8</sup> [www.acoustics.nzta.govt.nz/buildings-design-guide](http://www.acoustics.nzta.govt.nz/buildings-design-guide)

<sup>9</sup> [www.standard.no/en/](http://www.standard.no/en/)

### 3 Existing state highways

#### Noise

The Transport Agency seeks to reduce exposure to high traffic noise levels from the existing state highway network in a number of ways. These include good practice measures in road maintenance and resurfacing as set out in the draft *Guide to state highway road surface noise*, and initiatives to manage noise from individual vehicles such as heavy vehicle engine braking noise<sup>10</sup>.

Previously, the Transport Agency had a voluntary 'Noise Improvement Programme (NIP)' as set out in the Transport Agency *Environmental Plan*. This programme provided a process for identifying sections of the existing state highway network with elevated levels of road-traffic noise and to prioritise these sections for noise mitigation measures. The programme was stopped in July 2011 due to constrained funding.

The Transport Agency may use strategic mapping, as set out in the draft *Guide to state highway road surface noise* to identify where PPFs are subject to high noise exposures from the existing state highway network. This process may be used to inform the development of forward maintenance programmes for road surfacing. If there are areas identified where road-traffic noise might be considered unreasonable under Section 16 of the Resource Management Act the Transport Agency will develop a business case to establish whether noise mitigation measures are required for legal compliance.

#### Vibration

In the Section 5.5 of the Transport Agency *State highway control manual*<sup>11</sup> there is a provisional vibration policy which relates to two specific parts of the network in Napier and Taneatua. The provisional policy sets out a process for addressing complaints about road-traffic vibration, including details on measurements and criteria. This provisional policy is not used nationally. Most vibration complaints are related to road surface condition, which is addressed in the draft *Guide to state highway road surface noise*. In response to complaints, the Transport Agency will investigate and, if appropriate, seek to mitigate road-traffic vibration in PPFs found to be exceeding Class D in NS 8176.

---

<sup>10</sup> [www.acoustics.nzta.govt.nz/transport-agency-publications](http://www.acoustics.nzta.govt.nz/transport-agency-publications)

<sup>11</sup> Transit State highway control manual SM012, version 5, March 2007

## 4 New PPFs

In order to manage road-traffic noise and vibration in relation to PPFs close to state highways the Transport Agency has developed a *Reverse sensitivity policy and guidelines*<sup>12</sup>. Reverse sensitivity is the vulnerability of an established activity to objection from a new land use and typically arises where incompatible land uses are located in close proximity to each other, resulting in the potential for conflict and complaints from the more sensitive activity.

The *Reverse sensitivity policy and guidelines* are based on a shared responsibility for managing the effects of reverse sensitivity where new PPFs wish to establish near state highways. This means the Transport Agency, councils, landowners and developers must all assume some level of responsibility for managing reverse sensitivity effects.

To address noise and vibration reverse sensitivity issues, the Transport Agency requests district plan rules and resource consent conditions for new and altered PPFs near state highways. These requirements are for a setback from the state highway, and building designs to achieve appropriate internal noise levels. The criteria can result in buildings needing mechanical ventilation so windows can be kept closed, and other improvements. The distances within which the requirements apply depend on the traffic volume and speed of the state highway.

The *Reverse sensitivity policy and guidelines* are currently being reviewed and updated (2013/2014). The same general approach will be followed, but methods will be updated and expanded, and further guidance will be provided.

## 5 State highway construction and maintenance

The Transport Agency manages construction and maintenance noise and vibration in accordance with the *State highway construction and maintenance noise and vibration guide*<sup>13</sup>. The guide sets out criteria, processes, noise and vibration predictions/measurements and management. The processes include the use of Transport Agency templates<sup>14</sup> and web-based tools<sup>15</sup>.

---

<sup>12</sup> [www.nzta.govt.nz/resources/planning-policy-manual/docs/planning-policy-manual-appendix-5D.pdf](http://www.nzta.govt.nz/resources/planning-policy-manual/docs/planning-policy-manual-appendix-5D.pdf)

<sup>13</sup> [www.nzta.govt.nz/resources/sh-construction-maintenance-noise](http://www.nzta.govt.nz/resources/sh-construction-maintenance-noise)

<sup>14</sup> [www.acoustics.nzta.govt.nz/templates](http://www.acoustics.nzta.govt.nz/templates)

<sup>15</sup> [www.environment.nzta.govt.nz/project](http://www.environment.nzta.govt.nz/project)