Managing effects on and from the operational state highway network

Planning Policy Manual

NZ Transport Agency operational transport and land use planning guidance

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NZ TRANSPORT AGENCY
WAKA KOTAHI

Te Kāwanatanga o Aotearoa
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Document History

Date	Authors	Description of changes
11 September 2025	Cath Heppelthwaite, Caroline Horrox, Richard Jackett	New Standard

Contents

1. Purpose

This guidance forms part of the Planning Policy Manual (PPM) which provides a hub for operational transport and land use planning guidance to assist NZ Transport Agency staff and external stakeholders to navigate through relevant planning processes. PPM guidance is grouped into three parts:

- **Part I Third party land use developments**
- Part II Operational responses to The NZ Transport Agency strategic planning policy direction
- Part III Planning the transport network

This guide is part of the PPM Part I.

2. Scope

This guide sets out the NZ Transport Agency Waka Kotahi (NZTA) approach for:

- managing adverse effects of third-party land use and development on the safe and efficient operation of the state highway network
- managing adverse effects from the operation of the state highway network on adjacent land use activities
- implementing methods to manage potential operational noise and vibration effects on new or altered sensitive activities near the state highway

The guide supersedes the '*Guide to the management of effects on noise sensitive land use near to the state highway network,* September 2015, Version 1.0 and *Appendix 5D* to the NZ Transport Agency Planning Policy Manual.

The guidance does not address the management of effects associated with the construction of new state highways or major upgrades. For more information on these issues refer to NZTA's Z19 Taumata Taiao – Environmental and Sustainability Standard and the Highway Structures Design Guide.

3. Introduction

The state highway network is an essential part of New Zealand's transport system; connecting towns and cities for inter-regional journeys and providing access to economic, social, educational and recreational opportunities.

The operation and maintenance of the state highway network can potentially cause adverse effects on people and the environment that extend beyond the state highway boundary, such as:

- noise and vibration
- lighting/glare
- dust
- non-point source pollution e.g. stormwater run-off or spray-drift.

Development and land use activities adjacent to the state highway network can also potentially cause adverse effects on its safe and efficient operation, including:

- adverse effects on the state highway asset itself (eg stability of structures, effects on the stormwater system, efficiency of the transport network)
- increased risks to the safety of transport corridor users (eg glare, distraction, unsafe manoeuvres)
- reverse sensitivity effects on the transport network as a result of adjacent sensitive land uses.

Managing the effects both on and from the operational state highway network is primarily governed by the Resource Management Act 1991 and the hierarchy of policies and plans underneath it (eg national policy statements, national environmental standards, regional and district plans). In addition to statutory requirements, NZTA has a suite of environmental policies and standards which influence the way state highway effects are managed. NZTA also utilises provisions under the Government Roading Powers Act 1989, which include the authority to regulate direct access onto state highway and manage related impacts.

NZTA is committed to ensuring that the long-term functional needs of state highways are recognised and provided for and that new sensitive developments near state highways address potential adverse effects on occupants.

4. Effects from the transport network on adjacent land uses

The operation and maintenance of the state highway network can potentially cause adverse effects beyond the state highway boundary. Those effects are typically managed through conditions on the designations and resource consents that authorise relevant sections of the network.

In addition, NZTA has a suite of environmental and sustainability policies, standards, specifications and guidance relevant to state highway maintenance work and operations (as well as new and altered state highways), including but not limited to:

- air quality
- noise and vibration
- biodiversity
- contaminated land
- heritage and archaeology
- resource efficiency and waste minimisation
- stormwater management

NZTA's Z/19 Taumata Taiao – Environmental and Sustainability Standard sets out the requirements for how and when to apply NZTA environmental and sustainability policy, strategy and legislative requirements.

More detailed information on these policies and standards is available on the NZTA Website. Managing noise and vibration effects is also specifically addressed in this document.

5. Effects of land use development on the state highway network

The state highway network is nationally significant infrastructure, and it is important to protect its continued safe, effective and efficient operation. The main effects from land use development activities on the state highway network and the mechanisms NZTA use to manage these are outlined in the table below.

Table 1 Managing effects on the state highway network from third party development

Effect	Management
Transport	Land use developments can have a range of functional and operational effects on the transport network, including impacts on the safety for users, transport mode choice, level of service, network efficiency and maintenance. To manage these impacts, guidance has been developed under NZTA's Policy Planning Manual guidance on integrated transport assessments and state highway design and access requirements.
Building reflectivity	Effects can arise where buildings or structures reflect sunlight, headlights or other light sources. They can pose a risk to drivers by distraction or 'sunstrike' type events. Minimising or avoiding these effects will remove a potential risk to road user safety. Sunlight related reflectivity should be considered for a range of times during the day and year. Developers should ensure non-reflective materials are used on buildings where there would otherwise be potential for adverse glare effects on state highway users.

Effect	Management
Lighting glare / overspill	Lighting glare or overspill can distract drivers (particularly high luminance levels in generally dark rural environments) and detract from visibility of road signage or traffic lights. Sources can include illuminated private signs and billboards, and floodlit sports grounds. Ensuring lighting is set at an appropriate level will reduce potential driver distraction and lower road safety risk. Further guidance on assessing lighting for signs refer to the Planning Policy Manual Third party signs on and visible from the state highway corridor guidance.
Dust or spray drift	These are likely to be temporary effects. Both are a potential 'nuisance' and could result in driver distraction and increased risk to all road users. Dust and spray drift should be managed by landowners via compliance with district and regional plan or bylaw requirements and in accordance with any resource consent conditions.
Signs	Signs are designed to attract attention. Third party advertising signs can distract or confuse transport users. Access to these signs for maintenance may also impact transport network safety and operation. Signs located within the state highway corridor are subject to the NZ Transport Agency (Signs on State Highways) Bylaw 2010. Signs on private property visible from the state highway network are usually subject to district plan requirements or council bylaws. For detailed guidance on NZTA requirements relating to advertising signs visible from the state highway refer to the Third party signs on and visible from the state highway corridor guidance.
Stormwater	Stormwater runoff from adjacent land can adversely impact the state highway network by creating flooding, erosion and land stability issues. Stormwater from land use developments that ends up in state highway stormwater infrastructure can result in network capacity constraints and can adversely impact the quality and quantity of the discharges from the state highway infrastructure to the receiving environment. This can affect NZTA's ability to comply with regional plan provisions and stormwater discharge consent conditions. To avoid these impacts, stormwater runoff from land use developments should be either managed internally within development areas or connect into the reticulated local council stormwater network (where this exists). In each case stormwater runoff must comply with territorial authority and regional council stormwater management requirements.
Reverse Sensitivity to state highway operations	Reverse sensitivity is the vulnerability of an established land use (here, state highways) from a new 'sensitive' land use (for example, new or altered houses and other noise-sensitive activities constructed next to the state highway). This can potentially compromise the state highway by restricting how it can operate. It is established in law that reverse sensitivity is an adverse effect, and should therefore be avoided, remedied or mitigated[1]. There are often unavoidable noise and other effects associated with the construction, maintenance and normal operation of state highways. Tension can therefore arise between the need to operate and maintain a safe and efficient highway network and the effect on neighbouring landowners. Minimising conflicts creates social benefits in that it addresses potential impacts on sensitive receivers (such as those living next to a state highway) while allowing for the safe and efficient movement of people and goods. This is best achieved through careful planning of both the state highway network and the appropriate location and/or design of sensitive activities to minimise their exposure to operational effects from the transport network. Sensitive activities can include residential accommodation, schools and childcare facilities, hospitals, and residential and visitor accommodation. Noise and vibration effects management (described in **Section 5.2**) is a key focus area for NZTA to help avoid or address reverse sensitivity issues.

[1] Ngatarawa Development Trust Limited v The Hastings District Council W017/2008 [2008] NZEnvC 100 (14 April 2008)

<table>
<tr><th>Effect</th><th>Management</th></tr>
<tr><td>Noise and vibration</td><td>
The construction, upgrade, operation and maintenance of the transport network produces noise and vibration. Sensitive activities adjacent to the transport network can be exposed to these emissions which may lead to health impacts, and/or the perception of such impacts, along with consequential reverse sensitivity effects on the transport network (where the transport network was in existence or planned first).
It is accepted nationally and internationally that noise from transport networks has the potential to cause human health effects[2]. The World Health Organisation (WHO) Europe Guidelines[3] recommend policymakers reduce noise exposure from transport networks to below a range of guideline values. State highways pass through both urban and rural areas and most have sufficient traffic volumes to generate noise above WHO Europe Guideline levels, indicating there will be impacts on human health where noise-sensitive activities locate nearby.
NZTA employs and promotes a range of mechanisms to minimise the adverse effects of noise on sensitive activities adjacent to the state highway network. These include:

State highway and pavement design measures
Promoting district plan controls to managing ‘effects areas’ close to the state highway
Subdivision design and layout to minimise the location of sensitive land uses near state highways
Use of noise barriers
Building design measures to reduce internal noise levels

These methods are outlined in detail in Section 5.2.
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5.1 Mechanisms to manage effects from third party development

NZTA’s preferred mechanisms to manage effects from third party development on the state highway network include the following:

- Working with local authorities to include provisions in regional and district planning mechanisms[4] to minimise the impacts developments may face from existing or designated (but not constructed) state highways. This can involve:
  - Advocating for objectives and policies that recognise the national/regional significance of state highways
  - Requesting performance standards for noise and vibration sensitive activities and/or land development site layout to reduce the transmission of, or exposure to noise.
  - District plan provisions and associated standards for noise barriers, building design, setbacks from major arterial roads, site layout and building orientation, and restrictions on certain land uses near existing or planned road corridors
- Submitting on land development consents to ensure effects on the transport network and on users and occupiers of developments are avoided, remedied or mitigated, and that consent conditions oblige developers to internalise measures required to minimise impacts from the state highway network on the proposed land development
- Seeking side agreements or encumbrances/covenants on land adjacent to the state highway to manage reverse sensitivity issues.

[2] World Health Organisation (WHO), Environmental noise guidelines for the European region, 2018.
[3] The WHO Europe Guidelines are based on a critical review of academic literature and follow a rigorous protocol to assess the evidence of adverse effects.
[4] Such as regional policy statements, regional land transport strategies, regional plans, regional growth strategies, structure plans and district plans.

- Managing physical access onto the state highway on limited access roads through the Government Roading Powers Act 1989.

5.2 Methods to manage state highway noise and vibration effects

NZTA promotes a range of methods to reduce health effects (and in turn reverse sensitivity) associated with noise and where applicable, vibration.

In the first instance, NZTA seeks to avoid noise and vibration effects by ensuring sensitive development is located sufficiently distant from the state highway to avoid potential conflicts. Where sensitive development is to be located close to the state highway, NZTA seeks to avoid or minimise effects through development design and building location/layout. Where neither of these methods are possible, NZTA seeks measures to address noise via building design.

Responsibility for managing operational noise and vibration effects on new or altered sensitive activities adjacent to or near the transport network is a responsibility shared between NZTA, local authorities (regional, city and district councils) and landowners and developers.

5.2.1 NZTA measures for roads

For new or altered roads, NZTA manages noise effects in accordance with NZTA's Z19 Taumata Taiao – Environmental and Sustainability Standard. Generally, the focus is on achieving acceptable internal and external noise outcomes for existing noise-sensitive activities near to the road[5].

On existing state highways, NZTA surveys pavement conditions regularly and adopts good practice measures to manage road surface noise and vibration where practicable. Longer term, NZTA has a programme in place to investigate surfacing options including make standard pavement surfaces quieter. NZTA also investigates noise and vibration complaints and addresses these as required.

5.2.2 District plan land use controls – effects areas

NZTA actively promotes the inclusion of appropriate regulatory controls in district plans that require new or altered sensitive activities to protect themselves from significant state highway noise effects.

NZTA promotes the identification of 'effects areas', within which controls are imposed to manage the impacts on noise sensitive activities. The extent of the effects area is defined on a case-by-case basis, utilising modelled noise contours to ensure land use controls are commensurate with risk[6]. NZTA limits consideration of potential effects areas to a maximum of 100m from state highways. While some effects may extend further, 100m has been selected as a pragmatic value to capture significant effects. Our noise effects management approach is demonstrated in **Figure 1.**

NZTA have completed noise modelling for all state highways across NZ to identify noise contours[7]. These have been mapped and are available from NZTA's open data maps portal: https://nzta.maps.arcgis.com/home/index.html

Using the noise contours, additional spatial processing is required to identify a 'Noise Control Boundary Overlay'[8] to include in individual district plans. As district plans are reviewed, we will seek to replace any previous buffer and effects areas in district plans with this refined approach.

NZTA has prepared a Resource Management Act Section 32 Assessment[9] to support district plan provisions and effects assessments to manage the health effects of noise on the occupants of noise sensitive activities near state highways. To request a copy of this assessment email: **environmentalplanning@nzta.govt.nz**

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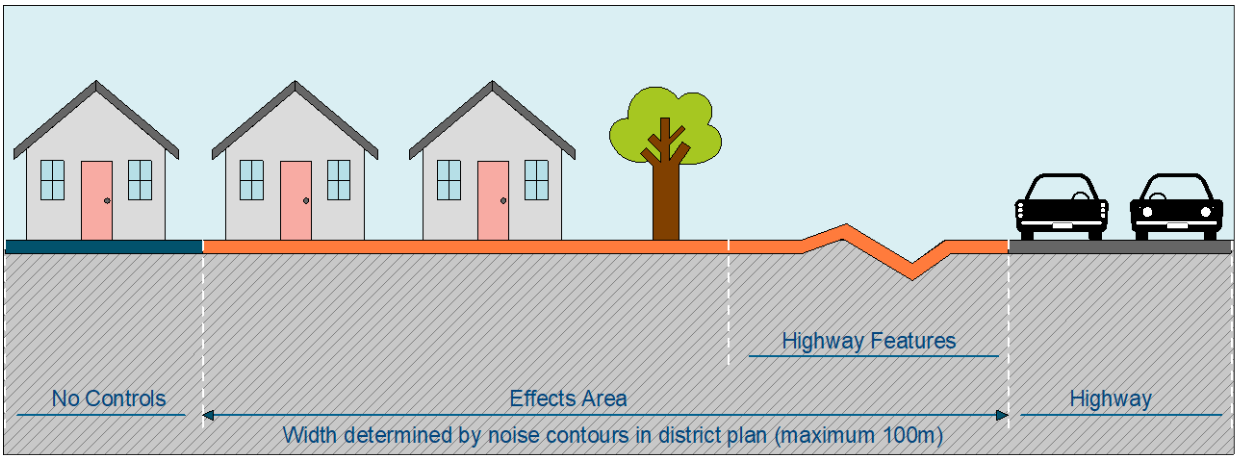
[5] For more information refer to https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/noise-and-vibration/assessment/nzs-6806/
[6] Previously, NZTA relied on fixed distances to define both 'no build buffer' areas and 'effects' areas. Buffer areas and fixed distances are no longer preferred.
[7] These contours will require refreshing in future to reflect changes to the network and surrounding buildings
[8] In accordance with the National Planning Standards Mapping Standard.
[9] Contact EnvironmentalPlanning@nzta.govt.nz for more information

Figure 1 Noise effects area adjacent to state highway



District plan provisions sought by NZTA are intended to apply to all new and altered noise sensitive activities (as identified in **Table 1**) within the 'effects area'. Provisions sought may include:

- Definition of 'noise sensitive activity'
- Internal noise criteria (as per **Table 2)**
- Ventilation requirements where internal noise criteria apply
- Outdoor living space requirements
- Setback provisions to limit potential vibration effects or an internal vibration criterion
- A district plan map layer showing the 'effects area' within which provisions apply. This is described as the Noise Control Boundary Overlay (NCBO).

Provisions can be integrated in plans with controls for local arterial roads and rail.

Councils should identify potential state highway noise effects when processing resource consent applications for developments. These should align with the 'effects area' where this is identified in a district plan or within 100m where there are no district plan controls.

5.2.3 Subdivision and development design

For developments close to existing (including designated but not constructed) state highways, the preferred way to minimise noise effects is through subdivision and development design that utilises non-sensitive spaces as a buffer between the state highway and noise sensitive land uses. Examples of this could include local roading, stormwater management infrastructure, and ancillary buildings. Site layout and building orientation can also help to manage effects (eg locate bedrooms away from the highway).

5.2.4 Noise barriers

Noise barriers (bunds/walls) can be incorporated inside the subdivision beside the highway boundary to control outdoor and indoor noise. Effective noise barriers are typically 3m high with returning at their ends.

5.2.5 Building design to manage internal noise design levels

Where the above options are not available, developments will be required to mitigate noise effects through the use of building design mechanisms to achieve the indoor noise criteria.

New or altered buildings containing noise sensitive activities should be designed, constructed and maintained to meet the internal noise levels set out in **Table 2**. Noise levels are defined in decibels, dB $L_{Aeq(24h)}$. This represents the average noise level over 24 hours.

Table 2 Design parameters for sensitive activities

Building Type	Occupancy/ Activity	Maximum indoor noise level $L_{Aeq(24h)}$
Residential	• Living space, sleeping spaces (including visitor and retirement accommodation)	40 dB
Educational	• Assembly halls • Lecture rooms and theatres • Music studios	35 dB
	• Conference rooms • Drama studios • Sleeping areas in education facilities • Teaching areas	40 dB
	• Libraries	45 dB
Health	• Overnight medical care, wards • Clinics, consulting rooms, theatres, nurses' stations	45 dB
Cultural buildings	• Places of worship • Marae	35 dB

The noise limits in **Table 2Table 2** are based on NZS 6806 and AS/NZS 2107:2000. In AS/NZS 2107 there is a "satisfactory" and "maximum" value given for each type of space. In **Table 1**, the maximum levels have generally been selected in recognition of the environment near a state highway. The noise levels relate to the sensitivity of each activity, for example activities requiring active listening (e.g. learning environments) can be more sensitive to external noise than sleeping. The noise levels in **Table 1** are not conservative and developers may wish to achieve lower maximum indoor noise levels.

Internal noise levels have been specified rather than a façade reduction, to consider the actual road traffic noise level outside a building. This approach is consistent with NZS 6806.

5.2.6 Ventilation design

Where closed windows are necessary to achieve specified internal noise levels, mechanical ventilation/ and temperature control (of an appropriate standard) will be necessary. In this situation the following specifications are recommended[10]:

1. For habitable rooms for a residential activity, mechanical ventilation/cooling must:
    a. satisfy clause G4 of the New Zealand Building Code; and
    b. be adjustable by the occupant to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour; and
    c. provide relief for equivalent volumes of spill air; and
    d. provide cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18 °C and 25 °C; and
    e. not generate more than 35 dB LAeq(30s) when measured 1 metre away from any grille or diffuser.

[10] Recommendations are based on the Ventilation systems installed for road-traffic noise mitigation report prepared for NZ Transport Agency by Beca Ltd, 2014.

2. For other spaces, mechanical ventilation/cooling should be as determined by a suitably qualified and experienced person.

Ventilation and cooling systems must comply with district plan provisions for noise emissions to neighbouring property. This may constrain the location of external equipment and air grilles, and/or require screening and attenuation.

The indoor noise limits for ventilation systems are lower than the 40 dB $L_{Aeq(24h)}$ road-traffic noise limit to avoid a cumulative effect.

5.2.7 Vibration design levels

Where a district plan includes provisions for assessment and design to manage vibration generated by the state highway, compliance with Class C vibration limits from NS 8176:2017 *Vibration and Shock: Measurement of Vibration in Buildings from Land Based Transport and Guidance to Evaluation of its Effects on Human Beings* is the preferred approach.

The Norwegian Standard is utilised as there no New Zealand or Australian standards. Class C has an upper limit of 0.3 mm/s vw,95 and this limit can be expressed within a district plan rule.

5.2.8 Applicability and Design Certification

NZTA will seek confirmation of design specifications relating to internal noise levels, ventilation and vibration design levels (as outlined above) prior to construction by a suitably qualified and experienced person as outlined in NZTA Z/19.

In the design and certification, an allowance of 3 dB should be included to partially account for the inherent uncertainty of both noise predictions and measurements, and also normal changes in road and traffic conditions, such as from routine resurfacing and traffic growth or composition change. This 3 dB allowance is practical to include when designing and constructing a new building. If not included, it may be difficult to address any discrepancies in assumed noise levels retrospectively over the building's lifespan. The same 3 dB allowance is used when preparing a 'Noise Corridor Boundary Overlay' based on modelled noise contours.

6. Summary of effects management methods

Table 3 Noise and vibration effects management methods and responsibilities

Party	Effects management measures
NZTA	• Work with local authorities to have objectives, policies and rules adopted in regional and district planning instruments to minimise the degree to which developments will be adversely affected by an existing state highway • Manage noise effects in accordance with NZTA's Z19 Taumata Taiao – Environmental and Sustainability Standard. • Employ good practice maintenance and construction measures to manage road surface noise and vibration (including communications with landowners and other stakeholders) • Utilise noise barriers on the state highway where appropriate • Influence development (location and design) through involvement in resource consent and other RMA processes, as well as using its GRPA powers in relation particularly to accessing highways.
Council	• Regional Councils to include objectives and policies in their regional policy statements and plans to recognise and protect state highways as regionally significant infrastructure

Party	Effects management measures
	• Territorial and unitary authorities to utilise land use controls in district plans that alert landowners to the potential for effects and require appropriate responses from them to avoid or mitigate these in 'effects areas' • Identify NZTA as an affected party for activities requiring resource consents close to the state highway
Developer	• Subdivision/ development design to position sensitive land uses away from the state highway • Utilise noise barriers to minimise noise effects • Utilise building design measures to manage internal noise levels

7. References

Topic and link	Details
Written approval from NZTA	Information on the process and requirements associated with development near the state highway.
Air Quality	CASANZ (Clean Air Society of Australia and New Zealand) Good practice guide for the assessment and management of air pollution from road transport projects (executive summary)
Noise	Webpage with information on NZTA noise related policy and guidance
Integrated transport assessments	PPM guidance on transport assessment requirements
Signs on or visible from the state highway	PPM guidance on third party advertising signs near or on the state highway
NZTA Maps Portal	Road-traffic Noise Contours