

**Before Independent Hearing Commissioners  
In Ngāruawāhia**

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Under the Resource Management Act 1991

In the matter of of a submission by NZ Transport Agency (Waka Kotahi)  
(submitter 742, further submitter 1202) on the Proposed  
Waikato District Plan

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**Statement of evidence of Michael Wood for Waka Kotahi – Planning and  
Corporate**

29 September 2020

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## **1 Qualifications and experience**

- 1.1 My full name is Michael Blain Wood. I am a Principal Planning Advisor with Waka Kotahi where I have been employed since June 2014.
- 1.2 I hold a Masters' in Resource and Environmental Planning (MRP) from Massey University in 2001. I am a full member of the New Zealand Planning Institute. I have 17 years' planning experience both within the public and private sector.
- 1.3 My key responsibilities at Waka Kotahi include working with local councils on district plan reviews and plan changes, assessing land use development applications and contributing to business cases for capital works.
- 1.4 I am also involved in the delivery of the Waka Kotahi capital works programme through the statutory consenting process. This involves stakeholder engagement and reviewing notices of requirement and resource consents prepared on behalf of Waka Kotahi.
- 1.5 In relation to the Proposed Waikato District Plan (PWDP), I am project managing the Waka Kotahi overall response to the Plan; this has included providing evidence and/or supporting consultants at a number of earlier hearings.
- 1.6 I have authority to give evidence on behalf of Waka Kotahi.

## **2 Code of conduct**

- 2.1 While I acknowledge that I am an employee of Waka Kotahi, I have read and am familiar with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014). I have complied with it in the preparation of this summary statement and during expert witness conferencing. I also confirm that the matters addressed in this statement are within my area of expertise, except where I rely on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## **3 Scope of evidence**

- 3.1 My evidence addresses the following:
  - a Managing road noise on sensitive land uses from the state highway network in the PWDP; and
  - b The use of Integrated Transport Assessments (ITAs) in the PWDP.

- 3.2 I have read the transportation evidence prepared by Robert Swears and the noise and vibration evidence prepared by Dr Stephen Chiles on behalf of Waka Kotahi and support the recommendations made.

#### **4 Summary of evidence**

- 4.1 I have reviewed the s42A Infrastructure reports and largely agree with the recommendations in those reports. My evidence focusses on matters which I consider require further amendments and those matters where I wish to reiterate my support for the s42A recommendations due to their significance to the operations of Waka Kotahi. In summary:

- a I support the recommendations on the management of road noise traffic from state highways on sensitive land uses; except for the amendments outlined in paragraph 7.4 of my evidence. These amendments relate to the application of these rules to the Business zone and outdoor areas and the noise and vibration measurement requirements.
- b The PWDP should be amended to provide a policy approach which recognises the need for reverse sensitivity effects to also apply to planned infrastructure (not just existing infrastructure as currently drafted).
- c The PWDP should be amended to include a new rule to require ITAs for new development based on a combination of traffic thresholds and the function of the road (providing access to the new development) in the roading hierarchy. The PWDP currently does not provide a clear signal as to when an ITA is required or what level of detail needs to be provided. A new rule is included in **Annexure C** to my evidence.

#### **5 Managing road noise and vibration on sensitive land uses from the state highway network**

- 5.1 Waka Kotahi lodged submission points 742.244 and 742.182 which relates to the inclusion of new rules in the PWDP to protect sensitive activities from road traffic noise and vibration alongside state highways. These new rules would replace the current “no build” setbacks established in the PWDP. I note that in his evidence at paragraph 1.11, Mr Chiles considers it appropriate that these new rules apply together with the residential zone building set back rules. Notwithstanding this, and the fact that Waka Kotahi has provided previous evidence on changes it has

requested to the “no build” setbacks,<sup>1</sup> it is the preference of Waka Kotahi for the setbacks to be deleted entirely and replaced with the new set of rules for the reasons set out below.

- 5.2 The new rules are, in part, set out in the s42A report - Section 18 Rail corridor and State Highways (Report D0 – Infrastructure and Energy).<sup>2</sup> The relief sought by the Waka Kotahi submission is consistent with the KiwiRail submission point (986.51). As noted in the s42A report, the proposed provisions have been worked on collaboratively between both agencies. The full rule set proposed (as it relates to state highways) is contained in **Annexure A** of my evidence. While the **Annexure A** rules are similar to the s42A recommendations, there are a few additions/clarifications which I have marked up.
- 5.3 Set out below is some background as to why this approach is important in terms of the statutory duties of Waka Kotahi to manage the state highway network.

***Statutory direction and responsibilities for managing road traffic noise and vibration***

- 5.4 The functions of Waka Kotahi are set out in s95(1) of the Land Transport Management Act 2003 (LTMA) and include requirements to:
- a Contribute to an effective, efficient, and safe land transport system in the public interest;<sup>3</sup> and
  - b Manage the state highway system, including planning, funding, design, supervision, construction, and maintenance and operations, in accordance with the LTMA and the Government Roading Powers Act 1989.<sup>4</sup>
- 5.5 The LTMA requires that in meeting its statutory objectives and undertaking its functions, Waka Kotahi “must exhibit a sense of social and environmental responsibility”.<sup>5</sup> Waka Kotahi takes those social and environmental responsibilities seriously. Transport noise can cause a range of impacts on people and communities including annoyance and interference with daytime activities such as work, study and domestic living.<sup>6</sup> Other effects include potential

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<sup>1</sup> See Waka Kotahi evidence for the Residential, Country Living, Rural, Business and Village Zone Topics. In summary, that evidence sought to increase the setback distances from the state highway network (in the absence of the new rule approach which Waka Kotahi prefers and is set out in this statement of evidence).

<sup>2</sup> S42A Report, 18.3.

<sup>3</sup> Section 95(1)(a), LTMA.

<sup>4</sup> Section 95(1)(c), LTMA.

<sup>5</sup> Section 96(1)(a), LTMA.

<sup>6</sup> See Annexure B (s32), section 21. Reference to WHO Guidelines for Community Noise.

sleep disturbance and long-term health impacts such as increased stress and hypertension.<sup>7</sup>

- 5.6 To ensure the land transport system enables better environmental outcomes, the current Government Policy Statement on Land Transport 2018/19-2027/2028 has a strategic priority to reduce the negative effects of transport recognising the public health benefits of reducing the harmful effects of land transport related noise.
- 5.7 As the road controlling authority responsible for the state highway network, Waka Kotahi looks to avoid unreasonable noise effects associated with traffic using the state highway. Sections 16 and 17 of the RMA also set out a number of requirements relating to avoiding and mitigating adverse environmental effects including in relation to noise.

***What is the role of Waka Kotahi in managing road traffic noise?***

- 5.8 Waka Kotahi recognises that constructing, operating and maintaining state highways can impose adverse effects on communities and the environment, and takes all practicable steps to manage noise and vibration emissions, and other adverse effects.
- 5.9 On new and altered state highways, Waka Kotahi routinely uses low-noise road surfaces; wider designations (where land use permits) and noise barriers to reduce noise levels. The construction of the Waikato Expressway provides an example of this approach (see Drawings 1 and 2 below).



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<sup>7</sup> See Annexure B (s32), section 21.

Drawing 1 - Noise wall constructed by Waka Kotahi – State Highway 1 (Tamahere) as part of upgrade works



Drawing 2 - Earth works (bundling) approach – State Highway 1 Expressway section between Taupiri and Hamilton

- 5.10 In cases where there is unavoidable high noise exposure, Waka Kotahi acoustically treats existing individual buildings as part of new or altered state highway projects. This approach has been undertaken during the construction of the Waikato Expressway.
- 5.11 Because existing state highways, like State Highway 39, 23, 26 and 21, were designed and constructed to the relevant standards at the time, there are often limited practicable opportunities<sup>8</sup> to further mitigate adverse road-traffic noise and vibration effects. On these “older” style state highways, Waka Kotahi adopts good practice measures to manage road surface noise and vibration rather than undertaking substantial (capital works) noise mitigation. In some cases, resurfacing treatments will be undertaken as part of maintenance works (typically in built up urban areas only where there are more existing sensitive activities). Waka Kotahi also investigates noise and vibration complaints and addresses issues where practicable, such as following up with truck operators using noisy engine brakes.
- 5.12 For maintenance works on these state highways, Waka Kotahi adopts good practice environmental management processes. This includes using noise and vibration management plans to determine the controls necessary to minimise any adverse effects.

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<sup>8</sup> Typically, older state highways do not have wider designations to allow for buffer areas or other mitigation like noise bunds.

***The role of councils and landowners/developers in managing the effects of road traffic noise from the state highway***

- 5.13 For new and altered noise sensitive land use activities establishing near existing or planned state highways, I consider that the responsibility lies with councils to include appropriate land-use controls in district plans, and on landowners/ developers to implement them.
- 5.14 In the case of the PWDP, the Council addresses the effects of road traffic noise on noise sensitive land use activities primarily through the use of building setbacks in relation to the Waikato Expressway and other national routes (State Highways 2, 21, 23, 26, 39). These setbacks apply in the Residential, Rural, Countryside Living and Village Zones<sup>9</sup>. The setback is 35 metres (except in the Residential Zone where the set back is 25 metres) from the designated boundary of the Waikato Expressway and 15 metres from the boundary of a national route (which incorporates all other state highways). Buildings containing sensitive land use activities within these buffer distances are listed as Discretionary Activities.

***Proposed approach for managing road traffic noise effects and vibration from state highways***

- 5.15 The Waka Kotahi proposed approach to managing the effects of road traffic noise and vibration from state highways on sensitive land uses is set out in **Annexure A**. These rules, reflect to a large extent, the Waka Kotahi *Guide to the management of effects on noise sensitive land uses near to the state highway network (2015)*.<sup>10</sup> This guide describes how Waka Kotahi, working together with local authorities and landowners/developers, manages reverse sensitivity effects from noise and vibration sensitive activities. Appropriate setback distances and criteria for acoustically treating buildings are provided, together with model district plan rules and resource consent conditions.
- 5.16 A s32<sup>11</sup> analysis has been developed by Waka Kotahi in support of its proposed approach in relation to the management of the effects of noise on sensitive activities (see **Annexure B**). This s32 analysis<sup>12</sup> has been developed to address plan changes and plan reviews (like the PWDP) throughout New Zealand. I consider that the analysis undertaken in this document directly applies to the Waikato District.

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<sup>9</sup> Rule 16.3.9.2, 22.3.7.2, 23.3.7.2, 24.3.6.2.

<sup>10</sup> <https://www.nzta.govt.nz/assets/resources/effects-on-noise-sensitive-land/effects-on-noise-sensitive-land-use.pdf>

<sup>11</sup> Section 32 Assessment for Plan Provisions to Provide for Human Health and Amenity (Waka Kotahi, September 2020).

<sup>12</sup> The document is still in draft format; it has been through a substantial internal review process and is expected to be made final shortly. I do not expect any material changes to this document.

- 5.17 The s32 document demonstrates that Waka Kotahi has undertaken a process to assess all reasonable alternatives to managing the adverse effects of road traffic noise and vibration from state highways on sensitive land uses.
- 5.18 In respect to the PWDP, the changes to the rules proposed in **Annexure A** of my evidence are in line with the rules set out in Attachment 2 of the s32 document. There are minor wording differences relating to the assessment criteria, but I do not consider these changes are material.
- 5.19 In summary, the proposed approach seeks to manage the adverse effects of road traffic noise and vibration from state highways in the PWDP by:
- a Establishing an “effects” area 100 metres from the edge of a state highway carriageway;
  - b Establishing noise standards for noise sensitive land uses within this “effects area” which address indoor and outdoor noise; and
  - c Establishing a vibration standard within the “effects” area.
- 5.20 The s32 document concludes that the proposed approach is the most appropriate means of addressing this resource management issue.
- 5.21 Compliance with these rules would need to be demonstrated (where relevant) by submitting an acoustic report undertaken by a suitably qualified and experienced person to Council. Activities not meeting the permitted activity rules are then required to obtain a resource consent for a restricted discretionary activity.
- 5.22 This proposed approach will impose additional costs on applicants for resource consents<sup>13</sup> (in comparison to costs that would occur as a result of non-compliance with the setback rules in the Operative Waikato District Plan and the PWDP). These costs have been assessed as part of the s32 analysis. Costs of mitigation have been assessed by Acoustic Engineering Services Limited as between a 0% and 2% increase in construction cost for new (or additions to) dwellings.<sup>14</sup> I consider it a reasonable requirement for people wishing to locate in the vicinity of a state highway to protect their health and amenity by mitigating the adverse effects of road traffic noise.

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<sup>13</sup> The Section 32 report notes (based on the Acoustic Engineering Service mem, 12 June 2020) that costs could typically be up to 2% of total construction costs for new and additions to dwellings. As a rough order comparison, the average cost of building a house in the Waikato District was \$421,019 in 2020 (source: [www.canstar.co.nz](http://www.canstar.co.nz)). A 2% increase in construction costs would equate to \$8420.38.

<sup>14</sup> Annexure B, section 32, page 8 and Annexure 1.

- 5.23 When considering the merits of the proposed approach the following matters should be considered:

***Effects of traffic noise beyond the current PWDP setbacks for sensitive land uses***

- 5.24 The proposed approach set out in **Annexure A** provides a more comprehensive response to managing the actual spatial extent of adverse effects that can arise from road traffic noise on human health than the currently proposed setback rules. Under the proposed PWDP approach, only the most significant adverse effects arising from road traffic noise would be addressed because the setback rules (at a maximum) require buildings containing sensitive land uses to be set back 35 metres from the edge of the state highway designation. There are no additional controls beyond this point.

***Consenting approach***

- 5.25 The proposed approach provides the applicants with a number of compliance pathways to meet the permitted standards. For example, there may be parts of the Waikato Expressway where existing buffers or noise walls constructed either by Waka Kotahi or developers (see examples at Pokeno on the western side of SH1) provide adequate noise mitigation without the need for further sound attenuation. In contrast the setback approach in the PWDP specifies a no-build area in the first instance; with non-compliance deemed to be a Discretionary Activity.

***Reverse sensitivity effects***

- 5.26 The proposed approach is considered to more effectively address potential reverse sensitivity effects which are defined in the Waikato Regional Policy Statement (2016) as -

*“the vulnerability of a lawfully established activity to a new activity or land use. It arises when a lawfully established activity causes potential, actual or perceived adverse environmental effects on the new activity, to a point where the new activity may seek to restrict the operation or require mitigation of the effects of the established activity”.*

- 5.27 For Waka Kotahi, there is a risk that new sensitive activities that choose to locate near to established state highways may object to the effects of the existing land transport network (such as noise and vibration). I have reviewed the Waka Kotahi files and have sighted examples of complaints (across the Waikato and other parts of New Zealand) related to road traffic noise where the customer has

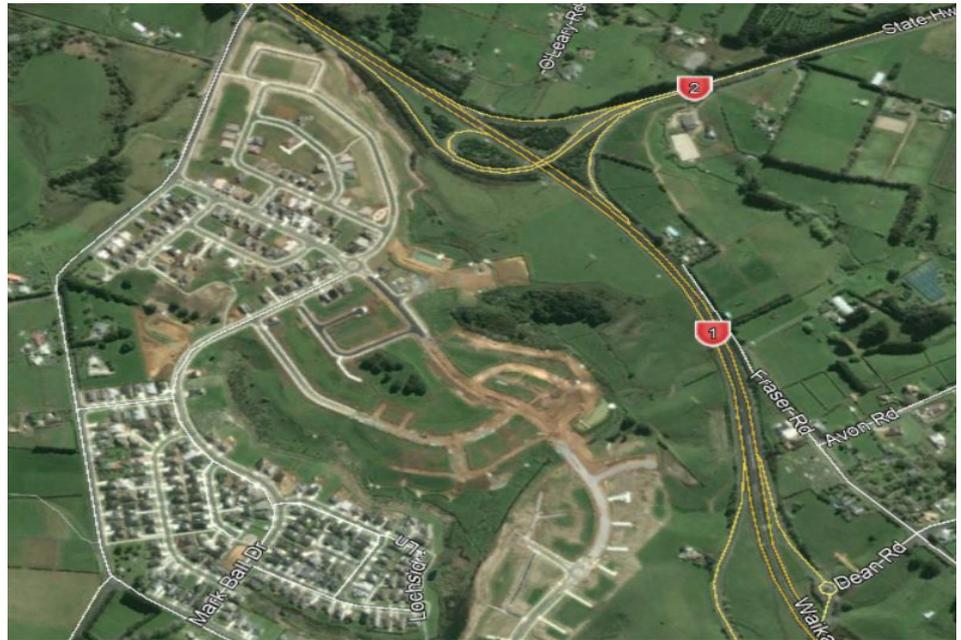
requested that Waka Kotahi undertake remedial action such as asphalt road surfacing, noise walls, speed restrictions and prohibitions on engine braking on existing state highways.

- 5.28 An illustrative example of how reverse sensitivity effects could potentially occur in the future can be seen in the various time scale aerial maps of Pokeno which is bisected by State Highway 1 (SH1). SH1 was legally established before these new residential subdivisions. In these maps we can see how residential development<sup>15</sup> has moved closer towards SH1 over the last ten years.

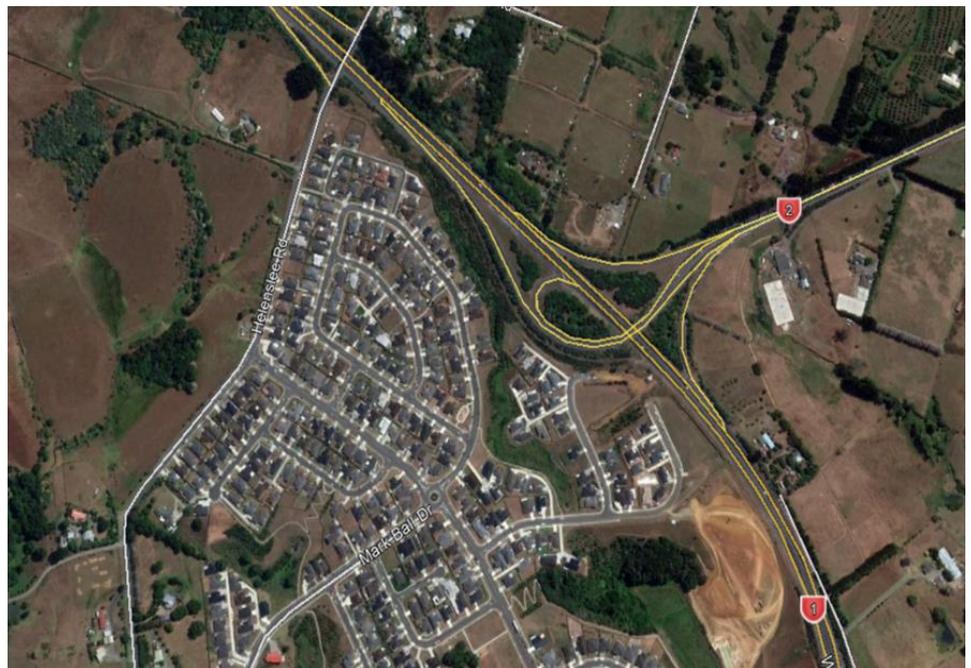
**Pokeno (Google Maps 24 January 2010)**



**Pokeno (Google Maps 26 June 2015)**



**Pokeno (Google Maps, 24 January 2020)**



- 5.29 Without a comprehensive noise management response in the PWDP, reverse sensitivity effects are likely to arise as the western side of Pokeno continues to be built out towards SH1. In the event that the proposed rezoning requests for further additional residential development along the eastern side of SH1 and southern side of SH2 are accepted, I consider that this is likely to increase the potential for reverse sensitivity effects in relation to these state highways.

- 5.30 The Waikato Regional Policy Statement includes several provisions in relation to reverse sensitivity effects and infrastructure (emphasis underlined) -
- a *Objective 3.12: Built environment: Development of the built environment (including transport and other infrastructure) and associated land use occurs in an integrated, sustainable and planned manner which enables positive environmental, social, cultural and economic outcomes, including by:*
    - g) minimising land use conflicts, including minimising potential for reverse sensitivity;*
  - b *Method 6.1.2: Reverse sensitivity: Local authorities should have particular regard to the potential for reverse sensitivity when assessing resource consent applications, preparing, reviewing or changing district or regional plans and development planning mechanisms such as structure plans and growth strategies. In particular, consideration should be given to discouraging new sensitive activities, locating near existing and planned land uses or activities that could be subject to effects including the discharge of substances, odour, smoke, noise, light spill, or dust which could affect the health of people and / or lower the amenity values of the surrounding area.*
  - c *Policy 6.1 Planned and co-ordinated subdivision, use and development Subdivision, use and development of the built environment, including transport, occurs in a planned and co-ordinated manner which:*
    - a) has regard to the principles in section 6A;*
    - b) recognises and addresses potential cumulative effects of subdivision, use and development;*
    - c) is based on sufficient information to allow assessment of the potential long-term effects of subdivision, use and development; and*
    - d) has regard to the existing built environment.*
  - d *6A Development principles: General development principles: New development should:*
    - ...
    - o) not result in incompatible adjacent land uses (including those that may result in reverse sensitivity effects), such as industry, rural activities and existing or planned infrastructure;*

- 5.31 The notified PWDP also includes a comprehensive suite of policies to address the issue of reverse sensitivity effects within the Waikato District on infrastructure; including strategic transport infrastructure networks (which include state highways). Of particular note are (underlined emphasis added) –

*4.1.11 Policy – Pokeno*

*(a) Pokeno is developed to ensure:*

- i Subdivision, land use and development of new growth areas does not compromise the potential further growth and development of the town;*
- ii Walking and cycling networks are integrated with the existing urban area; and*
- iii Reverse sensitivity effects from the strategic transport infrastructure networks are avoided or minimised.*

*4.1.16 Policy – Horotiu*

*(a) Horotiu is developed to ensure:*

- (i) Future residential areas are connected to the existing village;*
- (ii) Future residential development does not impact on the existing local road network;*
- (iii) Reverse sensitivity effects from the strategic transport infrastructure networks are avoided or minimised;*

*4.5.33 Policy - Reverse sensitivity - Reverse sensitivity is managed by ensuring residential activities and development within the Business Town Centre Zone and Business Zone are acoustically insulated to mitigate the adverse effects of noise.*

*6.1.7 Policy – Reverse sensitivity and infrastructure - Avoid Reverse sensitivity effects on infrastructure from subdivision, use and development as far as reasonably practicable, so that the ongoing and efficient operation of infrastructure is not compromised.*

- 5.32 The use of building setbacks for sensitive land uses is a key method in the PWDP aimed at achieving the avoidance and/or mitigation of reverse sensitivity effects on strategic transport infrastructure (as sought by these policies). As covered in

Dr Stephen Chiles' evidence at paragraph 3.4, the PWDP setbacks only address the most significant adverse effects; they do not address the spatial extent of road traffic noise that can be experienced by sensitive land uses up to 100 metres (and sometimes more) from the state highway carriageway. These adverse effects are not specifically addressed by any other controls within the PWDP.<sup>16</sup> In my opinion, this increases the potential for reverse sensitivity effects to arise in relation to the operation of the Waikato District state highway network.

- 5.33 On this basis, I consider that the rules only partially address the PWDP policies and do not give effect to the Waikato Regional Policy Statement (under s75(3) (c)) of the RMA 1991) provisions as identified under paragraph 5.29 above.

#### ***Land use mix/titles in the Waikato and setbacks***

- 5.34 The Waikato District is dominated to a large extent by the Rural and Countryside zones. Based on an assessment of the notified PWDP there are (approximately) 2100 lots within 100 metres of the Waikato District state highways network and 850 dwellings. The Waikato District State Highway network combined is approximately 200km in length. The application of the new proposed rules applying an extended "effects" buffer would apply mostly to rural and/or countryside living zones under the PWDP. Unlike more built up residential zones in the District,<sup>17</sup> these zones are characterised by larger lot sizes which provides more flexibility for new buildings to be positioned further away from the edge of the state highway carriageway.

#### ***Consistent planning approach***

- 5.35 The proposed approach provides more consistency (as opposed to the current setback approach) to managing road traffic noise on sensitive land uses from those state highways which share a common boundary with the Hamilton City Council. Under the Hamilton City District Plan, State Highway 39, State Highway 1 (Horotiu) and the SH1 Hamilton section of the expressway have setback requirements of between 80 metres (SH39) and 100 metres (SH1 Waikato Expressway) from the edge of the state highway carriageway. While these rules are different in some areas, they are more in line with the approach Waka Kotahi is proposing under **Annexure A**. Providing a consistent (regulatory) approach to cross boundary issues is an important consideration for the Council under s74(2)(c) of the RMA.

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<sup>16</sup> See statement of evidence of Mr Chiles dated 29 September 2020, paragraph 3.4.

<sup>17</sup> There are a number of urban areas within the Waikato District, most notably Pokeno, Whatawhata and parts of Rangiriri, where more urban lots are prevalent. In these areas, there is less ability to site buildings further away from the carriageway.

### **Comments on s42A report – road noise and vibration**

- 5.36 There are several recommendations raised in the s42A report which I do not support. These relate to the management of road noise and vibration in the Business Zone and some aspects of the drafting of the new rules which require some further additions and refinements. These changes, which are contained in **Annexure A**, have arisen as a result of the s32 analysis which was undertaken after the submissions were lodged.
- 5.37 In paragraph 286 of the s42A report, the Planning Officer recommends that the new noise and vibration rules need only apply to the Residential, Rural, Country Living and Village Zones. The reason for this is because the other zones (Reserve, Industrial, Business) have sufficient controls that either preclude sensitive activities (as a non-complying activity) or manage sensitive activities establishing in the Business Zones through the existing Appendix 1.6: Acoustic Insulation requirements. I agree that the proposed new rules do not need to apply in the Reserve and Industrial Zones. I also agree that sensitive activities establishing in these zones would be subject to a high level of assessment due to their non-complying status.
- 5.38 In relation to the Business Zone, which does adjoin State Highway 1 on the western side at Pokeno, Mercer and/or within 100 metres of State Highway 1 (western side) at Horotiu and Rangiriri, the zone provisions permit sensitive activities subject to (amongst other matters) meeting the requirements of Appendix 1: Acoustic Insulation requirements. As the evidence of Dr Chiles states (which I rely on), Appendix 1.6 is not adequate to address road traffic noise and vibration due to a number of reasons including ambiguity around the internal design sound level and the lack of ventilation requirements. In addition to the concerns raised by Dr Chiles, I note that as currently drafted, the requirement to comply with Appendix 1 in the Business Zone rules only appears to apply to multi-unit developments under Rule 17.1.3 RD1 (a) (v). There are no other references to sensitive activities (e.g. childcare, single dwellings) in this zone having to comply with Appendix 1. I note that this may be an error, because Appendix 1.6 does state that it applies to other buildings containing sensitive land uses.<sup>18</sup>
- 5.39 In relation to the recommended amendments in Section 18.3 of the s42A report, I have marked up the additions/refinements that I consider are necessary to

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<sup>18</sup> In particular, "Dwellings and other buildings containing sensitive land uses within high noise environments are to be acoustically insulated to an appropriate standard to achieve the internal design sound level specified in Table 14 – Internal sound level."

ensure that the proposed provisions are clear (see Annexure **A**). These are discussed more fully by Dr Chiles in his evidence, but in summary are:

- a Clarifying that the 100 metres should be measured from the state highway carriageway;
  - b Requesting that the building setback rule – sensitive land use is extended to the Business Zone;
  - c Requesting that a new rule be inserted to Appendix 1.7 to address the impact of road noise on outdoor space;
  - d Inserting an additional column to Appendix 1.7 to factor in Maximum Road noise and changing the sleeping space requirement to 40 dB;
  - e Clarifying the requirements for noise barriers in relation to the road surface in Appendix 1.7;
  - f Amending the Indoor Vibration rule in Appendix 1.7 so it applies from 40 metres to the carriageway of a state highway; and
  - g Inserting the measurement assumption for road noise in Appendix 1.7 which needs to be considered as part of any design report.
- 5.40 In summary, I consider that there should be shared responsibility for managing road traffic noise effects from the state highway because it is not practical nor reasonable for any one party to assume sole responsibility. Waka Kotahi, councils and landowners/developers all must assume responsibilities.

***Comments on s42A report – Reverse sensitivity objectives and policies***

- 5.41 In relation to submission 742.49, Waka Kotahi sought to retain Objective 6.1.6 Reverse Sensitivity, subject to the amendments below:

*Existing and planned infrastructure ~~Infrastructure (including the National Grid)~~ is protected from reverse sensitivity effects. ~~and infrastructure (including the National Grid)~~ its construction, operation, maintenance, repair, replacement and upgrading is not compromised.*

- 5.42 The s42A report accepts this submission<sup>19</sup> to the extent that reference is added to construction, operation, maintenance, repair, replacement and upgrading not being compromised. I support these additions as they recognise that these

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<sup>19</sup> Paragraph 195(b) s42A report.

infrastructure elements (not just new infrastructure) can also give to reverse sensitivity effects.

- 5.43 The s42A report rejects that part of the submission seeking that “existing and planned infrastructure” replaces the National Grid reference. I do not think it is necessary to remove the reference to the National Grid, however, I do think it is necessary for Objective 6.1.6 to be amended so it is clear that this applies to planned infrastructure. The reference to “planned” infrastructure is consistent with the Waikato Regional Policy Statement which directs that land uses do not impact on existing and planned regionally significant infrastructure (e.g. see policy 6.3 a ii), policy 6.6). For Waka Kotahi, this approach is important where the state highway is not yet constructed but there are multiple designations (e.g. State Highway 2) in place. In these locations, I consider there is a greater potential for reverse sensitivity effects to occur where there are no obvious (on the ground) signs of a future state highway (infrastructure) project.
- 5.44 The amendment suggested above is also consistent with the new policy 6.4.4(b) requested by Waka Kotahi and KiwiRail and accepted in the s42A report .<sup>20</sup> The proposed amendment refers to “planned” infrastructure as set out below:

### 41.3 Recommended amendments

651. Amend Policy 6.4.4 as follows:

6.4.4 Policy - ~~Road and rail~~ Land transport network [986.38 KiwiRail; 742.53 NZTA]

- (a) ~~Discourage–Avoid~~ [986.38 KiwiRail; 742.53 NZTA] effects of subdivision, use and development that would compromise:
- (i) The road function, as specified in the road hierarchy, ~~or the safety and efficiency of the roading network;~~ [742.53 NZTA]; and
  - (ii) The access by emergency services and their vehicles; and [297.40 Counties Manukau Police]
  - (iii) The safety and efficiency, including the maintenance, upgrading, development and operation of the ~~railway~~ land transport network. [986.38 KiwiRail, 742.53 NZTA]
- (b) Avoid reverse sensitivity effects on the land transport network through setbacks and design controls for new residential and other noise sensitive activities established in proximity to existing or planned transport corridors. [986.38 KiwiRail, 742.53 NZTA]

<sup>20</sup> D13 – Chapter 6, paragraph 651(b), s42A report.

“Planned” transport corridors would incorporate the type of designations I have referred to in paragraph 5.4.

- 5.45 In relation to submission 742.50, Waka Kotahi sought to amend Policy 6.1.7 Reverse sensitivity and infrastructure as follows:

*Avoid reverse sensitivity effects on existing and planned infrastructure from subdivision, use and development as far as reasonably practicable, so that ~~the~~ its construction operation maintenance repair replacement and upgrading ~~the ongoing and efficient operation of infrastructure~~ is not compromised.*

- 5.46 The s42A report<sup>21</sup> accepts this submission to the extent that reference is added to refer to construction, operation, maintenance, repair, replacement and upgrading not being compromised. I support these additions as they recognise that these infrastructure elements (not just new infrastructure) can also give to reverse sensitivity effects.

- 5.47 However, like Objective 6.1.6, the request to include “planned” in this policy has been rejected. I consider that this word should be added for the reasons outlined in paragraphs 5.43 of my evidence and to provide consistency with the s42A recommendation for Policy 6.4.4 (see paragraph 5.44 of my evidence).

## **6 The use of Integrated Transport Assessments in the PWDP**

- 6.1 Waka Kotahi lodged submission points 742.105 and 742.72 which relate to the use of ITAs in the PWDP.

- 6.2 Waka Kotahi, as an operator of the state highway network, strongly supports the inclusion of ITAs within district plans like the PWDP because:

- a ITAs enable Waka Kotahi and Waikato District Council to consider the proposed impact of a development on the transport system and the effectiveness of any mitigation measures that are proposed to address adverse impacts and/or opportunities to achieve wider transport outcomes such as road safety and mode shift, consistent with Council<sup>22</sup> and Government priorities;<sup>23</sup>
- b ITAs cover a range of initiatives to mitigate effects by influencing behaviour change including opportunities for walking, cycling, new technology, parking

<sup>21</sup> D13 Chapter 6: Infrastructure and Energy objectives and policies, paragraph 223, s42A report.

<sup>22</sup> For example, the PWDP supports mode shift outcomes as can be seen under objective 6.5.1 and policy 6.5.2 (a) (iv).

<sup>23</sup> Examples of Government priorities includes *Road to Zero: NZ's road safety strategy 2020-2030* and *NZTA's Keeping Cities Moving Strategy (2019)*.

or an alternative land use approach if considered necessary (this could be in cases where the operating performance of the network is poor).

6.3 Submission point 742.105 sought the following –

*Amend the title of Rule 14.1.2.2 RD4 Traffic generation as follows:*

*Traffic generation that does not comply with one or more of the conditions of Rule 14.12.1.4 and that is subject of an Integrated Transport Assessment.*

6.4 This submission point was rejected by s42A report writer (paragraph 318-319) on the basis that –

*“...it [is not] necessary to require an ITA because the permitted traffic generation thresholds have been exceeded. Instead I consider an ITA is a suitable requirement for a more comprehensive review for larger development as expressed in the Regional Policy Statement”.*

6.5 In my experience of reviewing ITAs, I accept that they are generally produced for larger scale proposals. However, I consider that there is real value in having an ITA requirement within a plan; based on an approach which considers both the traffic generation (a threshold) and the location of the activity relative to the roading function (or hierarchy). As Mr Swears notes in his evidence (on which I rely), even smaller scale proposals can generate traffic at levels that can cause adverse transport effects if they are reliant on a higher volume road like a regional arterial or state highway to service their development.<sup>24</sup>

6.6 To this end, I consider it appropriate that the PWDP specifies (through a new rule) when an ITA is required. A new rule is included in **Annexure C**. The submission of Waka Kotahi sought an ITA approach similar to that included in the Hamilton City Council and Waipa District Council District Plans. These Plans include similar ITA provisions which require either a simple or broad ITA based on a combination of vehicle thresholds and the function of the road (providing access) in the roading hierarchy. Mr Swears' evidence addresses the value of this approach from a transport perspective. The new rule is based on a combination of the Thames-Coromandel and Waipa District Plan provisions and the New Zealand Transport Agency's guidance for ITAs (NZTA Research Report No. 422, 2010). I consider that this rule provides an appropriate way to ensure that sufficient information is provided to the Council in relation to the transportation effects of new developments.

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<sup>24</sup> Statement of Evidence of Mr Swears, paragraph 5.10 and 5.11.

- 6.7 From an integrated land transport perspective, I also consider that this rule would assist with ensuring that land use and its impacts on the roading hierarchy (and vice versa) are considered more fully in land use applications. This is an important consideration as noted in PWDP Policy 6.5.3 which outlines the need to:

*“...provide a hierarchy of roads for different functions and modes of land transport while recognising the nature of the surrounding land use within the district”.*

- 6.8 In addition, Method 6.3.1 of the WRPS states that:

*Regional and district plans shall include provisions that provide for the long-term strategic approach to the integration of land use and infrastructure and that give effect to Policy 6.3, including by ensuring as appropriate that:*

*J) development recognises the transport hierarchy and manages effects on the function of transport infrastructure.*

- 6.9 If a similar approach is adopted in the PWDP, I consider that a consequential amendment to Rule 14.12.1 P4 of the PWDP would be required as having two sets of traffic generation rules would be confusing for the Plan user.
- 6.10 Submission point 742.72 requested that a new definition of ITA be included in the PWDP consistent with the WRPS definition<sup>25</sup>. The s42A report rejects this submission point on the basis that the term “integrated transport assessment” is not used within the PWDP and secondly because it is term already well known by traffic engineers. I accept that the term is well understood by traffic engineers but consider that there is considerable benefit in clearly specifying the level of ITA that is required in specific circumstances. This approach would assist applicants and avoid the situation where further information is required as part of a section 92 request. The proposed new rule in **Annexure C** provides a guide for this.

## **7 Conclusion**

- 7.1 Waka Kotahi lodged a large number of submissions to the Infrastructure section of the PWDP; this reflects the importance of this topic to Waka Kotahi. These submission points have largely been accepted by the s42A report writer.

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<sup>25</sup> WRPS – Means a comprehensive review of all the potential transport impacts of a development proposal.

- 7.2 My evidence has focussed on two key sub topics for Waka Kotahi; the management of road noise from state highways on sensitive land uses, and the use of ITAs to assess the impacts of proposals on the land transport network.
- 7.3 In relation to the resource management issue of traffic noise (from the state highway) and sensitive land uses, Waka Kotahi largely supports the s42A recommendations except where otherwise stated in my evidence. A s32 report (as requested by various report writers in previous topic hearings) has now been produced which I consider, along with the evidence of Dr Chiles, to provide sufficient evidence to support the s42A along with the amendments sought by Waka Kotahi.
- 7.4 Clearly specifying when ITAs are required within the PWDP will enable the effects of proposed development on the transportation network to be properly assessed. I consider that a new rule like the one set out in **Annexure C** which requires an ITA based on a combination of traffic thresholds and the function of the road (providing access) in the roading hierarchy is necessary. As set out in Mr Swears' evidence, this approach provides a more robust and comprehensive approach to assessing the impacts of development on the transport network.

**Michael Blain Wood**

29 September 2020

**Annexure A: Proposed changes to the Section 42A recommendations**

Add: Chapter 17: Business Zone and corresponding rules

### 18.3 Recommended amendments

292. The following amendments are recommended:

293. Amend the Building Setback – Sensitive Land Use rules in Chapter 16 Residential Zone, Chapter 22 Rural Zone, Chapter 23 Country Living Zone, and Chapter 24 Village Zone, and add a new Section 7 to Appendix I – Acoustic Insulation as follows:

#### Residential Zone 16.3.9.2 Building setback – Sensitive land use

PI	(a) Any new building or alteration to an existing building for a sensitive land use must be set back a minimum of: (i) <del>5m from the designated boundary of the railway corridor;</del> (ii) 15m from the boundary of a <del>national route or</del> regional arterial; (iii) <del>25m from the designated boundary of the Waikato Expressway;</del> (iv) 300m from the edge of oxidation ponds that are part of a municipal wastewater treatment facility on another site; and (v) 30m from a municipal wastewater treatment facility where the treatment process is fully enclosed.
P2	<u>(a) Any new building or alteration to an existing building for a sensitive land use within 100m of a state highway or legal boundary of a rail corridor must comply with Section 7 of Appendix I – Acoustic Insulation. [KiwiRail [986.51]]</u>
RDI	<u>Any new building or alteration to an existing building for a sensitive land use within 100m of a state highway or legal boundary of a rail corridor that does not comply with the condition of Rule 16.3.9.2 P2</u>  <u>Matters of discretion:</u> <u>Discretion is restricted to</u> <u>(a) Location of the building;</u> <u>(b) The effects of any non-compliance with the standards in Section 7 of Appendix I;</u> <u>(c) Topographical, ground conditions or building design features that will minimise vibration effects;</u> <u>(d) The outcome of any consultation with NZTA or KiwiRail. [KiwiRail [986.52]]</u>
DI	Any building for a sensitive land use that does not comply with Rule 16.3.9.2. PI.

at any point within 100 metres from the edge of a state highway carriageway

#### Residential Zone 16.4.12 Subdivision - Building platform

RDI	(a) Every proposed lot, other than one designed specifically for access, utility allotment must be capable of containing a building platform upon which a dwelling and living court could be sited as a permitted activity, with the building platform being contained within either of the following dimensions: (i) a circle with a diameter of at least 18m exclusive of yards; or (ii) a rectangle of at least 200m <sup>2</sup> with a minimum dimension of 12m exclusive of yards. (b) Council's discretion shall be restricted to the following matters: (i) Subdivision layout; (ii) Shape of allotments; (iii) Ability of allotments to accommodate a practical building platform; (iv) Likely location of future buildings and their potential effects on the environment; (v) Avoidance or mitigation of natural hazards; (vi) Geotechnical suitability for building; <del>and</del>
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at any point within 100 metres from the edge of a state highway carriageway

	(vii) Ponding areas and primary overland flow paths; <u>and</u> (viii) <u>Where any building platform is within 100m of a state highway or rail corridor, Subdivision layout and design, in relation to the management of noise and vibration effects from the land transport networks; and the location of complying building platforms in relation to the state highway and/or rail corridor.</u>
DI	Subdivision that does not comply with Rule 16.4.12 RDI.

Rural Zone 22.3.7.2 Building setback – Sensitive land use

at any point within 100 metres from the edge of a state highway carriageway

PI	(a) Any new building or alteration to an existing building for a sensitive land use must be set back a minimum of: (i) <del>5m from the designated boundary of the railway corridor;</del> (ii) 15m from the boundary of a <del>national route or</del> regional arterial road; (iii) <del>25m from the designated boundary of the Waikato Expressway;</del> (iv) 200m from an Aggregate...
P2	(a) <u>Any new building or alteration to an existing building for a sensitive land use within 100m of a state highway or legal boundary of a rail corridor must comply with Section 7 of Appendix I – Acoustic Insulation. [KiwiRail [986.51]]</u>
RDI	<u>Any new building or alteration to an existing building for a sensitive land use within 100m of a state highway or legal boundary of a rail corridor that does not comply with the condition of Rule 22.3.7.2 P2</u>  <u>Matters of discretion:</u> <u>Discretion is restricted to</u> <u>(a) Location of the building;</u> <u>(b) The effects of any non-compliance with the standards in Section 7 of Appendix I;</u> <u>(c) Topographical, ground conditions or building design features that will minimise vibration effects;</u> <u>(d) The outcome of any consultation with NZTA or KiwiRail.</u> <u>[KiwiRail [986.51]]</u>
DI	Any building for a sensitive land use that does not comply with Rule 22.3.7.2. PI.

at any point within 100 metres from the edge of a state highway carriageway

Rural Zone 22.4.9 Subdivision - Building platform

RDI	(a) Subdivision, other than an access... (b) Council's discretion is restricted to the following matters: (i)...; <u>and</u> (vii) <u>Where any building platform for a sensitive land use is within 100m of a state highway or rail corridor, Subdivision layout and design, in relation to the management of noise and vibration effects from the land transport networks; and the location of complying building platforms in relation to the state highway and/or rail corridor.</u>
DI	Subdivision that does not comply with Rule 22.4.9 RDI.

Country Living Zone 23.3.7.2 Building setback – Sensitive land use

PI	(a) Any new building or alteration to an existing building for a sensitive land use must be set back a minimum of:
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at any point within 100 metres from the edge of a state highway carriageway

	(i) <del>5m from the designated boundary of the railway corridor;</del> (ii) 15m from the boundary of a <del>national route or</del> regional arterial road; (iii) <del>25m from the designated boundary of the Waikato Expressway;</del> (iv) 200m from an Aggregate...
P2	(a) Any new building or alteration to an existing building for a sensitive land use <del>within 100m of a state highway or legal boundary of a rail corridor</del> must comply with Section 7 of Appendix I – Acoustic Insulation. [KiwiRail [986.51]]
RD1	Any new building or alteration to an existing building for a sensitive land use <del>within 100m of a state highway or legal boundary of a rail corridor</del> that does not comply with the condition of Rule 23.3.7.2 P2  Matters of discretion: Discretion is restricted to (a) Location of the building; (b) The effects of any non-compliance with the standards in Section 7 of Appendix I; (c) Topographical, ground conditions or building design features that will minimise vibration effects; (d) The outcome of any consultation with NZTA or KiwiRail. [KiwiRail [986.52]]
DI	Any building for a sensitive land use that does not comply with Rule 23.3.7.2. PI.

Country Living Zone 23.4.8 Subdivision - Building platform

at any point within 100 metres from the edge of a state highway carriageway

RD1	(a) Subdivision, other than an access... (b) Council's discretion is restricted to the following matters: (i)...; and (vi) <del>Where any building platform for a sensitive land use is within 100m of a state highway or rail corridor.</del> Subdivision layout and design, in relation to the management of noise and vibration effects from the land transport networks; and the location of complying building platforms in relation to the state highway and/or rail corridor.
DI	Subdivision that does not comply with Rule 23.4.8 RD1.

Village Zone 24.3.6.2 Building setback – Sensitive land use

at any point within 100 metres from the edge of a state highway carriageway

PI	(a) Any new building or alteration to an existing building for a sensitive land use must be set back a minimum of: (i) <del>5m from the designated boundary of the railway corridor;</del> (ii) 15m from the boundary of a <del>national route or</del> regional arterial road; (iii) <del>25m from the designated boundary of the Waikato Expressway;</del> (iv) 300m from the edge of oxidation ponds...
P2	(a) Any new building or alteration to an existing building for a sensitive land use <del>within 100m of a state highway or legal boundary of a rail corridor</del> must comply with Section 7 of Appendix I – Acoustic Insulation.
RD1	Any new building or alteration to an existing building for a sensitive land use <del>within 100m of a state highway or legal boundary of a rail corridor</del> that does not comply with the condition of Rule 24.3.6.2 P2  Matters of discretion:

	<p><u>Discretion is restricted to</u>  <u>(a) Location of the building;</u>  <u>(b) The effects of any non-compliance with the standards in Section 7 of Appendix I;</u>  <u>(c) Topographical, ground conditions or building design features that will minimise vibration effects;</u>  <u>(d) The outcome of any consultation with NZTA or KiwiRail.</u>                  [KiwiRail [986.52]]</p>
DI	Any building for a sensitive land use that does not comply with Rule 24.3.6.2. PI.

Village Zone 24.4.10 Subdivision - Building platform

at any point within 100 metres from the edge of a state highway carriageway

RD1	<p>(a) Every proposed lot...                  (b) Council's discretion is restricted to the following matters: (i)...; <u>and</u>  <u>(viii) Where any building platform for a sensitive land use is within 100m of a state highway or rail corridor, Subdivision layout and design, in relation to the management of noise and vibration effects from the land transport networks; and the location of complying building platforms in relation to the state highway and/or rail corridor.</u></p>
DI	Subdivision that does not comply with Rule 24.4.10 RD1.

Alter Appendix I: Acoustic Insulation as follows:

Add Chapter 17: Business Zone

<p>I. Application (a) This appendix is referred to in the rules related to:                  (i)...  <u>(iv) Buildings and alterations for Noise-sensitive Activities near State Highways and rail network within:</u>                  A. <u>Chapter 16: Residential Zone</u>                  B. <u>Chapter 22: Rural Zone</u>                  C. <u>Chapter 23: Country Living Zone</u>                  D. <u>Chapter 24: Village Zone</u></p>	
<p>Add to Appendix I a new standard as Section 7 as follows:  <u>7. Noise-Sensitive Activities or Sensitive Land Uses within 100m of a State Highway or Rail Corridor Boundary:</u></p>	
	<p><u>Activity sensitive to noise near a State Highway or Rail Corridor</u></p>

include a separate column titled:  
- Maximum road level noise  $L_{Aeq}$  (24h) and apply same dB levels for these activity groups, except for sleeping spaces which should be 40dB.

edge of the state highway carriageway

All zones – at any point within 100 metres from the ~~legal~~ boundary of any State Highway or railway network

Activity status: Permitted

1. Indoor noise

Any new building or alteration to an existing building that contains an activity sensitive to noise where the building or alteration:

(a) Is designed, constructed and maintained to achieve indoor design noise levels resulting from the State Highway or railway not exceeding the maximum values in the following table;

Building type	Occupancy/activity	Maximum noise level $L_{Aeq(1h)}$
Residential	Sleeping spaces	35 dB
	All other habitable rooms	40 dB
Education	Lecture rooms/theatres, music studios, assembly halls	35 dB
	Teaching areas, conference rooms, drama studios, sleeping areas	40 dB
	Libraries	45 dB
Health	Overnight medical care, wards	40 dB
	Clinics, consulting rooms, theatres; nurses' stations	40 dB
Cultural	Places of worship; marae	35dB

Add new Outdoor Noise rule (x)

1. Any new building or alteration to an existing building that contains an activity sensitive to noise where:

a. external road noise are less than 57dB<sub>L</sub> Aeq (24h) at all points 1.5 metres above ground level within the proposed notional boundary; or

b. there is a noise barrier at least 3 metres high which blocks the line-of sight to the road surface from all points 1.5 metres above ground level within the proposed notional boundary.

OR

carriageway

(b) is at least 50 metres from any State Highway or railway network and is designed so that a noise barrier completely blocks line-of-sight from all parts of doors and windows to all points 3.8 metres above the road carriageway or railway tracks; or to the road surface and

(c) is a single-storey framed residential building with habitable rooms designed, constructed and maintained in accordance with the construction schedule in Schedule Y.

2. Mechanical ventilation

If a building is constructed in accordance with 1(c) or if windows must be closed to achieve the design noise levels in clause 1(a), the building is designed, constructed and maintained with a mechanical ventilation system that:

(a) For habitable rooms for a residential activity achieves the following requirements:

- i. Provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code and;
- ii. Is adjustable by the occupant to control the ventilation rate in increments up to a high air flow setting that provides as least 6 air changes per hour; and
- iii. Provides relief for the equivalent volumes of spill air;
- iv. Provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C; and
- v. Does not generate more than 35 dB  $L_{Aeq(30s)}$  when measured 1 metre away from any grille or diffuser.

	<p>(b) <u>For other spaces is as determined by a suitably qualified and experienced person.</u></p> <p><u>3. Indoor vibration</u></p> <p><u>Any new buildings or alterations to existing buildings containing an activity sensitive to noise, closer than 40 metres from the boundary of a State Highway or railway network;</u></p> <p>(a) <u>is designed, constructed and maintained to achieve vibration levels from the road or railway not exceeding 0.3mm/s v.w.95 or</u></p> <p>(b) <u>is a single storey framed residential building with:</u></p> <ul style="list-style-type: none"> <li>i. <u>a constant level floor slab on a full surface vibration isolation bearing with natural frequency not exceeding 10Hz, installed in accordance with the supplier's instructions and recommendations; and</u></li> <li>ii. <u>vibration isolation separating the sides of the floor slab from the ground; and</u></li> <li>iii. <u>no rigid connections between the building and the ground.</u></li> </ul> <p><u>4. Design report [alternatively may be replaced with the development meeting the standard of construction in schedule 'Y' to demonstrate compliance]</u></p> <p><u>A report is submitted to the Council demonstrating compliance with clauses (1) to (3) above (as relevant) prior to the construction or alteration of any building containing an activity sensitive to noise.</u></p> <p><u>In the design: State Highway or railway noise level is assumed to be 70 L<sub>Aeq(1h)</sub> at a distance of 12 metres from the road or track, and must be deemed to reduce at a rate of 3dB per doubling of distance up to 40 metres and 6 dB per doubling of distance beyond 40 metres,</u></p> <p><u>Where the activity complies with the following rule requirements of Schedule Y: NIL</u>  <u>[KiwiRail [986.51]]</u></p>
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40 metres to the carriageway of a state highway or

road noise is based on measured or predicted noise level plus 3dB.

Add: Construction Schedule Y

Schedule Y Construction schedule for indoor noise control

<u>Elements</u>	<u>Minimum construction for noise control in addition to the requirements of the New Zealand Building Code</u> <u>[KiwiRail [986.51]]</u>
<u>External walls</u>	<u>Wall cavity infill of fibrous insulation, batts or similar (minimum density of 9 kg/m<sup>3</sup>)</u> <u>[KiwiRail [986.51]]</u>

**Annexure B: Section 32**

# Assessment of Plan Provisions to Provide for Human Health and Amenity in accordance with section 32 of the Resource Management Act

DRAFT September 2020

VERSION 3

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## 1. Introduction

The report has been prepared by Waka Kotahi – NZ Transport Agency in accordance with the requirements of Schedule 1 of the Resource Management Act 1991 (RMA) to assess and support the inclusion of human health and amenity provisions within District Plans.

Waka Kotahi proposes to introduce a suite including an objective, policies and methods which will seek to limit effects on sensitive activities in locations where noise and vibration levels result in negative health and amenity outcomes. Similar provisions are already included in operative plans throughout New Zealand.

Waka Kotahi also seeks a gradual reduction in exposure as existing activities are altered or relocated. This outcome aligns with Waka Kotahi's *Toitū Te Taiao – Our Sustainability Action Plan*<sup>1</sup> which in turn implements the Government Policy Statement on Land Transport 2018/2019-2027/2028<sup>2</sup> and the enduring Transport Outcomes: *A framework for shaping our transport system: Enabling New Zealanders to flourish Transport outcomes and mode neutrality, Ministry of Transport, June 2018.*

The introduction of provisions to provide human health and amenity protection within District Plans is one of a number of methods employed by Waka Kotahi to achieve these outcomes.

The report incorporates an evaluation in accordance with section 32 of the RMA (s32). Under the RMA, a section 32 evaluation must:

- a. Examine whether the proposed objectives are the most appropriate way to achieve the purpose of the RMA (s32(1)(a));
- b. Examine whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing their efficiency and effectiveness and summarising the reasons for deciding on provisions (s32(1)(b));
- c. Relative to considering the efficiency and effectiveness of the provisions in achieving the objective, include an assessment of the benefits and costs of the effects anticipated from implementing the provisions (s32(2)); and
- d. Contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from implementing the proposal (s32(1)(c)).
- e. For plan changes, evaluate the proposal against both the objectives of the proposed plan change and the objectives of the existing plan (s32(3)).

Each of these matters is addressed along with key issues pertaining to the human health and amenity provisions in terms of how they are understood and applied. This report is supported by an 'issue identification' statement which describes human health effects and a cost assessment of implementing mitigation.

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<sup>1</sup> <https://www.nzta.govt.nz/assets/About-us/docs/sustainability-action-plan-april-2020.pdf>

<sup>2</sup> See paragraphs 123-124 and Table 1 Action 25 – Environment.

## 2. Issue identification

It is widely accepted nationally and internationally that noise and vibration from transport networks have the potential to cause adverse health and amenity effects on people living nearby. That potential has been documented by authoritative bodies such as the World Health Organisation (WHO)<sup>3</sup> including the publication by WHO Europe of environmental noise guidelines in October 2018.<sup>4</sup> The WHO guidelines are based on a critical review of academic literature and followed a rigorous protocol to assess the evidence of adverse effects.

In addition to the WHO, Quality Planning's Plan *Managing Land Transport Noise Under the RMA* 2013 Guidance Note<sup>5</sup> recognises transport noise having potential health effects and identifies district plan responses (eg. managing sensitive activity location, setbacks, zoning (and re-zoning), and structural restrictions). The Guidance Note provides a specified outcome:

*One of the environmental results expected with the management of noise in plans should be the protection of people and communities from the impacts of land transport noise exposure<sup>6</sup>.*

Five alternative (non-RMA) responses<sup>7</sup> are also identified (urban design strategy, bylaws, NZ Standards, building code and NZTA guidance), two of these (building code and NZTA guidance) are addressed in this assessment.

### 2.1 Operational Transport Noise

With respect to sound from transport networks, the guidelines note the potential for the following adverse effects:

- i. ischaemic heart disease,
- ii. hypertension,
- iii. high annoyance, and
- iv. sleep disturbance.

Based on the strength of the evidence of adverse effects, WHO recommends that policymakers reduce sound exposure from transport networks to below a range of guideline values.

State highways<sup>8</sup> pass through both urban and rural areas and some have sufficient traffic volumes to generate sound above WHO guideline levels, indicating there will be greater impacts on human health and amenity where noise-sensitive activities are located nearby.

Managing health effects from road noise is a shared responsibility between the Road Controlling Authority and adjacent land users. Waka Kotahi invests significant funds in the design, construction, on-going maintenance to minimise the effects of road traffic noise. The establishment or modification of land uses adjacent to existing State highways should also share responsibility for protecting the health of site occupants.

Transport noise from an alteration to an existing State highway or a new State highway is assessed under NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads). NZS 6806:2010

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<sup>3</sup> World Health Organisation, Guidelines for community noise, 1999; World Health Organisation, Night noise guidelines for Europe, 2009; World Health Organisation, Burden of disease from environmental noise, 2011

<sup>4</sup> World Health Organisation, Environmental noise guidelines for the European region, 2018.

<sup>5</sup> <https://www.qualityplanning.org.nz/node/825>

<sup>6</sup> <https://www.qualityplanning.org.nz/node/825> 4. *Environmental Effects Expected – Optional*, page 12.

<sup>7</sup> <https://www.qualityplanning.org.nz/node/825> *Local Approaches – other mechanisms*, page 14.

<sup>8</sup> May also apply to high traffic volume roads managed by other Road Controlling Authorities.

specifically assesses noise arising from the new or altered road and the effects on noise-sensitive activities. However, there are limited existing provisions that address effects arising from changes to existing noise-sensitive activities or the establishment of new noise-sensitive activities.

## 2.2 Operational Vibration

Waka Kotahi commissioned a research paper by J. Whitlock entitled “A Review of the Adoption of International Vibration Standards in New Zealand” (2010) to inform policy on construction and operational vibration. The Whitlock paper was published in the *NZ Acoustics Journal*<sup>9</sup>. It identified and assessed a number of international standards in detail. The conclusions of the Whitlock research paper were used to inform the vibration criteria considered within this assessment.

Whitlock concluded that Norwegian Standard NS 8176.E:2005 “*Vibration and Shock – Measurement of vibration in buildings from land based transport and guidance to evaluation of its effects on human beings*” is the most appropriate standard to specifically address operational transport-related vibration. This conclusion was reached as the basis of the criteria are response relationships<sup>10</sup>. Whitlock also concluded that NS8176 has been successfully used in the New Zealand context on recent Waka Kotahi projects (eg Western Ring Route – Waterview Connection).

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<sup>9</sup> Vol 24/#2

[https://www.acoustics.org.nz/sites/www.acoustics.org.nz/files/journal/pdfs/Whitlock,\\_J\\_NZA2011.pdf](https://www.acoustics.org.nz/sites/www.acoustics.org.nz/files/journal/pdfs/Whitlock,_J_NZA2011.pdf)

<sup>10</sup> Appendix A of NS 8176 sets out a summary of how people react to vibration in their homes, based on a study conducted in Norway that involved questioning people living in buildings subject to a range of different road and rail vibration levels. From these response curves, Appendix B of NS8176 recommends criteria for new residential buildings by existing roads and railways that would result in only about 15% of people being disturbed by vibration.

### 3. Objectives Assessment

Section 32(1)(a) of the RMA requires an examination of whether the proposed objective is the most appropriate way to achieve the purpose of the RMA. The purpose of the RMA is set out in Part 2, Section 5 of the Act.

#### 5 Purpose

*(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.*

*(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—*

*(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*

*(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*

*(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

A proposed objective and policies to address noise effects from the transport network are set out in Table 1 below. The proposed objective is assessed against section 5.

<b>Table 1: Assessment of Objective under Section 5</b>	
<b>Proposed NZ Transport Agency Provision</b>	<b>Reason</b>
<p>Objective 1 Transport Network Effects Protect sensitive activities from potential health and amenity effects that may arise from noise and vibration associated the operation of the transport network.</p> <p>Policy 1 Locate and design new and altered buildings, and activities sensitive to noise to minimise potential effects of the transport network on those activities;</p> <p>Policy 2 Manage the location of sensitive activities (including subdivision) through set-backs, physical barriers and design controls.</p>	<p>The objective (and supporting policies) enable communities to provide for their social well-being and health by ensuring development (noise sensitive activities), where located in close proximity to a State highway, incorporates sufficient protection to ensure reasonable health outcomes and amenity levels.</p>

The balance of Part 2 of the RMA provides the framework for the sustainable management of natural and physical resources. Section 6 lists matters of national importance that shall be recognised and provided for, section 7 lists other matters that all persons exercising functions and powers under the RMA shall have particular regard to and section 8 addresses matters relating to the principles of the Treaty of Waitangi. No relevant matters in sections 6 or 8 have been identified. The proposed objective have been assessed against the following provisions of section 7 in Table 2.

Table 2: Assessment of Objective under Part Section 7	
RMA Provision	Objective 1
s7(b) (the efficient use and development of natural and physical resources)	Objective 1 will provide for the efficient use and development of physical resources (land and the State highway network) by enabling the proximity effects of land use and infrastructure to be managed appropriately.
s7(c) (maintain and enhance amenity values)	Objective 1 will give effect to s7(c) by enhancing amenity by reducing effects of noise and vibration on noise-sensitive activities.

Acknowledging that there are limited aspects of Part 2 which are relevant to the objective, as far as Part 2 applies, it is considered that the proposed objective is consistent and will result in the sustainable management of natural and physical resources.

## 4. Provisions Assessment

Sections 32(1)(b) and 32(2) require assessment of the proposed Plan provisions to be undertaken. These are summarised as:

- a. whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing their *efficiency and effectiveness* and summarising the reasons for deciding on provisions; and
- b. relative to considering the **efficiency and effectiveness** of the provisions in achieving the objective, include an assessment of the benefits and costs of the effects anticipated from implementing the provisions.

The cost and benefit assessment must identify and assess the costs and benefits associated with environmental, economic, social, and cultural effects including economic growth and employment that are anticipated to be provided or reduced. If practicable, these are to be quantified.

Section 32(2)(b) also requires an assessment of the risk of acting or not acting if there is uncertain or insufficient information. In this case, there is considered to be sufficient information about the subject to determine the range and nature of effects of the options set out, and so that assessment has not been undertaken.

### 4.1 Waka Kotahi Proposed Provisions

Waka Kotahi has made an assessment of Plan provisions to ascertain a suite of provisions which would best achieve its outcomes relative to health and amenity. The full suite of provisions is appended as Attachment 2 and includes an objective, two policies and methods (rules). These provisions provide a self-contained framework which is best placed within the district or city wide provisions section of the district / unitary plan.

#### 4.2 Establishing reasonably practicable options

A range of potential options has been considered, across existing approaches, a 'do nothing' approach, Waka Kotahi's preferred provisions and other regulatory methods. These are listed below and assessed in terms of Sections 32(1)(b) and 32(2) in Table 3.

- a. **Do nothing:** No or limited human health or amenity provisions. Limited provisions may include no specific health protection provisions but include consideration of reverse sensitivity effects as an assessment criteria or matter of discretion (eg. as part of any new subdivision adjoining a State highway designation). No provisions provided for the protection of outdoor noise amenity.
- b. **Waka Kotahi Plan Provisions:** Within 100m of a State highway; applying to all noise and vibration sensitive activities (including additions); requires internal acoustic levels (40dB  $L_{Aeq}$  (24 hours)) and requires ventilation. Provisions provide for outdoor noise amenity for new buildings.
- c. **Alternative Plan Provisions Variation 1:** Within 100m of a State highway; applying internal noise levels requirements within residential dwellings. Excludes dwelling additions, and other non-residential noise-sensitive activities. Includes ventilation requirements. No provision for outdoor amenity.
- d. **Alternative Plan Provisions Variation 2:** Within 100m of a State highway; require internal acoustic levels (40 dB  $L_{Aeq}$  (24 hours)) for residential and noise-sensitive activities but no ventilation. No provision for outdoor amenity.
- e. **Alternative Plan Provisions Variation 3:** Within 100m of a State highway; façade reduction requirements for residential and noise-sensitive activities. Includes ventilation requirements. No provision for outdoor amenity.
- f. **Alternative Plan Provisions Variation 4:** Building setback for noise sensitive activities of 100m from a State highway with no other noise or vibration management methods.
- g. **Noise Barriers:** Acoustic walls or bunds (installed by the applicant).
- h. **Low Noise Road Surfaces:** Installation of a low noise asphaltic surface.
- i. **Alternative Plan Provision 5:** Construction Specification Table. A table which specifies minimum construction materials and standards necessary to achieve internal acoustic levels.
- j. **National regulation:** (eg. changes to Building Act or Building Code or introduction of a National Planning Standard, National Environmental Standard). The Building Act (and Code) currently provides specifications to manage inter-tenancy noise (eg noise between residential apartments within the same building with shared tenancy walls). It does not, however, provide requirements for management of noise generated from outside a building (eg transport noise or nightclub noise from a separate building). A change to the Building Code would be needed to address the issue and is reliant on Government implementing such a change.
- k. **Landscaping:** Landscaping to provide acoustic mitigation.
- l. **Reverse sensitivity covenant:** A plan provision which requires a covenant whereby property owners agree not to complain about noise and vibration effects on sensitive land uses (often referred to as a 'no complaints' covenant).

<b>Table 3: Alternative Option Assessment</b>			
<b>Option</b>	<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p><b>Option A:</b> Do Nothing</p>	<p>This option requires no action from the regulatory authority or applicants so could be considered efficient. It is considered to be the least effective as it will allow an increase in exposure of sensitive activities to human health and amenity effects.</p>	<p>Will result in an increase in the number of sensitive activities occurring in situations where noise and vibration levels result in negative health and amenity outcomes.</p> <p>Poorer health and amenity outcomes fall on wider community and can be difficult to identify at an individual level.</p>	<p>No additional regulatory cost or costs to land/business owners in terms of compliance or building cost increases.</p>
<p><b>Option B:</b> Waka Kotahi provisions</p> <p><i>Apply to all noise and vibration sensitive activities (including additions); requires internal acoustic amenity (40dB L<sub>Aeq</sub> (24 hours)) and requires ventilation.</i></p>	<p>These provisions are effective and efficient as they balance providing the highest level of protection (ie. WHO recommendation) with ???. Waka Kotahi does not aim to achieve 'zero' health effects (which is the outcome sought by the WHO guidelines).</p> <p>In particular, proposals which meet the permitted activity standard do not require resource consent. Option B is a balance between meeting minimum design requirements and achieving a higher level of amenity.</p> <p>Provisions to protect outdoor amenity for new buildings are ???.</p>	<p>Additional compliance cost during building consent and building construction when compared with Option A. Building and compliance design costs will fall on applicants and compliance confirmation costs will be borne by the regulatory authority and/or the applicant.</p> <p>Costs of mitigation have been assessed by Acoustic Engineering Services Limited<sup>11</sup> and indicate typically a 0% to 2% increase in construction cost for new dwellings.</p> <p>For additions, where all external building components are new</p>	<p>Improvement in human health outcomes as there will be a reduction in the number of sensitive activities exposed to the causes of negative health and amenity outcomes when compared with Option A.</p> <p>The proposed approach of permitted standards provides a range of (flexible) compliance pathways for applicants.</p> <p>Option B also provides a comprehensive regulatory approach which recognises the actual spatial extent of road traffic noise. This option provides for a range of potential responses; eg. a noise barrier, setback or built</p>

<sup>11</sup> **Attachment 1:** Acoustic Engineering Services Limited, Report Reference AC20063 – 01 – R2: Cost of traffic noise mitigation measures, 12 June 2020.

<b>Table 3: Alternative Option Assessment</b>			
Option	Effectiveness and Efficiency	Costs	Benefits
		the Acoustic Engineering Services Limited <sup>12</sup> memo indicates typically a 0% to 2% increase in construction cost would apply.	response may be used to achieve the rule outcome.
<p><b>Option C:</b> Alternative Plan Provisions 1</p> <p><i>Applying internal noise level requirements within residential dwellings, excludes dwelling additions, other non-residential noise sensitive activities and external areas. No ventilation requirements or protection for outdoor activities.</i></p>	<p>Reasonably efficient: Residential building would require certification during building consent processing to show compliance. Compliant buildings would not require separate resource consent process.</p> <p>The requirement would apply to a more limited range of building types (ie. only residential dwellings, not additions or other non-residential noise-sensitive activities), and would therefore not be as effective in providing health or amenity benefits to non-residential activities/residential additions.</p> <p>No provisions to protect outdoor amenity. Option C is partially effective and efficient ie. provides benefits only for new residential dwellings but excludes other noise sensitive activities and residential additions.</p>	<p>Additional compliance cost during building consent and building construction when compared with Option A.</p> <p>Excluding noise sensitive activities and dwelling additions will have negative health and amenity effects relative to Option 2.</p> <p>Building and compliance design costs will fall on applicants and compliance confirmation costs will be borne by the regulatory authority and/or the applicant.</p>	<p>Improvement in human health outcomes as there will be a reduction in the number of sensitive activities exposed to the causes of negative health and amenity outcomes when compared with Option A.</p> <p>Narrower range of building activities impacted by proposal will result in a slightly lower overall cost to applicants when compared with Option 2. WHO evidence of health effects is strongest for a residential-type setting.</p>
<p><b>Option D:</b> Alternative Plan Provisions 2</p> <p><i>Require internal acoustic</i></p>	<p>Reasonably efficient: Building would require certification during building consent processing to show compliance. Compliant buildings would not require separate resource consent process.</p>	<p>Building and compliance design costs will fall on applicants and compliance confirmation costs will be borne by the</p>	<p>Potentially lower cost than for applicants and marginally lower costs for regulatory authority.</p>

<sup>12</sup> **Attachment 1:** Acoustic Engineering Services Limited, Report Reference AC20063 – 01 – R2: Cost of traffic noise mitigation measures, 12 June 2020.

<b>Table 3: Alternative Option Assessment</b>			
Option	Effectiveness and Efficiency	Costs	Benefits
<i>levels (40 dB LAeq (24 hours)) but no ventilation or protection for outdoor activities.</i>	<p>Low level of effectiveness as lack of ventilation may result in open windows and negate effectiveness of other measures.</p> <p>No provisions to protect outdoor amenity.</p>	regulatory authority and/or the applicant.	
<p><b>Option E:</b> Alternative Plan Provisions 3</p> <p><i>Façade reduction requirements for residential and noise sensitive activities. Includes ventilation requirements. No provision for outdoor amenity.</i></p>	<p>Reasonably efficient: Building would require certification during building consent processing only to show compliance. Compliant buildings would not require separate resource consent process.</p> <p>No provisions to protect outdoor amenity.</p>	<p>Building and compliance design costs will fall on applicants and compliance confirmation costs will be borne by the regulatory authority and/or the applicant.</p> <p>The same requirements apply regardless of the external noise exposure, and therefore many buildings will have more treatment (and cost) than needed to achieve adequate indoor noise levels. Some buildings with the highest external noise exposure might not have adequate treatment.</p>	Marginally lower design/assessment cost for applicants as external noise exposure does not need to be determined.
<p><b>Option F:</b> Alternative Plan Provisions 4</p> <p><i>Setback of building and noise sensitive activities of 100m with no</i></p>	<p>This option is effective and partially efficient.</p> <p>This response is not an efficient use of land in urban or peri-urban<sup>13</sup> areas.</p> <p>This response may be partially efficient in rural areas where there are large sites and/or</p>	This option will result in a significant area of land with a limited range of uses and is considered to be an extremely restrictive approach.	<p>Approach may be feasible in rural areas or where non-sensitive activities may locate.</p> <p>Setbacks required to provide health and acoustic benefits would also provide sufficient setback to manage any vibration effects.</p>

<sup>13</sup> the rural—urban transition area where urban and rural uses mix.

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
<i>other noise or vibration management methods.</i>	flexibility in locating noise sensitive activities.		Will ensure outdoor health and amenity benefits.
<p><b>Option G:</b> Noise Barrier</p> <p><i>Acoustic walls or bunds.</i></p> <p><i>Wall and bunds generally required to extend beyond sensitive land use to function.</i></p>	<p>This option is partially effective and efficient.</p> <p>Acoustic bunds and walls can be effective when integrated into the design of a new development.</p> <p>Acoustic walls may be able to be retrofitted in some instances.</p>	<p><u>Acoustic Wall</u> Retrofitting noise barriers by motorways by Waka Kotahi has been found to cost in the range of \$4,000 to \$10,000 per linear metre of barrier.</p> <p>Construction of noise fences by individuals or land developers generally have lower costs.</p> <p>Waka Kotahi has made a preliminary assessment of noise improvements across its network. It estimates a cost of at least \$150M<sup>14</sup> to retrospectively mitigate noise exposure for approximately 50% of persons exposed to noise above 64dBA. This demonstrates the significant cost of remedying existing issue and the need for a proactive approach to future development.</p> <p>Many locations have practical limitations to install noise barriers (space/ground conditions).</p>	<p><u>Acoustic Wall</u> For barriers close to buildings (or close to the road) and comprehensively blocking the line-of-sight of sensitive land uses to the state highway carriageway, a reduction of 5-10 dB can be achieved.</p> <p>Moderately small construction footprint.</p> <p><u>Bunds</u> Less likely to result in shading or dominance effects when compared with acoustic walls.</p> <p><u>Both</u> Cost of protecting multiple sites will aggregate to be less than cost of protecting a low number of sites.</p> <p>Suited to single landowner situations; potentially useful for larger subdivisions or where road improvements proposed.</p> <p>Reduces the need for individuals building houses to have to consider road noise or to keep windows closed.</p>

<sup>14</sup> Not currently funded.

**Table 3: Alternative Option Assessment**

Option	Effectiveness and Efficiency	Costs	Benefits
		<p>Can be visually dominant and result in significant shading (often 3m or higher to provide acoustic benefits).</p> <p><u>Bunds</u> Reasonably large land footprint required to establish which may reduce development potential.</p> <p><u>Both</u> Initial installation and ongoing maintenance costs (eg graffiti, landscape maintenance).</p> <p>May not be effective for buildings of more than one storey.</p> <p>Reduced passive surveillance of surrounds.</p> <p>Maybe more be suited for larger scales development which can enable a longer, more continuous wall/bund.</p> <p>Depending on topography, will generally only manage effects on single storied buildings.</p> <p>Can result in 'no man's land' issue for maintenance between wall/bund and property boundary as wall/bund is offset to</p>	<p>Can provide visual screening giving a benefit in reducing both perception of noise and actual noise level.</p> <p>Also serves as boundary/security fence.</p> <p>Effective method of noise reduction for single storied buildings, as for acoustic walls.</p> <p>Can provide improved amenity for outdoor areas.</p>

**Table 3: Alternative Option Assessment**

Option	Effectiveness and Efficiency	Costs	Benefits
		<p>accommodate footings/slope.</p> <p>No reduction in vibration effects.</p>	
<p><b>Option H:</b> Low Noise Road Surfaces</p> <p><i>Installation of a low noise asphaltic surface / maintenance of surfaces</i></p>	<p>This option is partially effective but has very high costs.</p>	<p>A porous asphalt surface would be in the order of \$30+/m<sup>2</sup> (standard two coat chipseal surface would be in the order of \$6/m<sup>2</sup> to \$10/m<sup>2</sup>). It cannot generally be laid directly on existing roads, because low noise (asphaltic) road surfaces require stiff underlying pavements, otherwise they fail prematurely. For much of the existing network, laying new asphaltic surfaces therefore first requires rebuilding of the structural pavement, which would increase the cost to over \$100/m<sup>2</sup>.</p> <p>Road vibration effects generally relate to features of the underlying pavement and local ground conditions. This again requires rebuilding of the pavement rather than resurfacing. Potentially further works may be required to reinstate drainage and to relocate buried services and service covers.</p>	<p>Low noise road surfaces can provide in the order of 5 dB reduction in noise generated from the tyre/road interface. For traffic at highway speeds this is a meaningful improvement, although is often not sufficient to reduce sound to below guideline values.</p>

**Table 3: Alternative Option Assessment**

Option	Effectiveness and Efficiency	Costs	Benefits
		<p>Road surfaces do not materially alter other sounds such as truck engine/air-braking noise.</p>	
<p><b>Option 1:</b> Alternative Plan Provision 5: Construction Specification Table</p> <p><i>A table which specifies minimum construction standards necessary to achieve internal acoustic levels.</i></p>	<p>This option is partially effective and efficient.</p>	<p>Building and compliance design costs will fall on applicants and compliance confirmation costs will be borne by the regulatory authority and/or the applicant.</p> <p>Table is complex, will require technical expertise on behalf of applicant and regulatory authority if deviating from the table which may lead to uncertain interpretations.</p> <p>Lacks flexibility to accommodate individual site circumstances (eg topography may remove the need for building response).</p> <p>Requires a plan change to update.</p> <p>No provisions to protect outdoor amenity.</p> <p>The same requirements apply regardless of the external noise exposure, and therefore many</p>	<p>If it is practical to use the exact constructions the table, the provision provides certainty as to outcome and design specifications. An acoustics specialist does not need to be engaged by any party.</p>

Table 3: Alternative Option Assessment			
Option	Effectiveness and Efficiency	Costs	Benefits
		buildings will have more treatment (and cost) than needed to achieve adequate indoor noise levels. Some buildings with the highest external noise exposure might not have adequate treatment.	
<b>Option J:</b> National Regulation <small>Note 1</small>	Option J is considered to be effective and efficient but is outside the RMA process.	N/a	N/a
<b>Option K:</b> Landscaping	This option is not effective or efficient, as dense landscaping would need to be in excess of 10s of metres in width to provide noise reduction.  Further, seasonal variations (leaf density, weather induced variations) may impact vegetation quality.	Same as for Option F (Building Setback).	Same as for Option F (Building Setback).  Visual screening of road traffic can reduce the <u>perception</u> of road-traffic noise.
<b>Option L:</b> No complaints covenant	This option is not effective and efficient, because it addresses the ability to complain about noise and vibration, rather than deal with those effects directly.	Legal costs for covenant preparation and registration. Option L provides no improvement for health or amenity outcomes as the actual effects of road noise or mitigation are not mitigated.	Simple to understand.

**Note 1:** Option J has been investigated directly with central government agencies. Discussions with those agencies indicate there is no current plan to promulgate RMA-based national planning direction in relation to health and amenity effects relative to transport networks. In addition, while proposals for relevant changes to Clause G6 of the Building Code were circulated in 2016 and remain on MBIE’s work programme, these are not imminent. Option J has not been further assessed as it is a method which requires central government policy, planning, and investment which are not currently programmed (ie. it is not *reasonably practical*).

### 4.3 Assessing reasonably practicable options

Based on the cost benefit analysis presented in Table 3, Table 4 summarises reasonably practicable options.

<b>Table 4: Identifying Reasonably Practicable Options</b>	
Option	Is it reasonably practicable?
<i>Option A: Do nothing</i> This option is currently applied in some District Plans.	✓
<i>Option B: Waka Kotahi Proposed Plan provisions</i> Options similar to this are currently applied in some District Plans.	✓
<i>Option C: Alternative Plan Provisions 1</i> Options similar to this are currently applied in some District Plans.	✓
<i>Option D: Alternative Plan Provisions 2</i> Options similar to this are currently applied in some District Plans.	✓
<i>Option E: Alternative Plan Provisions 3</i> Options similar to this are currently applied in some District Plans.	✓
<i>Option F: Alternative Plan Provisions 4</i> Options similar to this are currently applied in some District Plans.	x (urban) x/✓ (peri-urban) x/✓ (rural)
<i>Option G: Noise Barriers</i> Noise barriers are considered reasonably practicable options in some circumstances.	x/✓
<i>Option H: Low Noise Road Surface</i> It is not reasonably practicable to reconstruct and resurface all State highways.	x
<i>Option I: Construction Specification Table</i> This option is currently applied in some District Plans.	✓
<i>Option J: National Regulation</i> For the reasons outlined in Table 3, Note 1, National Regulation, while likely effective and efficient, is not considered to be a reasonably practicable option.	x
<i>Option K: Landscaping</i> Landscaping is not considered to be a reasonable alternative as the landscaping provides no practicable noise or vibration reduction.	x
<i>Option L: No Complaints Covenants</i> A no complaints covenant is not considered to be a reasonable alternative as it provides practicable noise or vibration reduction and results in no health or amenity improvements.	x

#### 4.4 Preferred Option

Based on the analysis in Table 3 and the reasonably practicable options identified in Table 4, Table 5 rates each of the reasonably practicable options.

Table 5: Preferred Option							
Least Preferred							Most Preferred
<b>Option A:</b> Do Nothing.	<b>Option F:</b> Yard 100m.	<b>Option G:</b> Noise barriers.	<b>Option I:</b> Construction Specification Table.	<b>Option D:</b> Internal noise levels; no ventilation. Applies to all noise sensitive activities.	<b>Option C:</b> Internal noise levels; with ventilation. Applies to dwellings (excludes dwelling additions and other noise sensitive activities).	<b>Option E:</b> Façade protection; with ventilation. Applies to all noise sensitive activities.	<b>Option B:</b> Waka Kotahi Provisions.

For the reasons set out in Tables 3 and 4, the Waka Kotahi provisions are considered to be the most efficient and effective methods for addressing the health and amenity effects of transport noise and vibration. The provisions proposed by Waka Kotahi do not aim to achieve ‘zero’ health effects (which is the outcome sought by the WHO guidelines). Rather, the Waka Kotahi provisions provide for a balance between levels of health and amenity protection, cost and regulatory administration. In particular the provisions:

- a. Are ‘outcomes’ focused leaving flexibility for the applicant to determine the most effective method; this recognises the variable environments in which sensitive activities and state highways are located. By comparison, Options F and I are specific standards and are not able to consider the environment in which they are applied.
- b. Have utilised an outdoor noise exposure level of 57dB (where the WHO guidelines recommend ~50dB) and an indoor noise threshold near the top of the design range<sup>15</sup> in AS/NZS 2107:2016 (40dB). These levels are considered to provide a reasonable level of health and amenity protection but are not the most stringent.
- c. Apply within a defined (limited) “effects” area of 100m; the actual effects may extend beyond this in some locations.
- d. Include an internationally recognised vibration standard appropriate for operational transport vibration effects to protect people.

Waka Kotahi’s provisions takes balanced approach to this resource management issue by ensuring that the impacts of road noise/vibration on human health are managed while not unduly

<sup>15</sup> *top of the design range* means that the noise limit is at the upper level of range -ie. allows more noise rather than less.

constraining growth. The provisions also recognise that the management of road noise is a shared responsibility. Waka Kotahi invests significant funds in the design, construction, on-going maintenance to minimise the effects of road traffic noise. Activities which choose to locate adjacent to the state highway network should also share responsibility for protection of health and amenity.

## 5. Conclusion

Waka Kotahi has developed provisions seeking to manage health and amenity effects relative to the transport network and provide a reasonable and appropriate balance between cost and benefit. The provisions apply only where an existing noise-sensitive activity is extended or a noise-sensitive activity is proposed.

New or altered State highway transport projects will continue to be assessed under NZS 6806:2010 (Acoustics – Road traffic noise – New and altered roads) which specifically addresses noise and vibration arising from the project.

Consistent with s32 of the RMA, the proposed objective (and policies) have been developed, and analysed against Part 2 of the RMA and it is considered that the proposed objective is the most appropriate way to achieve the purpose of the RMA.

The proposed provisions have been detailed and compared against a number of alternatives in terms of their costs, benefits, and efficiency and effectiveness in accordance with the relevant clauses of section 32 of the RMA.

The proposed provisions are considered to represent the most appropriate means of achieving the proposed objective and of addressing the underlying resource management issues relating to the transport environment, human health and amenity.

## Attachment 1: Acoustic Engineering Services Limited



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# Memorandum

To: Greg Haldane, Waka Kotahi  
From: Clare Dykes, Acoustic Engineering Services  
File Reference: AC20063 – 01 – R2  
Date: Friday, 12 June 2020  
Project: Cost of traffic noise mitigation measures  
Pages: 6

Meeting  Telephone  Memorandum  File Note

Dear Greg,

In March 2020, Waka Kotahi NZ Transport Agency engaged Acoustic Engineering Services (AES) and O'Brien Quantity Surveying to undertake a study relating to the cost of traffic noise insulation measures. The project involved a review of a number of situations where traffic noise mitigation had been installed, including:

- Buildings which required upgrades to reduce traffic noise break-in as a result of their location in proximity to major roads, and;
- New residential neighbourhoods which were constructed near to major roads, where traffic noise barriers were integrated into the overall scheme design so that the upgrading of dwellings was no longer required (or was reduced) and noise in outdoor living areas was reduced.

This memorandum summarises the study, and the general trends visible in the results.

### 1.0 BUILDING UPGRADES

A common method of ensuring that noise from roads is not intrusive within buildings is to design the building envelope to provide a high level of sound insulation, and to provide a mechanical ventilation system so occupants do not need to open windows for cooling and fresh air.

The Christchurch District Plan contains a rule requiring the design of new noise sensitive buildings to be constructed in higher noise locations to include these sound insulation features. AES have previously completed a study related to the Christchurch District Plan sound insulation rule, which involved a review of the specific circumstances relating to a sample of building projects. The work described in this memo built on aspects of that previous study, and looked to quantify the cost of those building upgrades, to assist Waka Kotahi in understanding the potential financial implications of mandatory traffic noise insulation rules. A number of additional examples from various sources were added to the original sample, to increase the sample size and diversity.

We have also completed a review of the Proposed and Operative District Plans for the 67 New Zealand Districts. Two thirds of the District Plans throughout the country include requirements for sound insulation when dwellings are located in proximity to major roads. Of these, 10 % include a requirement which is very

similar to the Waka Kotahi Guidelines<sup>1</sup> centred around an internal noise level requirement of 40 dB L<sub>Aeq</sub> (24 hour) in bedrooms and other habitable spaces, and the provision of mechanical ventilation. The remaining rules vary, with common variations including requiring different internal noise levels to be met, omitting any mechanical ventilation requirement (or a reduced mechanical ventilation requirement), and specifying a fixed level of sound insulation performance to be achieved by the building façade. As discussed below, all of these rule variations have a different cost impact.

### 1.1 The sample

A total of 58 buildings were considered for inclusion in the analysis. However, detailed costings were only completed on 23 of these, primarily because:

- A number of the building projects successfully obtained a Resource Consent to legitimise a partial or complete non-compliance with the relevant sound insulation rule, and so these results would not have assisted with understanding the cost of compliance.
- For a number of the building projects there was not sufficient publicly available information to complete an accurate costing.

The final 23 building projects included 11 detached residential dwellings, seven multi-residential units (such as terraced houses and duplexes), and five apartment buildings. These buildings were expected to experience worst-case traffic noise levels ranging from 55 dB L<sub>Aeq</sub> (24 hours) to 71 dB L<sub>Aeq</sub> (24 hours).

As discussed above, a variety of sound insulation rules are encountered throughout the country. The building projects in the sample had been assessed against the following rules:

- 12 of the sample has been assessed against a requirement which is similar to that described in the Waka Kotahi Guidelines, including an internal noise level requirement of 40 dB L<sub>Aeq</sub> (24 hour) in bedrooms and other habitable spaces, and the provision of mechanical ventilation.
- Two of the sample were assessed using a rule which has a different internal noise level requirement with no mechanical ventilation required.
- Eight of the sample were assessed against rule with a façade reduction requirement or a provided set of constructions intended to provide a fixed façade reduction, and no mechanical ventilation required.
- One involved review against an internal noise level requirement of 40 dB L<sub>Aeq</sub> (24 hours) for some spaces, and a façade reduction requirement for others.

Overall, the sample was relatively small – however a moderate number of examples could be assessed against a rule similar to that preferred by Waka Kotahi. Otherwise the variety within the sample is typical of the variety in sound insulation rules encountered in New Zealand.

Challenges of extending the sample included the lack of a centralised database to use for establishing a list of building projects of potential interest, and then the lack of availability of publicly available information for projects which provides sufficient detail for accurate costings.

### 1.2 Assumptions

Key assumptions embodied in this part of the study are as follows:

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<sup>1</sup> Waka Kotahi NZ Transport Agency, *Guide to the management of effects on noise sensitive land use near to the state highway network*, Version 1.0, September 2015

- The reported external noise levels are based on the available traffic numbers, road surface, and speed information for the road adjacent to the building project site at the time, and are for the most exposed building façade.
- The upgrades that were recommended by the acoustic engineers involved in each case were installed and alternative systems were not used.
- The systems where not specified were originally 10 mm Standard Gib plasterboard internal linings for walls, and 13 mm Standard Gib plasterboard linings for ceilings, and 4 mm float glass / 12 mm air space / 4 mm float glass for glazing.
- Where 7 mm Ecoply RAB board was specified for external walls it was assumed that this would have been included regardless of the acoustic upgrades, and so was not included in the upgrade costing.
- Where not specified, the mechanical ventilation system was assumed to be of similar or equal design and performance to those projects where this detail was provided.

### 1.3 Findings

We have summarised a number of key observations from the analysis below.

Table 1.1 outlines the increase in overall building cost associated with any upgrades to the building façade and/or the installation of mechanical ventilation system, to ensure compliance with the various sound insulation rules.

**Table 1.1 – Summary of cost of traffic noise mitigation by building type**

Building Type	Range of external noise levels (dB L <sub>Aeq</sub> (24 hours))	Increase in overall cost of building (per residential unit)	Percentage increase in overall cost of building
Detached residential	55 – 68	\$0 – \$16,000	0 – 2 %
Residential units	58 – 69	\$500 – \$15,000	0 – 2 %
Apartment buildings	60 – 71	\$500 – \$16,000	0 – 1 %

These results illustrate that the overall percentage increase in building cost due to compliance with a sound insulation rule was 2 % or less (noting that none of the buildings in the sample were exposed to external traffic noise levels exceeding 71 dB L<sub>Aeq</sub>(24 hour)).

For the residential units and apartment buildings, the figures in table 1.1 are based on the total cost of upgrades, divided by the total number of residential units in the development. However, some units did not require any upgrades, as they experience lower external noise levels. If the total cost of upgrades is only divided by the number of units in the development which required upgrading, the percentage increase changes to 1 – 4 %.

In table 1.2 the results are presented based on the type of sound insulation rule that the assessment was undertaken against.

**Table 1.2 – Summary of cost of traffic noise mitigation by rule type**

Rule	Range of external noise levels (dB L <sub>Aeq</sub> (24 hours))	Increase in overall cost of building per residential unit	Percentage increase in overall cost of building
Internal noise level of 40 dB L <sub>Aeq</sub> (24 hours) and mechanical ventilation	55 – 71	\$0 – \$16,000	0 – 2 %
Alternative internal noise level requirement, no mechanical ventilation	64 – 65	\$500 – \$1,500	0 – 1 %
Façade reduction requirement or defined constructions, and no mechanical ventilation	55 – 69	\$0 – \$16,000	0 – 2 %

This summary appears to indicate that the costs associated with both the internal noise level and façade reduction rules are similar (noting that the sample size for the ‘alternative internal noise level requirement, no mechanical ventilation’ rule was very small, and the external levels were moderate). However, we note the following:

- For the methods which used internal noise levels, the increase in costs is very dependent on the external noise level. The developments which resulted in upgrade costs of less than 1 % typically experienced external noise levels below 65 dB L<sub>Aeq</sub> (24 hours). There are exceptions to this depending on the layout of the units.
- While the ‘façade reduction requirement or defined constructions’ rules appear to attract a similar cost to the ‘internal noise level’ rules, those particular rules did not require mechanical ventilation to be installed. Occupants in some situations would therefore have still had to choose between thermal comfort, and noise. Additional cost should have been involved with installing mechanical ventilation in those situations, as was the case for the ‘internal noise level of 40 dB L<sub>Aeq</sub> (24 hours) and mechanical ventilation’ examples. To put it another way, the cost may be similar, but the benefit is likely to have been less in many cases.
- The required construction upgrades (and therefore the costs) of the ‘façade reduction requirement or a defined set constructions’ rules are not dependent on external noise levels. This means that while the range of cost increases is similar, in some situations the high costs lead to no benefit, as the external noise levels were low. For the ‘internal noise level of 40 dB L<sub>Aeq</sub> (24 hours) and mechanical ventilation’ examples where the costs were high, that was at least in response to high external noise levels and so was justified.

For a small number of developments, no upgrades were required as either external traffic noise levels were very low, or the original design included high mass cladding with small window areas on key façades.

## 2.0 BARRIERS

An alternative method for reducing the levels of road traffic noise experienced by the occupants of new dwellings is for a barrier to be installed to screen a new residential neighbourhood from the road. This means that individual dwellings are less likely to need to be upgraded, and noise levels in outdoor living areas are also reduced. However, the developer of the new neighbourhood is likely to primarily bear the cost of the barrier, compared to the building upgrades discussed in section 1.0 above, which are paid for by the individual building owners.

## 2.1 The sample

10 new residential neighbourhoods were included in the analysis. All of these adjoined State Highways and were likely to have been designed with some regard to the Waka Kotahi Guidelines. Each of the neighbourhoods had been screened from the State Highway with a traffic noise barrier, including:

- Seven examples with 'acoustic' fences ranging in height from 2 – 3 metres
- Two examples where earth bunds had been constructed – these were 2 – 3 metres in height, and 8 – 9 metres wide
- One example with a combination of acoustic fencing and earth bund

For each example, we determined the number of dwellings which would have experienced traffic noise levels of greater than 57 dB  $L_{Aeq(24\text{ hours})}$  without a barrier. These dwellings would have been the most likely to have required upgrading had the barrier not been constructed, in order to satisfy a traffic noise insulation rule of the type discussed in section 1.0 above. We note that it is possible that some dwellings still required upgrading even with the barrier – for example the upper level of two-storey houses. As above, the barrier also reduces the noise levels in outdoor living areas associated with dwellings – which is a benefit compared to the sound insulation rules discussed in section 1.0, which only modifies the environment within a dwelling.

The number of dwellings which would have experienced traffic noise levels of greater than 57 dB  $L_{Aeq(24\text{ hours})}$  without a barrier ranged from 1 through to 120. The number of affected lots was dependent on the overall layout of the subdivision relative to the road, as well as the traffic numbers, road surface, and speed.

## 2.2 Assumptions

Key assumptions were as follows:

- The acoustic fences were constructed of 125 x 75 mm H4 posts, 75 x 50 mm H3 railings, 150 x 25 mm H3 palings with 50 x 25 mm H3 battens over joins and 150 x 50 mm H3 capping.
- In some cases, the effective height of fences was increased, because they were constructed on top of a retaining wall. It was assumed that the retaining walls would have been required for general site levelling and not specifically to enhance the acoustic effectiveness of the barrier. This was therefore not included within the upgrade cost.
- It was assumed that the subdivision layout without the barrier would have been exactly the same. In reality larger setback distances or other rearrangement of the layout may have been included if the traffic noise had not been largely mitigated by the barrier.
- The earth bund was assumed to be constructed with surplus excavated soil from the site, with a layer of imported topsoil 150 mm thick spread on top for grass.

## 2.3 Findings

We have summarised a number of key observations from the analysis below.

Table 2.1 shows the cost of each barrier, divided by the number of dwellings which would have experienced a noise level of greater than 57 dB  $L_{Aeq(24\text{ hours})}$  without a barrier. We have grouped the results together for different barrier types, and have also shown the situations where are large and small number of dwellings benefited from the barrier separately.

**Table 2.1 – Summary of cost of traffic noise mitigation by barrier type**

Barrier Type	Approximate number of dwellings which benefited from barrier	Cost of barrier per dwelling
Acoustic fence	1 – 10	\$15,000 – \$30,000
	30	\$10,000
	80 – 110	\$3,000 – \$5,000
Earth bund	10	\$60,000
	50	\$6,000
Combination	120	\$4,000

Overall, this analysis shows that when the number of affected dwellings is low (i.e. the layout results in few lots near the road, or the volume of traffic is low etc.) the overall cost per dwelling is high. When these absolute costs are viewed as a percentage of the likely final value of each of the affected sections, the range is from 2 % (acoustic fence, benefiting a large number of sections) to 30 % (earth bund, benefiting a few sections). As above, in all of these examples for dwellings constructed on these sections, additional costs in the order of those presented in tables 1.1 and 1.2 above would be largely avoided, and traffic noise levels in outdoor living areas would also be reduced.

We note that a key decision in the above analysis is whether the loss of the land under the footprint of any earth bund is included as a 'cost'. In all of the examples the bund fell within an area which was ultimately sold to a homeowner as part of a site, or was within an area close to the State Highway which was unlikely to have been developed for residential use regardless – so the loss of the land under the bund has not been included as a cost. As an example, for the development with approximately 50 affected dwellings, if the cost of the land under the bund was included in the analysis, the total cost as a percentage of the likely final value of each of the affected sections would increase from 3 % to 16 %.

We trust this is of assistance. If you have any queries, please do not hesitate to contact us.

Kind Regards



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## Attachment 2: Waka Kotahi Preferred Provisions

### Objective 1 Transport Network Effects

Protect sensitive activities from potential health and amenity effects that may arise from noise and vibration associated the operation of the transport network.

#### Policy 1

Locate and design new and altered buildings, and activities sensitive to noise to minimise potential effects of the transport network;

#### Policy 2

Manage the location of sensitive activities (including subdivision) through set-backs, physical barriers and design controls.

#### Permitted Activity Rule XX

At any point within 100 metres from the edge of a state highway carriageway:

##### *Outdoor road noise*

1. Any noise sensitive land use with a noise sensitive room in a new building, or alteration to an existing building, that contains an activity sensitive to noise where:
  - a. External road noise levels are less than 57 dBL<sub>Aeq(24h)</sub> at all points 1.5 metres above ground level within the proposed notional boundary; or
  - b. there is a noise barrier at least 3 metres high which blocks the line-of-sight to the road surface from all points 1.5 metres above ground level within the proposed notional boundary.

##### *Indoor road noise*

2. Any noise sensitive land use with a noise sensitive room in a new building, or alteration to an existing building, that contains an activity sensitive to noise where the building or alteration is:
  - a. Designed, constructed and maintained to achieve indoor design noise levels resulting from the road not exceeding the maximum values in Table 1; or
  - b. At least 50 metres from the carriageway of any state highway and is designed so that a noise barrier entirely blocks line-of-sight from all parts of doors and windows, to the road surface.

**Table 1**

Occupancy/activity	Maximum road noise level L <sub>Aeq(24h)</sub>
<i>Building type: Residential</i>	
Sleeping spaces	40 dB
All other habitable rooms	40 dB
<i>Building type: Education</i>	
Lecture rooms/theatres, music studios, assembly halls	35 dB

Teaching areas, conference rooms, drama studios, sleeping areas	40 dB
Libraries	45 dB
<i>Building type: Health</i>	
Overnight medical care, wards	40 dB
Clinics, consulting rooms, theatres, nurses' stations	45 dB
<i>Building type: Cultural</i>	
Places of worship, marae	35 dB

### *Mechanical ventilation*

3. If windows must be closed to achieve the design noise levels in clause 2(a), the building is designed, constructed and maintained with a mechanical ventilation system that:
  - a. For habitable rooms for a residential activity, achieves the following requirements:
    - i. Provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and
    - ii. is 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
    - iii. provides relief for equivalent volumes of spill air; and
    - iv. provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18CC and 25CC; and
    - v. does not generate more than 35 dB LAeq(30s) when measured 1 metre away from any grille or diffuser.
  - b. For other spaces, is as determined by a suitably qualified and experienced person.

### *Indoor road vibration*

4. Any noise sensitive land use with a noise sensitive room in a new buildings or alterations to existing buildings containing an activity sensitive to noise, closer than 40 metres to the carriageway of a state highway, is designed constructed and maintained to achieve road vibration levels not exceeding 0.3mm/s  $v_{w.95}$ .

### *Design report*

5. A report is submitted by a suitably qualified and experienced person to the council demonstrating compliance with clauses (1) to (4) above (as relevant) prior to the construction or alteration of any building containing an activity sensitive to noise. In the design:
  - a. Road noise is based on measured or predicted noise levels plus 3 dB.

### **New Definition**

**Noise Sensitive Activity:** Means any residential activity including in visitor, student or retirement accommodation, educational activity including in any child care facility, healthcare activity and any congregations within places of worship/marae.

### **Restricted Discretionary Activity Rule XY**

Any new or altered noise sensitive activity which does not comply with Permitted Activity XX

### **Restricted Discretionary Activity – Matters of Discretion**

Discretion is restricted to:

- (a) Location of the building;
- (b) The effects of the non-compliance on the health and amenity of occupants;
- (c) Topographical, ground conditions or building design features that will mitigate noise or vibration effects; and
- (d) The outcome of any consultation with the NZ Transport Agency.

### **Restricted Discretionary Activity – Assessment Criteria**

Discretion is restricted to:

- (a) Whether the location of the building minimises effects;
- (b) Alternative mitigation which manages the effects of the non-compliance on the health and amenity of occupants;
- (c) Any identified topographical, ground conditions or building design features that will mitigate noise and vibration effects or; and
- (d) The outcome of any consultation with the NZ Transport Agency.

**Annexure C: Proposed New Integrated Transport Assessment rule**

**Proposed New Integrated Transport Assessment Rule**

(i) Any activity shall comply with the following table:

<b>Type of Assessment of Effects on the Transport Network</b>				
<b>Vehicle Trip Generation</b>	<b>Road Hierarchy</b>			
	Local	Collector	Arterial	Regional Arterial (including all State Highways)
Low (51-100 ECM per day)	n/a	n/a	Simple ITA	Simple ITA
Medium (101-250 ECM per day)	n/a	Simple ITA	Simple ITA	Broad ITA
High (>250 ECM per day)	Broad ITA	Broad ITA	Broad ITA	Broad ITA

**Notes**

1. Equivalent car movements (ECM) – 1 car movement is equivalent to 1 car movement/1 truck movement is equivalent to 3 car movements/1 truck and trailer movement is equivalent to 5 car movements.
2. See Table 14.12.5.13 provides indicative traffic generation rates for various activities.
3. A Simple ITA Checklist shall contain the following information:

<b>Requirements for Simple ITA</b>	
<b>Item Description</b>	<b>Details to be included</b>
1. Background	Description of proposed activity, purpose and intended use of ITA
2. Existing land data	Description of location, site layout, existing use, adjacent and surrounding land use.
3. Existing transport data	Description of access arrangements, onsite car parking, surrounding road network (including hierarchy, traffic volumes and crash analysis). Comment on public transport, walking and cycling networks.
4. Committed environmental changes	Consideration of other developments and land use in the immediate vicinity.
5. Existing travel characteristics	Trip generation of existing use.
6. Proposal details	Description of the proposal (site layout, operational hours, vehicle access, on site car parking, internal vehicle circulation, end of journey facilities).
7. Predicted travel data	Trip generation of proposal. Consideration of other modes.
8. Appraisal of transportation effects	Assessment of safety, efficiency and environmental effects.

9. Avoiding or mitigating actions	Details of any mitigating measures and revised effects.
10. Compliance with policy and other frameworks	Waikato District Plan objectives, policies and rules.
11. Discussion and conclusions	Assessment of effects and conclusion of effects.
12. Recommendations	Proposed conditions (if any).

4. A Broad ITA Checklist shall contain the following information:

<b>Requirements for Broad ITA</b>	
<b>Item Description</b>	<b>Details to be included</b>
1. Background	Description of proposed activity, purpose and intended use of ITA, outline of any previous discussions with Council
2. Existing land data	Description of location, site layout, existing use, adjacent and surrounding land use.
3. Existing transport data	<ol style="list-style-type: none"> <li>1. Description of existing access and service arrangements, onsite car parking.</li> <li>2. Description of surrounding road network (including hierarchy, traffic volumes, crash analysis, congestion and intersections).</li> <li>3. Description of public transport modes, walking and cycling networks.</li> </ol>
4. Committed environmental changes	Consideration of other developments and land use and transport network improvements (including public transport, walking and cycling).
5. Existing travel characteristics	Existing trip generation, modal split, assignment of trips to the network.
6. Proposal details	<ol style="list-style-type: none"> <li>1. Description of the proposal (site layout, operational hours, vehicle access, on site car parking and drop off, internal vehicle circulation, end of journey facilities, travel demand management).</li> <li>2. Construction management.</li> <li>3. Any staging, triggers and thresholds for activities and mitigation measures.</li> </ol>
7. Predicted travel data	Trip generation of proposal, modal split, trip assignment to the network, trip distribution and trip type proportions. Future traffic volumes and trip generation. Consideration of appropriate assessment year (e.g. 10 year forecast for collector and local roads: 30 year forecast for arterials).
8. Appraisal of transportation effects	Assessment of safety, efficiency and environmental effects. Sensitivity testing.
9. Avoiding or mitigating actions	Details of any mitigating measures and revised effects. This should include: travel planning and travel demand management measures and sensitivity testing mitigations.

10. Compliance with policy and other frameworks	Waikato District Plan objectives, policies and rules.
11. Discussion and conclusions	Assessment of effects and conclusion of effects.
12. Recommendations	Proposed conditions (if any).

(see Appendix A: New Zealand Transport Agency Research Report No. 422 “Integrated Transport Assessment Guidelines”, 2010 for additional guidance on items 3 and 4.)

(ii) Any activity not complying with table x shall be assessed as a restricted discretionary activity with the Council’s discretion limited to:

- Location and scale of activity; and
- Effects of vehicle generation on functioning of road, road hierarchy and other users; and
- Vehicle access and manoeuvring; and
- Number of car parks provided on site; and
- Provision for multi-modal transport options; and
- Effects on connectivity; and
- Vehicle queuing on site; and
- Effects on infrastructure provision; and
- Infrastructure deficiencies, risks or positive effects identified from consultation with the New Zealand Transport Agency where State Highways may be affected.