

# **AUCKLAND UNITARY PLAN OPERATIVE IN PART**

## **PROPOSED PLAN CHANGE 101 (Private)**

**Pilkington Park, 167-173 Pilkington Road and railway land  
on the corner of Apirana Avenue and Merton Road (North  
Island Main Trunk 671.04-672.38 KM), Point England**

## **SUMMARY OF DECISIONS REQUESTED**

**Enclosed:**

- **Explanation**
- **Summary of Decisions Requested**
- **Submissions**

## Explanation

- You may make a “further submission” to support or oppose any submission already received (see summaries that follow).
- You should use Form 6.
- Your further submission must be received by **26 July 2024**
- Send a copy of your further submission to the original submitter as soon as possible after submitting it to the Council.

## **Summary of Decisions Requested**

Plan Change 101 (Private) - Pilkington Park, 167-173 Pilkington Rd and railway land on the corner of Apirana Avenue and Merton Rd (North Island Main Trunk 671.04-672.38 KM), Point England				
Summary of Decisions Requested				
Sub #	Sub Point	Submitter Name	Address for Service	Summary of Decisions Requested
1	1.1	Charis Charan	<a href="mailto:cckumpula@gmail.com">cckumpula@gmail.com</a>	Reduce building height to 4 storeys in line with Hinaki St apartments.
1	1.2	Charis Charan	<a href="mailto:cckumpula@gmail.com">cckumpula@gmail.com</a>	Review and update noise management [controls] during building construction and operation
1	1.3	Charis Charan	<a href="mailto:cckumpula@gmail.com">cckumpula@gmail.com</a>	Increase on premise car parking requirements by at least 50%
2	2.1	Georgina Stewart	<a href="mailto:georginastewart2@gmail.com">georginastewart2@gmail.com</a>	Restrict building height to no more than three storeys
2	2.2	Georgina Stewart	<a href="mailto:georginastewart2@gmail.com">georginastewart2@gmail.com</a>	Any development of the site must minimise the impact for nearby residents.
3	3.1	Sibylle Van Hove	<a href="mailto:vanhove.s.c@gmail.com">vanhove.s.c@gmail.com</a>	Remove height variation control (21m and 27m) and maintain the existing height of 20m for the LIZ [Business - Light Industry zone] and 18m for THAB [Residential -Terrace Housing and Apartment Buildings zone].
4	4.1	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Add a new provision to ensure a key pedestrian crossing and facilities for pedestrians and active modes (across Apirana Avenue to/ from the site and the land to the east) is provided, as shown on page 8 of the submission. The provision may include thresholds or triggers (prior to the first occupation of any dwelling) or clear assessment and consenting processes aligned to related objectives and policies. Apply a non -complying activity status when staging triggers are not met.
4	4.2	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Add a new standard to manage access to the site and any associated measures to avoid adverse effects on Apirana Avenue and Pilkington Road. Refer to the full submission on page 9 for details.
4	4.3	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Amend paragraph 3 of the precinct description as follows: "Land use, development, and subdivision within the precinct is provided for in a manner which supports the ongoing safe and efficient operation of the North Island Main Trunk Line, and Apirana Avenue and Pilkington Road, including by protecting sensitive activities;.. below."
4	4.4	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Retain objective 3 [IX2.(3)]
4	4.5	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Amend objective 4 [ IX.2(4)] to read: Activities sensitive to noise located adjacent to the rail corridor, and Apirana Avenue and Pilkington Road, are designed to protect people's health and amenity values, and in a way which does not unduly constrain the operation of the North Island Main Trunk Line or arterial roads.
4	4.6	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Retain policy 1 [IX.3(1)]

Plan Change 101 (Private) - Pilkington Park, 167-173 Pilkington Rd and railway land on the corner of Apirana Avenue and Merton Rd (North Island Main Trunk 671.04-672.38 KM), Point England				
Summary of Decisions Requested				
Sub #	Sub Point	Submitter Name	Address for Service	Summary of Decisions Requested
4	4.7	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Amend policy 4 [ IX.3(4)] to read: "Ensure that activities sensitive to noise adjacent to the North Island Main Trunk Line, <u>and Apirana Avenue and Pilkington Road</u> do not unduly constrain the operation of the rail corridor <u>or arterial roads</u> by providing for buildings and outdoor play areas to be designed with acoustic attenuation measures."
4	4.8	Auckland Transport	<a href="mailto:spatialplanning@at.govt.nz">spatialplanning@at.govt.nz</a>	Amend standard IX.6.2 as follows: (4) Any new noise sensitive space within 60m of Apirana Avenue or Pilkington Road where the road traffic noise level <del>is predicted to exceed 55db LAeq24hr</del> <u>exceeds current measured or predicted noise levels plus 3 dB</u> must be designed, constructed and maintained with a mechanical ventilation/ cooling system that meets the requirements of E25.6.10(3)(b) and (d) to (f). Note: The design shall be based on <u>current measured or predicted road traffic noise levels ten years plus 3 dB</u> after the noise sensitive space is first occupied.
5	5.1	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain references in the precinct description to high-quality mixed-use development and protecting sensitive activities from noise associated with the rail corridor.
5	5.2	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Amend the precinct description to read " <u>An area within the Precinct which may experience vibration levels higher than would normally be expected because of proximity to the rail corridor is identified on Precinct Plan.</u> "
5	5.3	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Add a precinct plan to show a 'rail vibration notation over land within 100m of the rail corridor.
5	5.4	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Provide an alert layer to future landowners and occupants of sensitive activities that existing activities could have an effect on the level of amenity obtainable.
5	5.5	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain objective IX.2. 1 [ IX.2(1) ]
5	5.6	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain objective IX.2. 2 [ IX.2(2) ]
5	5.7	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain objective IX.2. 3 [IX2.(3) ]
5	5.8	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Add a new objective 4: ' <u>The North Island Main Trunk railway line is protected from adverse effects from the construction and maintenance of new buildings and structures through the use of setbacks</u> '
5	5.9	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain policy IX.3. 1 [ IX.3(3) ]
5	5.10	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain policy IX.3. 2 [IX.3(2) ]

Plan Change 101 (Private) - Pilkington Park, 167-173 Pilkington Rd and railway land on the corner of Apirana Avenue and Merton Rd (North Island Main Trunk 671.04-672.38 KM), Point England				
Summary of Decisions Requested				
Sub #	Sub Point	Submitter Name	Address for Service	Summary of Decisions Requested
5	5.11	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Amend policy 3 [IX.3(3)] to refer to the protection of amenity when indoors, the use of building setbacks and communal outdoor play areas. Refer to the full submission on page 3 for details.
5	5.12	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Amend IX.4.1 Activity table (A2) for restricted activities to read: <u>New buildings and alterations to existing buildings</u> which do not comply with standards IX.6.1 to IX.6.34
5	5.13	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Retain IX.5. Notification provisions
5	5.14	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Amend Standard IX6.2 Standard for activities sensitive to noise, to extend the distance to which these standards apply from 60m to 100m from the rail corridor. Refer to full submission on page 4 & 5 for details and attached Section 32 report [Standard Railway Noise and Vibration Reverse Sensitivity Provisions and Section 32 Report August 2023]
5	5.15	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Add a new standard to read: <u>IX.6.4 Safe operation of the NIMT Buildings and structures must be setback at least 5 metres from any boundary which adjoins the North Island Main Trunk railway line.</u>
5	5.16	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Amend IX.8.1(2) Matters of discretion in relation to activities sensitive to noise. Refer to full submission on page 7 for details. Apply these changes to breaches of standard IX.6.3.
5	5.17	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Insert new assessment criteria IX.8.1 (4) in relation to the infringement of standard IX.6.4 safe operation of the NIMT Setback from NIMT. Refer to full submission for details on page 7]
5	5.18	Kiwirail	<a href="mailto:Allison.Tindale@kiwirail.co.nz">Allison.Tindale@kiwirail.co.nz</a>	Amend IX.9 Special information requirements by requiring consultation with Kiwirail for activities sensitive to noise within 100m of the rail corridor. Refer to full submission for details on page 8.
6	6.1	Watercare Services Limited	<a href="mailto:planchanges@water.co.nz">planchanges@water.co.nz</a>	Ensure that the effects on Watercare's existing and planned water and wastewater networks are appropriately considered and managed in accordance with the Resource Management Act 1991.
6	6.2	Watercare Services Limited	<a href="mailto:planchanges@water.co.nz">planchanges@water.co.nz</a>	Reassess the effects on Watercare's existing and planned water supply and wastewater networks should the applicant's civil engineering assumption of a development yield of 711 dwellings be exceeded.
6	6.3	Watercare Services Limited	<a href="mailto:planchanges@water.co.nz">planchanges@water.co.nz</a>	The applicant will need to work with Watercare in advance of lodging resource consents to confirm the requirement for any local water supply infrastructure upgrades.

Plan Change 101 (Private) - Pilkington Park, 167-173 Pilkington Rd and railway land on the corner of Apirana Avenue and Merton Rd (North Island Main Trunk 671.04-672.38 KM), Point England				
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Sub #	Sub Point	Submitter Name	Address for Service	Summary of Decisions Requested
6	6.4	Watercare Services Limited	<a href="mailto:planchanges@water.co.nz">planchanges@water.co.nz</a>	The applicant will need to investigate the feasibility of a direct connection to the Eastern Interceptor at the resource consent stage. Any connection will need to be confirmed by Watercare.
7	7.1	Van Den Brink Poultry Limited	<a href="mailto:emma@civilplan.co.nz">emma@civilplan.co.nz</a>	Consider and address any potential reverse sensitivity effects associated with enabling residential development adjacent to Light Industry zoned land containing existing industrial activities and in particular a large poultry processing plant.
7	7.2	Van Den Brink Poultry Limited	<a href="mailto:emma@civilplan.co.nz">emma@civilplan.co.nz</a>	Retain objective IX.2(4)
7	7.3	Van Den Brink Poultry Limited	<a href="mailto:emma@civilplan.co.nz">emma@civilplan.co.nz</a>	Retain policy IX.3(4)
7	7.4	Van Den Brink Poultry Limited	<a href="mailto:emma@civilplan.co.nz">emma@civilplan.co.nz</a>	Retain standard IX.6.2 Standard for activities sensitive to noise
7	7.5	Van Den Brink Poultry Limited	<a href="mailto:emma@civilplan.co.nz">emma@civilplan.co.nz</a>	Retain standard IX.6.3 - Standards for outdoor play areas within 60m of the rail corridor.
8	8.1	Foodstuffs North Island Limited	<a href="mailto:david.boersen@foodstuffs.co.nz">david.boersen@foodstuffs.co.nz</a>	Retain Plan Change in its current form , and or with precinct provisions or other controls which remove the potential for interface issues to arise between the PC101 land and the Foodstuffs site.

## **Submissions**



**From:** [Unitary Plan](#)  
**To:** [Unitary Plan](#)  
**Subject:** Unitary Plan Publicly Notified Submission - Plan Change 101 - Charis Charan  
**Date:** Saturday, 1 June 2024 5:30:24 pm

---

The following customer has submitted a Unitary Plan online submission.

#### **Contact details**

Full name of submitter: Charis Charan

Organisation name:

Agent's full name:

Email address: cckumpula@gmail.com

Contact phone number:

Postal address:

5a Torino Street

Point England

Auckland 1072

#### **Submission details**

##### **This is a submission to:**

Plan change number: Plan Change 101

Plan change name: PC 101 (Private): Pilkington Park, 167-173 Pilkington Road and railway land on the corner of Apirana Avenue and Merton Road (North Island Main Trunk 671.04-672.38 KM), Point England

##### **My submission relates to**

Rule or rules:

Height

Noise

Transportation

Property address: 5a Torino Street

Map or maps:

Other provisions:

Do you support or oppose the provisions you have specified? I or we oppose the specific provisions identified

Do you wish to have the provisions you have identified above amended? Yes

The reason for my or our views are:

Height: The land identified for changes is already higher than the surrounding areas particularly the residential parts. Recent changes due to the Tamaki Regeneration programme have resulted in apartment buildings of 4 stories, which stand out in a residential area that is primarily flat. Whilst changes to this land may be beneficial, the proposed height is too high and will further create an eyesore and impose on the surrounding homes. I recommend meeting the height of the apartments on Hinaki St (4 stories).

Noise: As mentioned, the noise generated during construction and ongoing operation of the Tamaki regeneration has been difficult to live with in the area. Better reduction in noise pollution during the

days and weekends must be taken into consideration for residential occupants.

Transport: There is a significant shortage of on-street parking in this area and this has been further exasperated by high density residential housing, alongside more workers travelling to this exact location during the day. Far more consideration must be given to on-premise parking to reduce the pressure on residents. I cannot even have people over to my home as there is nowhere for them to park within a reasonable walking distance.

I or we seek the following decision by council: Decline the plan change, but if approved, make the amendments I requested

Details of amendments: Reduce height to 4 stories in line with Hinaki St apartments. Review and update noise management during construction and operation. Increase on premise parking requirements by at least 50%. | 1.1

| 1.2

Submission date: 1 June 2024

| 1.3

**Attend a hearing**

Do you wish to be heard in support of your submission? No

**Declaration**

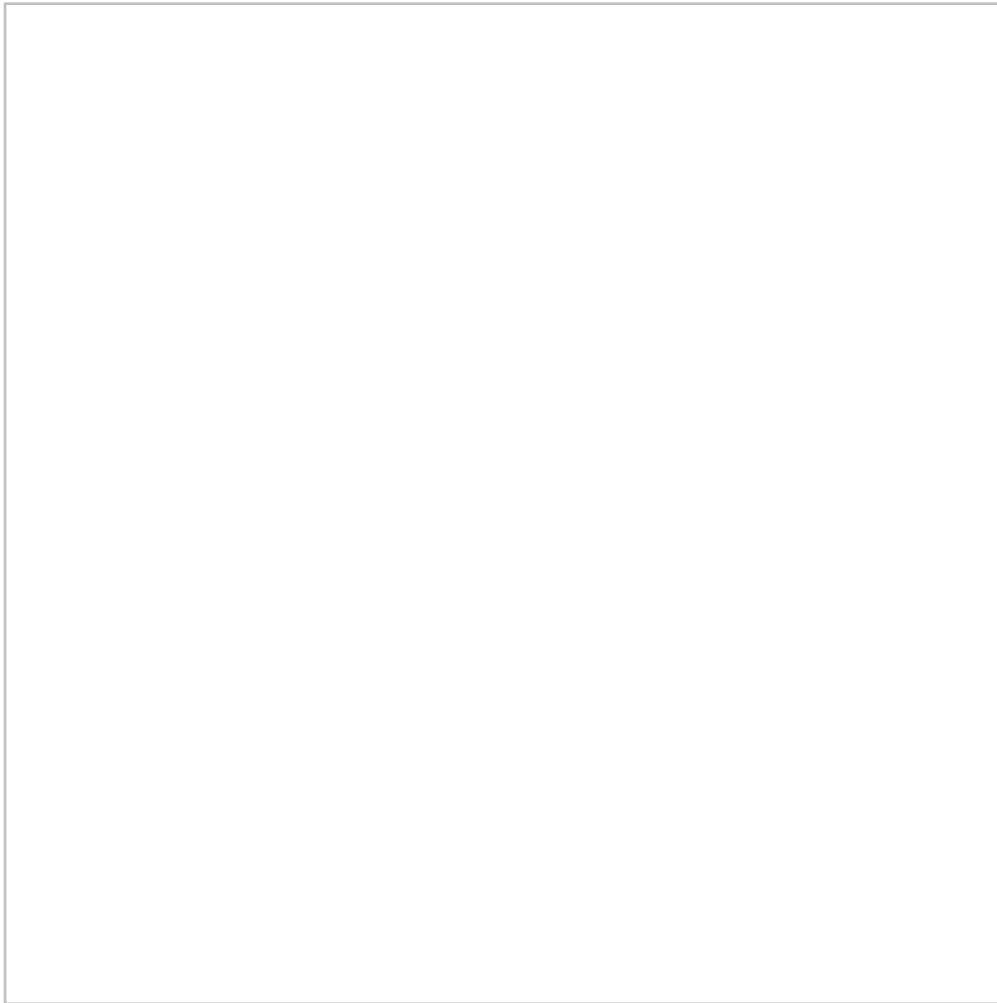
Could you gain an advantage in trade competition through this submission? No

Are you directly affected by an effect of the subject matter of this submission that:

- Adversely affects the environment; and
- Does not relate to trade competition or the effects of trade competition.

Yes

I accept by taking part in this public submission process that my submission (including personal details, names and addresses) will be made public.



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**From:** [UnitaryPlanSubmissionForm@donotreply.aucklandcouncil.govt.nz](mailto:UnitaryPlanSubmissionForm@donotreply.aucklandcouncil.govt.nz)  
**To:** [Unitary Plan](#)  
**Subject:** Unitary Plan Publicly Notified Submission - Plan Change 101 - Georgina Stewart  
**Date:** Tuesday, 11 June 2024 4:15:44 pm  
**Attachments:** [Council submission.pdf](#)

---

The following customer has submitted a Unitary Plan online submission.

**Contact details**

Full name of submitter: Georgina Stewart  
Organisation name:  
Agent's full name:  
Email address: [georginastewart2@gmail.com](mailto:georginastewart2@gmail.com)  
Contact phone number:  
Postal address:  
A202 7 Hinaki Street  
Point England  
Auckland 1072

**Submission details**

**This is a submission to:**

Plan change number: Plan Change 101  
Plan change name: PC 101 (Private): Pilkington Park, 167-173 Pilkington Road and railway land on the corner of Apirana Avenue and Merton Road (North Island Main Trunk 671.04-672.38 KM), Point England

**My submission relates to**

Rule or rules:  
Allowing greater building heights of between 21m and 27m  
Property address: 167-173 Pilkington Road  
Map or maps:  
Other provisions:  
Do you support or oppose the provisions you have specified? I or we oppose the specific provisions identified  
Do you wish to have the provisions you have identified above amended? Yes  
The reason for my or our views are:  
See attached pdf

I or we seek the following decision by council: Approve the plan change with the amendments I requested

Details of amendments: Restrict building height to no more than three stories

| 2.1

Submission date: 11 June 2024

Supporting documents  
Council submission.pdf

**Attend a hearing**

Do you wish to be heard in support of your submission? No

**Declaration**

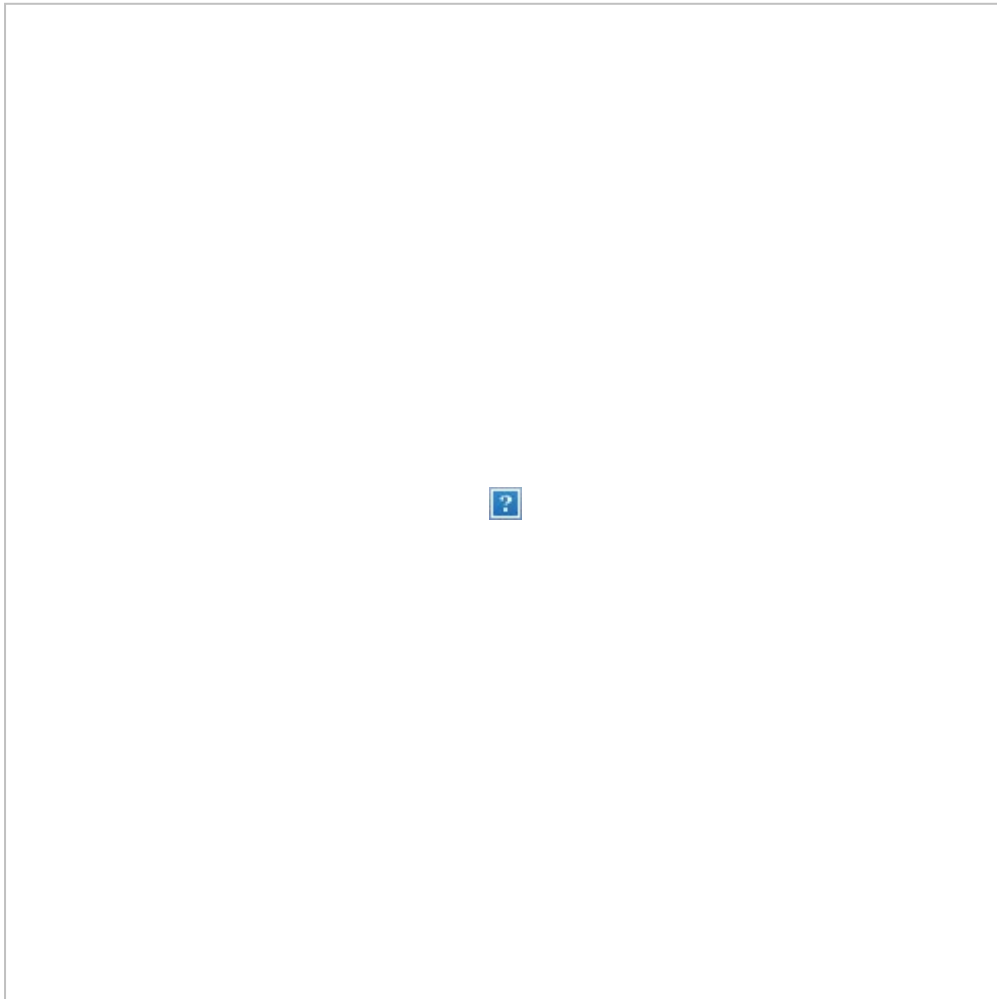
Could you gain an advantage in trade competition through this submission? No

Are you directly affected by an effect of the subject matter of this submission that:

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Yes

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I am writing in response to your letter dated May 17th concerning the rule change to 167-173 Pilkington Road, as I live in a nearby property.

#### Current situation

There is very little impact currently from Pilkington Park. The buildings and activities are shielded by a line of mature trees.

#### Concerns

##### Increase in height restrictions.

I am concerned about the visual impact of the increase in the height of buildings on the site, which would allow buildings of about five to seven stories. The buildings would be visible above the trees and obstruct views of Mt Wellington. The building heights would be twice the height of buildings in the surrounding area and dominate the skyline. The nearby Glen Innes shopping centre is low rise and apartment blocks in the area are up to a maximum of three stories.

##### Increase in noise and traffic.

As Pilkington Park is adjacent to residential areas zoned for intensive residential development, I am concerned that any development to the site must minimise the impact for nearby residents. Pilkington Road is already very busy and I experience quite a bit of road noise and general background noise. The area gets quite congested at peak times, and is not very pedestrian friendly.

2.2

**From:** [UnitaryPlanSubmissionForm@donotreply.aucklandcouncil.govt.nz](mailto:UnitaryPlanSubmissionForm@donotreply.aucklandcouncil.govt.nz)  
**To:** [Unitary Plan](#)  
**Subject:** Unitary Plan Publicly Notified Submission - Plan Change 101 - Sibylle Van Hove  
**Date:** Friday, 14 June 2024 3:46:24 pm

---

The following customer has submitted a Unitary Plan online submission.

**Contact details**

Full name of submitter: Sibylle Van Hove

Organisation name:

Agent's full name:

Email address: vanhove.s.c@gmail.com

Contact phone number:

Postal address:

Point England  
Auckland 1072

**Submission details**

**This is a submission to:**

Plan change number: Plan Change 101

Plan change name: PC 101 (Private): Pilkington Park, 167-173 Pilkington Road and railway land on the corner of Apirana Avenue and Merton Road (North Island Main Trunk 671.04-672.38 KM), Point England

**My submission relates to**

Rule or rules:

Property address: Pilkington Park, 167-173 Pilkington Road and railway land on the corner of Apirana Avenue and Merton Road

Map or maps:

Other provisions:

The submission relates to the proposed amendment of planning maps to enable greater building heights.

Do you support or oppose the provisions you have specified? I or we oppose the specific provisions identified

Do you wish to have the provisions you have identified above amended? Yes

The reason for my or our views are:

I strongly support the proposed plan change to rezone the land from Business-Light Industry to Business - Mixed use and introduce a new precinct.

Our reasons for opposing the requested greater building heights are to maintain a medium density urban area for the wellbeing of the community, resilience and equality of the city (and increase the area's value). Significant research has shown the ample reasons that areas of medium density building create more livable cities than those with higher rising buildings. Some reasons include; improving connection between individuals, improving airflow & light, increasing chance encounters & liveliness of the city, improved equality & affordability of the surrounding area, and improved health of community members by making exercise more easily attainable.

Examples of existing high rise buildings in Auckland's urban areas that do not foster community and livability include the multi-story buildings next to New Lynn and Glen Eden train stations. These are obvious examples of buildings that increase disconnect within the community.

The council's responsibility is to the city's residents and having the communities best interest in mind should be their number one consideration and priority in making this decision.

I or we seek the following decision by council: Approve the plan change with the amendments I requested

Details of amendments: Removal of the height variation control (of between 21 and 27m) and maintain the existing heights of 20m for the LIZ and 18m for THAB zones. | 3.1

Submission date: 14 June 2024

**Attend a hearing**

Do you wish to be heard in support of your submission? No

**Declaration**

Could you gain an advantage in trade competition through this submission? No

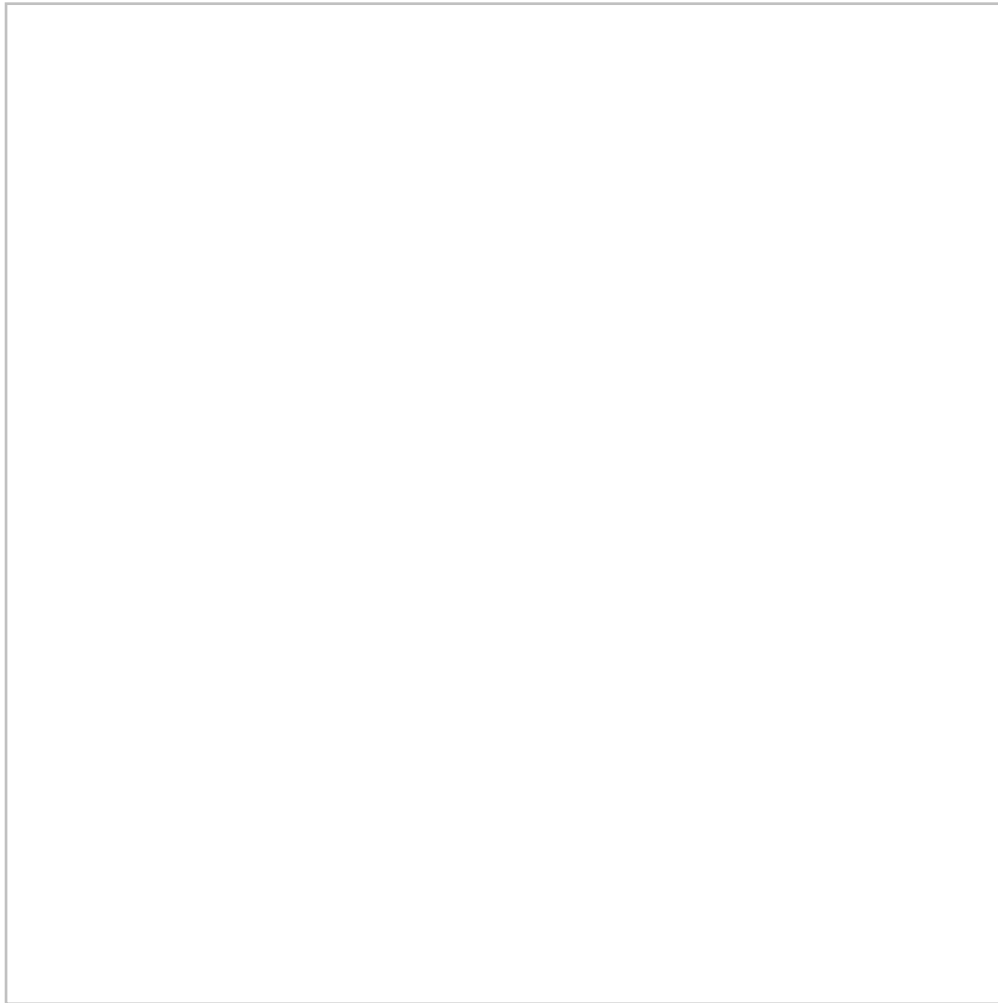
Are you directly affected by an effect of the subject matter of this submission that:

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- Does not relate to trade competition or the effects of trade competition.

No

I accept by taking part in this public submission process that my submission (including personal details, names and addresses) will be made public.





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**From:** [Robbie Lee \(AT\)](#)  
**To:** [Unitary Plan](#)  
**Subject:** PC101 - AT Submission Update  
**Date:** Tuesday, 2 July 2024 12:58:15 pm  
**Attachments:** [image001.png](#)  
[PC101 - Submission Final .pdf](#)

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Hi there,

Please see attached Auckland Transport's updated submission. I have removed reference to policies 10 & 12 that were incorrectly submitted in support of.

Let me know if you have any questions.

**Robbie Lee | Planner**  
**Spatial Planning Policy Advice | Strategy and Governance**  
**Auckland Transport**

20 Viaduct Harbour Avenue, Auckland 1010

+6499305001 EXT 2438 | [robbie.lee@at.govt.nz](mailto:robbie.lee@at.govt.nz) | [www.at.govt.nz](http://www.at.govt.nz)



We all have an important part to play in helping to reduce the spread of COVID-19 in our communities. [Find the latest information and advice from Auckland Transport.](#) For the latest news from the Ministry of Health go to the [Unite Against Covid-19 website.](#)

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An Auckland Council Organisation

20 Viaduct Harbour Avenue, Auckland 1010  
Private Bag 92250, Auckland 1142, New Zealand  
**Phone** 09 355 3553 **Website** [www.AT.govt.nz](http://www.AT.govt.nz)

20 June 2024

Plans and Places  
Auckland Council  
Private Bag 92300  
Auckland 1142

Attn: Planning Technician

Email: [unitaryplan@aucklandcouncil.govt.nz](mailto:unitaryplan@aucklandcouncil.govt.nz)

**Proposed Private Plan Change 101 – Pilkington Park, 167-173 Pilkington Road and railway land**

Please find attached Auckland Transport's submission on **Proposed Private Plan Change 101 – Pilkington Park Road and railway land**. The applicant is Wyborn Capital Investment Limited.

If you have any queries in relation to this submission, please contact me at [spatialplanning@at.govt.nz](mailto:spatialplanning@at.govt.nz) or on +6499305001 EXT 2438

Yours sincerely

*Robbie Lee*

Robbie Lee  
**Planner, Spatial Planning Policy Advice**



## Submission by Auckland Transport on Private Plan Change 101: 167-173 Pilkington Road, Point England

**To:** Auckland Council  
Private Bag 92300  
Auckland 1142

**Submission on:** Proposed Private Plan Change 101 from Wyborn Capital Investment Limited for land located at 167-173 Pilkington Road and railway land in Point England

**From:** Auckland Transport  
Private Bag 92250  
Auckland 1142

### 1. Introduction

- 1.1 Wyborn Capital Investment Limited (**the Applicant**) is seeking a private plan change (**PC101 or the plan change**) to the Auckland Unitary Plan - Operative in Part (**AUP(OP)**) to rezone approximately 7.3 hectares of land at 167-173 Pilkington Road, Point England and approximately 600m<sup>2</sup> of land on the corner of Apirana Avenue and Merton Road (North Island Main Trunk 671.04-672.38 KM) from Business – Light Industry to Business – Mixed Use with associated precinct provisions.
- 1.2 Auckland Transport is a Council-Controlled Organisation of Auckland Council (**the Council**) and the Road Controlling Authority for the Auckland region. Auckland Transport has the legislated purpose to contribute to an 'effective, efficient and safe Auckland land transport system in the public interest'.<sup>1</sup> In fulfilling this role, Auckland Transport is responsible for the following:
- a. The planning and funding of most public transport, including bus, train and ferry services
  - b. Promoting alternative modes of transport (i.e., alternatives to the private motor vehicle)
  - c. Operating the roading network
  - d. Developing and enhancing the local road, public transport, walking and cycling networks.
- 1.3 Auckland Transport is not a trade competitor for the purposes of section 308B of the Resource Management Act 1991.

### 2. Strategic context

- 2.1 The key overarching considerations and concerns for Auckland Transport are described below.

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<sup>1</sup> Local Government (Auckland Council) Act 2009, section 39.

## Auckland Plan 2050

- 2.2 The Auckland Plan 2050 (**Auckland Plan**) is a 30-year plan outlining the long-term strategy for Auckland's growth and development, including social, economic, environmental and cultural goals<sup>2</sup>. The transport outcomes identified in the Auckland Plan include providing better connections, increasing travel choices and maximising safety. To achieve these outcomes, focus areas outlined in the Auckland Plan include targeting new transport investment to the most significant challenges; making walking, cycling and public transport preferred choices for many more Aucklanders; and better integrating land use and transport.

### Sequencing growth and aligning with the provision of transport infrastructure and services

- 2.3 The need to coordinate urban development with infrastructure planning and funding decisions is highlighted in the objectives of the National Policy Statement on Urban Development 2020 (**NPS-UD**). Those objectives are quoted below (with emphasis in bold):

'Objective 3: Regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of an urban environment in which one or more of the following apply:

- (a) the area is in or near a centre zone or other area with many employment opportunities
- (b) **the area is well-serviced by existing or planned public transport**
- (c) there is high demand for housing or for business land in the area, relative to other areas within the urban environment.'

'Objective 6: Local authority decisions on urban development that affect urban environments are:

- (a) **integrated with infrastructure planning and funding decisions**; and
- (b) strategic over the medium term and long term; and
- (c) responsive, particularly in relation to proposals that would supply significant development capacity.'

- 2.4 The Regional Policy Statement (**RPS**) objectives and policies in the AUP(OP) place similar clear emphasis on the efficient provision of infrastructure and on the integration of land use and development with infrastructure, including transport infrastructure. Refer, for instance, to Objectives B2.2.1(1)(c) and (5) and B3.3.1(1)(b), and Policies B2.2.2(7)(c) and B3.3.2(5)(a). For example, Policy B3.3.2(5)(a) is to: *'Improve the integration of land use and transport by... ensuring transport infrastructure is planned, funded and staged to integrate with urban growth'*. The alignment of infrastructure to support growth is essential to achieving a well-functioning urban environment.
- 2.5 The Draft Regional Land Transport Plan (**RLTP**) 2024-2034 sets out the 10-year programme of transport infrastructure investment required to support the transport network including planned and enabled growth in the Auckland region. The Draft RLTP 2024-2034 is aligned with the Council's priority areas and the spend proposed within

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<sup>2</sup> The Auckland Plan is a statutory spatial plan required under section 79 of the Local Government (Auckland Council) Act 2009.

the Council's Draft 10 Year Budget 2024-2034. PC 101 will directly benefit from the Urban Cycleways Programme (Overall Rank 52) that will provide improved connections along Apirana Avenue to link to Glenn Innes.

### **Mitigation of adverse transport effects**

- 2.6 A critical issue is whether the Plan Change includes appropriate provisions to require development and subdivision proposals to mitigate adverse transport effects and to provide the transport infrastructure and services needed to serve it. This is addressed further in **Attachment 1**.
- 2.7 As mentioned above, adverse transport effects that arise when development occurs without required transport infrastructure and services being provided at an appropriate time cannot be addressed without funding to support the planning, design, consenting and construction of necessary transport infrastructure and services. There is a need to assess and clearly define responsibilities relating to the required infrastructure and the potential range of funding and delivery mechanisms. This includes a consideration of what infrastructure is required at various stages of development.

### **3. Specific parts of the plan change that this submission relates to**

- 3.1 The specific parts of the plan change that this submission relates to are set out in **Attachment 1**. In keeping with Auckland Transport's purpose, the matters raised relate to transport and transport assets, including integration between transport and land use.
- 3.2 Auckland Transport **Support in part** the plan change, subject to the matters raised in **Attachment 1** being satisfactorily addressed by the Applicant.
- 3.3 Auckland Transport is available and willing to work through the matters raised in this submission with the Applicant.

### **4. Decisions sought**

- 4.1 The decisions which Auckland Transport seeks from the Council are set out in **Attachment 1**.
- 4.2 In all cases where amendments to the plan change are proposed, Auckland Transport would consider alternative wording or amendments which address the reason for Auckland Transport's submission. Auckland Transport also seeks any consequential amendments required to give effect to the decisions requested.

### **5. Appearance at the hearing**

- 5.1 Auckland Transport wishes to be heard in support of this submission.
- 5.2 If others make a similar submission, Auckland Transport will consider presenting a joint case with them at the hearing.

**Name:** Auckland Transport

**Signature:**



Rory Power  
Manager - Spatial Planning Policy Advice

**Date:** 20 June 2024

**Contact person:** Robbie Lee  
Planner - Spatial Planning Policy Advice

**Address for service:** Auckland Transport  
Private Bag 92250  
Auckland 1142

**Telephone:** +6499305001 EXT 2438



**Email:** [spatialplanning@at.govt.nz](mailto:spatialplanning@at.govt.nz)

## Attachment 1

Issue / Provision	Support / oppose	Reasons for submission	Decision requested
Overall	Support in part	<p>Auckland Transport supports the plan change to rezone approximately 7.3 hectares of land at 167-173 Pilkington Road, Point England and 600m<sup>2</sup> of land within North Island Main Trunk from Business – Light Industry to Business – Mixed Use</p> <p>However, amendments are needed to address a range of transport-related matters. These matters must be addressed before Auckland Transport can be satisfied that appropriate provision has been made to ensure the transport needs of the precinct can be met.</p>	Accept the plan change, provided that the matters outlined in the main body of this submission and the issues identified in this table are addressed and resolved to Auckland Transport's satisfaction.
Pedestrian connection	Oppose in part	<p>Auckland Transport supports the proposal as it will encourage more people living and working in the area to complete some of their journeys through more sustainable modes of transport. This is in part due to the site's location which is near established services and amenities and can utilise existing transport infrastructure, including the Glen Innes Train Station.</p> <p>Additionally, the Links to Glen Innes Project will provide safer connections for residents and workers to access the Glen Innes Train Station through walking and cycling with safe crossing points at the key intersections of Apirana Avenue /Point England Road and Apirana Avenue / Pilkington Road (shown below).</p>	<p>Amend the plan change to include a new section with a provision to ensure the following key pedestrian crossing (infrastructure requirement) is provided in the first stage of development.</p> <ul style="list-style-type: none"> <li>- Safe crossing facilities and connections for pedestrians and active modes across Apirana Avenue to/from the site and the land to the east (indicative location shown below).</li> </ul>

4.1



Issue / Provision	Support / oppose	Reasons for submission	Decision requested
		 <p>While these upgrades will provide key connections for active mode users, an additional connection is needed to support access to neighbourhood amenities (parks and school) to the east of the site. The distance between the two intersections is approximately 500m and there is a risk that pedestrians will choose to cross in the middle of these two points rather than walk the extra distance. Providing an additional midblock</p>	 <p>Provision may include thresholds or triggers (prior to the first occupation of any dwelling), or clear assessment and consenting processes aligned to related objectives and policies. This should include non-complying activity status where staging triggers are not met.</p>

Issue / Provision	Support / oppose	Reasons for submission	Decision requested
		crossing point between these two intersections ensures that any development will connect users to the surrounding environment safely.	
Site access	Oppose in part	<p>The precinct provisions do not include any requirements to manage access to the site via the existing points on to Apirana Avenue and Pilkington Road and any associated measures to avoid adverse effects on these key arterial routes.</p> <p>The proposal appears to rely on two access points from Apirana Avenue (a small one to the north and larger one to the south) and three access points from Pilkington Road. As the plan change has the potential to significantly increase trip generation through the proposed rezoning, bespoke access provisions are required to illustrate how people will be able to access this site safely rather than relying on the Vehicle Access Restriction on Apirana Avenue and Pilkington Road.</p> <p>Furthermore, Pilkington Road has been identified in the Links to Glen Innes Project as a future cycleway. It is important that access onto this road is managed in a way that protects this future connection.</p>	<p>Amend the plan change to include the following new standard, or similar:</p> <p><u>X. Site Access</u></p> <p><u>Purpose:</u></p> <ul style="list-style-type: none"> <li>- <u>Maintain a safe road frontage and footpath uninterrupted by vehicle crossings and to provide for the safe and efficient operation of the arterial network</u></li> </ul> <p><u>1) Where subdivision and development adjoins a road with existing or planned footpath or protected cycle lane on the site’s frontage, rear lanes (access lot) or access from side roads must be provided so that no vehicle crossing occurs directly from the site’s frontage over any shared footpath, protected cycle lane or the road frontage.</u></p> <p><u>2) No new road intersection (excluding active mode only connections), additional vehicle crossing or additional activities using vehicles crossings existing as at the date of these precinct provisions being made operative shall be permitted along the Apirana Avenue and Pilkington Road frontage of the site.</u></p>
<b>Pilkington Park Precinct</b>			
IX. 1. – Precinct description	Support in part	<p>Reference to protecting sensitive activities from noise associated with the railway corridor is supported to protect people’s health and amenity while they are indoors.</p> <p>However, the precinct description requires an additional reference to Apirana Avenue and Pilkington Road to ensure</p>	<p>Amend the precinct description to include the following, or similar:</p> <p><i>Land use, development, and subdivision within the precinct is provided for in a manner which supports the ongoing safe and efficient operation of the North Island Main Trunk Line, and Apirana Avenue and Pilkington Road, including by protecting sensitive activities from noise associated with the railway corridor, and</i></p>

4.2

4.3

Issue / Provision	Support / oppose	Reasons for submission	Decision requested	
		that development within the precinct considers the efficient operation of these primary arterials.	<p><i>arterial roads. All relevant Auckland-wide and zone provisions apply in this precinct unless otherwise specified below.</i></p> <p>Otherwise retain the precinct description.</p>	
IX.2. Objective 3	Support	Objective 3 is consistent with integrating subdivision and development with sustainable transport and existing commercial centres. This enables communities to meet their essential needs within close proximity to where they live while being able to travel across Auckland more easily.	Retain Objective 3.	4.4
IX.2. Objective 4	Support in part	<p>Objective 4 is consistent with the protection of activities sensitive to noise from the operation of strategic transport networks. This is required to protect people’s health and amenity while they are indoors.</p> <p>However, reference to protecting noise sensitive activities from the adjacent arterial roads of Apirana Avenue and Pilkington Road is also required.</p>	<p>Amend Objective 4 to include the following, or similar:</p> <p><i>Activities sensitive to noise located adjacent to the rail corridor, <u>and Apirana Avenue and Pilkington Road</u>, are designed to protect people’s health and amenity values, and in a way which does not unduly constrain the operation of the North Island Main Trunk Line or arterial roads.</i></p> <p>Otherwise retain Objective 4.</p>	4.5
IX.3. Policy 1	Support	Policy 1 is consistent with integrating subdivision and development with effective, efficient and safe transport.	Retain Policy 1.	4.6
IX.3. Policy 4	Support in part	<p>Policy 4 is needed to ensure activities sensitive to noise are protected from the operation of strategic transport networks.</p> <p>However, this should be extended to include Apirana Avenue and Pilkington Road as they are arterial roads.</p>	<p>Amend Policy 4 to include the following, or similar:</p> <p><i>Ensure that activities sensitive to noise adjacent to the North Island Main Trunk Line, <u>and Apirana Avenue and Pilkington Road</u> do not unduly constrain the operation of the rail corridor or arterial roads by providing for buildings and outdoor play areas to be designed with acoustic attenuation measures.</i></p> <p>Otherwise retain Policy 4.</p>	4.7

Issue / Provision	Support / oppose	Reasons for submission	Decision requested
IX.6.2. Standard for activities sensitive to noise	Support in part	<p>The requirement to protect activities sensitive to noise arising from road traffic noise associated with Apirana Avenue and Pilkington Road is consistent with protecting people’s health and amenity value while they are indoors.</p> <p>The approach taken to assessing noise levels within other recent private plan changes requires measuring future predicted volumes against indoor noise level standards (rather than referencing to a 55 dB trigger). In this instance the applicant has chosen to assess development based on predicted road traffic noise levels ten years after the noise sensitive space is first occupied.</p> <p>However, to avoid the need for the applicant to predict traffic every time they complete an assessment, an alternative is to set a base on current measured or predicted noise levels plus 3 dB. This approach is considered appropriate in this instance as road noise only increases 3 dB with every doubling of traffic, and the design solutions are likely to be the same. Auckland Transport are of the view that due to the function of Apirana Avenue and Pilkington Road this approach would be appropriate here.</p>	<p>Amend IX.6.2. as follows:</p> <p><i>(4) Any new noise sensitive space or alteration to an existing noise sensitive space within 60m of Apirana Avenue or Pilkington Road where the road traffic noise level <del>is predicted to exceeds 55dB</del> <del>LAeq24hr</del> <u>exceeds current measured or predicted noise levels plus 3 dB</u> must be designed, constructed and maintained with a mechanical ventilation / cooling system that meets the requirements of E25.6.10(3)(b) and (d) to (f).</i></p> <p><i>Note:-The design shall be based on <u>current measured or predicted road traffic noise levels</u> <del>ten years</del> <u>plus 3 dB</u> after the noise sensitive space is first occupied</i></p> <p>Otherwise retain</p>

4.8

**From:** [Allison Tindale](#)  
**To:** [Unitary Plan](#)  
**Subject:** KiwiRail submission on Plan Change 101 - Pilkington Park  
**Date:** Friday, 21 June 2024 9:40:58 am  
**Attachments:** [KiwiRail submission on Plan Change 101 - Pilkington Park.pdf](#)

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Hello,

Please find attached KiwiRail's submission on the above plan change.

Any queries, please let me know.

Kind regards  
Allison Tindale  
Senior RMA Advisor  
027 287 3473

21 June 2024

Auckland Council  
Planning Technicians  
Plans and Places  
Private Bag 92300  
Auckland 1142  
Attn: Michele Perwick

By email to: [unitaryplan@aucklandcouncil.govt.nz](mailto:unitaryplan@aucklandcouncil.govt.nz)

**SUBMISSION ON PUBLICLY NOTIFIED PROPOSAL FOR PLAN, CHANGE OR VARIATION  
(FORM 5)**

**Plan Change 101**

**NAME OF SUBMITTER:**

KiwiRail Holdings Limited (KiwiRail)

**ADDRESS FOR SERVICE:**

Level 1  
Wellington Railway Station  
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PO Box 593  
WELLINGTON 6140  
Attention: Allison Tindale

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**KiwiRail Submission on Auckland Unitary Plan Operative in Plan Change 101 (Private):  
Pilkington Park by Wyborn Capital Investments Limited.**

KiwiRail is the State-Owned Enterprise responsible for the management and operation of the national railway network. This includes managing railway infrastructure and land, as well as rail freight and passenger services within New Zealand. KiwiRail is also the requiring authority for land designated “Railway Purposes” (or similar) in district plans throughout New Zealand.

The plan change area lies adjacent to the one of New Zealand’s key main railway lines, the North Island Main Trunk line (NIMT), which carries both rail freight traffic and Metro passenger services. This rail line forms part of the golden triangle network for rail freight between Auckland, Tauranga and Hamilton. KiwiRail seeks to protect the safe and efficient operation of the railway corridor, to enable its ongoing use for operational purposes.



The scope of KiwiRail's submission relates to the safe and efficient operation of the railway corridor for both passenger and freight services. KiwiRail supports the purpose of the Plan Change and acknowledges the inclusion of provisions, intended to manage reverse sensitivity effects. However, KiwiRail seeks amendments to the proposed precinct provisions to provide a more appropriate degree of protection to the railway corridor from reverse sensitivity effects and buildings built within 5m of the rail corridor.

KiwiRail also asks that acoustic mitigation for new noise sensitive activities be applied to land within 100m of the rail corridor, rather than the proposed 60m. Attached to this submission is KiwiRail's Section 32 Assessment on Noise, which provides additional justification for the amendments requested.

KiwiRail confirms that it has no objection to the proposed zoning of approximately 600m<sup>2</sup> of land within the existing railway corridor to Business-Mixed Use. It is noted that this area of land sits outside the proposed precinct boundary.

KiwiRail's specific suggested wording changes to the plan change provisions are provided in the following Table.

KiwiRail could not gain an advantage in trade competition through this submission.

KiwiRail wishes to speak to our submission and will consider presenting a joint case at the hearing with other parties who have a similar submission.

If you have any queries, please do not hesitate to contact me.

Yours faithfully,



Allison Tindale  
Senior RMA Advisor  
KiwiRail



Proposed Amendment	Support/Oppose/ Seek Amendment	Submission/Comments/Reasons Plan Change 101: Pilkington Park	Relief Sought (as stated or similar to achieve the requested relief)
IX.1 Precinct description	Part support Part seek amendment	<p>KiwiRail supports the precinct description, which includes references to both high-quality mixed-use development and protecting sensitive activities from noise associated with the rail corridor.</p> <p>It is requested that the Precinct description be amended to include reference to potential vibration effects, in a similar manner as Plan Change 48. The associated map to go with this reference should illustrate a 'rail vibration notation' over land within 100m of the rail corridor.</p> <p>Although no specific rules are proposed to manage vibration effects, it is noted that the acoustic assessment by Styles Group in Section 8.3.2 measured vibration levels for freight trains which typically ranged between 0.3mm/s PPV and 0.5mm/s PPV. It is also noted that occupants of buildings can considerably vary in their ability to detect vibration.</p> <p>KiwiRail feels it is important that future landowners and occupants of sensitive activities are aware of any existing activities, which could have an effect on levels of amenity obtainable. An alert level is considered valuable in flagging a potential issue, and reducing the possibility of future complaints.</p>	<p>Retain references to high-quality mixed-use development and protecting sensitive activities from noise associated with the rail corridor.</p> <p>Add</p> <p><b><u>An area within the Precinct which may experience vibration levels higher than would normally be expected because of proximity to the rail corridor is identified on Precinct Plan X.</u></b></p> <p>Include Precinct Plan X</p>
IX.2 Objectives	Part support Part seek amendment	<p>KiwiRail generally supports the proposed objectives which reflect good planning principles for a town centre location close to the rail corridor. The intent of objective (3) is particularly supported as it seeks to ensure future residents and occupants experience good health and amenity, whilst protecting the North Island Main Trunk Line from reverse sensitivity effects.</p> <p>A new policy is also suggested which refers to the need to manage the proximity of new buildings near the rail corridor to prevent adverse effects on the existing and future operation of trains using the North Island Main Trunk Line. This complements suggested changes to Standard IX.6.4.</p> <p>Objectives and policies within the Pilkington Park Precinct which manage the potential for adverse effects on the North Island Main Trunk Line are consistent with the following provisions in the Operative Unitary Plan.</p> <p>Infrastructure B.3.2.2 Reverse Sensitivity</p> <p><i>(4) Avoid where practicable, or otherwise remedy or mitigate, adverse effects of subdivision, use and development on infrastructure.</i></p> <p><i>(5) Ensure subdivision, use and development do not occur in a location or form that constrains the development, operation, maintenance and upgrading of existing and planned infrastructure.</i></p> <p>Transport B.3.3.2</p> <p><i>(5) "Improve the integration of land use and transport by:..</i></p> <p><i>(f) requiring activities adjacent to transport infrastructure to avoid, remedy or mitigate effects which may compromise the efficient and safe operation of such infrastructure.</i></p> <p><i>(6) Require activities sensitive to adverse effects from the operation of transport infrastructure to be located or designed to avoid, remedy or mitigate those potential adverse effects."</i></p>	<p>Retain Objectives 1 and 2 and 3</p> <p>Add new Objective 4</p> <p><b><u>4. The North Island Main Trunk railway line is protected from adverse effects from the construction and maintenance of new buildings and structures through the use of setbacks.</u></b></p>
IX.3 Policies	Part support Part seek amendment	<p>KiwiRail generally supports the proposed policies which reflect good planning principles for a town centre location close to the rail corridor. The intent of policy (3) is particularly supported as it seeks to ensure future residents and occupants experience good health and amenity, whilst protecting the North Island Main Trunk Line from reverse sensitivity effects.</p> <p>It is requested that the wording of policy (3) be amended to refer to protecting amenity when indoors and the use of building setbacks. This is consistent with suggested new objective 4. Reference is made to communal outdoor play areas for consistency reasons.</p>	<p>Retain Policies 1 and 2</p> <p>Amend Policy 3</p> <p>3. Ensure that activities <del>sensitive to noise</del> adjacent to the North Island Main Trunk Line do not unduly constrain the operation of the rail corridor by:</p> <p>i) <b><u>the use of acoustic attenuation measures in the design of building interiors for activities sensitive to noise and communal outdoor play areas providing for buildings and outdoor play areas to be designed with acoustic attenuation measures.</u></b></p>

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Proposed Amendment	Support/Oppose/ Seek Amendment	Submission/Comments/Reasons Plan Change 101: Pilkington Park	Relief Sought (as stated or similar to achieve the requested relief)
			ii) <b>managing the location of buildings close to the rail corridor through the use of setbacks.</b>
Table IX.4.1 Activity	Seek amendment	<p>An amendment is sought to Development A2 to trigger consent as a Restricted Discretionary activity for a new proposed standard IX.6.4. to provide a setback from the rail corridor, as well as also requiring acoustic mitigation for alterations/extensions to existing buildings containing noise sensitive activities. The absence of reference to alterations to existing building is inconsistent with suggested wording for IX.6.2 Standard for activities sensitive to noise.</p> <p>The need for acoustic mitigation equally applies to extensions and alterations of existing buildings, as it does to new buildings. The absence of provisions for alterations/extensions to existing buildings, can create a perverse incentive to partially demolish/rebuild existing buildings, to avoid a requirement that only applies to new buildings.</p> <p>I450.6.9 (1) in Plan Change 48 requires “any new building or alteration to an existing building that contains an activity sensitive to noise” to provide noise attenuation to achieve specified internal noise levels for bedrooms and other habitable spaces.</p>	<p>(A2)</p> <p>New buildings <b>and alterations to existing buildings</b> which do not comply with standards IX.6.1 to IX.6.34</p> <p>Restricted Discretionary</p>
IX.5 Notification	Support	KiwiRail supports the reference in point 2 to giving special consideration to those persons listed in Rule C1.13(4) [of the Operative Plan] when deciding on who is an affected person. This rule refers to “the network utility operator which operates that infrastructure” in relation to development potentially affecting infrastructure.	Retain as proposed
1X.6.2 Standard	Seek amendment	<p>KiwiRail supports the intent of the provision but seeks amendments to extend the distance to which these standards apply from 60m to 100m from the rail corridor. Rail noise effects extend approximately 100m from the railway designation. Additional reasoning for the need for a higher distance is contained in the attached Section 32 report. This assessment provides justification for applying a higher degree of acoustic mitigation for noise sensitive activities close to the rail corridor, than currently apply to this location in the Operative Unitary Plan or prior approved plan changes for the rezoning of land adjacent the rail corridor.</p> <p>The applicant’s Assessment of Noise and Vibration Effects by Styles Group dated 28 March 2024 refers in Section 8.2.1 to the logarithmic average of the loudest 6 trains measured 15m from the track of 99.6dBA. Section 8.2.2 confirms that the acoustic consultant accepts KiwiRail’s noise source level of 70 dB LAeq(1 hour) at a distance of 12 metres from the track. The acoustic consultant has effectively recognised the need for some acoustic measures within 60m of the rail corridor for the proposed mixed-use precinct.</p> <p>Little explanation is provided in the acoustic assessment as to why a 60m noise effects area was considered appropriate. Whilst the mixed-use precinct would be subject to existing standard E25.6.10, which may require some acoustic mitigation for noise sensitive activities, this standard is unlikely to achieve the specified noise level for bedrooms at night for properties close to the rail corridor, because noise levels in the mixed-use zone are assumed to be lower than that generated by a freight train. This is effectively acknowledged in Section 7.5 of the Section 32 report which states: “additional requirements for acoustic treatment and/or mechanical ventilation are recommended for all activities sensitive to noise...because the AUP does not include equivalent rules or standards for sensitive activities located within close proximity to the rail corridor.</p> <p>Rather than providing for alternative measurements of noise attenuation from rail over distance as a permitted activity, it is requested that variations from KiwiRail’s approved method for calculating rail noise be approved through the resource consent process as a Restricted Discretionary Activity.</p> <p>The applicant’s Section 32 report and accompanying acoustic assessment does not provide an obvious reason for the alternative method (modelling) to calculate the attenuation of rail noise over distance recommended in proposed standard IX.6.2. (1)(b)(ii). Whilst KiwiRail acknowledges the potential for actual noise levels to vary from predicted levels due to location specific factors, there are no existing or proposed features in the Precinct which are expected to significantly reduce rail noise below predicted levels, other than the possibility that a building within 100m of the rail corridor, may be built behind an existing building. Provisions suggested by KiwiRail would still allow for a resource consent to be submitted, which contains justification for not reaching the specified standard, based on location-specific factors.</p> <p>KiwiRail is of the view that while potential noise and vibration effects are partially addressed, the plan change does not adequately address likely noise effects from the rail corridor. The applicant’s acoustic report does not prove</p>	<p><b>IX.6.2. Standard for activities sensitive to noise within 6100m of the rail corridor</b></p> <p>Purpose: To ensure activities sensitive to noise adjacent to the railway corridor are designed to protect people’s health and amenity while they are indoors and that such activities do not unduly constrain the operation of the rail corridor.</p> <p>(1) Any new <del>building noise sensitive space</del> or alteration to an existing <b>building that contains an activity sensitive to noise sensitive space with a façade</b> within 6100 metres of the rail corridor, must be designed, constructed and maintained to <del>ensure that rail noise does not exceed internal</del> noise levels of 35 dB LAeq(1 hour) for sleeping areas and 40 dB LAeq(1 hour) for all other habitable spaces.</p> <p><b>Note:</b></p> <p>a. <del>The source level for R</del>railway noise is <b>assumed to be 70 LAeq(1h)</b> at a distance of 12 metres from the nearest track; <b>and must be deemed to reduce at a rate of</b></p> <p>b. <del>The attenuation over distance is:</del></p> <p>i. 3 dB per doubling of distance up to 40 metres and 6 dB per doubling of distance beyond 40 metres; <del>or</del></p> <p>ii. <del>As modelled by a Suitably Qualified and Experienced Acoustic Consultant using a recognised computer modelling method for freight trains with diesel locomotives, having regard to factors such as barrier attenuation, the location of the dwelling relative to the orientation of the track, topographical features and any intervening structures.</del></p>

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Proposed Amendment	Support/Oppose/ Seek Amendment	Submission/Comments/Reasons Plan Change 101: Pilkington Park	Relief Sought (as stated or similar to achieve the requested relief)
		<p>that the requested provisions by KiwiRail are unnecessary to achieve the desired internal noise levels for activities sensitive to noise.</p> <p>The increase in distance to which noise acoustic management is required from 60m to 100 from the rail corridor, is unlikely to have a significant effect on 'Table 3: Theme 3: Future development – Evaluation of Options', particularly in terms of the costs and benefits of 'Option 2 – Proposed plan change: Apply targeted provisions to manage the development of buildings' on pages 53 and 54 of the applicant's Section 32 Report.</p> <p>Existing standard E25.6.10(3)(c) specifies the need to provide mechanical ventilation for noise sensitive spaces other than residential dwellings. As the proposed Business – Mixed Use provides for a variety of uses which fit under the definition of 'activities sensitive to noise', it is relevant that this provision also apply to this precinct.</p> <p>KiwiRail feels that it would be more appropriate to test the acceptability of relying on any intervening buildings to achieve adequate levels of noise insulation within 100m of the rail corridor through a resource consent application. The deletion of the proposed exception would also increase consistency of provisions with those in Plan Change 48 and 50. Other minor wording amendments are suggested to increase consistency of proposed provisions with Plan Change 48.</p> <p>IX.6.2 Standard as proposed in the plan change documents is considered to be inconsistent with the following existing objectives and policies in the Operative District Plan, because it does not adequately protect the North Island Main Trunk Line from potential reverse sensitivity effects. This risk of reverse sensitivity effects is best prevented by requiring appropriate levels of noise mitigation for noise sensitive activities within 100m of the rail corridor, so that future occupants are not unduly disturbed by noise generated by the existing rail corridor.</p> <p><b>"E25.2.1 Objectives</b></p> <p><i>(1) People are protected from unreasonable levels of noise and vibration</i></p> <p><i>(3) Existing and authorised activities and infrastructure, which by their nature produce high levels of noise, are appropriately protected from reverse sensitivity effects where it is reasonable to do so.</i></p> <p><i>(7) Require activities to be appropriately located and/or designed to avoid where practicable or otherwise remedy or mitigate reverse sensitivity effects on: a) existing or authorised infrastructure...</i></p> <p>It is widely accepted that sound from rail networks has the potential to cause adverse health and amenity effects on people living nearby. Future occupants often do not appreciate the actual effects of living with 24/7 rail operations. With careful design, future occupants can be protected from the most significant adverse effects associated with railway noise. It is not possible nor appropriate to expect that the railway corridor can mitigate noise effects on new development, especially multi-storey development.</p>	<p>(2) If windows and doors must be closed to achieve the design noise levels in Standard IX.6.2(1), the building must be designed, constructed and maintained with a mechanical ventilation / cooling system that meets the requirements of E25.6.10(3)(b) and (d) to (f).</p> <p><del>(3) Standards IX.6.2(1) and IX.6.2(2) do not apply where:</del></p> <p><del>(a) The façade of any new or altered noise sensitive space is screened from all parts of the rail corridor by a proposed building(s) under the same land use consent or a building(s) existing as at XX XXX 202X; or</del></p> <p><del>(b) The façade of any new or altered noise sensitive space is partially screened from the rail corridor by a proposed building(s) under the same land use consent or a building(s) existing as at XX XXX 202X, and the closest viewing distance from the facade is over 100m from the rail corridor.</del></p> <p>(4) Where Standards IX.6.2(1) and IX.6.2(2) apply, <b>A</b>a report must be submitted by a suitably qualified and experienced person to the council demonstrating compliance with Standards IX.6.2(1) and IX.6.2(2) prior to <b>the</b> construction or alteration of any building containing <b>an activity sensitive to</b> noise. <del>sensitive space.</del></p> <p><b>Note:</b> The design shall be based on the cumulative level of external noise from the railway corridor in IX.6.2(1) and the maximum level of noise permitted by the zone or precinct standards or any adjacent zone or precinct standard <b>specified in-to-comply with</b> E25.6.10.</p> <p>Figure 1X6.2.3.1 viewing distance to the rail corridor is deleted.</p>
IX.6.3 Standard	Part Support	<p>KiwiRail commends the applicant for the consideration of a specific noise standard for outdoor play areas associated with early childhood centers. KiwiRail agrees that noise levels in outdoor play spaces could be above desirable levels for health and amenity, where located close to the rail corridor.</p> <p>KiwiRail generally supports the use of noise mitigation for a range of activities, but does not seek to prescribe noise standards for external or outdoor spaces. Nevertheless, it is recommended that the wording of this standard is consistent with the distance and wording used for activities sensitive to noise to avoid confusion.</p>	<p>KiwiRail does not seek a specific relief on this standard but raises this issue to ensure consistency for all noise sensitive activities within the precinct.</p>
IX.6.4	New standard	<p>A building setback is appropriate to reduce the potential conflict between the safe enjoyment and maintenance of buildings on adjacent properties and activities within the operational rail corridor. Providing a physical setback for buildings adjoining the railway corridor boundary, ensures that site occupants are able to carry out normal residential or business activities, including building maintenance with a reduced risk of coming into contact with railway infrastructure. The proposed 5m setback is consistent with the setback from the rail corridor specified in operative Plan Changes 48 and 50.</p> <p>The Proposed Plan Change enables buildings up to 27m in height along the rail corridor. When buildings are taller, they become more difficult to inspect and maintain and require additional equipment like scaffolding or cherry picker cranes for maintenance. A 5m setback provides space for the placement and dismantling of scaffolding at the base of taller buildings, as well as mechanical access.</p> <p>Trains travel at speed and are unable to stop quickly, with freight trains often taking one kilometre to come to a complete stop. Any person or equipment, such as poles and ladders, can all potentially be hit by an oncoming train</p>	<p>Add to IX.6 Standards a new standard IX.6.4:</p> <p><b><u>IX.6.4 Safe operation of the NIMT</u></b></p> <p><b><u>Buildings and structures must be setback at least 5 metres from any boundary which adjoins the North Island Main Trunk railway line.</u></b></p>

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Proposed Amendment	Support/Oppose/ Seek Amendment	Submission/Comments/Reasons Plan Change 101: Pilkington Park	Relief Sought (as stated or similar to achieve the requested relief)
		<p>if they encroach into the rail corridor. Whilst KiwiRail acknowledges that adjacent landowners require a 'Permit to Enter' from KiwiRail to legally enter the rail corridor, this legal requirement does not prevent all unauthorised access onto the rail corridor.</p> <p>The most efficient and effective means of ensuring that adjacent development does not interfere with the efficient and safe operation of the rail network is to require a setback from the boundary with the rail corridor. This setback reduces the adjoining landowners' likelihood of innocently accessing the rail corridor, reduces the risk of impact by train or the need for landowners to follow the 'Permit to Enter' process to carry out standard maintenance.</p>	
IX.8.1	Seek amendment	<p>Consequential change to name of standard to increase noise control area from 60m to 100m from the rail corridor.</p> <p>It is also noted that no matters of discretion are identified for a breach of proposed standard IX.6.3. To improve consistency, KiwiRail suggests similar provisions for both IX.6.2 and IX.6.3.</p> <p>Matters of discretion (a) to (d) are generally supported as relevant considerations. Some small changes to the matters of discretion to improve clarity are suggested. New matter (a) is suggested to make clear, that applications which infringe the standards should include details of expected internal noise limits, to assist the judgement as to whether the proposal achieves the purpose of the standard or not.</p> <p>The potential for reverse sensitive effects on the rail corridor, is a more relevant consideration than 'unduly constrain the operation of the rail corridor'. If buildings close to the rail corridor do not provide a satisfactory internal noise environment for occupants, it does not immediately or directly affect the operation of the rail corridor. Rather, it increases the probability that residents will seek future restrictions on the operation of the rail corridor, which could ultimately affect its long-term viability. It is therefore easier to make a judgement on potential for reverse sensitivity effects than assess whether a development 'unduly constrains the operation of the rail network'.</p>	<p><b>IX.8.1 Matters of discretion</b></p> <p>The Council will....</p> <p>(2) Infringement of standard IX.6.2. Activities sensitive to noise within <u>6100m</u> of the rail corridor</p> <p><b>(a) <u>Measured or predicted internal noise levels within bedrooms and other habitable rooms.</u></b></p> <p><b>(b) (a) <u>Any Effects</u> on human health and amenity values arising from non-compliance with Standard IX.6.2.</b> <i>(b) <u>The location and design of buildings</u></i></p> <p>(c) <b><u>Location</u></b>, topographical, building design features or other alternative mitigate that will mitigate potential adverse effects relevant to noise.</p> <p>(d) Whether the <del>activity or</del> infringement will <del>unduly constrain the operation of the rail corridor</del> <b><u>increase the risk of reverse sensitive effects on the existing rail corridor.</u></b></p> <p>(e) <b><u>The outcome of any consultation with KiwiRail.</u></b></p> <p>Noting that any consequential amendments to 1X.8.2. Assessment Criteria will follow from the above</p> <p>Matters of discretion are also identified for Infringement of standard IX.6.3. Outdoor play areas within 100m of the rail corridor for consistency reasons.</p>
IX.8.1	New matters of discretion	<p>This is sought as a consequential change to accommodate restricted discretionary status if the development does not meet proposed standard IX.6.4. Setback from NIMT. These include considerations on how far removed from the rail corridor a building or structure is, the ability to maintain a building within private site boundaries, potential effects on the safety and operation of the rail corridor and whether the location and design of the building achieves the purpose the standard. Suggested matter (e) does not require pre-consultation with KiwiRail but does suggest to potential developers, that it would be advisable to consult with KiwiRail, at an early stage, for any intended building within the setback distance. Matters of consideration should refer to effects on the efficient operation of the rail corridor, as both authorised and unauthorised access to the rail corridor can have a significant effect on the efficient operation of the rail corridor, as well as rail safety.</p>	<p>Insert new assessment criteria IX.8.1 (4) as follows:</p> <p><b><u>(4) Infringement of standard IX.6.4. Safe operation of the NIMT Setback from NIMT</u></b></p> <p>(a) <b><u>Distance of building/structure from the rail corridor</u></b></p> <p>(b) <b><u>Whether the proposal ensures that building(s) or structure(s) can be maintained within their site boundaries.</u></b></p> <p>(c) <b><u>Whether the proposal is likely to affect the safe operation or operating efficiency of the North Island Main Trunk Line.</u></b></p> <p>(d) <b><u>Any characteristics of the proposed building(s) or structure that makes compliance with the standard unnecessary.</u></b></p>

5.16

5.17



Proposed Amendment	Support/Oppose/ Seek Amendment	Submission/Comments/Reasons Plan Change 101: Pilkington Park	Relief Sought (as stated or similar to achieve the requested relief)
			(e) <u>The outcome of any consultation with KiwiRail.</u>
IX.9	Seek amendment	It is requested that a similar special information requirement be placed on non-compliance with standards relating to the rail corridor, as that contained in Plan Change 48.	<p><b>IX.9 Special information requirements</b></p> <p><del>There are no special information requirements in this precinct.</del></p> <p>1. <u>Activities sensitive to noise within 100m of the rail corridor which infringe standard IX.6.2 and/or Buildings/structures within 5m of any boundary which adjoins the North Island Main Trunk Line IX.6.4.</u></p> <p>(a) <u>Evidence of consultation with KiwiRail and its response to that consultation.</u></p>

5.17

5.18



**From:** [Allison Tindale](#)  
**To:** [Unitary Plan](#)  
**Subject:** Plan Change 101 - Pilkington Park - attachment to previous email sent Friday  
**Date:** Monday, 24 June 2024 7:56:55 am  
**Attachments:** [KiwiRail Noise and Vibration s32 2023.pdf](#)

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Hello,

I sent in Kiwirail's submission on this plan change yesterday morning.

To my consternation, I remembered, when I got home that I forgot to add the attachment referred to in the submission.

The attachment is our section 32 report regarding noise.

I am very sorry for the delay.

I am hoping that you can still accept it.

It would be better for all parties if this document was considered at an earlier, rather than later stage.

The attached report provides more supporting information for points raised in our submission, but does not itself raise any additional points.

Thank you for your time and consideration

Allison Tindale  
Senior RMA Advisor  
KiwiRail

# KiwiRail Holdings Limited

Standard Railway Noise and Vibration  
Reverse Sensitivity Provisions and  
Section 32 Report

16 August 2023

Report Authors: Louise Taylor and Lisa Thorne



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# KiwiRail Holdings Limited Section 32 Analysis of Rail Noise and Vibration Provisions

## 1. Introduction

KiwiRail Holdings Limited (**KiwiRail**) is the State-Owned Enterprise responsible for the construction, maintenance and operation of New Zealand's rail network. The rail network is critical to the safe and efficient movement of freight and passengers throughout New Zealand, and forms an essential part of the national transportation network and the wider supply chain.

KiwiRail is a network utility operator, and the Requiring Authority for railways throughout New Zealand. KiwiRail's rail network operates over 3500km of rail network and infrastructure, used by more than 900 freight trains every week, operating between Whangarei and Bluff. The rail network is utilised to carry imported and exported goods from New Zealand ports, timber and forestry products, bulk good such as dairy products and steel, domestic goods between cities, and domestic passengers, and demand for this service is expected to continue to grow. Passenger rail is also a growing source of traffic for the rail network. While passenger rail volumes are currently only located in New Zealand's main cities, expansion of passenger rail inter-regionally is a growing focus of national transport strategy.

This mix of freight and passenger rail traffic is critical to New Zealand's decarbonisation and public transport goals currently and into the future. For this reason, the rail network is recognised as nationally significant, and is often classified as regionally and/or nationally significant infrastructure in District Plans.

This report has been prepared in accordance with the requirements of s32 and Schedule 1 of the Resource Management Act 1991 (**Act**). It assesses and supports the inclusion of District Plan land use provisions to appropriately manage noise and vibration effects on sensitive activities in the vicinity of the rail network. In some cases, the provisions may require amendment to reflect the structure and style of the District Plan drafting (for example, utilising existing definitions, objectives or policies relating to the transport network or Activities Sensitive to Noise).

## 1.1 Value of Rail

The rail network is a significant contributor to the movement of freight within New Zealand, carrying 16% of total national freight, 25% of exports, and 18 million tonnes of freight every year. The 2021 Value of Rail in New Zealand report<sup>1</sup> found that the total value of rail in New Zealand was estimated to be between \$1.70 billion – \$2.14 billion each year, from:

- reduced greenhouse gas emissions and air pollution, by reducing 2.5 million tonnes of CO<sub>2</sub> emissions each year;
- time savings and reduced congestion; reducing cars and trucks on road, avoiding 26 million car trips a year in Auckland and Wellington alone, and removing 24,000 trucks from the road;
- improved road safety, including fewer injuries and fatalities, with 288 fewer injuries and fatalities each year; and
- lower road maintenance costs for taxpayers and greater fuel savings, saving between \$310–\$329 million each year.

Rail is an energy efficient mode of transport, and generates 70% fewer emissions than heavy road freight transport. KiwiRail is a leader in low emissions freight transport, supporting the national transition to net zero carbon by 2050. To achieve this, KiwiRail's Sustainability Strategy 2022–2025 contains specific carbon emission reduction objectives. With New Zealand's freight market projected to grow by 30% by 2030, rail will play an increasing part in handling the increase, providing greater resilience to the transport network, and reducing carbon emissions.

Acknowledging the benefits of rail (as outlined briefly above) and the role rail will play in decarbonising the freight network, the New Zealand Government has, to an extent not seen in a generation, chosen to fund, via the National Land Transport Fund, rail infrastructure, to ensure rail can scale effectively and efficiently to the needs of passengers and freight. Investment in rail (including new and improved infrastructure and rolling stock – locomotives, wagons and carriages) since 2019 now exceeds \$8b.

Given the nationally significant benefits and savings to the New Zealand economy, the greenhouse gas emission reductions, and air pollution reductions associated with rail freight, the adverse effects of failing to protect the rail network from reverse sensitivity are significant. At a national

<sup>1</sup> Ernst and Young, The Value of Rail in New Zealand, Report for the Ministry of Transport, February 2021

scale, for illustrative purposes, every 1% reduction in rail traffic caused by reverse sensitivity may equate to costs in the range of approximately \$17 to \$21 million per annum.

## 1.2 Proposed Provisions

KiwiRail proposes to introduce a suite of provisions to the District Plan to appropriately protect the railway network from reverse sensitivity by avoiding and mitigating adverse health and amenity effects associated with railway noise and vibration where sensitive uses locate in proximity to the railway corridor<sup>2</sup>. As outlined in further detail below, similar provisions are already included in numerous operative plans throughout New Zealand.

These proposed provisions are provided in full in **Appendix I** and are summarised below:

- Insert a new objective and two policies providing for the importance of the rail network and the potential for reverse sensitivity effects when activities sensitive to noise are in close proximity; [if needed, depending on nature of plan change or proposed district plan, including any existing policies which are in place regarding management of reverse sensitivity or activities sensitive to noise near infrastructure / industry]
- Insert a new definition for 'Activity Sensitive to Noise' In the Definitions Section (if required);
- Insert new vibration alert layer to District Plan maps;
- Insert new 100m rail corridor buffer to District Plan maps (called "Rail Noise Control and Vibration Alert Area") to which the rules below will apply:
- Insert new rules and standards for noise and vibration in the vicinity of the railway corridor:
  - Railway noise standards for Activities Sensitive to Noise within 100m of a rail network boundary (i.e. within the Rail Noise Control and Vibration Alert Area); and
  - Construction design standards for indoor noise control for Activities Sensitive to Noise within 100m of a rail network boundary (i.e. within the Rail Noise Control and Vibration Alert Area).
- Require resource consent for a Restricted Discretionary Activity where these standards are not met. Provide matters of discretion by which resource consent applications will be assessed against.

<sup>2</sup> "Railway Corridor" means the area captured within the KiwiRail designation.

- Include an advice note that applies within the Rail Noise Control and Vibration Alert Area, and which alerts the plan user that activities within this Area may be subject to vibration effects from rail activities. No standards or other rules apply in relation to vibration.

## 1.2 Supporting Information and Assessment

The development of these provisions and the assessment in this Section 32 Report is informed by:

- an expert Noise and Vibration Memorandum by Stephen Chiles, dated July 2023, and attached as **Appendix 2**; and
- an expert Economic Assessment of Options to Manage Rail Noise and Vibration Effects (Economic Assessment) by Insight Economics, dated July 2023, and attached as **Appendix 3**.

The Noise and Vibration Memorandum characterises the noise and vibration associated with the operation of the rail network, and analyses the adverse health effects associated with rail noise and vibration both internationally and in New Zealand. It includes an assessment of appropriate levels for exposure to railway sound and vibration in the New Zealand context to avoid or mitigate sensitivity to rail noise and vibration in proximity to the KiwiRail network. This has informed the preparation and analysis of the proposed provisions, and particularly the appropriateness of the proposed Rail Noise Control and Vibration Alert Area and associated setbacks, acoustic standards, and the consideration of vibration standards.

The Economic Assessment analyses the economic costs and benefits associated with the proposed provisions against a 'do nothing approach', and KiwiRail proposed provisions approach (being option G in this report), and a 100m setback approach (being Option E in this report). This includes the economic costs and benefits of health and amenity effects, building design/location, policy implementation, administration and compliance, opportunity costs of potentially forgoing noise sensitive development, and compromised rail operation and efficiency as a result of reverse sensitivity. The Economic Assessment quantifies an estimate of the net costs and benefits per kilometre of track, which confirms that the preferred option has the highest net economic benefit of the three options assessed.

## 1.3 Requirements of Section 32 of the Act

This report provides an evaluation of the proposed objective and options to achieve the objectives in accordance with section 32 of the Act. Under the Act, a section 32 evaluation must:

- Examine whether the proposed objectives of the proposal are the most appropriate way to achieve the purpose of the Act (s32(1)(a));

- Examine whether the proposed provisions are the most appropriate way to achieve the objectives by identifying other reasonably practicable options, assessing the efficiency and effectiveness of options and summarising the reasons for deciding on provisions (s32(1)(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 (s32(2));
- 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)); and
- Where amendments are sought to a plan change that is already proposed or a plan which already exists, evaluate the proposal against both the objectives of the proposal and the objectives of the existing plan or plan change (s32(3)). As this assessment applies to District Plans generally, additional evidence is likely to be required in terms of s32(3) for specific plans or plan changes.

Each of these matters is assessed in this report (other than s32(3)), and on that basis the proposed provisions are considered the most appropriate way to achieve the sustainable management purpose of the Act.

## 2. Resource Management Issue

### 2.1 Operational Rail Noise

Railway noise levels are dependent on the type and condition of train and traffic volumes, speeds, track geometry and condition, and terrain and other factors. When considering railway noise levels the assumed railway traffic volumes are also important. With full geospatial details and information on railway activity, various standard acoustics computer modelling packages can be used to predict railway noise levels, depending on the situation. However, there is currently no standardised approach to this modelling for railway sound in New Zealand, nor consistent use of a particular method.

In 2009 KiwiRail commissioned Marshall Day Acoustics to provide a recommended method for the prediction and control of rail noise. The recommendations of Marshall Day Acoustics have provided the basis for the methods developed and considered in this report. This is assessed and explained in greater detail in the Noise and Vibration Memorandum provided at Appendix 2 to this report.

The method proposed by Marshall Day Acoustics, and outlined in detail in the Noise and Vibration Memorandum uses a 1 hour averaging method, to appropriately capture the noise maximums likely from the rail network. Specifically, it utilises the following assumed noise levels from rail activities at certain distances:

*The following provides an illustration of typical railway sound levels based on an assumption of approximately two freight train movements in a one-hour period, in a flat area without screening. This is based on data summarised by Marshall Day Acoustics. More recent (unpublished) measurements for various New Zealand train types confirm these sound levels are in a realistic range.*

Distance from track	Sound level
10 metres	71 dB L <sub>Aeq</sub> (1h)
20 metres	68 dB L <sub>Aeq</sub> (1h)
30 metres	66 dB L <sub>Aeq</sub> (1h)
40 metres	64 dB L <sub>Aeq</sub> (1h)
50 metres	62 dB L <sub>Aeq</sub> (1h)
60 metres	60 dB L <sub>Aeq</sub> (1h)
70 metres	59 dB L <sub>Aeq</sub> (1h)
80 metres	58 dB L <sub>Aeq</sub> (1h)
90 metres	56 dB L <sub>Aeq</sub> (1h)
100 metres	56 dB L <sub>Aeq</sub> (1h)

Table 1: Typical rail sound levels (Noise and Vibration Memorandum)

The Noise and Vibration Memorandum sets out that internal sound levels with windows ajar for ventilation will typically be around 15 dB less than the above external levels.

## 2.2 Reverse Sensitivity

Reverse sensitivity is the susceptibility of lawfully established effects-generating activities (which cannot internalise all of their effects) to complaints or objections arising from the location of new sensitive activities nearby those lawfully established activities.

In the context of the railway corridor, this can adversely affect the 3500km of rail network throughout New Zealand, where activities that are sensitive to noise and vibration establish in close proximity to the rail corridor without suitable mitigation. The rail corridor is existing, fixed in place, and actively used for rail services (freight and/or passenger).

Without appropriate land use controls in place to manage health and amenity effects and the resulting reverse sensitivity effects associated with new or altered land uses in the vicinity of the railway corridor, sensitive activities can be adversely affected by rail noise and vibration, and this has adverse reverse sensitivity effects on the efficient operation of the rail network.

The rail network is usually identified as “regionally significant infrastructure” or similar definition in District Plans, which makes clear its importance to the District, Region and in some cases Country in terms of transportation of freight, passengers and associated resilience.

The Economic Assessment quantifies the net benefits and costs on rail operations under a ‘do nothing’ scenario (being Option A in this report). The net costs related to impacts on rail operation are estimated as \$97,000 per kilometre of track. Conversely, the Economic Assessment confirms

there will be 0\$ net costs to rail operation resulting from the proposed provisions.

## 2.3 Health Effects of Rail Noise

Where noise effects from the railway corridor are not appropriately managed by land use controls, health and amenity effects can arise for Activities Sensitive to Noise located on land near the railway network throughout New Zealand.

It is widely accepted nationally and internationally that sound and vibration from rail networks have the potential to cause adverse health effects on people living nearby. This has been documented by authoritative bodies such as the World Health Organisation<sup>3</sup> (**WHO**), including a publication by WHO Europe in October 2018 (**2018 WHO Guidelines**), which set out guidelines for managing environmental noise<sup>4</sup>. These WHO publications are underpinned by robust scientific research.

The 2018 WHO Guidelines are based on a critical review of academic literature and followed a rigorous protocol to determine the quality of evidence of adverse effects. With respect to noise from rail networks, the 2018 WHO Guidelines note the following adverse effects: ischaemic heart disease, hypertension, high annoyance and sleep disturbance. Based on the evidence of adverse effects, WHO makes recommendations to policymakers to reduce rail noise exposure to below a range of guideline values.

The Noise and Vibration Memorandum provides an analysis of the WHO Guidelines and applicability of those guidelines to New Zealand. Research published in 2019<sup>5</sup> specifically addresses the applicability of international data on noise annoyance to New Zealand. For rail noise, this research was based on a survey of 244 people living in the vicinity of the North Island Main Trunk in South Auckland, including the section through Drury. The survey was based on the questions and methods set out in the international technical specification ISO/TS 15666<sup>6</sup>, which is the same approach used in most international studies. The research found that international noise response curves are generally applicable to the New Zealand context, although potentially New Zealanders may be slightly more noise sensitive.

<sup>3</sup> World Health Organisation, Guidelines for community noise, 1999; 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> Humpheson D. and Wareing R., 2019. Evidential basis for community response to land transport noise, Waka Kotahi Research Report 656. <https://nzta.govt.nz/resources/research/reports/656/>

<sup>6</sup> International Standards Organisation ISO/TS 15666:2003 Acoustics – assessment of noise annoyance by means of social and socio-acoustic surveys.



Although there is current New Zealand and international research that may further refine the understanding of health effects associated with exposure to railway noise, the memorandum sets out that the existing 2018 WHO Guidelines already establishes there are adverse health effects that warrant intervention.

KiwiRail employs various other mechanisms to reduce rail noise and vibration from the railway corridor. These include the installation of ballast mat, rail grinding and tamping, ballast cleaning and replacement, and automated monitoring of rolling stock wheel condition. In terms of track condition, KiwiRail has comprehensive procedures including measurement of track condition/ geometry with a specialist survey vehicle several times a year, and maintenance systems acting on that data.

As explained by Dr Chiles in the Noise and Vibration Memorandum, noise attenuation walls are rarely available for mitigation purposes as typically the rail corridor is elevated and therefore such a wall would need to be unreasonably high to provide benefit. Therefore, not all noise and vibration effects can be completely internalised within the KiwiRail designation boundaries. These effects are the result of normal rail operation and maintenance and cannot be solely attributed to defects in track or rolling stock, and form part of the existing environment.

For new buildings and alterations or additions to existing buildings near to the railway network, it is relatively straight-forward to control internal noise through building location, design and systems (such as using acoustic insulation and mechanical ventilation). In most cases, it is practical to achieve acceptable internal noise levels using such measures. Therefore, with careful design of building location, orientation and materials, and/or the use of new or existing barriers such as acoustic walls and/or bunds, or locating new dwellings behind existing dwellings or landforms on a site, the adverse effects of noise can be appropriately avoided and/or mitigated.

The Noise and Vibration Memorandum sets out that in the New Zealand context:

*...railway sound level criteria of 35 dB LAeq(1h) inside bedrooms and 40 dB LAeq(1h) inside other habitable spaces have previously been applied for protection from health effects. These values are slightly higher (more lenient) than the 2018 WHO Guidelines for regular sound events but would be more stringent for infrequent events. This comparison relates only to average sound levels, but corresponding relationships with health effects for different frequencies of railway events are uncertain/unknown. Therefore, currently there is not an evidence base available that would support significantly more or less stringent railway sound criteria than 35 dB LAeq(1h) inside bedrooms and 40 dB LAeq(1h) inside other habitable spaces for*

*protection of health.*

The provisions proposed by KiwiRail is consistent with this approach, and adapted for the New Zealand context as an integral part of KiwiRail's broader noise management activities. The internal noise levels are therefore adopted in the proposed provisions, which provide a suite of options for compliance including building location, orientation and materials, and/or the use of barriers such as acoustic walls and/or bunds.

## **2.4 Effects of Rail Vibration**

Norwegian Standard NS 8176<sup>7</sup> provides a summary of annoyance and disturbance relationships associated with vibration from land-based transport. These relationships demonstrate that adverse effects occur at vibration exposures typically found around existing rail networks. The primary issue relates to people in buildings being disturbed due to feeling vibration. Furthermore, the same vibration can cause buildings to radiate noise inside. As for managing sound, routine track and rolling stock (wheel) maintenance can contribute to reducing vibration at source.

Vibration can vary significantly depending on ground conditions and localised features such as buried services and structures. Even with 'good' ground, track and rolling stock conditions there is still inherent vibration from railways that can cause disturbance.

The Noise and Vibration Memorandum sets out that:

*Adverse effects of railway vibration can include annoyance and sleep disturbance for building occupants and damage to buildings. Damage to buildings (even cosmetic damage) occurs at greater vibration magnitudes than those which can cause annoyance.*

*Internationally, there has been less research into transportation vibration effects on people compared to research on transportation sound effects. However, the evidence that does exist on adverse health effects caused by railway vibration indicates they are material, and as such the relative paucity of research is not an indicator of the degree of effects. There is international research ongoing in this area. Research is also investigating health effects arising from the combination of railway sound and vibration.*

<sup>7</sup> Norwegian Standard NS 8176:2017 Vibration and shock - Measurement of vibration in buildings from land based transport. and guidance to evaluation of its effects on human beings.

In analysing the standards currently adopted nationally and internationally for assessing vibration effects, the Noise and Vibration Memorandum assesses vibration levels measured from different sources in New Zealand, and concludes that,

*There is a knowledge gap as to the actual likelihood of cosmetic damage from railway vibration in New Zealand. However, all potential criteria for vibration effects on people are substantially more stringent, such that for buildings containing sensitive activities, cosmetic building damage might not require separate consideration.*

For new buildings and alterations or additions to existing buildings near to the railway network, as with railway noise, vibration can be controlled through building location, and design. Therefore, with careful design of building location, orientation and materials, the adverse effects of vibration can be appropriately avoided and/or mitigated.

However, the exact design requirements to ensure compliance with appropriate vibration levels depend significantly on site-specific factors, including ground condition / soil type, topography or other environmental features. The level of controls required and the associated cost of implementing such controls can therefore differ significantly on a site-to-site basis.

Without further research into the requirements and cost of implementing such controls on a district-wide basis, there is insufficient existing data to confirm appropriate district-wide provisions which require physical controls for vibration.

For this reason, KiwiRail has instead pursued a "Rail Vibration Alert Layer" be added to the District Plan maps. Such alert layers ensure landowners and occupiers are aware that vibration effects may be present in this location (100m from the rail corridor). They can then make their own design and location decisions should they wish to mitigate such effects. This enables behaviour change and appropriate notice to landowners, while avoiding uncertain costs of controls at this time.

## **2.4 Economic Effects**

The Economic Assessment estimates the likely costs and benefits of 3 options: Option 1 to 'do nothing' (Option A in the s32 assessment below), Option 2 being the proposed provisions (Option G in the s32 assessment below), and Option 3 being a 100m setback option (per kilometre of rail track) (Option E in the s32 assessment below). The net costs and benefits of each option based on the assumptions set out in the Economic Assessment are summarised below.

Costs/Benefits per km of Track	Option 1	Option 2	Option 3
Amenity & health benefits	-\$4,665,600	\$0	\$0
Impacts on rail operation	-\$97,000	\$0	\$0
Policy compliance costs	\$0	-\$1,728,000	\$0
Housing market impacts	\$0	\$0	-\$28,800,000
<b>Option Net Benefits/Costs</b>	<b>-\$4,762,600</b>	<b>-\$1,728,000</b>	<b>-\$28,800,000</b>

Table 2: Estimated net benefits and costs per kilometre of track (Economic Assessment)

The Economic Assessment notes there are different economic costs associated with the assessed options, and that when compared to a 'do nothing' or set back approach, the proposed approach has the lowest economic cost.

"Doing nothing" (Option 1/Option A) has a higher economic cost, primarily related to impacts on amenity and health, with some costs to rail operations. The Economic Assessment sets out that it is impossible to accurately assess the extent to which reverse sensitivity would disrupt the rail network and the consequential impacts on the economy. However the Economic Assessment sets out for illustrative purposes, at a national scale, *"every 1% reduction in rail traffic caused by reverse sensitivity from new Activities Sensitive to Noise establishing nearby would cost approximately \$17 to \$21 million per annum"*.

A 100m setback (Option 3/Option E) while avoiding any economic impacts on rail and human health, *"will have the greatest impacts on housing supply because it sterilises the use of land for Activities Sensitive to Noise within 100 metres of the rail network"*. The housing market costs associated with the loss of developable land are analysed in the Economic Assessment, and estimated net costs for a conservative typical mixed residential and non-noise sensitive activity scenario are approximately \$28,800,000 per kilometre of track.

The proposed approach (Option 2/Option G) is assessed in the Economic Assessment as having no economic impacts associated with human health and rail operation effects. However there will be policy, administrative, and compliance costs estimated at approximately \$1,728,000 per kilometre of track for a conservative typical mixed residential and non-noise sensitive activity scenario. These costs include the upfront costs to comply with the noise standards (acoustic assessment and the mitigation measures themselves), conservatively estimated as being \$3000 (for an acoustic assessment), plus 3% of the building value for the associated mitigation to achieve compliance.

Although this places some cost burden on those establishing activities sensitive to noise in the vicinity of the rail network, these are largely one-off upfront costs which are a small proportion of

the total build cost. Additionally, these costs are significantly lower than the costs to health associated with no mitigation, and significantly lower still than the opportunity costs to the housing market of prohibiting the activity in the vicinity of the rail network.

## 2.5 Duty to Avoid Unreasonable Noise

Section 16 of the Act requires that:

*"Every occupier of land... shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level", and*

*"A national environmental standard, plan, or resource consent made or granted for the purposes of any of sections 9, 12, 13, 14, 15, 15A, and 15B may prescribe noise emission standards, and is not limited in its ability to do so by subsection".*

KiwiRail is a responsible infrastructure operator that endeavours to avoid, remedy or mitigate the adverse rail noise and vibration it produces, through its ongoing programme of upgrade, repairs and maintenance work to improve track conditions.

As discussed above, KiwiRail employs various mechanisms to reduce rail noise and vibration from the railway corridor. These include the installation of ballast mat, rail grinding and tamping, ballast cleaning and replacement, and automated monitoring of rolling stock wheel condition. KiwiRail has comprehensive procedures including measurement of track condition/geometry with a specialist survey vehicle several times a year, and maintenance systems acting on that data.

Not only is this important to KiwiRail as part of being a good neighbour, but it is also under a statutory obligation to use the best practicable option to avoid unreasonable noise (s16) and to avoid, remedy or mitigate adverse effects on the environment (s17).

The proposed provisions complement the above measures undertaken by KiwiRail in respect of its responsibilities under s 16 of the Act - to mitigate the remaining adverse effects that remain following the responsible management of noise and vibration by KiwiRail. They apply only to those developments which are bringing new or expanded sensitive activities to the existing activity operated by the KiwiRail - they do not impose new obligations on already established activities. As set out in the Economics Report, the provisions are also likely to result in a range of ancillary benefits to those dwellings where they are incorporated, including warmer, drier, and quieter homes that are also worth more.

Given the responsibility for the new activity lies with the neighbouring landowners, and the benefits

which come from the controls accrue to the new landowners, including in respect of overall property value, it is considered appropriate that the costs are assumed by those landowners. This is discussed further below in respect of Option H.

## 3. Approach to Issue

Mapping, land use rules and standards to avoid or mitigate adverse noise and vibration effects on sensitive activities are critical to protect sensitive activities from these effects. These standards are also fundamental to managing the potential for reverse sensitivity effects on the railway network as a result of this sensitivity. The location of incompatible sensitive activities in proximity to rail infrastructure can lead to noise and vibration effects on and complaints from sensitive users, affecting both the occupants in these areas, and affecting KiwiRail.

There are many examples in NZ district plans which seek to control the location and design of sensitive activities such as housing, healthcare and education facilities where such activities seek to locate near existing sources of noise and/or vibration. These include roads, railways, airports, ports, quarries, industrial sites, industrial and business zones, gun clubs and motorsport facilities. For sensitive activities near existing railways, examples of second-generation operative district plans containing controls include: Christchurch, Dunedin, Tauranga, Hamilton, Palmerston North and Hutt City. All these existing plans control land use standards to manage the adverse effects of noise and/or vibration.

The proposed provisions require that noise and vibration sensitive activities that may establish in proximity to the rail network are appropriately designed and sited to reduce the noise effect to an acceptable level. This will ensure that adverse effects on human health and amenity are appropriately managed, protects public health, provides certainty to those developing land adjacent to the rail corridor of the permitted standards, and protects nationally and regionally significant rail infrastructure from reverse sensitivity.

The proposed provisions are set out in full in **Appendix 1** and are summarised briefly below.

### 3.1 New Definitions

KiwiRail seeks the following definitions be added to the Definitions Section (if a suitably similar definition is not already in place in the District Plan):

**Activity Sensitive to Noise:** means any residential activity (including student or retirement accommodation), visitor accommodation, educational facility, child care facility, healthcare activity, and places of worship/marae.

### 3.2 New Objective and Policies

Insert a new objective and two policies providing for the importance of the rail network and the potential for reverse sensitivity effects when activities sensitive to noise are in close proximity:

- The Objective is to *'Ensure adverse reverse sensitivity, health and wellbeing effects arising from the development of Activities Sensitive to Noise adjacent to the railway network are appropriately avoided or mitigated'*.
- The policies are to:
  - *'Avoid reverse sensitivity effects on the ongoing and future operation and development of the railway network by ensuring new Activities Sensitive to Noise are designed or located to meet appropriate acoustic design standards'*; and
  - *'Manage effects on the health and wellbeing of communities through the design and location of Activities Sensitive to Noise adjacent to the railway network to meet appropriate acoustic design standards'*.

Where plans include existing objectives and/or policies which appropriately capture the matters above, or which could be amended or added to in order to integrate the objectives above, then this may be appropriate to ensure greater integration of the provisions into the particular plan.

### 3.3 New Rules and Standards

KiwiRail seeks the following rules and standards be added to the District Plan:

- For all zones at any point within 100 meters from the legal boundary of the KiwiRail Rail Corridor Designation (**Rail Noise Control and Vibration Alert Area**), all new buildings or alterations to existing buildings containing an Activity Sensitive to Noise, must meet:
  - Specified Internal noise standards ranging from:
    - 35 dB LAeq(1h) for sleeping spaces, lecture rooms/theatres, music studios, assembly halls, and places of worship and marae,
    - 40 dB LAeq(1h) for all other habitable rooms, and education teaching areas, conference rooms, drama studios and sleeping areas, and overnight medical care and wards, and



- 45 dB LAeq(1h) for libraries, and health clinics, consulting rooms, theatres and nurses' stations; or
  - The nearest exterior façade of the building accommodating the activity is at least 50m from the railway network and is protected by a specified noise barrier, or
  - It can be demonstrated by way of prediction or measurement that the noise at all exterior façades of the listed activity is no more than 15 dB above the relevant noise levels; and
  - For buildings which require windows to be closed to achieve the noise standards, mechanical ventilation standards must be met; and
  - A report is submitted to the council demonstrating compliance with the above rules prior to the construction or alteration of any building containing an activity sensitive to noise using specified assumptions.
- Require resource consent for a Restricted Discretionary Activity where these standards are not met. Provide matters of discretion by which resource consent applications will be assessed against which limit the assessment of effects to the extent of non-compliance, effects on health and wellbeing, reverse sensitivity effects, and the outcome of any consultation with KiwiRail.
  - Include an advice note that applies within the Rail Noise Control and Vibration Alert Area, and which alerts the plan user that activities within this Area may be subject to vibration effects from rail activities. No standards or other rules apply in relation to vibration.

## 4. Assessment of Objective

Section 32(1)(a) requires an assessment of whether the proposed objective is the most appropriate way to achieve the purpose of the Act. The purpose of the Act is set out in Section 5 as:

- (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.*

An assessment of the provisions against the proposed Objective against section 5 is set out in the table, below.

Table 3: Assessment of Objective under Section 5 of the Act

Proposed KiwiRail Provisions	Reason for Objective
<p>Objective</p> <p>Ensure adverse reverse sensitivity, health and wellbeing effects arising from the development of Activities Sensitive to Noise adjacent to the railway network are appropriately avoided or mitigated.</p> <p>Policy</p> <p>Avoid reverse sensitivity effects on the ongoing and future operation and</p>	<p>The objective and supporting policies enable communities to provide for their health and wellbeing, and protects the railway network from reverse sensitivity.</p> <p>Where located in close proximity to the railway corridor, activities sensitive to noise are appropriately designed and sited so that adverse effects on health and wellbeing are appropriately managed, and railway infrastructure is appropriately protected from reverse sensitivity.</p>

<p>development of the railway network by ensuring new Activities Sensitive to Noise are designed or located to meet appropriate acoustic design standards.</p> <p>Policy</p> <p>Manage effects on the health and wellbeing of communities through the design and location of Activities Sensitive to Noise adjacent to the railway network to meet appropriate acoustic design standards.</p>	<p>This enables people to provide for the economic and social use of sites adjacent to the railway corridor, and to meet the reasonably foreseeable needs of the activity, while ensuring that adverse noise and vibration effects are avoided and mitigated.</p> <p>It is therefore considered that the proposed objective is the most appropriate way to achieve the purpose of the Act.</p>
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## 5. Assessment of Proposed Noise and Vibration Provisions

Sections 32(1)(b) and 32(2) require an assessment of the proposed provisions to be undertaken to test their appropriateness and efficiency and effectiveness. This must include:

- 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
- 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, the Act requires that these 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, it is acknowledged that the costs of implementing the insulation measures will vary on a site by site basis, and the scale will depend on factors such as extent of area affected and density of housing. However, there is considered to be sufficient information about the effects of noise and vibration on health and amenity and reverse sensitivity to the rail corridor, to determine the range and nature of effects of the options. No assessment of the risk of acting or not acting is necessary.

### 5.1 Identification of Reasonably Practicable Options

KiwiRail have considered a range of potential options. This includes 'doing nothing', a number of existing approaches, the proposed provisions, and other regulatory methods and mechanisms available. These are summarised below:

#### **Option A - Do nothing:**

No or limited railway noise and vibration provisions in the District Plan. This may include no specific noise and vibration rules, standards or mapping overlays, but may include consideration of reverse sensitivity effects when assessing the adverse effects of any resource consent application, depending on the existing objectives, policies and rules in the District Plan.

This includes subdivision, use or development within the vicinity of the railway corridor if the District Plan provides sufficient direction to do so.

**Option B – Rail operator reduces noise and vibration emissions:**

The rail operator ensure that noise and vibration emissions are reduced to the extent that Activities Sensitive to Noise within 100m of the rail corridor achieve the recommended noise and vibration levels without needing to undertake any specific insulation, ventilation or construction design standards.

**Option C – Noise barriers:**

Acoustic walls or bunds installed by the applicant or the rail operator with no other noise or vibration management methods.

**Option D – Construction design standards:**

A table which specifies minimum construction materials and standards necessary to achieve internal acoustic levels within buildings, with no other noise or vibration management methods.

**Option E – Setbacks:**

Requiring Activities Sensitive to Noise to be set back 100m from the railway corridor with no other noise or vibration management methods.

**Option F – Internal acoustic standards:**

Require internal acoustic and ventilation rules and standards for noise-sensitive activities, but provide no other options to achieve compliance.

**Option G – Combination of rules and standards (Proposed provisions):**

Within 100m of the railway corridor, provide several options to achieve compliance with internal acoustic levels – within 50m of the rail corridor buildings are designed to meet specified Internal noise levels, or must meet a 50m setback, or where the noise at exterior façades is measured or predicted to be no more than 15 dB above the relevant noise level. Buildings must also meet mechanical ventilation standards and reporting standards. Includes an advice note to alert plan users that Activities Sensitive to Noise within the Rail Noise Control and Vibration Alert Area may be subject to vibration effects.

**Option H – Proposed provisions funded by rail operator:**

Within 100m of the railway corridor, via a mapped Rail Noise Control and Vibration Alert Area, the same options to achieve compliance would be available – buildings are designed to meet

specified Internal noise levels, or must meet a 50m setback, or noise at exterior façades is no more than 15 dB higher. Buildings must also meet mechanical ventilation standards and reporting standards, and there is an advice note regarding vibration effects. However, the difference is that KiwiRail would fund the achievement of these standards.

**Option I - Landscaping:**

Landscape planting to provide acoustic mitigation, with no other noise or vibration management methods.

**Option J - National regulation:**

This may include changes to the Building Act or Building Code or introduction of a National Planning Standard or 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). However, it does not require the management of internal noise where noise is generated from outside a building (e.g. rail noise from an adjacent rail corridor).

**Option K 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. This is often referred to as a 'no complaints' covenant.

An assessment of these options in accordance with Sections 32(1)(b) and 32(2) of the Act is provided below.

## 5.2 Assessment of Reasonably Practicable Options

Table 4: Assessment of Reasonably Practicable Options

**Option A - Do nothing**

No or limited railway noise and vibration provisions, but this option may include consideration of reverse sensitivity effects when assessing a resource consent application for subdivision, use or development within the vicinity of the railway corridor.

<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>Doing nothing requires no action from the territorial authority or applicant so could be considered efficient.</p> <p>It is considered to be the least effective option as it will place no limit on the establishment of Activities Sensitive to Noise in the vicinity of the railway corridor. This will result in an increase in exposure of sensitive activities to the adverse effects of rail noise and vibration.</p>	<p>Doing nothing will result in the establishment of Activities Sensitive to Noise in the vicinity of the railway corridor without being appropriately designed and sited.</p> <p>This will result in an increase in exposure of sensitive activities to the adverse effects of rail noise and vibration, resulting in adverse health and amenity effects for people, and adverse reverse sensitivity effects on rail activity.</p> <p>These costs are analysed in the Economic Assessment, and estimated net costs to health and amenity are approximately \$4,665,600, estimated net costs to rail operation is approximately \$97,000, with these costs totalling approximately \$4,762,600 per kilometre of track.</p>	<p>There will be no additional regulatory cost or costs to landowners and occupiers in terms of compliance or building cost increases.</p> <p>There will be no administration and regulatory costs to the territorial authority as there will be no associated resource consenting or monitoring and compliance.</p>
<p><i>Is doing nothing reasonably practicable?</i> No - it will not achieve the objective and will result in adverse health and wellbeing effects, and adverse reverse sensitivity effects.</p>		

### Option B - Rail operator reduces noise and vibration emissions

The rail operator ensure that noise and vibration emissions are reduced to the extent that Activities Sensitive to Noise within 100m of the rail corridor achieve the recommended noise and vibration levels without needing to undertake any specific insulation, ventilation or construction design standards.

<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>This option would not be efficient or effective as, given mitigation measures to minimise rail noise and vibration are unable to comprehensively control these effects, this would significantly curtail the reasonable operation of the existing rail network, and would eliminate the opportunity for any growth in rail traffic over time, resulting in an inefficient use of infrastructure.</p> <p>This would then have consequences for the delivery of freight and passenger transport, and may compromise the achievement of emissions reduction targets by increasing the reliance on road freight.</p>	<p>This option would likely be cost prohibitive to KiwiRail given the impacts on its operations.</p> <p>There may be an environmental cost associated with an increase in emissions associated with having to rely on alternative transport methods.</p>	<p>There are no potential benefits to KiwiRail associated with this option.</p> <p>There would be health and amenity benefits associated with the reduction of rail noise and vibration for Activities Sensitive to Noise within the vicinity of the rail corridor.</p> <p>There may be benefits to landowners to maximise development potential for Activities Sensitive to Noise within the vicinity of the rail corridor.</p>

*Is doing noting reasonably practicable?* No – this option would places significantly curtail rail the efficient use and development of rail infrastructure.



<b>Option C - Noise barriers</b>		
Acoustic walls or bunds installed by the property owner or by the rail operator.		
<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>This option is effective and efficient when it integrated into the design of a new development in some instances.</p> <p>Acoustic walls may be able to be retrofitted in some instances.</p> <p>However it is not always practical because the height of the barrier required to achieve compliance would be very high (often in excess of 3.8m) and is therefore either impracticable or not consentable/difficult to consent. Most locations have practical limitations to install noise barriers. Limitations include the typical raised nature of rail lines (and train engines above these) above surrounding land, or from undesirable ground conditions and a lack of physical corridor which may necessitate property purchase due to the wider</p>	<p>There is a monetary cost of the installation of acoustic walls by KiwiRail. However this is not typically done by KiwiRail given the practical limitations set out in the efficiency and effectiveness review.</p> <p>Acoustic walls can be visually dominant and result in significant shading and shadowing, and can block view and outlook, given the heights required to achieve acoustic compliance. For these reasons the amenity and construction costs may in some circumstances be greater than the health and amenity effects they seek to mitigate.</p> <p>Walls and bunds also may reduce passive surveillance of surrounds and do not reduce vibration effects which would still need to be managed in a different way.</p> <p>If the permitted standards</p>	<p>Acoustic walls and bunds can provide noise reduction for single storied buildings.</p> <p>They also assist in visually screening development from the rail corridor, reducing the perception of noise, however they are often not practical or consentable, and can result in other health and amenity effects.</p>

<p>area of land required for the foundations of the noise barriers which require a wide base (which may result in the removal of adjacent activities) or for the physical space required for any bund.</p> <p>Whether bunds or acoustic walls are used, these may not often be effective for buildings of more than one storey.</p>	<p>are not met, then there will be costs borne by the applicant to prepare a resource consent application, costs to the territorial authority to assess the application, and costs to KiwiRail as a submitter to the application.</p>	
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*Is the proposed approach reasonably practicable?* In some circumstances acoustic walls and bunds can manage the adverse effects of noise on Activities Sensitive to Noise, and will protect KiwiRail railway infrastructure from reverse sensitivity. However, they are difficult to retrofit to existing situations, are often impractical for new situations, and can result on other adverse health and amenity effects.

**Option D - Construction design standards**

A table which specifies minimum construction materials and standards necessary to achieve internal acoustic levels.

<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>This option is somewhat effective and efficient. It is a relatively common approach</p>	<p>There will be additional compliance costs during building consent and building</p>	<p>Construction standards provide certainty as to outcome and design</p>

<p>to managing the adverse effects of noise in District Plan.</p> <p>However, it can have some limitations in terms of effectiveness as it essentially 'locks in' the standards to those at the time of writing the provisions. This means as construction standards improve and change over time, the standards in the plan remain static. This can result in future activities needing to obtain a resource consent where the standards are not met - even where the noise and vibration effects are appropriately managed.</p> <p>The Noise and Vibration Memorandum also sets out that in the Christchurch District Plan, although multiple compliance options were included for mitigating road and rail noise in buildings, including design standards, that on review of the controls the Council found that in most cases site-specific assessment associated with meeting internal acoustic standards was selected. This was presumably as despite any</p>	<p>construction when compared with Option A.</p> <p>Building and compliance design costs will be borne by the applicant and compliance confirmation costs will be borne by the territorial authority and/or the applicant.</p> <p>If the permitted standards are not met, then there will be costs borne by the applicant to prepare a resource consent application, costs to the territorial authority to assess the application, and costs to KiwiRail as a submitter to the application.</p> <p>Construction standards can often be complex, and typically require technical expertise on behalf of applicant and regulatory authority if there is any deviation from the standards in the schedule. This can impose additional monetary and time costs.</p> <p>Construction standards often lack the flexibility to accommodate individual site circumstances. This may occur if the topography of the site removes or reduces the</p>	<p>specifications, and the associated costs can be estimated.</p> <p>Where compliance with the standards is demonstrated, an acoustics specialist does not need to be engaged by any party. Compliance can simply be demonstrated on building plans at the time a building consent is lodged.</p>
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<p>specialist assessment costs the site-specific assessment provided a more efficient solution. This option is therefore considered to be less efficient than the preferred options.</p>	<p>need for all construction design standards to be met. As the standards are essentially 'locked in' to the plan, it requires a plan change to update them.</p> <p>The same requirements apply regardless of the level of external noise exposure. This means that some buildings will have more treatment and associated costs than is necessarily needed to achieve adequate indoor noise levels. Conversely, some buildings with the higher external noise exposure might not have adequate treatment.</p>	
<p><i>Is the proposed approach reasonably practicable?</i> Somewhat - construction standards are a common regulatory approach to manage the adverse effects of noise and vibration for Activities Sensitive to Noise, and will protect KiwiRail railway infrastructure from reverse sensitivity. However, achieving compliance can be complex, and it is less preferred in practice than the acoustic standards in Option F, and there are limitations to this approach.</p>		

<b>Option E - Setbacks</b>		
Building or activity setback for Activities Sensitive to Noise of 100m from the railway corridor with no other noise or vibration management methods.		
<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>This option is effective as it is a simple method to minimise noise and vibration. However, it is not an efficient use of land.</p> <p>This approach is efficient for large rural sites where there is flexibility to locate Activities Sensitive to Noise away from the railway corridor.</p>	<p>The costs of requiring effective setbacks is the loss of developable land for Activities Sensitive to Noise within the vicinity of the railway corridor.</p> <p>The housing market costs associated with the loss of developable land are analysed in the Economic Assessment, and estimated net costs for a conservative typical mixed residential and non noise sensitive activity scenario are approximately \$28,800,000 per kilometre of track.</p> <p>This also imposes a maintenance burden on the landowner as the person responsible for maintaining the large setback areas.</p> <p>If the permitted standards are not met, then there will be costs borne by the applicant to prepare a resource consent application, costs to</p>	<p>This is a simple approach that can work well for large rural sites where setback areas can continue to be used for agricultural purposes. However this approach remains open to rural sites as a method of management under other controls (including noise provisions).</p> <p>Setbacks effectively minimise noise, vibration and amenity effects.</p>

	<p>the territorial authority to assess the application, and costs to KiwiRail as a submitter to the application.</p>	
<p><i>Is the proposed approach reasonably practicable?</i> Yes - it provides a tried and tested regulatory approach to effectively manage the adverse effects of noise and vibration on Activities Sensitive to Noise, and will protect KiwiRail railway infrastructure from reverse sensitivity. However, it is only efficient and effective for large rural sites, and there are high opportunity costs to the housing market.</p>		

<p><b>Option F – Acoustic Standards</b></p> <p>Require internal acoustic rules and standards for noise-sensitive activities, but provide no other options to achieve compliance.</p>		
<p><b>Effectiveness and Efficiency</b></p>	<p><b>Costs</b></p>	<p><b>Benefits</b></p>
<p>Acoustic standards are reasonably efficient and are common in a number of District Plans to manage noise effects of different activities including road, rail and aircraft noise.</p> <p>Territorial authorities typically require certification that the standard is met as part of the building consent application processing. Compliant buildings would not require a resource</p>	<p>There will be additional compliance costs during building consent and building construction when compared with Option A.</p> <p>Building and compliance design costs will be borne by the applicant and compliance confirmation costs will be borne by the territorial authority and/or the applicant.</p> <p>If the permitted standards are not met, then there will be</p>	<p>Acoustic standards which require Activities Sensitive to Noise to meet internal noise standards provide flexibility to the applicant to determine how they wish to meet the standards. This can be achieved using different options.</p> <p>Provides health and amenity benefits for new and expanded sensitive activities locating adjacent to the rail corridor, without unduly constraining development of</p>

<p>consent.</p> <p>Internal acoustic standards are not effective if there are opening windows. Any standards therefore require internal ventilation standards to be included alongside insulation controls.</p>	<p>costs borne by the applicant to prepare a resource consent application, costs to the territorial authority to assess the application, and potentially costs to KiwiRail as a submitter to the application depending on the potential level of reverse sensitivity effect.</p> <p>These policy, administrative and compliance costs for a conservative typical mixed residential and non noise sensitive activity scenario are analysed in the Economic Assessment, and estimated net costs are approximately \$1,728,000 per kilometre of track.</p>	<p>Activities Sensitive to Noise near the rail corridor.</p> <p>Acoustic insulation also provides energy savings to occupiers and is likely to be capitalised in the value of the property.</p> <p>Avoids reverse sensitivity impacts on KiwiRail from increased numbers of sensitive activities locating adjacent to the rail corridor.</p>
<p><i>Is the proposed approach reasonably practicable? Yes – as addressed in full above it provides for a tried and tested regulatory approach to effectively manage the adverse effects of noise and vibration on Activities Sensitive to Noise, and will protect KiwiRail railway infrastructure from reverse sensitivity.</i></p>		

**Option G – Proposed Approach: Combination of new rules and standards for Activities Sensitive to Noise**

Within 100m of the railway corridor, provide several options to achieve compliance with internal acoustic levels – within 50m of the rail corridor buildings are designed to meet specified Internal noise levels, or must meet a 50m setback, or where the noise at exterior façades is measured or predicted to be no more than 15 dB above the relevant noise level.

Buildings must also meet mechanical ventilation standards and reporting standards. Includes an advice note to alert plan users that Activities Sensitive to Noise within the Rail Noise Control and Vibration Alert Area may be subject to vibration effects.

<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>The provisions are effective as, depending on the activity and site circumstances, they provide several options for compliance.</p> <p>This option is efficient as it provides a range of options to achieve compliance.</p> <p>The standards are efficient as development meeting these standards will not require a consent and can be advanced as a permitted activity, which strikes an appropriate balance between enabling development and managing adverse effects.</p> <p>The standards are also efficient as they align with the rules in other District Plans - providing a nationally consistent approach and improving administration for KiwiRail and organisations operating nationally such as housing, healthcare and</p>	<p>There will be additional compliance costs during building consent and building construction when compared with Option A.</p> <p>Building and compliance design costs will be borne by the applicant and compliance confirmation costs will be borne by the territorial authority and/or the applicant.</p> <p>If the permitted standards are not met, then there will be costs borne by the applicant to prepare a resource consent application, costs to the territorial authority to assess the application, and costs to KiwiRail as a submitter to the application depending on the potential level of reverse sensitivity effect.</p> <p>These policy, administrative and compliance costs are analysed in the Economic Assessment, and for a</p>	<p>There will be an improvement in human health and amenity outcomes compared to Option A as there will be a reduction in the number of sensitive activities exposed to unacceptable levels of noise and vibration. It therefore enables Activities Sensitive to Noise to establish in the vicinity of the railway corridor where adverse effects can be effectively managed. This provides for the efficient use and development of land in accordance with section 7(b) of the Act.</p> <p>The range of permitted standards provides a flexible compliance pathway for applicants. It provides a range of potential responses to achieve compliance.</p> <p>This option also provides a comprehensive regulatory approach which recognises the actual spatial extent of railway corridor noise and vibration - and only limits</p>



<p>education providers.</p> <p>The noise and vibration provisions do not apply to existing activities so there are no additional constraints on developed sites where redevelopment is not anticipated.</p> <p>The provisions provide clear and specific matters of discretion which gives greater certainty to developers (and the Council) over the matters that will be assessed if resource consent is required.</p>	<p>conservative typical mixed residential and non noise sensitive activity scenario, the estimated net costs are approximately \$1,728,000 per kilometre of track.</p>	<p>activities which are adversely affected by operating outside these parameters.</p>
<p><i>Is the proposed approach reasonably practicable?</i> Yes - it provides for a range of tried and tested regulatory approaches to effectively manage the adverse effects of noise and vibration on Activities Sensitive to Noise, and will protect KiwiRail railway infrastructure from reverse sensitivity.</p>		

**Option H - Proposed provisions funded by rail operator**

Within 100m of the railway corridor, via a mapped Rail Noise Control and Vibration Alert Area, the same options to achieve compliance would be available - buildings are designed to meet specified Internal noise levels, or must meet a 50m setback, or noise at exterior façades is no more than 15 dB higher. Buildings must also meet mechanical ventilation standards and

reporting standards, and other than an advice note, there are no vibration standards. However, the difference is that KiwiRail would fund compliance with these standards.

<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>This option is efficient as it provides a range of options to KiwiRail to achieve compliance.</p> <p>This option is not effective as putting the onus on KiwiRail to fund any compliance costs could perversely incentivise landowners to develop closer to the rail corridor than they would if the measures were self-funded. This could increase the costs of compliance as higher standards of insulation could be required, and it would result in more Activities Sensitive to Noise establishing in closer proximity to the rail corridor.</p>	<p>The policy, administrative and compliance costs are analysed in the Economic Assessment, and for a conservative typical mixed residential and non noise sensitive activity scenario, the estimated net costs are approximately \$1,728,000 per kilometre of track. A large portion of these costs would be borne by KiwiRail.</p>	<p>The same benefit outlined in Option G apply, noting that benefits accrue to the landowner and occupier without any cost to them, despite their choice being to locate near a railway corridor.</p>

*Is the proposed approach reasonably practicable?* No – this option could result in considerable cost to KiwiRail, of a level that would mean the implementation of the provisions is not feasible, and could perversely incentivise Activities Sensitive to Noise to establish in closer proximity to the rail corridor than they would otherwise.

<p><b>Option I - Landscaping</b></p> <p>Planted buffers to provide acoustic mitigation.</p>		
<p><b>Effectiveness and Efficiency</b></p>	<p><b>Costs</b></p>	<p><b>Benefits</b></p>
<p>This option is not effective or efficient, as dense landscaping in excess of tens of metres in width would be needed to provide noise reduction.</p> <p>Seasonal variations in terms of leaf density and weather induced variations may impact vegetation quality.</p>	<p>The costs of requiring effective landscape mitigation setbacks is the loss of developable land within the vicinity of the railway corridor. This also imposes a maintenance burden on the landowner as the person responsible for maintaining the large planted areas.</p> <p>If the permitted standards are not met, then there will be costs borne by the applicant to prepare a resource consent application, costs to the territorial authority to assess the application, and costs to KiwiRail as a submitter to the application.</p>	<p>Provides the benefit of added visual screening.</p>
<p><i>Is the proposed approach reasonably practicable?</i> No – landscape planting is not an efficient or effective option.</p>		

<b>Option J - National Regulation</b>		
<p>This may include changes to the Building Act or Building Code or the introduction of a National Planning Standard or National Environmental Standard.</p>		
<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>This option is likely to be the most efficient and effective compared to all other options. Unfortunately, although a nationally consistent approach would have a number of benefits, it is outside the Schedule 1 process of the Act and ultimately relies on political will.</p>	<p>Not applicable.</p>	<p>Not applicable.</p>
<p><i>Is the proposed approach reasonably practicable?</i> No - not within scope.</p>		

<b>Option K - Reverse Sensitivity Covenant</b>		
<p>A plan provision which requires a covenant requiring the property owners agree not to complain about noise and vibration effects on sensitive land uses.</p>		
<b>Effectiveness and Efficiency</b>	<b>Costs</b>	<b>Benefits</b>
<p>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.</p> <p>Although this may avoid complaint regarding noise and vibration, Activities</p>	<p>There are legal costs associated with the covenant preparation and registration process. These costs will be borne by both the landowner and the territorial authority.</p> <p>This option provides for poor health and amenity outcomes as the actual</p>	<p>A covenant is a legally binding agreement between the property owner and the territorial authority, and is generally simple to understand.</p> <p>A covenant is likely to be a more cost effective approach compared to the other</p>

<p>Sensitive to Noise will still be affected by noise and vibration, resulting in adverse health and amenity effects for the occupants of these buildings and areas.</p> <p>A provision which requires a covenant is not efficient as it requires every individual site seeking to establish or add to a building to go through a covenant registration process against that individual parcel of land. In time, this can become difficult for a territorial authority to administer as it is not obvious whether or not a covenant applies to a record of title without searching that record of title individually.</p>	<p>effects of railway noise are not appropriately avoided or mitigated.</p> <p>If the permitted standards are not met, then there will be costs borne by the applicant to prepare a resource consent application, costs to the territorial authority to assess the application, and costs to KiwiRail as a submitter to the application.</p>	<p>options (excluding 'do nothing'), as It requires no additional building or design controls, or landscaping or noise barriers.</p>
<p><i>Is the proposed approach reasonably practicable?</i> No - a reverse sensitivity covenant standard is not an efficient or effective option.</p>		

## 6. Assessment Summary

Table 5: Assessment Summary

Reasonably Practicable Option	Assessment Summary
<b>Option A – Do nothing:</b> No or limited provisions.	Not reasonably practicable.
<b>Option B – Rail operator reduces noise and vibration emissions:</b> To the extent that no noise or vibration effect is generated on nearby Activities Sensitive to Noise.	Not reasonably practicable.
<b>Option C – Noise barriers:</b> Acoustic walls or bunds.	Not reasonably practicable.
<b>Option D – Construction design standards:</b> A table of minimum design requirements and construction materials to meet noise levels.	Somewhat reasonably practicable, but no favoured by plan users.
<b>Option E – Setbacks:</b> Building or activity setback of 100m with no other noise or vibration management methods.	Preferred methods – these methods can effectively manage the adverse effects of noise and vibration on Activities Sensitive to Noise and will protect KiwiRail railway infrastructure from reverse sensitivity.  The most appropriate method to use is dependant on the site context.
<b>Option F – Internal acoustic standards:</b> Require internal acoustic rules and standards for noise-sensitive activities, but provide no other options to achieve compliance.	
<b>Option G – Combination of rules and standards (Proposed provisions):</b> New rules and standards for Activities Sensitive to Noise  Within 100m of the railway corridor, provide several options to achieve compliance with internal acoustic levels – within 50m of the rail corridor buildings are designed to meet specified Internal noise levels, or must meet a 50m setback, or where	Most preferred method – Combines several of the methods above to provide options to effectively manage adverse noise effects and vibration and protect KiwiRail railway infrastructure from reverse sensitivity.

<p>the noise at exterior façades is measured or predicted to be no more than 15 dB above the relevant noise level.</p> <p>Buildings must also meet mechanical ventilation standards and reporting standards. Includes an advice note to alert plan users that Activities Sensitive to Noise within the Rail Noise Control and Vibration Alert Area may be subject to vibration effects.</p>	
<p><b>Option H - Proposed provisions funded by rail operator:</b> As above but funded by KiwiRail.</p>	<p>Not reasonably practicable.</p>
<p><b>Option I – Landscaping:</b> Landscaping to provide acoustic mitigation.</p>	<p>Not reasonably practicable.</p>
<p><b>Option J - National Regulation:</b> Changes to the Building Act or Code or new National Planning or Environmental Standards.</p>	<p>An out-of-scope potential long term solution.</p>
<p><b>Option K - Covenant:</b> A 'no complaints' covenant provision.</p>	<p>Not reasonably practicable.</p>

## 7. Conclusion

The operation, maintenance and development of the rail network is critical to the safe and efficient movement of freight and passengers throughout New Zealand, and forms an essential part of the national transportation network and the wider supply chain. KiwiRail's proposed provisions to the District Plan enable Activities Sensitive to Noise to be developed in the vicinity of the railway corridor where adverse noise and vibration effects can be effectively managed through a range of standards. The proposed provisions will mitigate health and amenity effects on new and altered Activities Sensitive to Noise that seek to establish within 100 metres of the railway corridor. This will ensure that the continued operation of nationally and regionally significant infrastructure of the rail corridor will be appropriately protected from reverse sensitivity, and neighbouring communities will experience positive health and amenity outcomes.

Consistent with section 32 of the Act, the proposed objective and policies have been developed and analysed against Part 2 and it is considered that the proposed objective is the most appropriate way to achieve the purpose of the Act.

The proposed provisions have been assessed against a number of alternative options in terms of their costs, benefits, and efficiency and effectiveness in accordance with the relevant clauses of section 32 of the Act.

The proposed provisions are considered to represent the most appropriate means of achieving the proposed objective. The provisions are also the most appropriate way of addressing the underlying resource management issues relating to managing the adverse effects of noise and vibration of surrounding land uses, and minimising reverse sensitivity effects to protect the railway network. Adopting the proposed provisions will maintain and enhance the continued use of Railway infrastructure while enabling the efficient subdivision, use and development of land in its vicinity, and providing for health and amenity outcomes.



# Appendix 1: Proposed Provisions



## Model District Plan Provisions

### 1. Definitions

Noise sensitive activity [if required]

Means any residential activity (including student or retirement accommodation), visitor accommodation, educational facility, child care facility, healthcare activity, and places of worship/marae.

The following provisions should be co-located together in a district -wide chapter (preferable noise and infrastructure) rather than applied on a zone by zone basis.

### 2. Objective

Ensure adverse reverse sensitivity, health and wellbeing effects arising from the development of noise sensitive activities adjacent to the railway network are appropriately avoided or mitigated.

### 3. Policies

Avoid reverse sensitivity effects on the ongoing and future operation and development of the railway network by ensuring new noise sensitive activities are designed or located to meet appropriate acoustic design standards.

Manage effects on the health and wellbeing of communities through the design and location of noise sensitive activities adjacent to the railway network to meet appropriate acoustic design standards.

### 4. Rules/Standards

#### 4.1 Noise and vibration

E. Activities sensitive to noise within 100m of [KiwiRail Rail Corridor Designation]:

Activity sensitive to noise near a railway network				
All zones – at any point within 100 metres from the legal boundary of [KiwiRail Rail Corridor Designation] (Rail Noise Control and Vibration Alert Area)	Activity status: Permitted			Activity status when compliance with standards 1, 2 or 3 not achieved: Restricted discretionary  Matters of discretion are restricted to: 1. The extent of non-compliance with the noise and vibration standards. 2. Effects on the health and wellbeing of people. 3. The reverse sensitivity effects on the rail network, including the extent to which the activity will unduly constrain the-ongoing operation, maintenance and upgrade of the rail network. 4. The outcome of any consultation with KiwiRail.
	<b>Indoor railway noise</b> 1. Where any activity listed in Table 1 is located within the Rail Noise Control and Vibration Alert Area: (a) the entire room or space shall be designed, constructed and maintained (including in any alterations) to achieve indoor design noise levels in Table 1; or			
	[RULEXX] Table 1			
	Building type	Occupancy/activity	Maximum railway noise level LAeq(1h)	
Residential <i>[note definition in the plan must be broad enough to cover all types of residential activities – or other types of</i>	Sleeping spaces	35 dB		
	All other habitable rooms <i>[note this may require the definition from the National</i>	40 dB		

<p><i>residential activities not addressed within it will need to be added to this table]</i></p>	<p><i>Planning Standards to be added if this is not already defined in the District Plan]</i></p>		<p>Notification: Application for resource consent under this rule shall not be notified or limited notified unless KiwiRail is determined to be an affected person determined in accordance with section 95B of the Resource Management Act 1991 or the Council decides that special circumstances exist under s 94A(4) of the Resource Management Act 1991.</p>
<p>Visitor Accommodation</p>	<p>Sleeping spaces</p>	<p>35 dB</p>	
	<p>All other habitable rooms</p>	<p>40 dB</p>	
<p>Education Facility</p>	<p>Lecture rooms/theatres, music studios, assembly halls</p>	<p>35 dB</p>	
	<p>Teaching areas, conference rooms, drama studios, sleeping areas</p>	<p>40 dB</p>	
	<p>Libraries</p>	<p>45 dB</p>	
<p>Health</p>	<p>Overnight medical care, wards</p>	<p>40 dB</p>	
	<p>Clinics, consulting rooms, theatres, nurses' stations</p>	<p>45 dB</p>	
<p>Cultural</p>	<p>Places of worship, marae</p>	<p>35 dB</p>	
<p>(b) the nearest exterior façade of the building accommodating the activity listed in Table 1 is at least 50 metres from the legal boundary of the [KiwiRail Rail Corridor Designation], and there is a solid building, fence, wall or landform that completely blocks line-of-sight from all parts of doors and windows, to all points 3.8 metres above railway tracks; or</p> <p>(c) it can be demonstrated by way of prediction or measurement that the noise at all exterior façades of the listed activity is no more than 15 dB above the relevant noise levels in Table 1.</p>			
<p><b>Mechanical ventilation</b></p>			
<p>2. 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:</p>			
<p>(a) For habitable rooms for a residential activity or visitor accommodation activity, achieves the following requirements:</p>			
<p>i. provides mechanical ventilation to satisfy clause G4 of the New Zealand Building Code; and</p>			
<p>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</p>			
<p>iii. provides relief for equivalent volumes of spill air;</p>			
<p>iv. provides cooling and heating that is controllable by the occupant and can maintain the inside temperature between 18°C and 25°C; and</p>			

	<p>v. does not generate more than 35 dB <math>L_{Aeq(30s)}</math> when measured 1 metre away from any grille or diffuser.</p> <p>(b) For other spaces, is as determined by a suitably qualified and experienced person.</p> <p><b>Report required</b></p> <p>3. A report is submitted to the council demonstrating compliance with clauses (1) to (2) above (as relevant) prior to the construction or alteration of any building containing an activity sensitive to noise. Compliance with 1(a) and (c) must be confirmed by a Registered Acoustician and when doing so railway noise must be assumed to be 70 <math>L_{Aeq(1h)}</math> at a distance of 12 metres from the track, and must be deemed to reduce at a rate of 3 dB per doubling of distance up to 40 metres and 6 dB per doubling of distance beyond 40 metres.</p> <p>Note: The Rail Noise Control and Vibration Alert Area identifies the vibration-sensitive area within 100metres each side of the [KiwiRail Rail Corridor Designation]. Properties within this area may experience rail vibration effects. No specific district plan rules or notification requirements apply in relation to vibration controls as a result of this Rail Noise Control and Vibration Alert Area.</p>	
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Insert mapping overlay which identifies a 100m buffer on each side of the [KiwiRail Rail Corridor Designation] called "Rail Noise Control and Vibration Alert Area" to which the above rules will apply.

# Appendix 2: Acoustics Advice



# Chiles Ltd

Project: **Land use controls for railway sound and vibration**

Report: **Acoustics advice**

Client: KiwiRail

Reference: 130418h

Date: 19 July 2023

Author: Stephen Chiles

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## 1. Introduction

- 1.1. KiwiRail is undertaking an analysis of potential controls for existing/permitted railway sound and vibration from its national network, affecting new and altered sensitive land uses nearby. Chiles Ltd has been engaged by KiwiRail to provide advice on associated acoustics details to inform that analysis. This report sets out: effects of sound and vibration on people and buildings, indicative sound and vibration levels at different distances from railway tracks, methods to reduce sound and vibration, and recommendations for land use controls.
- 1.2. In normal acoustics usage the term “noise” describes unwanted airborne “sound”, although some people use the words interchangeably. However, under the Resource Management Act (RMA) “noise” is defined as including vibration; presumably ground-borne. Notwithstanding that in practice “noise limits” in rules and conditions under the RMA refer exclusively to airborne sound. The term sound has been used in this report to distinguish airborne sound from ground-borne vibration in an RMA context where both are defined as noise.
- 1.3. A fundamental input when assessing railway sound and vibration is the type, volume and timing of railway traffic to be assumed on a particular section of the network. For comparison, when considering roads in New Zealand, road traffic volumes often gradually increase or remain steady, such that acousticians can sometimes use existing measured road traffic volumes as a reasonable baseline for future design. However, for railways in New Zealand, railway traffic volumes and times can change significantly, such that existing railway traffic may not be a reliable baseline when considering effects associated with new neighbouring houses that will exist for many decades. Therefore, appropriate assumptions for railway traffic types, volumes and times are an essential input that should be considered alongside the following acoustics information in this report.
- 1.4. Both sound and vibration have complex varying characteristics which are only approximated by metrics representing levels as a single number. There are compromises with whichever metrics are used. In the case of railway sound and vibration in New Zealand the choice of metrics is particularly challenging because often there are a relatively small number of intense events. In this situation, use of average values might under-represent adverse effects and use of maximum values might over-represent effects. The extent of under or over representation varies depending on the rail traffic in any location, which in turn relates to the comment above on railway traffic volumes. Metrics and objective analysis can still be valuable to focus interventions in the most effective places, but the limitations of the metrics require consideration when evaluating potential land use controls. This issue is discussed further in section 4.

## 2. Effects of sound

- 2.1. The World Health Organisation (“WHO”) has periodically reviewed and collated evidence of health effects caused by environmental sound including from railways.<sup>1</sup> The most recent publication was by WHO Europe (“2018 WHO Guidelines”),<sup>2</sup> which was based on systematic

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<sup>1</sup> World Health Organisation, Guidelines for community noise, 1999; World Health Organisation, Burden of disease from environmental noise, 2011.

<sup>2</sup> World Health Organisation, Environmental noise guidelines for the European region, 2018.

- reviews of a large number of published studies. There have been numerous other discrete studies of these issues, but the 2018 WHO Guidelines provides a robust synthesis of available information and its findings with respect to railway sound appear to be widely accepted.
- 2.2. From preceding studies, the 2018 WHO Guidelines found moderate quality evidence that railway sound causes adverse health effects in that it increases the risk of annoyance and sleep disturbance in the population. Various other potential health effects were examined but evidence was not available to determine a relationship for them with railway sound. Based on the information available the 2018 WHO Guidelines made "strong" recommendations that external railway sound levels should be reduced below 54 dB  $L_{den}$  and 44 dB  $L_{night}$ . The 2018 WHO Guidelines found there was insufficient evidence to recommend one type of intervention over another to reduce levels.
  - 2.3. The above 2018 WHO Guidelines recommendations are in terms of long-term (annual) average sound levels. One of the metrics relates just to the night period ( $L_{night}$ ) and the other ( $L_{den}$ ) is for a 24-hour average including penalties for sound occurring in the evening (+5dB) and at night (+10dB). By necessity, this use of long-term averages is a pragmatic approach given that potential health effects generally relate to exposure over extended periods and are determined from consideration of the community/population rather than specific individuals. Other research into health effects, such as relating to awakenings from sleep, has previously referenced maximum sound levels, but sleep disturbance as a health effect is only assessed in terms of average levels in the 2018 WHO Guidelines.
  - 2.4. The 2018 WHO Guidelines were based on international research from a wide range of countries. There was no available data from New Zealand at that time. Subsequent research published in 2019 specifically addressed the applicability of international data on railway sound annoyance of the New Zealand population.<sup>3</sup> This included a survey of people living in the vicinity of the North Island Main Trunk line in South Auckland, using the same general methodology as most international studies. The research found that international noise annoyance response curves are generally applicable for the New Zealand population.
  - 2.5. There is current New Zealand and international research that may further refine the understanding of health effects caused by railway sound. However, the existing 2018 WHO Guidelines already establishes there are adverse health effects that warrant intervention.
  - 2.6. In New Zealand, railway sound criteria have commonly been defined in terms of one-hour average levels (see section 4). Values of 35 dB  $L_{Aeq(1h)}$  inside bedrooms and 40 dB  $L_{Aeq(1h)}$  inside other habitable spaces have previously been applied for protection from health effects. Accounting for the different metrics, these values are slightly higher (more lenient) than the 2018 WHO Guidelines for regular sound events but would be more stringent for infrequent events. This comparison relates only to average sound levels, but corresponding relationships with health effects for different frequencies of railway events are uncertain/unknown. Therefore, currently there is no evidence base available that would support significantly more or less

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<sup>3</sup> Humpheson D. and Wareing R., 2019. Evidential basis for community response to land transport noise, Waka Kotahi Research Report 656. <https://nzta.govt.nz/resources/research/reports/656/>



stringent railway sound criteria than 35 dB  $L_{Aeq(1h)}$  inside bedrooms and 40 dB  $L_{Aeq(1h)}$  inside other habitable spaces for protection of health.

- 2.7. There is a lack of information on the combination of indoor and outdoor living conditions in relation to health effects. Even if indoor conditions are controlled, there may still be residual health effects arising from outdoor conditions. In a New Zealand context, based on criteria applied for other sources, reasonable conditions in outdoor living spaces might be achieved with railway sound levels of 55 dB  $L_{Aeq(1h)}$ .

### 3. Effects of vibration

- 3.1. Adverse effects of railway vibration can include annoyance and sleep disturbance for building occupants and damage to buildings. Damage to buildings (even cosmetic damage) occurs at greater vibration magnitudes than those which can cause annoyance.
- 3.2. Internationally, there has been less research into transportation vibration effects on people compared to research on transportation sound effects. However, the evidence that does exist on adverse health effects caused by railway vibration indicates they are material, and as such the relative paucity of research is not an indicator of the degree of effects. There is international research ongoing in this area. Research is also investigating health effects arising from the combination of railway sound and vibration.
- 3.3. Norwegian Standard NS 8176<sup>4</sup> summarises research of human response to transportation vibration and provides exposure response curves in terms of the percentage of people who would perceive or experience degrees of annoyance from vibration. The current version of the standard (2017) discusses the inherent uncertainty in the data, including that it does not account for varying traffic volumes, although notes no other studies addressing that factor were found.
- 3.4. NS 8176 defines four categories of vibration exposure in residential buildings, with Class A representing the best vibration conditions and Class D (or below) representing the worst. The Class C criterion has previously been applied in New Zealand for habitable spaces in new buildings. This corresponds to a vibration level at which about 20% of people would be expected to be highly or moderately annoyed by vibration. The Class C criterion is defined as a  $v_{w,95}$  of 0.3 mm/s (vibration metrics are explained in section 4).
- 3.5. For vibration effects on buildings, a ppv criterion of 5 mm/s is often used in New Zealand as a threshold at which there is potential for cosmetic damage to new buildings. While the 5 mm/s ppv criterion has been taken from guidance in an overseas standard, it does not relate specifically to railway vibration and is generally regarded as a cautious value. There is a knowledge gap as to the actual likelihood of cosmetic damage from railway vibration in New Zealand. However, all potential criteria for vibration effects on people are substantially more stringent, such that for buildings containing sensitive activities, cosmetic building damage might not require separate consideration.

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<sup>4</sup> Norwegian Standard NS 8176:2017 Vibration and shock - Measurement of vibration in buildings from land-based transport, vibration classification and guidance to evaluation of effects on human beings

## 4. Methods

### Sound level metrics

- 4.1. As discussed in section 1, for railway lines with intermittent traffic in New Zealand, use of an average sound level over any time period can cause inconsistencies between the level and the corresponding human response or health effect.
- 4.2. The noise provisions which have been sought by KiwiRail in plan changes around New Zealand to date have adopted a one-hour average ( $L_{Aeq(1h)}$ ) for railway sound in their standards. This approach was initially proposed by Marshall Day Acoustics in a review undertaken in 2009 of appropriate noise criteria for district planning rules.<sup>5</sup> This report considered the utilisation of one-hour averaging as against broadscale setbacks and average / maximum or day / night averages. The one-hour average allows for a degree of averaging compared to single events, but still represents periods of activity when disturbance from railway sound is occurring. In the New Zealand context an alternative metric with longer averaging times (e.g.  $L_{den}/L_{night}$ ) would be likely to significantly under-represent adverse effects from maximum/event sound levels over much of the network.
- 4.3. Neither one-hour averages or maximum levels however have an established, researched relationship with the health effects correlated to the external long term average sound level criteria recommended by the 2018 WHO Guidelines. This represents a knowledge gap and currently necessitates a broad judgement to determine criteria using the one-hour average (or another metric like maximum levels).
- 4.4. As set out in section 2, the 2018 WHO Guidelines recommend annual average criteria of 54 dB  $L_{dn}$  and 44 dB  $L_{night}$  applying outside buildings. These values assume windows may be open, resulting in internal sound levels around 15 dB lower than the criteria (with windows ajar for ventilation): 39 dB  $L_{den}$  and 29 dB  $L_{night}$ . In a situation where there are regular railway sound events, it could be appropriate to directly take the long-term average  $L_{den}$  and  $L_{night}$  criteria to apply as one-hour criteria (the  $L_{den}$  would also need a -10dB adjustment if applying at night). However, for irregular or infrequent events a higher one-hour criterion could be appropriate. It might also be appropriate to adjust criteria if there are no events at night.

### Vibration level metrics

- 4.5. Internationally there are a range of different metrics used to quantify vibration affecting humans, with no accepted standardisation for this application. The "statistical maximum value of weighted velocity" ( $v_{w,95}$ ) metric has been used previously in New Zealand for both road and railway vibration affecting people, and has the advantage that it corresponds to the exposure response curves in Norwegian Standard NS 8176.
- 4.6. For vibration effects on buildings and structures, the "peak particle velocity" (ppv) metric is in widespread use in New Zealand. This metric is mandated by the Noise and Vibration Metrics National Planning Standard for construction vibration affecting structures.

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<sup>5</sup> Marshall Day Acoustics, *Ontrack rail noise criteria reverse sensitivity guidelines*, 22/10/09

- 4.7. In this report, vibration is presented in terms of the  $v_{w,95}$  with respect to effects on people, and in terms of the ppv with respect to effects on buildings/structures.

#### Railway traffic characteristics

- 4.8. The above railway sound levels and effects depend on the timing, type and frequency of train movements at a particular location. As discussed in section 2, the proposed one-hour average sound criteria are generally less stringent than international daily average values for lines with more frequent movements. This was acknowledged by the original Marshall Day Acoustics report, which noted the application of one-hour averages are likely insufficient for lines with greater than 20 train movements a day, and the use of day / night averages or maximum levels would be more protective.
- 4.9. At the other end of the spectrum, for lines with very infrequent movements the proposed one-hour average criteria might be considered too stringent. With the numerous factors involved and the underlying knowledge gaps relating to sound effects, it is not possible to precisely define a lower railway traffic volume at which one-hour average sound criteria might become unwarranted. Any such consideration should not just include current rail volumes, but potential future rail volumes to which newly established activities may be subject to in the future.
- 4.10. Railway vibration levels and effects also depend on the traffic characteristics. However, the vibration criteria discussed in section 3 relate to levels from individual events rather than average levels. As such, the criteria are independent of the number of movements. Under the specified standard (NS 8176) the vibration criteria relate to the type of train at a particular location that generates the highest vibration levels, which will generally be freight trains. Therefore, the proposed criteria could be applied to all lines regardless of traffic characteristics.

## **5. Sound levels**

- 5.1. Different options for sound level metrics are discussed in section 4 with respect to effects and criteria. In this section, example railway sound levels are presented in terms of average values over one hour ( $L_{Aeq(1h)}$ ).
- 5.2. Railway sound levels are dependent on train types/condition, traffic volumes, speeds, track geometry/condition, terrain and various other factors. As discussed above, when considering average levels the assumed railway traffic volumes are a critical input.
- 5.3. With full geospatial details and information on railway activity, various standard acoustics computer modelling packages are available to predict railway sound levels for a specific situation. There is currently no standardised approach to this modelling for railway sound in New Zealand or consistent use of a particular calculation algorithm. Consequently, even with the same input data, predictions are likely to vary when made by different practitioners.
- 5.4. The following provides an illustration of typical railway sound levels based on an assumption of approximately two freight train movements in a one-hour period, in a flat area without screening. This is based on data summarised by Marshall Day Acoustics.<sup>6</sup> More recent

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<sup>6</sup> Marshall Day Acoustics, *Ontrack rail noise criteria reverse sensitivity guidelines*, 22/10/09

(unpublished) measurements for various New Zealand train types confirm these sound levels are in a realistic range.

Distance from track	Sound level
10 metres	71 dB $L_{Aeq(1h)}$
20 metres	68 dB $L_{Aeq(1h)}$
30 metres	66 dB $L_{Aeq(1h)}$
40 metres	64 dB $L_{Aeq(1h)}$
50 metres	62 dB $L_{Aeq(1h)}$
60 metres	60 dB $L_{Aeq(1h)}$
70 metres	59 dB $L_{Aeq(1h)}$
80 metres	58 dB $L_{Aeq(1h)}$
90 metres	56 dB $L_{Aeq(1h)}$
100 metres	56 dB $L_{Aeq(1h)}$

- 5.5. In the Marshall Day Acoustics report which generated the above levels, this sound level assumption of 2 freight train movements in a one-hour period was originally proposed as being approximately equivalent to the sound level from lines with regular passenger trains. It was not intended to apply in settings which actually experienced two freight train movements per hour across a day (as noted in section 4 above, where there were more than 20 movements a day, a one-hour average was considered inadequate to address the likely effects). Instead the intention of the average is to provide an approximation of both the effects of a single event, and a generalised average of noise from the corridor. The report considered a single measurement would enable simpler application of the rule framework by landowners (compared to an average/maximum approach which was considered to add extra complication without significant benefits in effects management given the variability of single train pass-bys).
- 5.6. Based on this assumption the proposed sound criteria are likely to be appropriate for all urban lines with passenger trains and any lines with at least say six daily freight movements and/or freight movements at night (including where this level of activity may be required in future). This threshold of six freight movements is tentatively suggested based on a hypothesis that the one-hour average criteria would not be unduly stringent at this frequency of effect.
- 5.7. Internal sound levels with windows ajar for ventilation will typically be around 15 dB less than the external levels set out above. As such, at 100 metres from a track with 56 dB  $L_{Aeq(1h)}$  outside, there is still potential to exceed internal criteria of 35 and 40 dB  $L_{Aeq(1h)}$  (section 2). A 35 dB internal criterion in particular could be exceeded significantly beyond 100 metres from the track, potentially to around 200 metres. However, at progressively further distances from the track the actual sound level is more likely to be affected by topography and localised screening such that there will be greater variability in sound levels.
- 5.8. For land use controls, the appropriate method to determine railway sound levels for a particular site (specified values, modelled, measured) depends significantly on the approach to information on train types, volumes and times. This is discussed further in section 9 with respect to recommended controls.

## 6. Vibration levels (ground-borne)

- 6.1. The following table summarises various railway vibration measurements (and associated predictions) in New Zealand from a range of sources, generally ordered from lowest to greatest magnitude (other than the first row which uses the ppv metric rather than  $v_{w,95}$ ). Where the data relates to a private development or complaint, a generic source reference is given. Not all measured values are directly comparable due to issues such as differences in measurement positions (ground/building) that would require adjustments.

Data source	Vibration levels
Marshall Day Acoustics, <i>Ontrack rail noise criteria reverse sensitivity guidelines, 22/10/09 (secondary reporting of Marshall Day Acoustics 2006 assessment for Marsden Point)</i>	Based on measurements: 2 to 3 mm/s ppv at 30m 0.5 to 1 mm/s ppv at 60m
AECOM, <i>Bayfair to Bayview – Rail Relocation Post Construction Noise and Vibration Monitoring, 6/3/17</i>	Measured: 0.56 mm/s $v_{w,95}$ at 7m From measurement and distance correction: 0.19 mm/s $v_{w,95}$ at 100m 0.26 mm/s $v_{w,95}$ at 50m 0.37 mm/s $v_{w,95}$ at 25m
Marshall Day Acoustics, <i>Wiri to Quay Park third main rail line noise and vibration assessment, 10/7/20</i>	Measured: 0.6 mm/s $v_{w,95}$ at 9.5m
URS, <i>Maunganui-Girven Road Intersection -Rail Vibration Assessment, 14/4/14</i>	Measured: 26.5 mm/s <sup>2</sup> $a_{w,95}$ at 17m <i>(this <math>a_{w,95}</math> value has different units and is not directly comparable to a <math>v_{w,95}</math> value)</i> From measurement and distance correction: 0.34 mm/s $v_{w,95}$ at 100m 0.47 mm/s $v_{w,95}$ at 50m 0.67 mm/s $v_{w,95}$ at 25m
URS, <i>Operational noise and vibration assessment Peka Peka to North Ōtaki Expressway Project, 12/2/13</i>	Measured: 0.58 mm/s $v_{w,95}$ at 60m
Marshall Day Acoustics, <i>assessment in relation to a complaint near Hamilton, 28/11/12</i>	Measured (on a deck structure): 0.42 mm/s $v_{w,95}$ at 140m
Marshall Day Acoustics, <i>assessment for development in Napier, 6/2/20</i>	Measured: 1.2 mm/s $v_{w,95}$ at 10m
URS, <i>Ground-borne vibration measurements at Hornby, Christchurch, 12/9/14</i>	Measured before renewal: 2.2/2.9 mm/s $v_{w,95}$ at 8.4m Measured after renewal: 0.5/0.4 mm/s $v_{w,95}$ at 8.4m

- 6.2. The data in the above table illustrates the significant variation that is inherent in railway vibration. Vibration levels often vary even within a localised area and cannot be reliably predicted, such as in the same manner as airborne sound. Hence, measurements are generally required to assess ground-borne vibration.
- 6.3. With respect to effects on people, a vibration criterion of 0.3 mm/s  $v_{w,95}$  is discussed in section 3. The measurement data shows that this criterion can routinely be exceeded at over

100 metres from railway tracks in New Zealand, but there is significant variation. Vibration levels exceeding this criterion occur beyond at least 50 metres from the track in most cases.

- 6.4. With respect to effects on buildings, a vibration criterion of 5 mm/s ppv is discussed in section 3. The vibration measurement data indicates that vibration levels might exceed this criterion within approximately 20 metres of the track. The implications of this are discussed further with respect to recommended controls in section 9.

## **7. Approaches to manage effects of railway sound**

### Source

- 7.1. Routine rolling stock and track maintenance undertaken by KiwiRail contributes to reducing sound at source. There might be incremental improvements if more stringent maintenance service standards were adopted.
- 7.2. Locomotives can be designed with sound reducing features, such as attenuators and silencers. Generally, these need to be integrated at the time of initial design/manufacture. Retrofitting measures to existing locomotives may be constrained and would be likely to constitute a major rebuilding. Locomotives with alternative power systems such as battery power can have reduced sound, although significant sound still arises from the track/wheel interface. Unpublished research<sup>7</sup> included measurements that show the sound levels set out in section 5 remain representative for the current locomotive fleet, including the newer DL class locomotives. It is understood that KiwiRail has existing workstreams to renew its rolling stock (including the locomotives) overtime. This workstream is focused on alternative power systems, and as a multi-year project to explore (and where supported) upgrades/renewals of its stock, as opposed to retrofitting of existing or old stock.
- 7.3. Specific sound sources such as wheel squeal, can sometimes be reduced through treatment of rolling stock.
- 7.4. If older track is not continuously welded, implementing this measure can reduce sound.

### Pathway

- 7.5. Barriers such as formed by earth bunds or walls can reduce railway sound. A barrier providing effective screening could typically reduce railway sound levels by around 5 dB. However, this is often impracticable because any noise barrier would typically need to be in the order of 5 metres high to achieve effective screening of locomotive sound sources that are several metres above the tracks, which in turn are often raised above local ground level. Sound screening might also be provided by intervening buildings or the terrain. As barrier performance is limited by sound passing over the top, typical barriers generally do not provide sufficient sound reduction for receivers close to the railway (within around 50 metres).

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<sup>7</sup> Waka Kotahi research programme. Social cost (health) of land transport noise exposure, <https://www.nzta.govt.nz/planning-and-investment/research-programme/current-research-activity/active-research-projects/>

- 7.6. Increasing the distance of the pathway reduces sound levels: i.e. separating the receiver from the source by a greater distance. As discussed previously, this measure in isolation may require separation of 100 to 200 metres.

#### Receiver

- 7.7. If habitable/sensitive spaces are orientated with no opening windows with exposure to railway sound then internal levels will be reduced. Hence the layout of a building can be used to manage railway sound. A practical approach can be to locate only ancillary, non-sensitive spaces such as garages and bathrooms on the side of the building facing the railway.
- 7.8. Where windows do have exposure to railway sound, closing those windows reduces internal sound levels. This typically provides a reduction in the order of 10 dB compared to when windows are open ajar for ventilation. However, if windows are required to be closed to reduce sound then an alternative (i.e. mechanical) ventilation and temperature control method is needed for occupants to maintain thermal comfort such that they have a genuine choice to leave the windows closed. For two older roading projects (SH20 Mt Roskill and SH1 Plimmerton) Waka Kotahi installed ventilation systems in 35 and 57 houses respectively with the intention that it would allow windows to be kept closed to reduce road-traffic noise.<sup>8</sup> However, those systems only provided ventilation and not temperature control (e.g. cooling) and for both projects residents reported the temperature being uncomfortable with windows closed. Therefore, if closed windows are to be considered as a noise reduction measure, temperature control should be included in any alternative ventilation system.
- 7.9. If greater reductions are required than can be achieved just by building layout or closing windows, then the building fabric can be upgraded. This typically requires thicker and/or laminated glazing of windows and in some cases additional/thicker layers of plasterboard wall/ceiling linings.

## **8. Approaches to manage effects of railway vibration**

### Source

- 8.1. As for managing sound, routine track and rolling stock (wheel) maintenance contributes to reducing vibration at source. Again, there might be incremental improvements if more stringent maintenance service standards were adopted. It is understood based on evidence previously provided by KiwiRail that it endeavours to undertake current maintenance best practice where practicable, and continues to invest in ongoing upgrades of its maintenance abilities. This includes the recent commissioning of a new wheel maintenance facility at its Hutt Workshops, which should contribute to improved wheel servicing and repair. In terms of track condition, KiwiRail has comprehensive procedures including measurement of track condition/geometry with a specialist survey vehicle several times a year, and maintenance systems acting on that data.
- 8.2. There are several different methods to treat railway track to reduce vibration. These include resilient clips fastening the rails to sleepers, resilient material under the sleepers or ballast, and

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<sup>8</sup> Waka Kotahi, State highway guide to acoustic treatment of buildings, 2015

tracks directly or on ballast on concrete slabs, "floating" on resilient or spring vibration bearings. These vibration treatments are generally "built into" the overall track formation, particularly for the better performing options. Some treatments can increase the height of the track, having implications on clearances from bridges and overhead structures. As such, these measures are most commonly used for new tracks when the treatments can be integrated into and constructed as part of the overall design (e.g. on the Auckland City Rail Link). Retrofitting treatments over a wide area would require a major rebuilding of the tracks, beyond standard upgrading or maintenance.

#### Pathway

- 8.3. There are no standard pathway controls to reduce vibration. In some instances, depending on the dominant propagation route in the specific location, in-ground barriers can reduce vibration propagation. In addition to practical/space constraints (where the corridor is too narrow to construct an in-ground barrier), this is generally not something that could be applied broadly along a rail corridor as it would require analysis and design for specific locations.
- 8.4. Again, increasing the distance of the pathway reduces vibration levels: i.e. separating the receiver from the source by a greater distance.

#### Receiver

- 8.5. Depending on the specific propagation paths, use of different building foundation types (e.g. pile/pad) can result in reduced vibration entering a structure. Likewise, propagation through a structure will alter depending on its design (e.g. concrete/steel).
- 8.6. Buildings can be built on vibration bearings to reduce vibration from the foundations entering the building. (Some types of vibration bearing are similar to earthquake bearings.) Individual spaces within a building could be constructed as separate structures mounted on vibration isolators, but this is unlikely to be a practical solution in most cases compared to isolating the entire building.

### **9. Recommended land use controls**

#### Form of controls

- 9.1. Extensive and widespread mitigation at source would generally only give relatively small incremental improvements and/or would require renewal/replacement of a substantial proportion of track and rolling stock. While (as set out at 7.2 above) there are programmes being undertaken by KiwiRail to renew its existing rolling stock, this confirms any improvements are likely to be incremental as fleets are gradually renewed. There are therefore unlikely to be practicable options for extensive mitigation at source to address sound and vibration effects on new and altered sensitive land uses seeking to establish near existing railways.
- 9.2. In terms of sound and vibration affecting people, the most robust control would be avoidance of effects by separating sensitive activities from railways. This could be achieved by defining an area around railways where new noise sensitive activities are not allowed. However, in addition to any non-acoustic impacts of such a control, if it contributed to larger and/or more dispersed urban areas then it might in itself cause increased transportation sound and vibration as the



overall population travels greater distances. The following recommendations are therefore made on the assumption that avoidance of effects by separation alone is not a practicable option.

- 9.3. If new and altered sensitive activities are allowed near railways, then to manage potential health effects, controls are needed to result in appropriate design of buildings or effective screening and separation of those buildings from the railway.
- 9.4. Several different methods have previously been used in RMA plans. Two common approaches are:
  - a) setting internal sound and vibration limits; or
  - b) specifying building constructions directly or in terms of sound reduction performance.
- 9.5. The first approach requires a site-by-site assessment and tailored mitigation for each development, whereas the second approach requires the same mitigation for all developments. The first requires specialist acoustics expertise whereas the second does not if specifying building constructions directly.
- 9.6. The potential health effects discussed above have been shown to occur (or be more likely) above certain sound and vibration threshold levels inside buildings. As discussed previously, there are a large number of variables that determine external railway sound and vibration exposure and there are nuances with building siting/layout and design that affect the internal levels. Controls that require the same mitigation for all developments result in excess treatment in many cases and inadequate treatment for those developments most exposed (nearest to the railway). Technically, setting internal sound and vibration criteria and requiring a site-by-site assessment should be the most efficient and effective approach.
- 9.7. In the Christchurch District Plan, multiple compliance options were included for mitigating road and rail noise in buildings for new sensitive activities. On review of the controls the Council found that in most cases site-specific assessment was selected by developers rather than fixed mitigation (i.e. following a standard building design schedule or fixed sound reduction performance).<sup>9</sup> This was presumably as despite any specialist assessment costs the site-specific assessment provided a more efficient solution.
- 9.8. It is recommended that any land use controls should be based on achieving internal sound and vibration criteria and allowing for requirements for each site to be determined through individual assessment.

#### Sound and vibration criteria

- 9.9. For the reasons discussed previously, the following criteria are recommended to manage potential health effects. A range of sensitive activities have been included in this table, extending from the primary issue of residential units.
- 9.10. For all these building types the vibration criterion relating to health effects is more stringent than any separate control that might relate to building damage. For other building types a

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<sup>9</sup> Christchurch District Plan, Plan Change 5E

separate vibration criterion is included in the table, which could be used to avoid potential building damage.

Building type	Occupancy/activity	Sound criterion	Vibration criterion
		$L_{Aeq(1h)}$	
Residential	sleeping spaces	35 dB	0.3 mm/s $v_{w,95}$
	all other habitable rooms	40 dB	
Visitor accommodation	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	45 dB	
Cultural	places of worship, marae	35 dB	
All	All occupancies/activities not specified above	-	5 mm/s ppv

- 9.11. As discussed in section 2, reasonable conditions should be achieved in outdoor living spaces if they are subject to a sound criterion of 55 dB  $L_{Aeq(1h)}$ .
- 9.12. The sound level criteria are based on intermittent rail activity. For the assumed rail activity discussed in sections 4 and 5, controls should specify that criteria are to be achieved for external railway sound of 70  $L_{Aeq(1h)}$  at a distance of 12 metres from the track, reducing at a rate of 3 dB per doubling of distance up to 40 metres and 6 dB per doubling of distance beyond 40 metres.

#### Extent of controls

- 9.13. Setting a distance for application of controls that includes most land affected by railway sound and vibration would extend for say 200 metres from railways, and would include a substantial area towards the periphery where on closer examination of specific developments no building treatments would be required. Previously, a distance of 100 metres has been used for the application of controls for railway sound. Technically this represents a reasonable compromise if the aim is to capture the most affected sites without requiring assessment where building treatment is less likely to be required. This aligns with the assumed sound levels applied for the rail volumes and one-hour average discussed at section 5 above.
- 9.14. For vibration, a distance of 60 metres has been used for controls previously. On the basis of the measurement data presented above, I have recommended this be increased to 100 metres consistent with the distance used for sound.

### Ventilation

- 9.15. Where windows are required to be closed it is recommended that a mechanical system be required to provide thermal comfort so there is a genuine choice to leave windows closed. Ventilation is outside the expertise of Chiles Ltd, but on the basis of work published by Waka Kotahi<sup>10,11</sup> the following system specification for residential and visitor accommodation habitable rooms may be appropriate:
- 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;
  - 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.

### Alternative compliance pathways

- 9.16. Existing controls in district plans based on internal sound and vibration criteria, often include alternative compliance pathways that can be used in some cases to demonstrate that appropriate sound and vibration conditions will be achieved, without requiring specialist assessment or only requiring a reduced assessment. Essentially, these pathways allow for sites and buildings that are likely to have lower sound exposure, or that adopt conservative building designs, to face reduced assessment requirements. Alternative pathways have included:
- a) Compliance with internal sound criteria demonstrated by external levels not exceeding the internal criteria by more than 15 dB (reduced assessment needed for external levels).
  - b) Compliance with internal sound criteria demonstrated by the building being at least 50 m from the railway and screened by a solid barrier, from all points up to 3.8 m above the tracks.
  - c) Compliance with internal sound criteria demonstrated by using prescribed building constructions.
  - d) Compliance with internal vibration criterion demonstrated by use of prescribed building base isolation system.
- 9.17. Technically, the alternative pathways are valid as they result in compliance with the sound and vibration criteria, albeit generally not in the most efficient manner. As discussed above, in the case of the Christchurch District Plan alternative pathways provided were generally not used and were found to make the plan more confusing for users and harder to administer for the Council.

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<sup>10</sup> Acoustic Engineering Services, NZTA Ventilation specification review, 30 June 2020

<sup>11</sup> Beca, Ventilation systems installed for road-traffic noise mitigation, 26 June 2014

# Appendix 3: Economic Assessment





Final Report: 16 August 2023

# Economic Assessment of Options to Manage Adverse Rail Noise Effects

Prepared for: **KiwiRail Holdings Limited**

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# 1. Executive Summary

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## Introduction

The rail network is an integral part of New Zealand's transport infrastructure and is estimated to generate nearly \$2 billion of value annually (via reduced traffic). To ensure that it is free to grow and operate as needed, and to protect the health and amenity of people, KiwiRail promotes the inclusion of District Plan provisions that require new buildings and/or alterations to existing ones, for noise sensitive activities to mitigate the effects of rail noise. To assist decision-makers, this report assesses the likely high level economic costs and benefits of three options for managing such effects.

## Options Analysed

The three options analysed are:

1. Do nothing – where the adverse effects of rail noise are not managed (Option A in the s32 report);
2. KiwiRail's proposed provisions – which apply within 100 metres of the rail network (Option G in the s32 report); and
3. No noise sensitive development within 100 metres of the rail network (Option E in the s32 report).

## Option Costs and Benefits

The main costs and benefits of the options relate to:

1. Adverse health and amenity effects from prolonged exposure to rail noise.
2. Costs of changing building designs and/or locations to mitigate effects.
3. Policy implementation, administration, and compliance costs.
4. The opportunity cost of potentially foregoing noise sensitive development near the network.
5. Compromised rail operation and efficiency due to potential reverse sensitivity issues (complaints, changes in operating regime).

## Worked Example

The likely costs and benefits of each option are area- and context-specific because they depend on a range of factors that are fluid through both time and space. To demonstrate how the approach can be applied in each territorial authority where KiwiRail's preferred provisions are sought, we derived a model that can be applied on a case-by-case-basis. It contains nearly 20 inputs and assumptions that can be populated with figures that match the circumstances of each district at that time to provide timely and reliable insights to the likely costs and benefits of the three options evaluated herein.

Table 1 below shows the various inputs and parameters in the model, which are populated here with a set of hypothetical values purely for illustration.



Table 1: Model Parameters for Assessing Option Costs and Benefits (Hypothetical Example)

<b>Area of Land Affected &amp; Likely Dwelling Yield</b>	<b>Values</b>
Control Area (Buffer) start distance in metres from edge of rail network	10
Control Area (Buffer) end distance in metres from edge of rail network	100
Share of land within proposed buffer otherwise available for development	80%
Residential development density - dwellings/ha (gross)	10
Metres per kilometre	1,000
Square metres per hectare	10,000
<b>Land Values for Noise Sensitive and Non-Sensitive Activities</b>	<b>Values</b>
Value of land zoned for residential & other noise sensitive activities (\$/m <sup>2</sup> )	\$400
Value of land zoned for non-noise sensitive activities (\$/m <sup>2</sup> )	\$200
<b>Health &amp; Amenity Benefits</b>	<b>Values</b>
Average dwelling price	\$540,000
Mitigation Impact (dB of noise reduction)	5
Mitigation benefits (as a % of property value) per 1 dB improvement	1.20%
<b>Policy Compliance Cost Parameters</b>	<b>Values</b>
Average dwelling build cost	\$300,000
Mitigation fixed costs per dwelling	\$3,000
Mitigation variable cost (as a % of construction cost)	3%
<b>Impacts on Rail Operation</b>	<b>Values</b>
Annual value of rail to New Zealand (from Deloitte Study)	\$1,900,000,000
Impact of new noise sensitive activities on value of rail (as a %)	2%
Total length of NZ railway track (km)	3,700
<b>Financial Parameters</b>	<b>Values</b>
Time Period of Analysis (years)	30
Discount Rate	10%

Finally, Table 2 shows the corresponding option costs and benefits for this specific example, where KiwiRail's proposed provisions generate the lowest net cost and hence are the preferred option.

Table 2: Estimated Net Costs/Benefits per Kilometre of Track (Hypothetical Example)

<b>Costs/Benefits per km of Track</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
Amenity & health benefits	-\$4,665,600	\$0	\$0
Impacts on rail operation	-\$97,000	\$0	\$0
Policy compliance costs	\$0	-\$1,728,000	\$0
Housing market impacts	\$0	\$0	-\$28,800,000
<b>Option Net Benefits/Costs</b>	<b>-\$4,762,600</b>	<b>-\$1,728,000</b>	<b>-\$28,800,000</b>

## 2. Introduction

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### 2.1 Context & Purpose of Report

KiwiRail is responsible for the development and operation of New Zealand's rail network. To ensure that the rail network is free to grow and operate as needed to meet ever-evolving needs, KiwiRail promotes the inclusion of District Plan provisions that require new buildings, and/or alterations to existing ones, for noise sensitive activities to mitigate the effects of rail noise. To assist, this high-level report assesses the likely key economic costs and benefits of three options for managing such effects, including KiwiRail's proposed provisions.

### 2.2 Steps in Assessment & Report Structure

Below are the key steps in our assessment and the sections of this report where each is addressed.

1. Understand the strategic context (section **3**)
2. Identify options to manage rail noise effects (section **4**)
3. Identify option effects and key stakeholders (section **5**)
4. Assess the impacts of each option on stakeholders (sections **6 to 9**)
5. Identify the best/preferred option (section **10**)

The rest of this report works through each step.

## 3. Strategic Context

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### 3.1 About the New Zealand Freight Task

New Zealand, like all developed nations, is highly dependent on domestic and international trade. This trade creates a massive freight task, with approximately 280 million tonnes moved around NZ annually.<sup>1</sup> While rail plays a key role in the freight sector, particularly for certain goods like timber, dairy, and meat<sup>2</sup>, most of the national freight task is performed by diesel trucks. These generate harmful emissions, including CO<sub>2</sub>, and are therefore the target of a concerted effort to decarbonise the transport fleet. For example, the New Zealand freight and supply chain strategy seeks to move 20% more freight by 2035 while generating 25% lower emissions, including via modal shifts to rail.

### 3.2 Rail for Passengers

Rail is not just a freight mode, either, and also plays an increasingly important role in keeping people moving in and around our largest metropolitan areas, particularly Auckland and Wellington. As those cities continue to intensify with more people living in and around centres serviced by the rail network, the share of passenger journeys taken by rail will also naturally increase too. The potential for to reconnect large metropolitan centres through inter-regional passenger rail is also an increasing focus, building on pilot programmes like the Te Huia connection between Auckland and Hamilton.

### 3.3 The Future Role of Rail

In parallel, the New Zealand Government has recognised the need to maximise the value of its existing investments in the rail network, including making rail a more attractive mode for freight and expanding the passenger rail network. Previously, investment in the rail network lacked a long-term view about its role in the transport system. This caused short-term thinking and investment decision-making, so a new approach was needed.<sup>3</sup>

The New Zealand Rail Plan<sup>4</sup> was developed in 2021 to articulate the Government's vision and priorities for rail to 2030, and to identify the investment needed to achieve it. In June 2021, the Rail Network Investment Programme (RNIP) was created to fund various planks of the Rail Plan that will help renew the network, restore it to a resilient and reliable state, and support freight and passenger rail growth and productivity.<sup>5</sup>

### 3.4 The Value of Rail to New Zealand

The New Zealand rail network delivers significant value to its freight and passenger customers, and also generates significant benefits for all New Zealanders. These wider benefits are far-reaching, but the most significant are lower road congestion, fewer road accidents, and lower carbon emissions that result from less road traffic.

<sup>1</sup> <https://www.transport.govt.nz/assets/Uploads/Freight-and-supply-chain-issues-paper-full-version.pdf>

<sup>2</sup> <https://www.kiwirail.co.nz/our-business/freight/>

<sup>3</sup> <https://www.transport.govt.nz/area-of-interest/infrastructure-and-investment/the-new-zealand-rail-plan/>

<sup>4</sup> ibid

<sup>5</sup> ibid

In 2021, Ernst & Young were commissioned by the Ministry of Transport to evaluate the value of rail to New Zealand.<sup>6</sup> Their study built on an earlier analysis from 2016 and considered the benefits of (i) national freight rail, and (ii) passenger rail in Auckland and Wellington.<sup>7</sup> Two scenarios were modelled. The first assumed that all rail services were cancelled, with all rail freight and passengers shifted to the road network. The second scenario also assumed that all rail services were cancelled and shifted to the road network, but with 20% higher rail traffic to capture the impacts of projected future growth. For both scenarios, the value of rail equals the costs of road traffic avoided.

The table below summarises the study's estimates of rail's benefits for the first scenario, where rail volumes match today. In short, the value of rail is estimated to be \$1.7 to \$2.1 billion per annum.

Table 3: Estimated Annual Value of Rail to New Zealand

<b>Benefit</b>	<b>Low Estimate</b>	<b>High Estimate</b>
Time (congestion) savings	\$939	\$1,054
Reduced air pollution	\$170	\$474
- NOx emissions	\$92	\$394
- SOx emissions	<\$1	<1
- Brake & tire (PM10)	\$21	\$22
- Exhaust (PM2.5)	\$57	\$58
Reduced fuel use	\$211	\$222
Reduced GHG emissions	\$178	\$182
Maintenance benefits	\$104	\$107
Safety	\$94	\$98
- Death	\$63	\$65
- Serious injuries	\$25	\$27
- Minor injuries	\$5	\$6
<b>Totals</b>	<b>\$1,695</b>	<b>\$2,137</b>

In the words of the Ernst & Young study, as demonstrated above, rail transportation provides the largest benefits to the road sector and society through:

- Time and congestion savings (49% - 55% of benefits)
- Reduced air pollution (10% - 22% of benefits)
- Reduced fuel use and maintenance costs (14% of benefits)
- Reduced greenhouse gas (GHG) emissions (9% to 10% of benefits).

The report also notes that the second scenario, where rail volumes are 20% higher, generates higher benefits than the scenario summarise above, but the difference is not linear with rail volumes. Specifically, the second scenario generates benefits that are about 10% higher than scenario one.

<sup>6</sup> Ernst & Young, the Value of Rail in New Zealand, 2021.

<sup>7</sup> i.e. it excluded inter-island ferries and long-distance passenger rail services, which are also operated by KiwiRail.

### **3.5 Need for Operational Freedom & Flexibility**

To continue realising rail's substantial value to New Zealand, as per above, and to maximise its potential to limit growth in road traffic over time, the rail network must be available for operations 24/7 just like the road network. Reverse sensitivity from nearby sensitive receivers risks undermining that flexibility.

### **3.6 Summary and Conclusion**

Rail is an important part of New Zealand's current transport mix. It provides significant value to New Zealand. It is necessary to protect that critical role to enable rail traffic to grow over time alongside population and economic growth. It is on this basis that KiwiRail seeks the inclusion of District Plan provisions which manage the risk to its operations and future growth that reverse sensitivity poses.

## 4. Policy Options

This section identifies three policy options to manage the adverse effects of rail noise. These were considered the most plausible/workable options from the long list shown in the appendix.

### 4.1 Option 1: Do Nothing (option A in the s32 report)

The first option is to “do nothing” with the adverse effects of rail noise not managed, either in the District Plan, or via other means. This forms the baseline (or counterfactual) against which the impacts of the other options are assessed.

### 4.2 Option 2: KiwiRail Proposed Provisions (option G in the s32 report)

The next option is KiwiRail’s proposed provisions. These require new buildings for noise sensitive activities, or alterations to existing ones, within 100 metres of the railway network boundary to mitigate the effects of noise. Specifically, affected buildings must either:

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

Building Type	Occupancy or Activity	Max Railway Noise LAeq(1h)
Residential	Sleeping spaces	35 dB
	All other habitable rooms	40 dB
Visitor Accommodation	Sleeping spaces	35 dB
	All other habitable rooms	40 dB
Education Facility	Lecture rooms/theatres, music studios, assembly halls	35 dB
	Teaching & sleeping areas, conference rooms, drama studios	40 dB
	Libraries	45 dB
Health	Overnight medical care, wards	40 dB
	Clinics, consulting rooms, theatres, nurses’ stations	45 dB
Cultural	Places of worship, marae	35 dB

- (b) be located at least 50 metres from any 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 railway tracks, or
- (c) it can be demonstrated by way of prediction or measurement that the noise at all exterior façades of the listed activity is no more than 15 dB above the relevant noise levels in Table 1 (above).

If windows must be closed to achieve the design noise levels in (a), mechanical ventilation must be designed, constructed, and maintained. Finally, a report must be submitted to the Council demonstrating compliance with the proposed provisions prior to the construction or alteration of any building containing a noise sensitive activity.

We note the assessment of the costs of Option 2 may also be helpful in assessing a scenario where KiwiRail adopts the funding of the various mitigation measures. This scenario is not assessed

separately below, but we note from an economics assessment, the feasibility of implementing these provisions drops rapidly should KiwiRail adopt both its internal (eg track maintenance and noise reduction costs) and the cost of implementing the provisions. Given the benefits of the provisions also attribute the benefits of the costs of implementation (via warmer, drier, and quieter homes that are also worth more) solely to the landowner, this further reduces the burden of the costs of those provisions sitting with the landowner, rather than KiwiRail.

### **4.3 Option 3: No Noise Sensitive Development within 100 Metres (option E in the s32 report)**

The final option is to prevent new buildings for noise sensitive activities, or alterations to existing ones, occurring within 100 metres of the railway network to avoid adverse noise effects. For clarity, this option does not preclude activities that are not noise-sensitive (eg commercial, industrial or rural activities) from establishing there.

## 5. Option Impacts & Key Stakeholders

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This section identifies likely option impacts and key stakeholders affected.

### 5.1 Option Costs

The main costs of the options are likely to be:

1. Adverse **health and amenity effects** from prolonged exposure to rail noise. These impacts will vary with several factors, including distance from the network, the design and orientation of buildings, the extent of outdoor activity, plus the health and resilience of affected people.
2. Costs of **changing building designs and/or locations** to mitigate effects. These costs result directly from the need to mitigate effects within the 100-metre buffer area (where deemed necessary by a suitably-qualified noise/acoustic expert).
3. Policy **implementation (ie construction), administration, and compliance** costs. While KiwiRail is seeking the inclusion of provisions only during District Plan review processes, rather than via its own plan change processes (which helps minimise implementation costs), the proposal will still have ongoing administration and compliance costs. These include costs borne by Councils as the administrators of District Plans, plus costs incurred by affected landowners, such as the engaging a noise/acoustic expert to assess the extent of mitigation required, if any.
4. Potential **impacts on housing supply**. If affected properties cannot mitigate the adverse effects of rail noise in a financially feasible manner, there may be a reduction in the quantity of new housing built. This, in turn, could affect the wider housing market and may affect the ability of some Councils to meet their obligations under the National Policy Statement on Urban Development 2020 (NPSUD).
5. **Compromised rail operation and efficiency** due to potential reverse sensitivity. Finally, for options that do not properly manage the adverse effects of rail noise on nearby noise sensitive activities, there may be potential risks to the ongoing operation and efficiency of the rail network.

### 5.2 Option Benefits

The main benefits of the options are likely to be:

- Improved **health and amenity effects** from properly managing exposure to rail noise. In many cases, these measures will also result in **warmer, drier, healthier homes** that are cheaper to run.
- For options that properly manage the adverse effects of noise, there will be **benefits from the ongoing, unconstrained operation of the rail network**. To the extent that rail can attract a larger share of the national freight task, as sought by several policy initiatives, all new Zealanders will benefit from **lower congestion, accidents, and harmful emissions**.



- Compared to options that effectively sterilise development (for noise sensitive activities) near the rail network, those that enable it will **allow affected land to be put to higher and better uses** than they likely would to otherwise.
- Finally, to the extent that options avoid investments that would otherwise be needed, there will be benefits in the form of **avoided costs saved**.

### 5.3 Key Stakeholder Groups

Our analysis considers the extent to which option costs and benefits affect the following key stakeholder groups:

- **Affected property owners** – this group will be directly affected in several ways. First, if they develop their land to accommodate noise sensitive activities near the railway line and no mitigation measures are adopted, future occupants may experience adverse effects from prolonged exposure to rail noise. Conversely, affected property owners may face provisions that either (i) limit their ability to develop their land for certain activities, and/or (ii) which impose additional costs to enable noise sensitive activities to establish there.
- **Rail network customers** – this group could be adversely affected if growth in noise sensitive activities near the rail network causes reverse sensitivity, which in turn reduces the frequency, reach, and/or availability of the rail services upon which they rely.
- **KiwiRail and the NZ Government** – As the rail network operator and funder, respectively, KiwiRail and the New Zealand Government will also be affected by the presence or absence of provisions to manage the adverse effects of rail noise. For example, if such effects are left unmanaged, these groups may be negatively impacted by potential constraints arising from reverse sensitivity, which would undermine the operation of – and investment in – the rail network.
- **Territorial authorities** – to the extent that provisions are included in District Plans, territorial authorities will bear the costs and responsibility of incorporating and administering them. While these costs are unlikely to be significant over and above those already associated with their day-to-day functions, they are still an important consideration.
- **NZ's people and its economy** – finally, we note that provisions to manage adverse rail noise, or the absence thereof, may have far reaching effects. For example, if such effects are not properly managed leading to reverse sensitivity that curtail rail operation or availability, any consequent increases in road freight traffic will have negative effects on all of New Zealand. In addition, New Zealanders will bear some of the costs of treating adverse health effects via the tax-funded public health system.

## 6. Health and Amenity Impacts

This section considers the health and amenity impacts of each option.

### 6.1 Option 1: Do Nothing<sup>8</sup>

Under this option, the District Plan does not contain provisions that manage the adverse health and amenity impacts of rail noise. Accordingly, it exposes proximate noise sensitive activities to potential adverse health and amenity effects from the rail network.

### 6.2 Option 2: KiwiRail Proposed Provisions<sup>9</sup>

By design, KiwiRail's proposed provisions directly manage the adverse effects of proximity to the rail network and therefore create ongoing benefits for affected landowners and their tenants (if any). In addition, this option will have wider benefits on the increased warmth, energy efficiency and dryness of homes due to the kinds of mitigation measures imposed (see further discussion re these benefits in the report of Dr Chiles).

However, the true impacts of this option on health and amenity depend fundamentally on the extent to which any proposed mitigation measures would be required anyway, for example to meet the New Zealand Building Code. As the code (likely) continues to strengthen over time, or as developers voluntarily include such measures anyway to keep pace with consumer preferences, the marginal benefits of complying with these provisions will decline. So too, however will the costs, which we return in section 8 below.

To the extent that KiwiRail's proposal does cause some buildings to install design features or elements that they would not have otherwise, there will be health and amenity benefits. First, and most foremost, the adverse effects of rail noise will be properly managed. While it is difficult to accurately quantify such benefits, a recent report for Christchurch City Council (CCC) estimated the health and amenity benefits of noise attenuation to be approximately 1.2% of property value per decibel of road noise reduction.<sup>10</sup>

We consider it unlikely that health and amenity effects accrue linearly with property value, as suggested by the CCC estimate. This would imply, for example, that a \$1 million house receives double the benefits of a \$500,000 one. Instead, there are likely to also be lump-sum (per-property) elements. That said, these estimates are the best currently available, so below we use them to show the potential benefits for different combinations of property values and noise level reductions.

Table 4: Health & Amenity Benefits by Property Value and Size of Noise Reduction in dB (\$000s)

Property Value (000s)	Noise Reduction dB									
	1	2	3	4	5	6	7	8	9	10
\$250	\$3	\$6	\$9	\$12	\$15	\$18	\$21	\$24	\$27	\$30
\$500	\$6	\$12	\$18	\$24	\$30	\$36	\$42	\$48	\$54	\$60
\$750	\$9	\$18	\$27	\$36	\$45	\$54	\$63	\$72	\$81	\$90

<sup>8</sup> Option A in the s32 report

<sup>9</sup> Option G in the s32 report

<sup>10</sup> Formative, Christchurch Plan Change 5E Noise Sensitive Activities Near Road and Rail Corridors, 30 September 2022.

\$1,000	\$12	\$24	\$36	\$48	\$60	\$72	\$84	\$96	\$108	\$120
\$1,250	\$15	\$30	\$45	\$60	\$75	\$90	\$105	\$120	\$135	\$150
\$1,500	\$18	\$36	\$54	\$72	\$90	\$108	\$126	\$144	\$162	\$180
\$1,750	\$21	\$42	\$63	\$84	\$105	\$126	\$147	\$168	\$189	\$210
\$2,000	\$24	\$48	\$72	\$96	\$120	\$144	\$168	\$192	\$216	\$240

Table 4 shows that health and amenity benefits could be substantial, especially if they accrue linearly with property value as assumed/modelled. For example, a 5dB reduction could translate to a \$30,000 benefit for a \$500,000 home, or \$60,000 for a \$1 million home.

In addition, measures adopted to comply with KiwiRail's proposed provisions, such as double glazing and/or mechanical ventilation, are likely to make homes warmer, healthier, and drier. For example, a 2022 interim report by EECA<sup>11</sup> found that 62% of families who were provided heat pumps reported being in very good or excellent health, compared to only 46% before installation. Further, EECA's final report from December 2022<sup>12</sup> noted that electricity use (through winter) falls in a house fitted with a heat pump by an estimated 16% relative to a house without a heat pump installed.

Thus, not only do heat pumps make homes warmer, drier, and healthier, but they also save on energy costs. Over time, these savings will add up and help offset the initial costs of purchase and installation.

### 6.3 Option 3: No Noise Sensitive Development within 100 Metres<sup>13</sup>

This option also (largely) avoids the adverse effects of rail noise but does not deliver the additional benefits resulting from building improvements associated with the KiwiRail proposal.

<sup>11</sup> Motu report for EECA, Warmer Kiwis Study: Interim Report: An impact evaluation of the Warmer Kiwi Homes programme

<sup>12</sup> Motu report for EECA, Warmer Kiwis Study: Final Report: An impact evaluation of the Warmer Kiwi Homes programme

<sup>13</sup> Option E in the s32 report

## 7. Impacts on Rail Uptake & Operation

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This section considers impacts of each option on rail network uptake and operation.

### 7.1 Option 1: Do Nothing<sup>14</sup>

Because this option does not manage adverse rail noise effects, it can cause reverse sensitivity that gradually undermines the future uptake and operation of the rail network. This, in turn, would erode the value created by rail (as summarised above) and limit rail's ability to attract market share from the road freight sector. In addition, it can affect the ability of passenger rail services to shift people out of single occupancy vehicles during rush hour, which are a major contributor to congestion and delay on the road network as well as emissions.

Unfortunately, it is impossible to accurately assess the extent to which reverse sensitivity resulting from this option would disrupt the rail network and the consequential impacts on the economy. However, for the sake of illustration, we note that every 1% reduction in rail traffic caused by reverse sensitivity from new noise sensitive activities establishing nearby would cost the broader economy approximately \$17 to \$21 million per annum (based on the annual values shown in section 3.3 above).

### 7.2 Option 2: KiwiRail Proposed Provisions<sup>15</sup>

By design, KiwiRail's proposed provisions would directly manage the adverse effects of new noise sensitive activities establishing in proximity to the rail network which would help it become an increasingly credible alternative to road transport for freight and passenger movements. However, that said, we acknowledge that reverse sensitivity may still arise from existing proximate activities.

### 7.3 Option 3: No Noise Sensitive Development within 100 Metres<sup>16</sup>

This option also (largely) avoids the adverse effects of rail noise and therefore should result in the same outcomes for the rail network as KiwiRail's proposed provisions.

<sup>14</sup> Option A in the s32 report

<sup>15</sup> Option G in the s32 report

<sup>16</sup> Option E in the s32 report

## 8. Policy Administration/Compliance Costs

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### 8.1 Option 1: Status Quo<sup>17</sup>

The status quo does not incur any administrative or compliance costs because it is (assumed to be) devoid of such provisions.

### 8.2 Option 2: KiwiRail Proposed Provisions<sup>18</sup>

KiwiRail's proposed provisions will have one-off costs to the Council of including them in the District Plan. However, because KiwiRail is proposing their introduction only during District Plan review or Plan Change processes, where changes to plans are occurring anyway, the marginal costs to Councils of including the proposed provisions is likely to be negligible. Further, while there will be ongoing costs from administering the provisions once operative, these are not expected to be material in the context of functions ordinarily carried out by Councils.

The greatest administrative and compliance costs associated with this option are those that fall on affected landowners. First, affected properties must commission a noise/acoustic expert to identify the need for, and optimal types of, mitigation to manage rail noise. We understand that these are likely to cost about a few thousand dollars.

Where buildings cannot be situated on a site or designed to locate sensitive activities away from the rail corridor, installing insulation, double glazing, mechanical ventilation, and other mitigation features will be the major cost felt by affected landowners. Again, unfortunately, it is difficult to provide reliable generalised estimates of these features because they are context-specific, and depend on the particular design choices of each landowner and their preferred use of their site. In addition, as noted earlier, the true cost of complying with these provisions will depend on the extent to which such measures would have been included in the building design anyway (either due to Building Code requirements and/or because the developer chose to adopt them).

Another complication is that the nature and cost of mitigation works will differ with several variables, including building height and distance from the rail network. For example, the following table from a recent report by Chiles Limited indicates the general relationship between distance from the rail network and the level of noise experienced.<sup>19</sup>

<sup>17</sup> Option A in the s32 report

<sup>18</sup> Option G in the s32 report

<sup>19</sup> Chiles Limited, Land use controls for railway sound and vibration, March 2023.

Table 5: Relationship Between Distance and Sound Levels

Distance from Track	Sound Level $L_{Aeq(1h)}$
10 metres	71 dB
20 metres	68 dB
30 metres	66 dB
40 metres	64 dB
50 metres	62 dB
60 metres	60 dB
70 metres	59 dB
80 metres	58 dB
90 metres	56 dB
100 metres	56 dB

To advance the analysis, and for the sake of illustration, we draw on work completed by Beca for Waka Kotahi in 2013<sup>20</sup>, which estimated the cost of mitigating road noise for dwellings located at different distances from the state highway network. The excerpt below summarises their key findings.

Figure 1: Beca Estimate of Mitigation Costs by Distance from Road Network (2013 \$)



A more recent estimate of likely costs was provided by AES for Christchurch City Council, which suggested that they may be about 1 to 2% of construction costs. Thus, the expense for a dwelling that costs \$300,000 to build may be \$3,000 to \$4,000, while the cost for a \$500,000 dwelling would be around \$5,000 to \$10,000. Again, however, we emphasise that the true cost of complying with the

<sup>20</sup> New Zealand Transport Agency Building Acoustic Mitigation Case Study, prepared for NZTA, 2013

provisions depends fundamentally on the extent to which any of the design features or building elements required would have been provided anyway.

It is also important to acknowledge that these costs will be offset by potential energy savings over time, as noted in the previous section. Plus, as set out in the table at 6.2 above, more importantly, they will likely be capitalised in the value of the property. Even setting aside that direct research, houses with double glazing and/or heat pumps are generally worth more than those without. Thus, while this option imposes upfront costs on homeowners, these will not be lost and instead could be better described as investments in the quality and future marketability of properties.

### **8.3 Option 3: No Noise Sensitive Development within 100 Metres<sup>21</sup>**

This option is unlikely to impose any notable administrative or compliance costs.

<sup>21</sup> Option E in the s32 report

## 9. Housing Market Impacts

### 9.1 Option 1: Status Quo<sup>22</sup>

The status quo will not affect the quantity of housing supplied in each district.

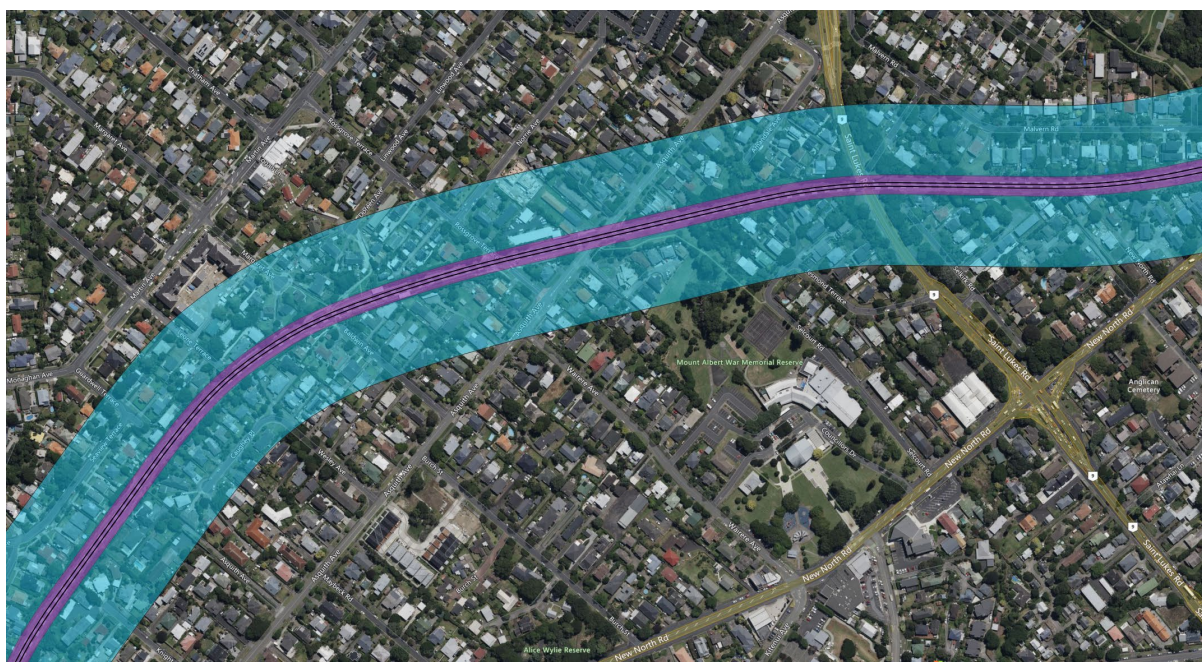
### 9.2 Option 2: KiwiRail Proposed Provisions<sup>23</sup>

KiwiRail's proposed provisions may have small impacts on housing supply at the margin if the costs of mitigation are considered prohibitively expensive. However, this seems unlikely given the quantum of costs estimated by AES for Christchurch City Council, as per the previous section.

### 9.3 Option 3: No Noise Sensitive Development within 100 Metres<sup>24</sup>

This option will have the greatest impacts on housing supply because it sterilises the use of land for noise sensitive activities within 100 metres of the rail network. To broadly quantify this impact, we used GIS to inspect the proximity of existing noise sensitive activities to the rail network in built-up areas, particularly Auckland. To that end, the figure below draws 10 and 100 metre buffers around the rail network in pink, and blue, respectively, to investigate how close existing homes are to the tracks.

Figure 2: Proximity of Noise Sensitive Activities to the Rail Network in Mt Albert, Auckland



This map shows there is very little development within 10 metres of the network, although the edges of some buildings are close. Conversely, there are large swathes of development within the 100-metre

<sup>22</sup> Option A in the s32 report

<sup>23</sup> Option G in the s32 report

<sup>24</sup> Option E in the s32 report



buffer. Accordingly, per kilometre of track, this option may prohibit noise sensitive development that would have otherwise likely occurred on approximately 180,000m<sup>2</sup> (or 18 hectares) of land.<sup>25</sup>

The cost of this prohibition will depend on several factors, including the zoning of affected land, the extent to which it is already developed or not, the presence or absence of other binding constraints on development, the underlying value of land, and the scope for accommodating non-noise sensitive activities instead.

Below, we estimate the value of land foregone for noise sensitive development per kilometre of track based on (i) the proportion of land that is developable for any purpose, and (ii) the incremental value of developing land for noise sensitive activities vs other activities. Table 5 presents the results.

Table 6: Value of Land Foregone for Noise Sensitive Activities by 100-Metre Setback per Kilometre of Track (\$ millions)

Developable Land %	Incremental Value of Using Land for Noise Sensitive Activities per m <sup>2</sup>							
	\$50	\$100	\$150	\$200	\$250	\$300	\$350	\$400
0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10%	\$1	\$2	\$3	\$4	\$5	\$5	\$6	\$7
20%	\$2	\$4	\$5	\$7	\$9	\$11	\$13	\$14
30%	\$3	\$5	\$8	\$11	\$14	\$16	\$19	\$22
40%	\$4	\$7	\$11	\$14	\$18	\$22	\$25	\$29
50%	\$5	\$9	\$14	\$18	\$23	\$27	\$32	\$36
60%	\$5	\$11	\$16	\$22	\$27	\$32	\$38	\$43
70%	\$6	\$13	\$19	\$25	\$32	\$38	\$44	\$50
80%	\$7	\$14	\$22	\$29	\$36	\$43	\$50	\$58
90%	\$8	\$16	\$24	\$32	\$41	\$49	\$57	\$65
100%	\$9	\$18	\$27	\$36	\$45	\$54	\$63	\$72

To summarise: the opportunity cost of precluding noise sensitive development within the 100-metre buffer depends critically on the proportion of such land that is developable in the first place, and the difference in land value between noise sensitive activities and all others.

For example, suppose that the current value of residential land is \$200 per square metre but (say) \$100 for industrial, and that 50% of land within the buffer is available for some form of development. According to the table above, the cost per kilometre of track is \$9 million.<sup>26</sup>

In more extreme cases, say where residential land values are \$300 higher than industrial and the full buffer area is available for development, the opportunity cost per kilometre is \$54 million.

<sup>25</sup> This equals one kilometre of track (1,000 metres) multiplied by 90 metres of developable land between the 10- and 100-meter buffers, which is then multiplied by two because the buffer extends in both directions on both sides of the tracks.

<sup>26</sup> This can be found by subtracting the value of land for industrial from the value for residential (which is \$100 per m<sup>2</sup>) and scanning down that column to the row labelled as 50% developable.

# 10. Calculating Option Net Benefits

## 10.1 Introduction

The likely costs and benefits of each option are area- and context-specific because they depend on a range of factors that are fluid through both time and space. To demonstrate how the approach can be applied in each territorial authority where Kiwirail's preferred provisions are sought, we derived a model that can be applied on a case-by-case-basis. It contains nearly 20 inputs and assumptions that can be populated with figures that match the circumstances of each district at that time to provide timely and reliable insights to the likely costs and benefits of the three options evaluated herein.

## 10.2 Worked (Hypothetical) Example

Table 7 below shows the various inputs and parameters in the model, which are populated here with a set of hypothetical values purely for illustration.

Table 7: Model Parameters for Assessing Option Costs and Benefits (Hypothetical Example)

<b>Area of Land Affected &amp; Likely Dwelling Yield</b>	<b>Values</b>
Control Area (Buffer) start distance in metres from edge of rail network	10
Control Area (Buffer) end distance in metres from edge of rail network	100
Share of land within proposed buffer otherwise available for development	80%
Residential development density - dwellings/ha (gross)	10
Metres per kilometre	1,000
Square metres per hectare	10,000
<b>Land Values for Noise Sensitive and Non-Sensitive Activities</b>	<b>Values</b>
Value of land zoned for residential & other noise sensitive activities (\$/m <sup>2</sup> )	\$400
Value of land zoned for non-noise sensitive activities (\$/m <sup>2</sup> )	\$200
<b>Health &amp; Amenity Benefits</b>	<b>Values</b>
Average dwelling price	\$540,000
Mitigation Impact (dB of noise reduction)	5
Mitigation benefits (as a % of property value) per 1 dB improvement	1.20%
<b>Policy Compliance Cost Parameters</b>	<b>Values</b>
Average dwelling build cost	\$300,000
Mitigation fixed costs per dwelling	\$3,000
Mitigation variable cost (as a % of construction cost)	3%
<b>Impacts on Rail Operation</b>	<b>Values</b>
Annual value of rail to New Zealand (from Deloitte Study)	\$1,900,000,000
Impact of new noise sensitive activities on value of rail (as a %)	2%
Total length of NZ railway track (km)	3,700
<b>Financial Parameters</b>	<b>Values</b>
Time Period of Analysis (years)	30
Discount Rate	10%

Finally, Table 2 Table 8 shows the corresponding option costs and benefits for this specific example, where KiwiRail's proposed provisions generate the lowest net cost and hence are the preferred option.

Table 8: Estimated Net Costs/Benefits per Kilometre of Track (Hypothetical Example)

<b>Costs/Benefits per km of Track</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
Amenity & health benefits	-\$4,665,600	\$0	\$0
Impacts on rail operation	-\$97,000	\$0	\$0
Policy compliance costs	\$0	-\$1,728,000	\$0
Housing market impacts	\$0	\$0	-\$28,800,000
<b>Option Net Benefits/Costs</b>	<b>-\$4,762,600</b>	<b>-\$1,728,000</b>	<b>-\$28,800,000</b>

# 11. Appendix: Long List of Options

---

Below is the long list of options from which the three analysed in this report were drawn.

**Option A - Do nothing:**

No or limited railway noise and vibration provisions in the District Plan. This may include no specific noise and vibration rules, standards or mapping overlays, but may include consideration of reverse sensitivity effects when assessing the adverse effects of any resource consent application, depending on the existing objectives, policies and rules in the District Plan. This includes subdivision, use or development within the vicinity of the railway corridor if the District Plan provides sufficient direction to do so.

**Option B – Rail operator reduces noise and vibration emissions:**

The rail operator ensure that noise and vibration emissions are reduced to the extent that Activities Sensitive to Noise within 100m of the rail corridor achieve the recommended noise and vibration levels without needing to undertake any specific insulation, ventilation or construction design standards.

**Option C - Noise barriers:**

Acoustic walls or bunds installed by the applicant or the rail operator with no other noise or vibration management methods.

**Option D - Construction design standards:**

A table which specifies minimum construction materials and standards necessary to achieve internal acoustic levels within buildings, with no other noise or vibration management methods.

**Option E - Setbacks:**

Requiring Activities Sensitive to Noise to be set back 100m from the railway corridor with no other noise or vibration management methods.

**Option F - Internal acoustic standards:**

Require internal acoustic and ventilation rules and standards for noise-sensitive activities, but provide no other options to achieve compliance.

**Option G – Combination of rules and standards (Proposed provisions):**

Within 100m of the railway corridor, provide several options to achieve compliance with internal acoustic levels – within 50m of the rail corridor buildings are designed to meet specified Internal noise levels, or must meet a 50m setback, or where the noise at exterior façades is measured or predicted to be no more than 15 dB above the relevant noise level. Buildings must also meet mechanical ventilation standards and reporting standards. Includes an advice note to alert plan users that Activities Sensitive to Noise within the Rail Noise Control and Vibration Alert Area may be subject to vibration effects.

**Option H – Proposed provisions funded by rail operator:**

Within 100m of the railway corridor, via a mapped Rail Noise Control and Vibration Alert Area,

the same options to achieve compliance would be available - buildings are designed to meet specified Internal noise levels, or must meet a 50m setback, or noise at exterior façades is no more than 15 dB higher. Buildings must also meet mechanical ventilation standards and reporting standards, and there is an advice note regarding vibration effects. However, the difference is that KiwiRail would fund the achievement of these standards.

**Option I - Landscaping:**

Landscape planting to provide acoustic mitigation, with no other noise or vibration management methods.

**Option J - National regulation:**

This may include changes to the Building Act or Building Code or introduction of a National Planning Standard or 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). However, it does not require the management of internal noise where noise is generated from outside a building (e.g. rail noise from an adjacent rail corridor).

**Option K 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. This is often referred to as a 'no complaints' covenant.

**From:** [PlanChanges](#)  
**To:** [Unitary Plan](#)  
**Subject:** Watercare Private Plan Change 101 Submission  
**Date:** Friday, 21 June 2024 12:06:01 pm  
**Attachments:** [Outlook-mlhafisp.png](#)  
[Outlook-dkubitpe.png](#)  
[Outlook-k10yw0w4.png](#)  
[Outlook-ogv0plkh.png](#)  
[Outlook-tnsienpc.png](#)  
[Outlook-3lpty4bl.png](#)  
[Outlook-xanbvp2z.png](#)  
[Watercare Private Plan Change 101 Submission.pdf](#)

---

Kia ora,

Please find attached Watercare Services Limited submission to Private Plan Change 101.

Ngā mihi,

[Logan Fraser-List](#)

Graduate Planner | Major Developments

Ika Tauhou Kaiwhakamahere | Nga Hanganga Matua

**Watercare Services Limited**

**Mobile:** 021 786 491

Mon Tue Wed Thu Fri



Office  Home

Auckland Council  
Unitary Plan Private Bag 92300  
Auckland 1142

Attn.: Planning Technician

[unitaryplan@aucklandcouncil.govt.nz](mailto:unitaryplan@aucklandcouncil.govt.nz)

**TO:** Auckland Council

**SUBMISSION ON:** Plan Change 101 (Private): Pilkington Park, 167-173 Pilkington Road and railway land on the corner of Apirana Avenue and Merton Road (North Island Main Trunk 671.04-672.38 KM), Point England

**FROM:** Watercare Services Limited

**ADDRESS FOR SERVICE:** [planchanges@water.co.nz](mailto:planchanges@water.co.nz)

**DATE:** 21st June 2024

**Watercare could not gain an advantage in trade competition through this submission.**

## **1. WATERCARE'S PURPOSE AND MISSION**

- 1.1. Watercare Services Limited ("Watercare") is New Zealand's largest provider of water and wastewater services. Watercare is a council-controlled organisation under the Local Government Act 2002 and is wholly owned by the Auckland Council ("Council").
- 1.2. As Auckland's water and wastewater services provider, Watercare has a significant role in helping Auckland Council achieve its vision for the Auckland region. Watercare's mission is to provide reliable, safe, and efficient water and wastewater services to Auckland's communities.
- 1.3. Watercare is required to manage its operations efficiently with a view to keeping overall costs of water supply and wastewater services to its customers (collectively) at minimum levels, consistent with the effective conduct of its undertakings and the maintenance of the long-term integrity of its assets. Watercare must also give effect to relevant aspects of the Council's Long Term Plan, and act consistently with other plans and strategies of the Council, including the Auckland Unitary Plan (Operative in Part) and the Auckland Future Development Strategy 2023-2053.<sup>1</sup>

---

<sup>1</sup> Local Government (Auckland Council) Act 2009, s58.

## 2. SUBMISSION

### General

- 2.1. This is a submission on a private plan change requested by Wyborn Capital Investments Limited ("Applicant") to the Auckland Unitary Plan (Operative in Part) ("AUP-OP") that was publicly notified on 18 April 2024 ("Plan Change 101").
- 2.2. Plan Change 101 requests to rezone approximately 7.3 hectares of land at 167 – 173 Pilkington Road, Point England and approximately 600m<sup>2</sup> of land within RAILWAY LAND NIMT 671.04-672.38 KM, Point England from Business-Light Industry to Business–Mixed Use with associated precinct provisions. The purpose of Plan Change 101 is to enable mixed use development and greater building height to make efficient use of land that is highly accessible to the Glen Innes Town Centre and Train Station.
- 2.3. Watercare neither supports nor opposes the plan change. The purpose of this submission is to ensure that the effects on Watercare's existing and planned water and wastewater network are appropriately considered and managed in accordance with the Resource Management Act 1991 ("RMA").
- 2.4. In making its submission, Watercare has considered the relevant provisions of the Auckland Plan 2050, Te Tahua Pūtea Tau 2021-2031 / The 10-year Budget 2021-2031, the Auckland Future Development Strategy 2023-2053 ("FDS"), the Water Supply and Wastewater Network Bylaw 2015 ("Bylaw"), the Water and Wastewater Code of Practice for Land Development and Subdivision and the Watercare Asset Management Plan 2021 – 2041. Watercare has also considered the relevant RMA documents including the AUP-OP and the National Policy Statement on Urban Development 2020 (updated in May 2022) which (among other matters) requires Auckland Council as a Tier 1 local authority to ensure that at any one time there is sufficient development capacity to meet expected demand for housing and business land over the short term, medium term, and long term<sup>2</sup>.

6.1

### Watercare's position and interest in the plan change

- 2.5. Watercare's submission relates to Plan Change 101 in its entirety.
- 2.6. Watercare is interested in the plan change insofar as it relates to Watercare's water and wastewater network infrastructure servicing the plan change area. This submission raises several matters which will be relevant to the ultimate development of the plan change area, and which will need to be addressed at the future resource consenting and development stages.

### Yield

- 2.7. The Civil Engineering Report<sup>3</sup> supporting the plan change adopts a high density development scheme comprising 711 dwellings, one commercial development and one community hub. If the final development yield is greater than this assumption, then the effects on Watercare's existing and planned water supply and wastewater networks will need to be reassessed.

6.2

<sup>2</sup> National Policy Statement on Urban Development 202 (May 2022) Policy 2.

<sup>3</sup> 167-173 Pilkington Road, Proposed Plan Change – Civil Engineering Report prepared by Blue Barn Consulting Engineers, Date: 13/04/2023.



*Wastewater servicing*

- 2.8. Wastewater servicing for the plan change area is proposed to connect directly to the Eastern Interceptor which runs through the plan change area. Connection is proposed via an existing satellite manhole located within the plan change area close to the existing Apirana Ave entrance.
- 2.9. As at the date of this submission, Watercare confirms there is capacity in the bulk wastewater network to service the development anticipated in the plan change area.
- 2.10. Future development will need to carefully consider the location of the Eastern Interceptor. It is noted that works near Watercare assets and infrastructure may require approval from Watercare under the Bylaw. All works within 10m of the interceptor will require a 'critical assets works over' approval from Watercare under the Bylaw.
- 2.11. Feasibility of a direct connection to the Eastern Interceptor will need to be investigated by the applicant at the resource consent stage and confirmed by Watercare. Watercare advises that connections to interceptors of this size can be complex, even where there is an existing connection point. **6.3**
- 2.12. Connections to Watercare's wastewater network are subject to Watercare's approval under the Bylaw. Watercare has the ability under the Bylaw to refuse an application for approval to connect to a network where, in Watercare's reasonable opinion, refusal is necessary to protect its networks, or the health and safety of any person, or the environment.

*Water supply servicing*

- 2.13. Plan Change 101 is located within a Kāinga Ora high growth area which is within the Glen Innes water supply zone supplied by the bulk St John's water reservoir. As at the date of this submission, Watercare confirms there is capacity in the bulk water supply network to service the development anticipated in the plan change area.
- 2.14. The development of the Kāinga Ora high growth area will increase the demand on the existing local water supply network, in addition to the development of the plan change area.
- 2.15. The local water network currently does not have the capacity or resilience to service the additional development from the plan change area without additional upgrades. These upgrades will need to be integrated with Watercare's proposed other short-term upgrades to the local network and will be at the cost of the developer. As per Watercare's Code of Practice for Land Development and Subdivision, the local networks must be sized to accommodate the future upstream and downstream development potential at the developers cost.
- 2.16. The Applicant will need to work with Watercare in advance of lodging resource consents to confirm the requirement for any local water supply infrastructure upgrades. **6.4**
- 2.17. Connections to Watercare's water supply network are subject to approval by Watercare under the Bylaw. Watercare has the ability under the Bylaw to refuse an application for approval to connect to a network where, in Watercare's reasonable opinion, there is insufficient capacity in the network to accommodate the connection.

**3. DECISION SOUGHT**

- 3.1. Watercare neither supports nor opposes Plan Change 101.
- 3.2. Watercare's interests lie more with the water and wastewater aspects of the proposal which will be dealt with through subsequent processes and at the resourcing consenting stage.

**4. HEARING**

- 4.1. Watercare wishes to be heard in support of its submission.

21st June 2024

*Mark Iszard*

Mark Iszard  
**Head of Major Developments**  
**Watercare Services Limited**

Address for Service:  
Amber Taylor  
Development Planning Lead  
Watercare Services Limited  
Private Bag 92521  
Victoria Street West  
Auckland 1142  
Phone: 022 158 4426  
Email: [Planchanges@water.co.nz](mailto:Planchanges@water.co.nz)

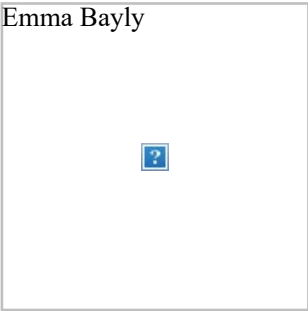
**From:** [Emma Bayly](#)  
**To:** [Unitary Plan](#)  
**Cc:** [Michael Sheridan - Van den Brink Group \(Michael@vandenbrinkgroup.co.nz\)](#); [Andrew Cocks](#); [Belinda Sutton](#)  
**Subject:** Submission on Plan Change 101  
**Date:** Friday, 21 June 2024 3:48:32 pm  
**Attachments:** [2595-SUB01v1-elb-20240621.pdf](#)

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Please find attached a submission on proposed Plan Change 101 on behalf of Van Den Brink Poultry Ltd, Van Den Brink 15 Limited and Van Den Brink 12 Limited.

Let me know if you have any queries.

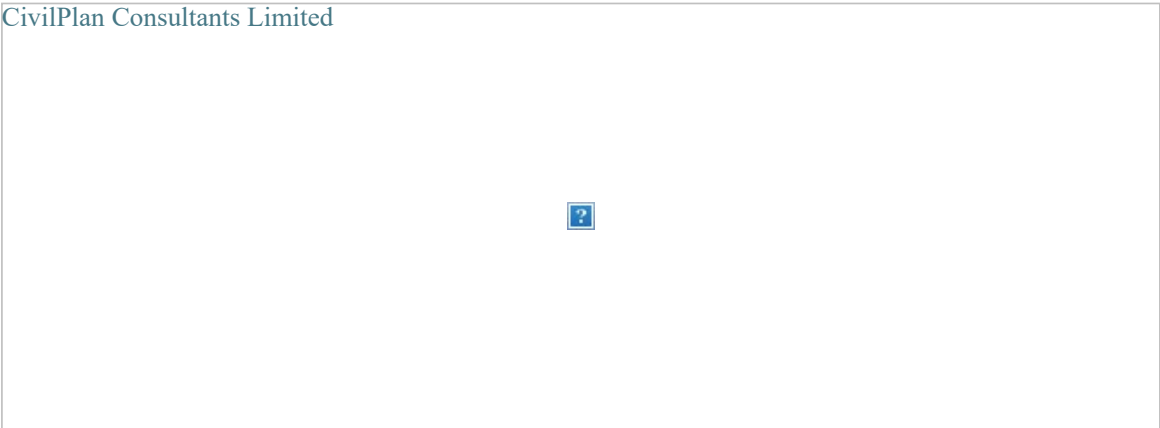
Kind Regards



**Emma Bayly**

Associate  
BPlan(Hons), MNZPI  
027 461 2313  
09 222 2445

**CivilPlan Consultants Limited**  
Level 9, 20 Amersham Way, Manukau, 2104  
[www.civilplan.co.nz](http://www.civilplan.co.nz)



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## Form 5

### Submission on the Proposed Plan Change 101

**To:** Auckland Council

**Name of Submitter:** Van Den Brink Poultry Ltd, Van Den Brink 15 Limited, Van Den Brink 12 Limited

**Address for Service:** C/- CivilPlan Consultants Limited  
PO Box 97796  
Manukau City  
**Auckland 2241**  
  
Attn: Emma Bayly

**Telephone:** (09) 222 2445

**Email:** emma@civilplan.co.nz

This is a submission on Plan Change 101 (Private) (“the proposal”).

The submitter is not a trade competitor for the purposes of section 308B of the Resource Management Act 1991 (“RMA”).

#### 1. Specific provisions of the proposal that this submission relates to

This submission relates to the change of zoning from Business – Light Industry to Business – Mixed Use, which results in residential dwellings being a permitted activity.

#### 2. Submission

##### 2.1 The Submitter

The submitters own/occupy land at 9-15 Hannigan Drive and 8-12 Hannigan Drive, St Johns, as shown in Figure 1 below. The submitters’ land is zoned Business - Light Industry Zone.

The submitters lease land for/operate a Broiler Poultry Processing plant on the land at 9-15 Hannigan Drive, which has been in operation for 10 years. The activities include processing of dressed whole chickens (including chopping and deboning, marinating/crumbing, cooking and smoking) and packaging along with an administration and distribution centre.

The plant has high vehicle and truck movements and employs 300-350 people across multiple shifts, operating 7 days a week and on statutory holidays when required.

The submitter intends to continue these operations and likely expand their operations in this location in the near future. These activities are permitted in the Light Industry zone.

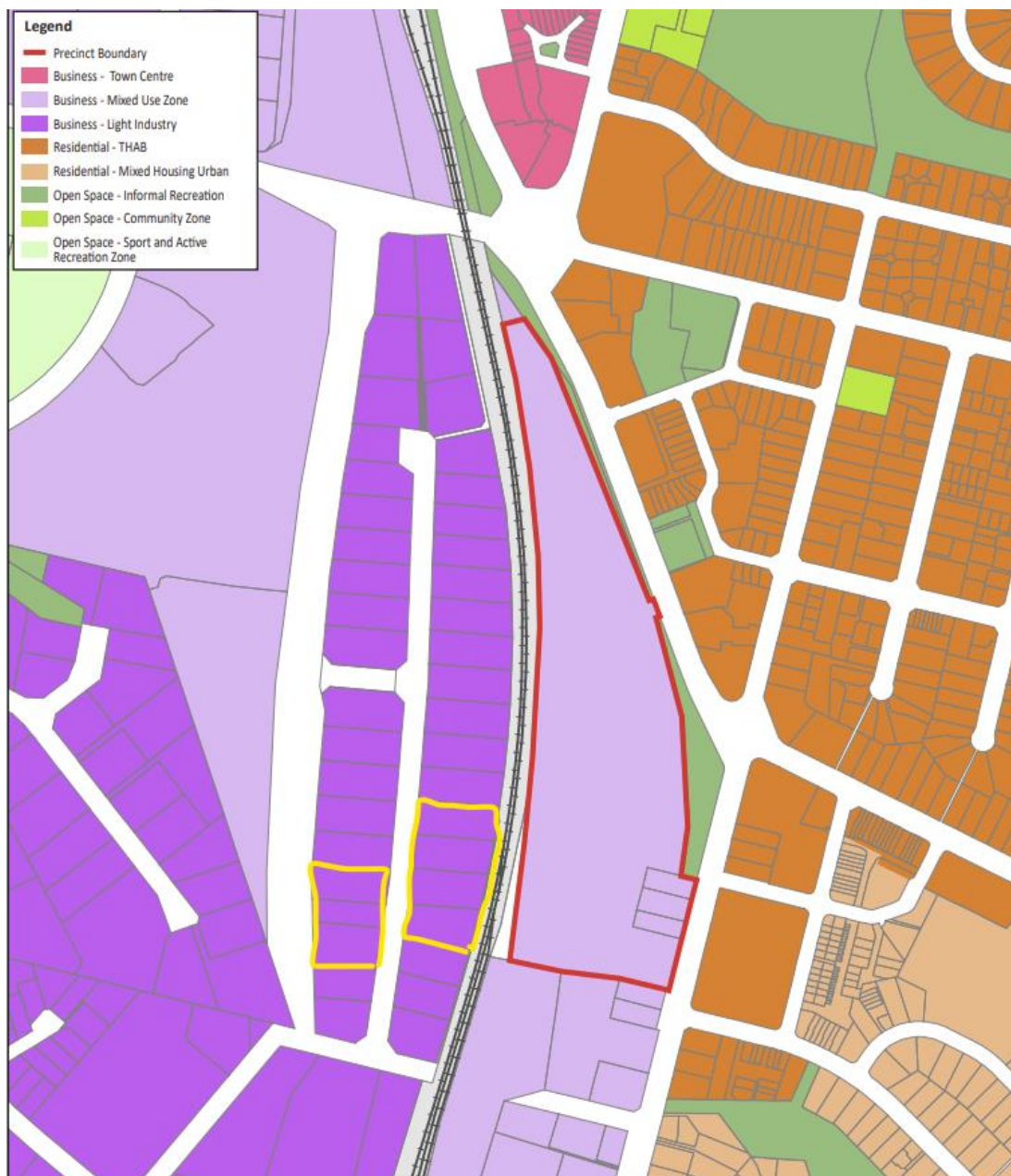


Figure 1: Submitter’s landholdings identified in yellow.

## 2.2 The Submission

The submitter is neutral with respect to the proposed rezoning and new Precinct, provided that the plan change does not result in new reverse sensitivity effects on the operation of existing or new industrial activities located on the Light Industry zoned land along Hannigan Drive.


If the zoning is confirmed, the submitter supports the proposed precinct provisions include provisions that seek to ensure that reverse sensitivity effects of future land use activities within the precinct do not unduly inhibit the operation of the North Island Main Trunk Line. This includes Objective IX.2(4), Policy IX.3(4) and the standards in IX.6.2 Standard for activities sensitive to noise and IX.6.3 Standards for outdoor play areas within 60m of the rail corridor. These provisions are supported as they will also have the effect of mitigating potential acoustic reverse sensitivity effects on activities operating in the adjacent Light Industry zone.

### 3. Relief Sought

The submitter requests the following relief:

- a) That the plan change considers and addresses any potential reverse sensitivity effects associated with enabling residential development adjacent to Light Industry zoned land containing existing industrial activities, and in particular a large poultry processing plant. | 7.1
- b) That if the zoning is confirmed, the proposed precinct provisions that manage reverse sensitivity effects in relation to the Main Trunk Railway Line are retained, including:
  - i) Objective IX.2(4); | 7.2
  - ii) Policy IX.3(4); and | 7.3
  - iii) Standards IX.6.2 Standard for activities sensitive to noise and IX.6.3 Standards for outdoor play areas within 60m of the rail corridor | 7.4  
| 7.5
- c) Any additional or consequential relief to address the concerns of the submitter
- d) Any alternative relief to address the concerns of the submitter.

The submitter does not wish to be heard in support of it submission.

Signature:  .....

Emma Bayly - Associate, CivilPlan Consultants Ltd  
 on behalf of Van Den Brink Poultry Ltd, Van Den Brink 15 Limited, Van Den Brink 12 Limited

Date: 21 June 2024

**From:** [David Boersen](#)  
**To:** [Unitary Plan](#)  
**Cc:** [melissam@barker.co.nz](mailto:melissam@barker.co.nz); [kaseyz@barker.co.nz](mailto:kaseyz@barker.co.nz)  
**Subject:** Plan Change 101  
**Date:** Tuesday, 25 June 2024 6:26:31 pm  
**Attachments:** [image001.png](#)  
[991397 - Letter to Auckland Council seeking Waiver.docx](#)  
[991290 - Foodstuffs Submission on PC101.docx](#)

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Please see attached

**David Boersen**  
Senior Development Manager



M: 027 689 0586  
P: 2365  
35 Landing Drive, Mangere, Auckland 2022, DX Box CX 15021

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This message has been sent from Foodstuffs North Island Limited

The information contained in this email is intended only for the person or entity to which it is addressed. If you received this message in error, please contact the sender immediately by return email and delete this message and your reply. If you received this message in error you are prohibited from using any information in this email in any other way.

**SUBMISSION ON PRIVATE PLAN CHANGE 101 (PRIVATE): PILKINGTON PARK,  
167-173 PILKINGTON ROAD AND RAILWAY LAND ON THE CORNER OF  
APIRANA AVENUE AND MERTON ROAD (NORTH ISLAND MAIN TRUNK 671.04-  
672.38 KM), POINT ENGLAND TO THE AUCKLAND UNITARY PLAN  
(OPERATIVE IN PART)**

To: Auckland Council, Plans and Places  
unitaryplan@aucklandcouncil.govt.nz

And: The Plan Change Applicant  
C/- Barker & Associates Ltd  
Attn: Melissa McGrath / Kasey Zhai  
melissam@barker.co.nz; kaseyz@barker.co.nz

**FOODSTUFFS (AUCKLAND) LIMITED** at the address for service set out below ("**Foodstuffs**" or "**the Submitter**") makes the following submission in relation to Private Plan Change 101: PC 101 (Private): Pilkington Park, 167-173 Pilkington Road and railway land on the corner of Apirana Avenue and Merton Road (North Island Main Trunk 671.04-672.38 KM), Point England ("**PC101**" or "**the Plan Change**") lodged by Wyborn Capital Investments Limited ("**the Applicant**") in respect of 9.7ha of land at 167-173 Pilkington Road, Point England ("**PC101 Land**").

1. PC101 seeks to rezone the PC101 Land from Business-Light Industry to Business- Mixed Use, amend the planning maps to enable greater building heights and introduce a new precinct - Pilkington Park.
2. The Submitter is directly affected by PC101 as it owns the property at 153 Pilkington Road, Glen Innes<sup>1</sup> ("**the Foodstuffs Site**"), which directly adjoins the PC101 Land.
3. The Submitter is not a trade competitor of the Applicant and could not gain any advantage in trade competition through this submission.
4. The submission relates to the parts of PC101 which have the potential to impact on the Foodstuffs Site. The Submitter is not opposed to PC101 provided that the proposal (and in particular the precinct provisions) does not create any interface issues for the Foodstuffs Site.

**Reasons for submission**

5. The reasons for the submission are as follows:

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<sup>1</sup> Legally described as Lot 2 Deposited Plan 86427 comprised in Record of Title NA44A/841 (North Auckland Registry)



- (a) Provided the relief sought below in this submission is granted, PC101 will:
- (i) Promote the sustainable management of natural and physical resources;
  - (ii) Amount to and promote the efficient use and development of resources;
  - (iii) Otherwise be consistent with the purpose and principles in Part 2 of the Resource Management Act 1991 (“**RMA**”);
  - (iv) Represent the most appropriate way to achieve the objectives of the Plan Change and the Auckland Unitary Plan in accordance with s 32 of the RMA; and
  - (v) Not generate significant adverse effects on the environment, or the potential for interface issues with the Foodstuffs Site; and
  - (vi) Represent best resource management practice.
6. In particular, but without derogating from the generality of the above:
- (a) Foodstuffs (Auckland) Limited is a property holding company of Foodstuffs North Island Limited (“**FNIL**”). Foodstuffs is a cooperative owned by the operators of Gilmours, New World, Pak ‘n’ Save, Four Square, and Liquorland stores. The wider Foodstuffs group is New Zealand’s largest grocery distributor.
  - (b) The Foodstuffs Site adjoins the Plan Change Land and is zoned Business – Mixed Use. It currently houses the Tamaki Zero Waste Hub, but it is likely to be redeveloped in the future to accommodate Foodstuffs activities. Foodstuffs’ interest is therefore in ensuring that the provisions applied to the PC101 Land do not have the potential to adversely impact future activities on the Foodstuffs Site. Provided PC101 does not create any interface issues with its site, Foodstuffs is not opposed to the Plan Change in principle.

**Relief sought:**

7. The Submitter seeks the following relief with regard to PC101:
- (a) That the Plan Change is retained in its current form, and/or with precinct provisions or other controls which remove the potential for interface issues to arise between the PC101 Land and the Foodstuffs Site.
  - (b) Such other conditions, relief or other consequential amendments as are considered appropriate or necessary to address the matters outlined in this submission.

8.1

8. The Submitter wishes to be heard in support of its submission.
9. If other parties make a similar submission, the Submitter would consider presenting a joint case with them at any hearing.

**DATED** this 24<sup>th</sup> day of June 2024

**FOODSTUFFS (AUCKLAND) LIMITED**



---

**David Boersen – Senior Development Manager  
Foodstuffs North Island**

**ADDRESS FOR SERVICE:** Foodstuffs North Island Limited 35 Landing Drive, Mangere, Tāmaki Makaurau Auckland, 2022. Attention: David Boersen. david.boersen@foodstuffs.co.nz.