



**MARSHALL DAY**  
Acoustics 

**RAES ROAD SUNBURY DEVELOPMENT**  
**RAIL NOISE ASSESSMENT**  
Rp 001 20200146 | 26 June 2020



**Project:** RAES ROAD SUNBURY DEVELOPMENT  
RAIL NOISE ASSESSMENT

**Prepared for:** Raes Road Pty Ltd  
C/o Mesh  
Level 2 299 Clarendon Street  
South Melbourne Vic 3205

**Attention:** Ryan Moyle

**Report No.:** Rp 001 20200146

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## 1.0 INTRODUCTION

Mesh Planning seeks to lodge a planning permit application for subdivision of a parcel of land known as “Raes Road” in Sunbury. The developer, Raes Road Pty Ltd, propose to subdivide 300 hectares of land north east of Sunbury, including approximately 75 hectares allocated for residential dwellings. The site is west of the Bendigo rail line, extending along a north-south boundary interface of approximately 2.5 km.

Marshall Day Acoustics Pty Ltd has been commissioned to prepare an environmental noise assessment of the proposed residential/rail interface and provide mitigation measures, where required.

This report provides details of relevant noise criteria, measurement surveys, predicted levels and recommended control treatments for the development.

A glossary of acoustic terminology is provided in Appendix A.

## 2.0 PRECINCT STRUCTURE PLAN

The land is referred to in the Lancefield Road Precinct Structure Plan (PSP) as property LR-01 on Plan 4. As per Clause 37.07 of the Hume Planning Scheme, the parcel consists of land within 100 m of a railway corridor marked as *Interface with Railway* on Plan 6 of the PSP.

In accordance with the PSP, the documentation for the planning submission must be accompanied by an acoustic assessment which takes into consideration the *Victorian Passenger Rail Infrastructure Noise Policy 2013* (VPRINP).

The VPRINP provides noise level *investigation thresholds* for triggering the need to assess railway noise based on the outside noise levels expected to propagate from an existing railway line.

In the event that the investigation thresholds are expected to be exceeded, the PSP stipulates noise criteria to be met inside future habitable spaces within the proposed subdivision as follows:

- *Rail noise inside bedrooms: 65 dB  $L_{Amax}$  and 40 dB  $L_{Aeq}$ , (8hr night 10pm to 6 am)*
- *The assessment must take into account existing and future rail noise up to 10 years hence.*

This assessment includes the results of the greenfield site survey conducted to determine if the investigation thresholds are expected to be exceeded and the resulting mitigation measures recommended to meet the PSP requirements. For further reference, extracts from the relevant section in the PSP is provided in Appendix B.

## 3.0 SITE AND DEVELOPMENT DESCRIPTION

The subject land is located approximately 5 km north east of Sunbury and is zoned Urban Growth Zone 10 (UGZ10) and bounded as follows:

- North : Rural land zoned RCZ and RCZ1 (Rural Conservation Zone)
- West: Jacksons Creek and Emu Bottom Wetlands zoned RCZ and GWZ (Green Wedge Zone)
- East/South: Bendigo Rail reserve zoned PUZ4 (Public Use Zone) with existing residential properties and subdivisions beyond zoned UGZ10.

The relevant planning map is provided in Appendix C and an aerial photograph of the subject site and the surrounding environment is provided in Figure 1.

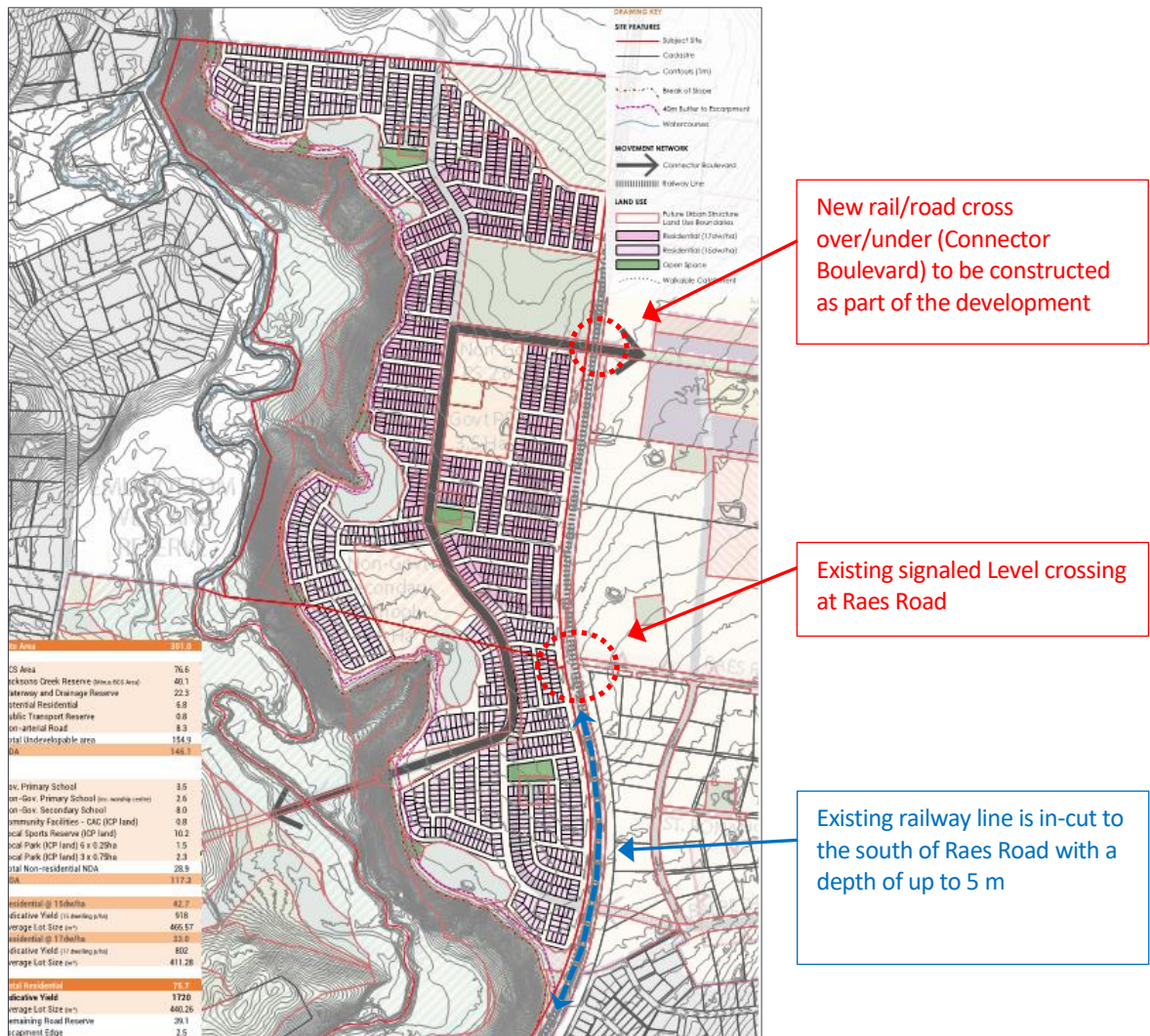
Figure 1: Aerial view of the subject site



(Source: NearMap)

A draft concept plan, prepared by Mesh, showing the extent of residential properties proposed to be included in the subdivision, is provided in Figure 2.

Figure 2: Subject site – extract from draft concept master plan



(Source: Mesh Draft Concept Plan - Sunbury East – Raes Road Villawood Properties)

As shown in Figure 2, there are planned to be a significant number of residential properties aligned along the 2.5 km long eastern rail interface boundary.



The buffer distance between the rail corridor and the boundary of any given residential property is planned to be a typical minimum of 45 m, as shown in Figure 3.

**Figure 3: Typical buffer distance between residential properties and rail**



Whilst the development plan shows the indicative subdivision road layout, there are no detailed plans as to the final individual dwellings, their orientations or configurations. Nevertheless, there are sufficient details to generate a scenario to conservatively represent the expected future residential configuration, as follows:

- Allowance for multi storey dwellings and bedrooms up to Level 1
- Based on our review of the subdivision plan, it is assumed that the facades to habitable spaces will be no closer than 45 m to the rail tracks.

At this stage, the scope of this report is to survey the noise from passing trains and develop an approach to mitigate rail noise including suggested facade constructions for dwellings and buffer zone distances between future dwellings and the railway. The merits of a boundary acoustic barrier are also reviewed in this assessment and relevant comments are provided.

There are a number of additional significant existing and future geographical items to be considered in the rail noise assessment as follows:

- A new rail road cross over/under is planned to be constructed as part of the development, approximately 1 km to the North of Raes Road. At this stage it is unknown if this is to be a level crossing or a grade separated crossing. This assessment conservatively assumes the cross over will be a signalled level crossing comparable to the existing cross over arrangement at Raes Rd.
- A significant length of the railway line along the interface boundary south of the Raes Road is in-cut by up to 5 m. This is expected to provide some additional rail noise attenuation to the nearest future dwellings and this is taken into consideration in the assessment.

### 3.1 Daily rail usage

To assist with the rail assessment, it is necessary to understand the usage along the adjacent rail corridor. As the rail corridor is not electrified, all trains passing the site, including passenger trains, are diesel powered. A review of publicly available WEB based information for VLINE and freight services indicates the following typical activity. (PTV information is provided for reference in Appendix D).

**Table 1: Weekday train movements past the site (Data: ptv.vic.gov.au)**

Period	Weekday train activity past the subject site			
	VLINE Diesel Passenger		Diesel Freight	
	City Inbound	City Outbound	City Inbound (Up)	City Outbound (Down)
Day (0700 – 2200 hrs)	18	21	ID No. 0082 <sup>Note 1</sup> Approx 1930 hrs	-
Night (2200 – 0700 hrs)	4	4	ID No. 9072 <sup>Note 2</sup> Approx 0000 hrs	ID No. 0081 <sup>Note 1</sup> Approx 2315 hrs*
	Earliest 0550 hrs	Latest 0025 hrs		ID No. 9072 <sup>Note 2</sup> Approx 0230 hrs*

Note 1: Only runs when/if required by Operator; potentially Saturday and Sunday also

Note 2: Wednesday and Friday only if required by Operator

The VLINE Diesel passenger train activity on weekends is similar to the weekday schedule except somewhat less frequent. Freight train activity, as per ID Nos. 0082 and 0083, can potentially occur on the weekends also, as required by operator.

The vast majority of VLINE passenger trains servicing the line are Vlocity trains with a small number of N Class locomotive hauled passenger trains and also Sprinters.

Apart from special speed restrictions, publicly available information (ptv.vic.gov.au) indicates that the permitted train speeds between Sunbury and Kyneton are as follows:

- Diesel passenger trains: 100 to 130 km/h depending on train type
- Diesel Freight trains: 80 km/h.

### 3.2 Future rail usage

Whilst upgrades are underway on the railway line between Bendigo and Echuca, we understand that upgrades necessary to allow faster trains on the Bendigo line between Melbourne may be considered in the future, however, current publicly available information does not specify a definitive timeline for a 'fast line' from Melbourne to Bendigo.

Publicly available information suggests that Sprinters are planned to be phased out of service and replaced by Vlocity trains, across the VLINE network.

#### 4.0 LEGISLATION AND GUIDELINES

A range of guidelines and legislation is used in Victoria to assess environmental noise. This section provides an overview of the key documents and guidelines that are applicable to the proposed subdivision with respect to Rail noise, as presented in Table 2.

**Table 2: Relevant Victorian references and guidelines**

Reference	Overview
Environment Protection Act 1970 (the Act)	The Act provides the overarching legislative framework for the protection of the environment in Victoria. It establishes obligations for the control of environmental noise and applies to all types of noise sources <i>except rail operations</i> .
Clause 58 of the Victorian Planning Provisions (VPP)	<p>Clause 58.04-3, Standard (D16) of the Victorian Planning Provisions (VPP) states <i>Buildings within a noise influence area specified in Table D3 should be designed and constructed to achieve the following noise levels:</i></p> <ul style="list-style-type: none"> <li>• Not greater than 35dB(A) for bedrooms, assessed as an <math>L_{Aeq,8h}</math> from 10pm to 6am.</li> <li>• Not greater than 40dB(A) for living areas, assessed <math>L_{Aeq,16h}</math> from 6am to 10pm</li> </ul> <p>However, D16 applies to Apartment developments of 5 storeys or more, thus considered not applicable for the individual dwellings expected to be built on this subdivision.</p>
Victorian Passenger Rail Infrastructure Noise Policy (VPRINP)	<p>Released in April 2013. Section 5 of the policy sets out the conditions under which transport bodies must apply the policy.</p> <p>The policy sets ‘investigation thresholds’ for the assessment of noise. These are noise levels, which if exceeded, indicate that noise mitigation should be considered.</p> <p>Refer to Appendix E for further detail.</p>
Clause 37.07 of the Urban Growth Zone of the Hume Planning Scheme (Raes Road Precinct Structure Plan (PSP) Plan 6)	<p>The PSP requires an acoustic report which includes:</p> <p><i>Recommendations for noise attenuation measures designed to ensure internal bedroom noise levels will not exceed 65 dB <math>L_{Amax}</math> and 40 dB <math>L_{Aeq,8h}</math> for the night period from 10pm to 6am</i></p> <p>Refer to Appendix B for further detail.</p>

As per the notes in Table 2, there are no legislative policies set out to cover rail noise in Victoria. Additionally, it is noted that Clause 58.04-3, Standard (D16) of the Victorian Planning Provisions (VPP), applies to Apartment developments of 5 storeys or more, thus considered not strictly applicable for the individual dwellings expected to be built on this subdivision.

The Raes Road PSP requirements are considered appropriate for this assessment in lieu of the absence of Victorian noise policy for rail.



## 5.0 RAILWAY NOISE SURVEY

Noise monitoring was conducted at two positions along the subject site's rail interface. Rail noise was measured over a 1 week period from period on 24 April to 4 May 2020 using 01dB Cube IEC Class 1 noise monitors (Serial Nos.10520, 11916)

Figure 4 provides the location of the monitoring positions which were selected to represent the nearest affected future dwellings within the proposed subdivision at key rail noise source locations.

**Figure 4: Monitoring positions**



Table 3 provides the approximate distance from the measurement positions to the rail corridor.

**Table 3: Measurement positions relative to the rail corridor**

Position	Distance to centre of rail corridor, m	Observations
1	30	Direct line of sight to entire train and wheels; Directly adjacent to level crossing warning chime unit.
2	30	Line of sight to roof of trains passing through the in-cut section of the corridor

## 5.1 Results

The measured rail noise results from the noise monitoring survey are detailed in Appendix F and summarised in Table 4 (maximum noise levels  $L_{Amax}$ ) and Table 5 (equivalent average noise levels  $L_{Aeq}$ ).

It is noted that the level crossing warning chime close to Position 1, assisted the process of train pass-by noise identification, as distinct from other transient noise sources in the environment such as traffic noise, aircraft noise etc, which are considered extraneous in this assessment.

**Table 4: Summary of measured maximum rail noise levels,  $L_{max}$  dB**

Rail noise sources identified throughout survey	$L_{Amax}$ (30 m from rail)	
	Position 1	Position 2
<i>Train pass-by noise (not include train horn sounding events)</i>		
Diesel passenger	71 to 86	57 to 80
Diesel freight*	Pass #1 89	Pass #1 85
	Pass #2 93	Pass #2 91
<i>Other train/rail related noise</i>		
Train horn sounding events	Up to 102	95
Level crossing warning chime	67	< 50
<b>95<sup>th</sup> percentile maximum all rail sources</b>	<b>95</b>	<b>92</b>

\*Two Diesel Freight pass-byes were measured, both occurred at night between 0100 hrs and 0430 hrs

Table 4 shows that whilst the maximum measured rail noise levels are higher at Position 1 compared to Position, as expected due to the in-cut of the rail line at Position 2, the differences are diminished to as little as 2-3 dB, meaning the assessment outcome is not expected to vary significantly between the two locations.

Based on observations taken at site, it is likely that this is because the pass by noise levels are influence significantly by sources such as horns and diesel exhaust outlets which are higher compared to the wheel track interface.

Whilst the VLINE passenger train passes appeared to be consistent with the respective schedules we note that the two freight train pass-byes measured during the survey were not fully consistent with the PTV scheduled pass by times, as detailed in Table 1. Thus, the Freight train ID Nos. associated with the freight train noise results are not known.

**Table 5: Summary of measured average rail noise levels,  $L_{Aeq, 8hr}$ , dB**

Rail noise sources identified in 8 hour period	$L_{Aeq}$ , (8hr night 10pm to 6 am) (30 m from rail)	
	Position 1	Position 2
<i>Diesel passenger &amp; freight pass-byes, train horn sounding, level crossing warning chime</i>		
2200 hrs Friday 24 <sup>th</sup> to 0600 hrs Sat 25 <sup>th</sup>	55	51
2200 hrs Sat 25 <sup>th</sup> to 0600 hrs Sun 26 <sup>th</sup>	55	51

The above results show that the whilst the  $L_{Aeq}$  results (Table 5) were significantly lower than the VPRINP investigation threshold of 65 dB  $L_{Aeq, 8hr\ night}$ , the 95th percentile maximum rail noise level at the both positions (Table 4) exceeded the VPRINP investigation threshold of 85 dB  $L_{Amax}$ .

Therefore, under VPRINP, further investigation is required, substantiating the necessity to apply the PSP noise criteria for bedrooms, referred to in Section 2.0.

Note that the threshold exceedance does not mean that the external rail noise levels need to be reduced below the given thresholds. This is not the intention of the VPRINP investigation thresholds. The  $L_{max}$  'exceedance threshold' triggers the need to investigate and mitigate rail noise in habitable spaces with respect to an appropriate internal noise criterion, which in this case is the PSP noise criteria outlined in Section 4.0.

The rail noise design spectra, derived from the results and used for the building envelope sound insulation assessment of rail noise in future dwellings, are presented in Table 6.

**Table 6: Rail noise design spectra (@30 m from railway line)**

Position	Octave band centre frequency (Hz)								
	A	63	125	250	500	1k	2k	4k	Hz
<i><math>L_{max}</math> 95<sup>th</sup> percentile maximum all rail sources</i>									
Position 1	95	89	85	86	87	92	90	82	dB
Position 2	92	87	81	76	89	86	85	83	dB
<i><math>L_{max}</math> survey maximum of 2 x Diesel Freight trains</i>									
Position 1	93	91	93	86	87	91	80	78	dB
Position 2	91	89	91	83	80	90	79	73	dB
<i><math>L_{Aeq, (8hr\ night)}</math> Diesel passenger &amp; freight pass-byes, train horn sounding, level crossing warning chime</i>									
Position 1	55	53	54	53	50	49	50	46	dB
Position 2	51	51	51	49	43	43	47	42	dB

Based on the reference rail noise data measured at 30 m and shown above, we calculate that rail noise will fall below the VPRINP  $L_{max}$  threshold at a distance of 100 m from the rail corridor. Once dwellings are set back 100 m from the rail line, no special noise mitigation treatment would be required. Dwellings within 100 m of the rail line corridor will need to incorporate building envelope sound insulation.



## 6.0 PRELIMINARY ACOUSTIC ASSESSMENT

For compliance with the PSP rail noise requirements, the bedrooms of houses aligned adjacent to the rail corridor will require building envelope treatment to meet a minimum sound insulation requirement accounting for 95th percentile maximum of all rail sources and freight trains.

The key concern is to determine the sound insulation requirements for building envelope glazing, which represents the weakest acoustic element. The glazing performance requirements and indicative constructions have been laid out in Table 7.

**Table 7: Building envelope glazing acoustic performance and indicative configurations**

Location	Minimum Sound Insulation Performance, $R_w$ Note 1	Indicative Glazing Configuration	Comments
<i>Facades to habitable spaces inside the 100m set back (Figure 5) – any level; facing North, East or South</i>			
Living rooms	$R_w$ 33	6 mm laminate or: DGU* 6 mm float/12 mm air/6 mm float	External sliding doors and openable windows must seal to a high standard with compressible perimeter seals.
Bedrooms Option with up to 10 m <sup>2</sup> glazing per room	$R_w$ 37	12 mm laminate or: DGU* 10 mm float/12 mm air/6 mm float	
Bedrooms Option with up to 4 m <sup>2</sup> glazing per room	$R_w$ 36	10 mm laminate or: DGU* 6 mm float/12 mm air/6 mm float	
<i>Facades to habitable spaces inside the 100 m set back (Figure 5) – any level; facing West</i>			
Living rooms			External sliding doors and openable windows must seal to a high standard with compressible perimeter seals.
Bedrooms	$R_w$ 33	6 mm laminate or: DGU* 6 mm float/12 mm air/6 mm float	

\*DGU- Double Glazing Unit

Note 1: Assumes minimum room dimensions 3.5 m x 4 m bedrooms; 5.5 m x 6 m living rooms; reverberation time 0.5 sec.

The building envelope glazing recommendations in Table 7 are determined decisively by the  $L_{max}$  assessment with respect to the PSP criterion of 65 dB  $L_{Amax}$  in bedrooms with an allowance to account for track wear. Calculations show that the PSP 40 dB  $L_{Aeq, (8hr night)}$  criterion will be met by a margin of greater than 10 dB with these glazing sound insulation performance requirements.

The recommendations conservatively allow for the future scenario of a signalled level crossing at Connector Boulevard with rail noise levels comparable to the existing cross over at Raes Rd.

It is noted that several options are provided for the minimum sound insulation performance for the Bedroom windows, depending on the external window area to be selected in the final design of the dwelling. Indicative glazing constructions which will meet these performance requirements are provided for information purposes. Should alternative windows for thermal insulation be selected, care shall be taken such that the acoustic performance of such system meets the respective minimum sound insulation performance  $R_w$  requirements.

Although the dwellings set back into the subdivision will be afforded some shielding by the “first row” of dwellings nearest to rail, the building envelope recommendations in Table 7 apply to any facades to habitable spaces situated inside the 100 m VPRINP exceedance zone, as shown in Figure 5.

Figure 5: Dwellings recommended to consider acoustic recommendations



As is the case for any building that is exposed to significant external noise, the design criteria will not be achieved with windows open, however, the occupants have the option to close external windows and doors to significantly reduce noise intrusion. Ventilation may be required in some rooms in order to allow the windows to remain closed. This should be addressed by the mechanical consultant/builder for any given dwelling.

It should be noted that care should also be taken when specifying openings to the facade such as kitchen extract ducts or ventilation path ways to ensure that noise ingress through these does not de-rate the noise insulation performance of the glazing and walls.

The assessment assumes that non glazed portions of the facades including any lightweight walls and any roofs exposed to environmental noise shall have sound insulation  $R_w$  performance at least 10 dB greater than that of the associated glazing system. This is expected to be readily achievable with conventional construction as per the following generic descriptions in Table 8.

Table 8: Description of construction to non-glazed building envelope elements

External walls	Roof/ceiling	External doors
<p><u>Brick veneer construction:</u></p> <ul style="list-style-type: none"> <li>- 110 mm external face brickwork</li> <li>- 90 mm timber stud framing</li> <li>- R2.0 insulation in cavity, 90 mm thick, minimum density 9 kg/m<sup>3</sup></li> <li>- 10 mm thick plasterboard (minimum 6.5 kg/m<sup>2</sup>) internal wall lining</li> </ul>	<p><u>Pitched roof at 22.5 degrees:</u></p> <ul style="list-style-type: none"> <li>- Concrete tiled roof with sarking</li> <li>- R4.0 insulation above ceiling (as proposed), 195 mm thick, minimum density 11 kg/m<sup>3</sup></li> <li>- 13 mm thick plasterboard (minimum 9 kg/m<sup>2</sup>) internal ceiling lining</li> <li>- Eaves to be sealed and treated to minimise noise break-in to the roof space</li> </ul>	<p>The external doors should consist of a 35mm thick, solid core timber door with standard weather seals to the door bottom and jamb. Glazed panels should consist of 6 mm laminate glass.</p>

## 6.1 Future rail use

Whilst the building envelope recommendations make an allowance for possible future track wear, the  $L_{max}$  assessment could be expected to be affected by any future changes/upgrades to rolling stock, permitted speeds, diesel exhaust and horn characteristics etc, however these considerations are a matter for the rail authority to inform if deemed necessary and may be considered on merit.

As the assessment is dictated by the PSP requirement to meet 65 dB  $L_{Amax}$  and not the  $L_{Aeq, (8hr night)}$  requirement, which relates to exposure, any reasonable increase in the rate of train passage in 10 years hence is not likely to affect the assessment.

## 7.0 SUMMARY

Raes Road Pty Ltd propose to subdivide land adjacent to the Bendigo railway corridor at Raes Road in Sunbury.

Mesh has commissioned Marshall Day Acoustics to undertake a rail noise assessment for the future residential dwellings and, where required, provide noise mitigation measures for rail noise.

A rail noise survey was conducted at two locations along the rail interface to assist with the assessment of rail noise and address the acoustic requirements of the PSP.

For compliance with the PSP rail noise requirements, the dwellings aligned inside a 100 m buffer distance will require building envelopes to meet minimum sound insulation requirements as set out in Section 6.0 and Table 7 of this report.

These recommendations account for 95th percentile maximum of all rail sources including VLINE passenger train pass by noise, noise from train horns, the level crossing warning signal chime and the maximum noise expected from freight trains.

The building envelope requirements in Section 6.0 and Table 7 are considered reasonable and well within normal residential construction techniques, thus additional shielding via a boundary acoustic barrier is not considered a mandatory rail noise mitigation measure to meet the PSP requirements.

## 8.0 RECOMMENDATIONS

As detailed plans for the final individual dwellings, including orientations, layouts etc are not developed at this stage, there is expected to be scope to review the building envelope acoustic recommendations for affected dwellings within 100 m buffer distance on a case by case basis at the appropriate detailed design phases of the project.



## APPENDIX A GLOSSARY OF TERMINOLOGY

<b>A-weighting</b>	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
<b>dB</b>	Decibel The unit of sound level.
<b>L<sub>A90</sub></b>	The noise level exceeded for 90% of the measurement period, measured in dB. This is commonly referred to as the background noise level.
<b>L<sub>Aeq</sub></b>	The equivalent continuous sound level. This is commonly referred to as the average noise level and is measured in dB.
<b>L<sub>Amax</sub></b>	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
<b>Sound Insulation</b>	When sound hits a surface, some of the sound energy travels through the material. 'Sound insulation' refers to ability of a material to stop sound travelling through it.
<b>R<sub>w</sub></b>	<u>Weighted Sound Reduction Index</u> A single number rating of the sound insulation performance of a specific building element. R <sub>w</sub> is measured in a laboratory. R <sub>w</sub> is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete.
<b>Hertz (Hz)</b>	Noise can occur over a range of frequencies extending from the very low, such as the rumble of thunder, up to the very high such as the crash of cymbals. The frequency of noise is measured in hertz (Hz). Once hertz is one cycle per second.

## APPENDIX B PRECINCT STRUCTURE PLAN

### *Section 3.0 Application requirements*

#### *Railway noise attenuation*

*An application to subdivide land, use land or to construct a building or carry out works for accommodation, child care centre, school, display home, hospital, hotel or a tavern on land within 100m of the railway corridor where land is marked as 'Interface with Railway' on Plan 6 of the Lancefield Road Precinct Structure Plan must be accompanied by an acoustic assessment report prepared by a qualified acoustic engineer or other suitably skilled person to the satisfaction of the responsible authority, after seeking the views of Public Transport Victoria.*

*The acoustic assessment report must take into consideration the Victorian Passenger Rail Infrastructure Noise Policy 2013 and include:*

- > An assessment of noise levels on the land taking into account the existing and likely future noise levels associated with the ongoing passenger and freight operation of the Melbourne-Bendigo rail line (up to 10 years hence) published by the relevant Government agencies, with allowance also provided for seasonal or unscheduled freight traffic.*
- > Recommendations for noise attenuation measures designed to ensure internal bedroom noise levels will not exceed 65 dB LAmax and 40 dB LAeq,8h for the night period from 10pm to 6am.*
- > Recommendations for limiting the impact of railway noise on future buildings within the proposed subdivision.*
- > Ongoing ownership and management of any works or land associated with mitigation measures.*

*For subdivision applications the acoustic assessment must:*

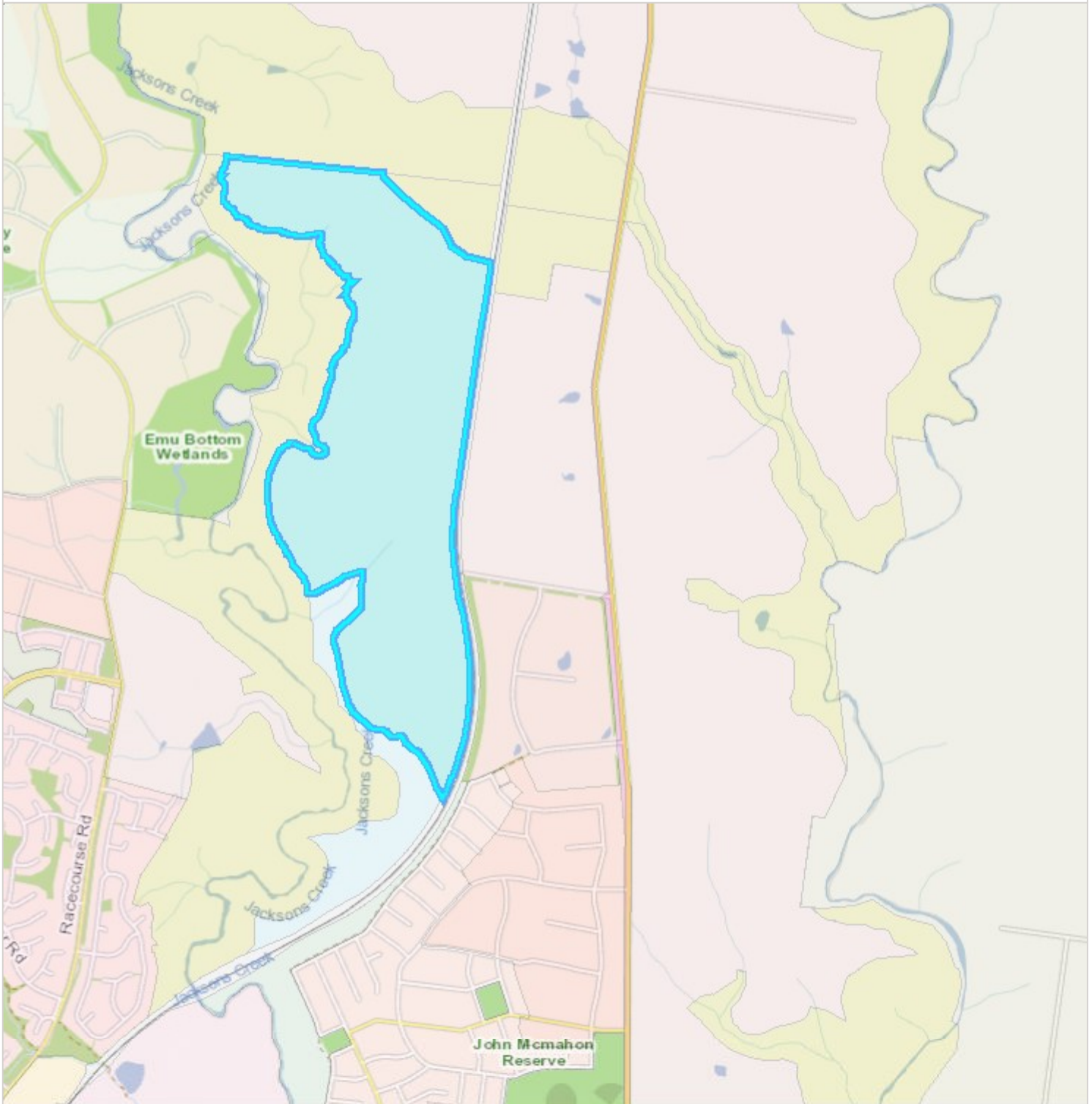
- > Be accompanied by a design response that addresses the recommendations of the acoustic assessment and minimises the number of buildings requiring architectural noise attenuation treatments*

APPENDIX C PLANNING MAP

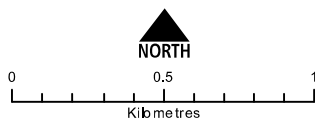


# Planning Map

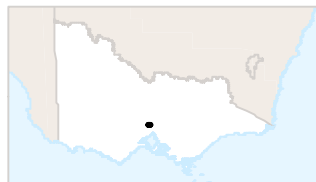
Raes Rd



All Zones	C1Z - Commercial 1 Zone	PUZ4 - Public Use Zone-Transport
<b>Planning Scheme Zones</b>	C2Z - Commercial 2 Zone	PPRZ - Public Park and Recreation Zone
<b>Residential Zones</b>	<b>Rural Zones</b>	RDZ1 - Road Zone-Category 1
LDRZ - Low Density Residential Zone	GWZ - Green Wedge Zone	<b>Special Purpose Zones</b>
MUZ - Mixed Use Zone	GWAZ - Green Wedge A	UFZ - Urban Floodway Zone
NRZ - Neighbourhood Residential Zone	RCZ - Rural Conservation Zone	UGZ - Urban Growth Zone
GRZ - General Residential Zone	<b>Public Land Zones</b>	
<b>Commercial Zones</b>	PUZ2 - Public Use Zone-Education	



Map Projection : G DA 1994 VICGRID94  
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APPENDIX D VLINE PASSENGER AND FREIGHT SCHEDULES - BENDIGO LINE

# Bendigo Line



## Bendigo to Melbourne

Effective 01/12/19

### Monday to Friday

Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	
<b>Service information</b>	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	★☑	♿	♿
EPSOM STATION <i>depart</i>				05.56			06.58		08.23			10.18	
EAGLEHAWK <i>depart</i>			05.31	–	06.20		–		–	09.05		–	
BENDIGO <i>arrive</i>			05.39	06.04	06.28		07.06		08.33	09.18	10.26		
BENDIGO <i>depart</i>		05.05	05.41	06.06	06.30		07.08	07.51	08.45	09.20	10.28	11.33	
Kangaroo Flat		05.09	05.45	06.10	06.34		07.12	07.55	08.49	09.24	10.32	11.37	
Castlemaine		05.26	06.02	06.27	06.51		07.29	08.12	09.08	09.48	10.49	11.54	
Malmsbury		05.38	–	06.39	–		07.44	–	09.22	–	11.01	–	
Kyneton	05.12	05.47	–	06.48	07.10	07.22	07.53	08.31	09.30	10.13	11.09	12.13	
Woodend	05.21	05.56	–	06.57	07.19	07.31	08.02	08.39	09.38	10.24	11.17	12.21	
Macedon	05.27	06.02	–	07.03	07.25	07.37	08.08	08.45	09.45	–	11.24	–	
Gisborne	05.31	06.06	06.29	07.07	07.29	07.41	08.12	08.49	09.49	10.35	11.28	12.30	
Riddells Creek	05.36	06.11	–	07.12	07.34	07.46	08.17	08.54	09.54	–	11.33	–	
Clarkefield	05.41	06.16	–	07.17	07.39	07.51	08.22	08.59	10.00	–	11.39	–	
Sunbury	05.52	06.28	–	–	–	08.00	–	09.11	10.13	–	11.52	12.50	
Watergardens	–	–	–	07.38d	07.56d	–	08.39d	–	–	11.06d	–	–	
Footscray	06.15d	06.50d	07.09d	07.56d	08.14d	08.29d	08.58d	09.34d	10.35d	11.24d	12.13d	13.12d	
SOUTHERN CROSS STATION <i>arr</i>	06.25	07.00	07.19	08.06	08.24	08.39	09.08	09.44	10.45	11.34	12.23	13.22	

### Monday to Friday continued

Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	Fri
<b>Service information</b>	♿	♿	♿	★☑	♿	♿	♿	♿	♿	♿	♿☾
EPSOM STATION <i>depart</i>			14.23			16.33		18.35			
EAGLEHAWK <i>depart</i>			–	15.03	15.48	–	–	–	–	–	–
BENDIGO <i>arrive</i>			14.31	15.15	15.56	16.41		18.43			
BENDIGO <i>depart</i>	12.28	13.33	14.33	15.18	16.00	16.43	17.26	18.47	20.01	21.20	22.20
Kangaroo Flat	12.32	13.37	14.37	15.22	16.06	16.47	17.30	18.51	20.05	21.26	–
Castlemaine	12.49	13.55	14.56	15.47	16.23	17.06	17.48	19.09	20.24	21.44	–
Malmsbury	13.01	–	15.08	–	–	17.18	18.05	19.23	20.36	21.57	–
Kyneton Post Office	–	–	–	–	–	–	–	–	–	–	23.10
Kyneton	13.09	14.14	15.16	16.11	16.48	17.26	18.13	19.31	20.44	22.05	–
Woodend	13.17	14.22	15.24	16.21	16.56	17.34	18.21	19.39	20.52	22.13	23.25
Macedon	13.24	–	15.31	–	–	17.41	18.28	19.46	20.59	22.20	–
Gisborne	13.28	14.31	15.35	16.31	17.05	17.45	18.32	19.50	21.03	22.24	–
Gisborne, Aitken St	–	–	–	–	–	–	–	–	–	–	23.40
Riddells Creek	13.33	–	15.40	–	–	17.50	18.37	19.55	21.08	22.29	–
Clarkefield	13.39	–	15.46	–	–	17.56	18.43	20.01	21.14	22.35	–
Sunbury	13.52	14.51	15.59	–	17.24	18.09	18.55	20.13	21.26	22.47	24.00
Watergardens	–	–	–	17.01d	–	–	–	–	–	–	–
Footscray	14.13d	15.13d	16.23d	17.15d	17.52d	18.32d	19.22d	20.33d	21.46d	23.07d	–
SOUTHERN CROSS STATION <i>arr</i>	14.23	15.23	16.33	17.25	18.02	18.42	19.32	20.43	21.56	23.17	00.40

★ – First Class available / ☑ – Catering available / ♿ – Wheelchair accessible / ☾ – Night Coaches run on Friday and Saturday nights / d – Set down only / ☐ – Reservations required  
**Note:** Off-peak fares are available for trips covering at least three zones. Off-peak fares are not available with myki touch on in Zone 1 between 4pm and 6pm on a weekday, and touch off must not occur in Zone 1 before 9am on a weekday. Altered timetables may apply on public holidays. Please check [vline.com.au](http://vline.com.au) prior to travelling.

# Bendigo Line



## Bendigo to Melbourne

Effective 01/12/19

Saturday																
Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	COACH
Service information	♿	♿	♿	★☑	♿	♿	♿	♿	♿	♿	★☑	♿	♿	♿	♿	♿
EPSOM STATION <i>depart</i>			08.10									17.04				
EAGLEHAWK <i>depart</i>			–	09.01							15.23					
BENDIGO <i>arrive</i>			08.18	09.14							15.36		17.13			
BENDIGO <i>depart</i>	05.53	07.30	08.30	09.17	10.22	11.25	12.25	13.25	14.25	15.39	16.25	17.25	18.42	20.09	21.27	22.20
Kangaroo Flat	05.57	07.34	08.34	–	10.27	11.30	12.30	13.30	14.30	–	16.30	17.30	18.46	20.14	21.32	–
Castlemaine	06.14	07.52	08.51	09.41	10.44	11.47	12.47	13.47	14.47	16.05	16.47	17.47	19.08	20.32	21.49	–
Malmsbury	06.26	08.04	09.03	–	10.57	12.00	13.00	14.00	15.00	–	17.00	18.00	–	20.47	22.04	–
Kyneton Post Office	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	23.10
Kyneton	06.34	08.12	09.11	10.06	11.05	12.08	13.08	14.08	15.08	16.28	17.08	18.08	19.29	20.55	22.12	–
Woodend	06.42	08.20	09.19	10.17	11.13	12.16	13.16	14.16	15.16	16.38	17.16	18.16	19.37	21.03	22.20	23.25
Macedon	06.48	08.26	09.26	–	11.20	12.23	13.23	14.23	15.23	–	17.23	18.23	–	21.10	22.27	–
Gisborne	06.52	08.30	09.30	10.28	11.24	12.27	13.27	14.27	15.27	16.48	17.27	18.27	19.46	21.14	22.31	–
Gisborne, Aitken Street	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	23.40
Riddells Creek	06.57	08.35	09.35	–	11.29	12.32	13.32	14.32	15.32	–	17.32	18.32	–	21.19	22.36	–
Clarkefield	07.02	08.40	09.41	–	11.35	12.38	13.38	14.38	15.38	–	17.38	18.38	–	21.25	22.42	–
Sunbury	07.13	08.51	09.53	–	11.47	12.50	13.50	14.50	15.50	–	17.50	18.50	20.04	21.37	22.54	24.00
Watergardens	–	–	–	10.59d	–	–	–	–	–	–	17.20d	–	–	–	–	–
Footscray	07.35d	09.14d	10.16d	11.14d	12.10d	13.12d	14.12d	15.12d	16.12d	17.34d	18.12d	19.12d	20.28d	21.59d	23.16d	–
SOUTHERN CROSS STATION <i>arr</i>	07.45	09.24	10.26	11.24	12.20	13.22	14.22	15.22	16.22	17.44	18.22	19.22	20.38	22.09	23.26	00.40

Sunday													
Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN
Service information	♿	♿	★☑	♿	♿	♿	♿	♿	♿	♿	♿	★☑	♿
EPSOM STATION <i>depart</i>				10.00								17.04	
EAGLEHAWK <i>depart</i>			09.01	–								–	18.22
BENDIGO <i>arrive</i>			09.14	10.09								17.13	18.35
BENDIGO <i>depart</i>	05.53	08.03	09.17	10.22	11.25	12.25	13.25	14.25	15.25	16.25	17.25	18.38	20.46
Kangaroo Flat	05.57	08.07	–	10.27	11.30	12.30	13.30	14.30	15.30	16.30	17.30	–	20.50
Castlemaine	06.14	08.24	09.41	10.44	11.47	12.47	13.47	14.47	15.47	16.47	17.47	19.05	21.07
Malmsbury	06.26	08.36	–	10.57	12.00	13.00	14.00	15.00	16.00	17.00	18.00	–	21.19
Kyneton	06.34	08.44	10.06	11.05	12.08	13.08	14.08	15.08	16.08	17.08	18.08	19.33	21.27
Woodend	06.42	08.52	10.17	11.13	12.16	13.16	14.16	15.16	16.16	17.16	18.16	19.43	21.35
Macedon	06.48	08.59	–	11.20	12.23	13.23	14.23	15.23	16.23	17.23	18.23	–	21.42
Gisborne	06.52	09.03	10.28	11.24	12.27	13.27	14.27	15.27	16.27	17.27	18.27	19.53	21.46
Riddells Creek	06.57	09.08	–	11.29	12.32	13.32	14.32	15.32	16.32	17.32	18.32	–	21.51
Clarkefield	07.02	09.14	–	11.35	12.38	13.38	14.38	15.38	16.38	17.38	18.38	–	21.57
Sunbury	07.13	09.26	–	11.47	12.50	13.50	14.50	15.50	16.50	17.50	18.50	–	22.09
Watergardens	–	–	10.59d	–	–	–	–	–	–	–	–	20.20d	–
Footscray	07.35d	09.48d	11.14d	12.10d	13.12d	14.12d	15.15	16.12d	17.12d	18.12d	19.12d	20.34d	22.32d
SOUTHERN CROSS STATION <i>arr</i>	07.45	09.57	11.24	12.20	13.22	14.22	15.25	16.22	17.22	18.22	19.22	20.44	22.42

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# Bendigo Line



## Melbourne to Bendigo

Effective 01/12/19

### Monday to Friday

Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN
<b>Service information</b>	♿	♿	★♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
SOUTHERN CROSS STATION <i>depart</i>	06.16	07.13	07.41	09.14	10.20	11.20	12.20	13.20	14.20	15.20	16.03	16.25	16.57
Footscray	06.23u	07.20u	07.49u	09.21u	10.27u	11.27u	12.27u	13.27u	14.27u	15.27u	16.10u	16.32u	17.04u
Watergardens	–	–	08.09u	–	–	–	–	–	–	–	–	–	–
Sunbury	06.52	07.51	–	09.52	10.51	11.51	12.51	13.51	14.51	15.51	–	16.55u	–
Clarkefield	06.59	07.58	–	09.59	–	11.58	–	13.58	14.58	15.58	16.40	17.02	–
Riddells Creek	07.05	08.04	–	10.04	–	12.03	–	14.03	15.03	16.03	16.45	17.07	–
Gisborne	07.11	08.10	08.37	10.10	11.05	12.09	13.05	14.09	15.09	16.09	16.51	17.13	–
Macedon	07.16	08.15	–	10.14	–	12.13	–	14.13	15.13	16.13	16.55	17.17	–
Woodend	07.22	08.21	08.47	10.20	11.12	12.19	13.12	14.19	15.19	16.19	17.01	17.23	–
Kyneton	07.32	08.32	08.57	10.27	11.20	12.26	13.20	14.26	15.26	16.26	17.08	17.30	–
Malmsbury	07.38	08.38	–	10.33	–	12.32	–	–	15.32	16.32	–	17.36	–
Castlemaine	07.52	08.51	09.27	10.46	11.37	12.46	13.37	14.56	15.48	16.47	17.25	17.50	18.09
Kangaroo Flat	08.12	09.10	09.49	11.05	11.58	13.01	13.55	15.12	16.02	17.03	17.46	18.06	18.25
BENDIGO <i>arrive</i>	08.20	09.17	09.56	11.14	12.07	13.14	14.00	15.16	16.08	17.10	17.55	18.11	18.30
BENDIGO <i>depart</i>		09.22	10.01				14.05	15.21	16.13	17.20		18.16	18.35
EAGLEHAWK <i>arrive</i>		–	10.09				–	15.32	–	–		–	18.48
EPSOM STATION <i>arrive</i>		09.32					14.16		16.26	17.29		18.29	
			SH							E			

### Monday to Friday continued

Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN
<b>Service information</b>	♿	♿	♿	★♿	♿	♿	♿	♿	♿	♿	♿	♿
SOUTHERN CROSS STATION <i>depart</i>	17.04	17.30	17.53	18.25	18.44	19.02	19.42	20.22	21.02	21.52	22.52	23.52
Footscray	17.11u	17.37u	18.00u	18.32u	18.51u	19.09u	19.49u	20.29u	21.09u	21.59u	22.59u	23.59u
Watergardens	–	17.58u	18.19u	18.49u	–	–	–	–	–	–	–	–
Sunbury	17.41u	–	–	–	19.16	19.33	20.14	20.53	21.33	22.23	23.23	00.23
Clarkefield	17.48	–	18.38	–	19.24	19.40	20.21	21.00	21.40	22.30	23.30	00.30
Riddells Creek	17.53	–	18.43	–	19.29	19.45	20.26	21.05	21.45	22.35	23.35	00.35
Gisborne	17.59	18.20	18.49	19.20	19.36	19.51	20.32	21.11	21.51	22.41	23.41	00.41
Macedon	18.03	–	18.52	–	19.41	19.55	20.36	21.15	21.55	22.45	23.45	00.45
Woodend	18.09	18.27	18.58	19.32	19.47	20.01	20.42	21.21	22.01	22.52	23.51	00.51
Kyneton	18.21	18.35	19.06	19.42	20.01	20.08	20.49	21.28	22.08	22.58	23.58	00.58
Malmsbury		–	19.12	19.50		–	20.55	21.34	22.14	–	00.04	01.04
Castlemaine		18.53	19.26	20.06		20.26	21.08	21.47	22.27	23.15	00.17	01.17
Kangaroo Flat		19.09	19.42	20.26		20.42	21.24	22.03	22.43	23.31	00.33	01.33
BENDIGO <i>arrive</i>		19.14	19.51	20.34		20.51	21.33	22.08	22.50	23.36	00.42	01.42
BENDIGO <i>depart</i>		19.19		20.39				22.13		23.41		
EAGLEHAWK <i>arrive</i>		–		20.47				–		23.54		
EPSOM STATION <i>arrive</i>		19.32						22.26				
				SH								

★ – First Class available / ♿ – Catering available / ♿ – Wheelchair accessible / u – Pick up only / □ – Reservations required / SH – continues to Swan Hill / E – continues to Echuca  
**Note:** Off-peak fares are available for trips covering at least three zones. Off-peak fares are not available with myki touch on in Zone 1 between 4pm and 6pm on a weekday, and touch off must not occur in Zone 1 before 9am on a weekday. Altered timetables may apply on public holidays. Please check [vline.com.au](http://vline.com.au) prior to travelling.

# Bendigo Line



## Melbourne to Bendigo

Effective 01/12/19

Saturday													
Service	COACH	COACH	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN
Service information	☾♿	☾♿	♿	★▼	♿	♿	♿	♿	♿	♿	♿	♿	♿
SOUTHERN CROSS STATION depart	01.05	02.05	07.19	08.00	09.02	10.22	11.22	12.22	13.22	14.22	15.22	16.22	17.20
Footscray	—	—	07.26u	08.07u	09.09u	10.29u	11.29u	12.29u	13.29u	14.29u	15.29u	16.29u	17.27u
Watergardens	—	—	—	08.24u	—	—	—	—	—	—	—	—	—
Sunbury	01.45	02.45	07.50	—	09.33	10.53	11.53	12.53	13.53	14.53	15.53	16.53	17.51
Clarkefield	01.52d	02.52d	07.57	—	09.40	11.00	12.00	13.00	14.00	15.00	16.00	17.00	17.58
Riddells Creek	02.05d	03.05d	08.03	—	09.45	11.05	12.05	13.05	14.05	15.05	16.05	17.05	18.03
Gisborne, Aitken Street	02.20	03.20	—	—	—	—	—	—	—	—	—	—	—
Gisborne Station	02.25d	03.25d	08.09	08.54	09.51	11.11	12.11	13.11	14.11	15.11	16.11	17.11	18.09
Macedon	02.37d	03.37d	08.14	—	09.55	11.15	12.15	13.15	14.15	15.15	16.15	17.15	18.13
Woodend	02.49d	03.49d	08.20	09.04	10.01	11.21	12.21	13.21	14.21	15.21	16.21	17.21	18.19
Kyneton Station	03.05d	04.05d	08.30	09.14	10.08	11.28	12.28	13.28	14.28	15.28	16.28	17.28	18.26
Kyneton Post Office	03.10	04.10	—	—	—	—	—	—	—	—	—	—	—
Malmsbury	03.20d	04.20d	08.36	—	10.14	11.34	12.34	13.34	14.34	15.34	16.34	17.34	18.32
Castlemaine	03.45d	04.45d	08.51	09.41	10.28	11.48	12.48	13.48	14.48	15.47	16.48	17.48	18.46
Kangaroo Flat	04.10d	05.10d	09.07	—	10.47	12.04	13.04	14.04	15.04	16.03	17.04	18.04	19.02
BENDIGO arrive	04.15	05.15	09.16	10.06	10.53	12.12	13.12	14.12	15.12	16.11	17.12	18.12	19.09
BENDIGO depart	—	—	—	10.11	11.03	—	—	—	—	—	—	—	19.19
EAGLEHAWK arrive	—	—	—	10.19	—	—	—	—	—	—	—	—	—
EPSOM STATION arrive	—	—	—	—	11.12	—	—	—	—	—	—	—	19.28
				SH	E								E

Saturday continued								Sunday					
Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	COACH	COACH	COACH	TRAIN	TRAIN	TRAIN
Service information	♿	★▼	♿	♿	♿	♿	♿	☾♿	☾♿	☾♿	★▼	♿	♿
SOUTHERN CROSS STATION depart	18.02	18.35	19.25	20.25	21.25	22.25	23.55	01.05	02.05	07.30	08.00	09.02	10.22
Footscray	18.09u	18.42u	19.32u	20.32u	21.32u	22.32u	00.02u	—	—	—	08.07u	09.09u	10.29u
Watergardens	—	18.59u	—	—	—	—	—	—	—	—	08.24u	—	—
Sunbury	18.32	—	19.55	20.55	21.55	22.55	00.25	01.45	02.45	—	—	09.33	10.53
Clarkefield	18.39	—	20.02	21.02	22.02	23.02	00.32	01.52d	02.52d	—	—	09.40	11.00
Riddells Creek	18.44	—	20.07	21.07	22.07	23.07	00.37	02.05d	03.05d	—	—	09.45	11.05
Gisborne, Aitken Street	—	—	—	—	—	—	—	02.20	03.20	—	—	—	—
Gisborne Station	18.50	19.30	20.13	21.13	22.13	23.13	00.43	02.25d	03.25d	—	08.54	09.51	11.11
Macedon	18.54	—	20.17	21.17	22.17	23.17	00.47	02.37d	03.37d	—	—	09.55	11.15
Woodend	19.00	19.42	20.23	21.23	22.23	23.23	00.53	02.49d	03.49d	—	09.04	10.01	11.21
Kyneton Station	19.07	19.52	20.30	21.30	22.30	23.30	01.00	03.05d	04.05d	08.30	09.14	10.08	11.28
Kyneton Post Office	—	—	—	—	—	—	—	03.10	04.10	—	—	—	—
Malmsbury	19.13	—	20.36	21.36	22.36	23.36	01.06	03.20d	04.20d	—	—	10.14	11.34
Castlemaine	19.30	20.14	20.50	21.49	22.49	23.49	01.19	03.45d	04.45d	—	09.41	10.28	11.48
Kangaroo Flat	19.46	—	21.06	22.05	23.05	00.05	01.35	04.10d	05.10d	—	—	10.47	12.04
BENDIGO arrive	19.54	20.38	21.16	22.14	23.14	00.14	01.44	04.15	05.15	09.20	10.06	10.53	12.12
BENDIGO depart	—	20.43	—	—	—	—	—	—	—	—	10.11	11.03	—
EAGLEHAWK arrive	—	20.51	—	—	—	—	—	—	—	—	10.19	—	—
EPSOM STATION arrive	—	—	—	—	—	—	—	—	—	—	—	11.12	—
		SH									SH		E

Sunday													
Service	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN	TRAIN
Service information	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿	♿
SOUTHERN CROSS STATION depart	11.22	12.22	13.22	14.22	15.22	16.22	17.20	18.02	18.35	19.22	20.25	22.25	—
Footscray	11.29u	12.29u	13.29u	14.29u	15.29u	16.29u	17.27u	18.09u	18.42u	19.29u	20.32u	22.32u	—
Watergardens	—	—	—	—	—	—	—	—	18.59u	—	—	—	—
Sunbury	11.53	12.53	13.53	14.53	15.53	16.53	17.51	18.32	—	19.52	20.55	22.55	—
Clarkefield	12.00	13.00	14.00	15.00	16.00	17.00	17.58	18.39	—	19.59	21.02	23.02	—
Riddells Creek	12.05	13.05	14.05	15.05	16.05	17.05	18.03	18.44	—	20.04	21.07	23.07	—
Gisborne	12.11	13.11	14.11	15.11	16.11	17.11	18.09	18.50	19.30	20.10	21.13	23.13	—
Macedon	12.15	13.15	14.15	15.15	16.15	17.15	18.13	18.54	—	20.14	21.17	23.17	—
Woodend	12.21	13.21	14.21	15.21	16.21	17.21	18.19	19.00	19.42	20.20	21.23	23.23	—
Kyneton	12.28	13.28	14.28	15.28	16.28	17.28	18.26	19.07	19.52	20.27	21.30	23.30	—
Malmsbury	12.34	13.34	14.34	15.34	16.34	17.34	18.32	19.13	—	20.33	21.36	23.36	—
Castlemaine	12.48	13.48	14.48	15.48	16.48	17.48	18.46	19.30	20.14	20.46	21.49	23.49	—
Kangaroo Flat	13.04	14.04	15.04	16.04	17.04	18.04	19.02	19.46	—	21.05	22.05	00.05	—
BENDIGO arrive	13.12	14.12	15.12	16.12	17.12	18.12	19.09	19.54	20.38	21.15	22.14	00.14	—
BENDIGO depart	—	—	—	—	—	—	—	—	20.43	—	—	—	—
EAGLEHAWK arrive	—	—	—	—	—	—	—	—	20.51	—	—	—	—
EPSOM STATION arrive	—	—	—	—	—	—	19.28	—	—	—	—	—	—
								E	SH				

★ – First Class available / ▼ – Catering available / ♿ – Wheelchair accessible / ☾ – Night Coach. Night Coaches run on Friday and Saturday nights / u – Pick up only / d – Set down only / Coach services shown in red / ☐ – Reservations required / SH – continues to Swan Hill / E – continues to Echuca  
 Altered timetables may apply on public holidays. Please check [vline.com.au](http://vline.com.au) prior to travelling.

V/Line Network Service Plan - Freight Schedules  
Northern Down Services

<b>Business ID</b>		<b>9073</b>	<b>0081 ††</b>	<b>0081 ††</b>
<b>Days Run</b>		<b>WFO</b>	<b>MF</b>	<b>Sun+Sat</b>
<b>Vehicle Formation</b>				
<b>Formed By On Arrival</b>		<b>ON</b>	<b>ON</b>	<b>ON</b>
<b>Operator</b>		<b>QL</b>	<b>SSR</b>	<b>SSR</b>
<b>South Dynon Loco</b>	Dep		22:10	22:10
<b>West Tower</b>			22:20	22:20
<b>Spion Kop</b>			22:31*	22:31*
South Kensington Junction			22:33*	22:32*
<b>WestGate Port Sdg</b>		01:15		
<b>Appleton Dock Jct.</b>		01:17*		
<b>Sth Dynon Junction</b>		01:23*		
<b>Dynon Jct.</b>	Dep			
<b>Sims Street Junction</b>		01:25*		
<b>West Footscray Junction</b>		01:35*		
<b>Tottenham Yard</b>		01:40*		
<b>Tottenham Junction</b>		01:45*		
<b>Sunshine</b>		01:50*	22:40*	22:42*
<b>Anderson Road Junction</b>		01:51*	22:41*	22:43*
<b>Albion Junction</b>		01:53*	22:42*	22:44*
<b>Watergardens</b>		02:06*	22:50*	22:52*
<b>Sunbury</b>		02:19*	23:02*	23:04*
	Plat	1A	1A	1A
		W	W	W
<b>Sunbury MTM Boundary</b>		02:21*	23:04*	23:06*
<b>Gisborne</b>		02:40*	23:23*	23:25*
		W	W	W
<b>Kyneton</b>		03:05*	00:06	23:47*
<b>Taradale</b>		03:12*	00:19*	23:59*
		E	E	E
<b>Elphinstone</b>		03:17*	00:24*	00:04*
<b>Castlemaine</b>		03:27*	00:34*	00:14*
<b>Harcourt</b>		03:38*	00:45*	00:25*
		E	E	E
<b>Ravenswood</b>		03:44*	00:51*	00:31*
<b>Kangaroo Flat</b>		03:53*	01:00*	00:40*
		E	E	E
<b>Golden Square</b>		03:56*	01:03*	00:43*
<b>Bendigo</b>	Arr	04:00	01:08	00:45
	Dep	04:05	01:13	00:50
Bendigo Car Sidings			01:15	00:52
<b>North Bendigo Junction</b>		04:10*		
<b>Epsom BP</b>		04:16*		
<b>Hunter Block Point</b>		05:05*		
<b>Echuca</b>	Arr	05:40		
	Dep	05:45		
<b>Henwood BP</b>		06:00*		
<b>Moira BP</b>		06:36*		
<b>Deniliquin Rice Growers Sdg</b>	Arr	07:40		
Forms		OFF		

V/Line Network Service Plan - Freight Schedules  
Northern Up Services

<b>Business ID</b>		<b>0082 ††</b>	<b>0082 ††</b>	<b>9072</b>
<b>Days Run</b>		<b>Sun+Sat</b>	<b>MF</b>	<b>WFO</b>
<b>Vehicle Formation</b>				
<b>Formed By On Arrival</b>		<b>ON</b>	<b>ON</b>	<b>ON</b>
<b>Train Movement Type</b>		<b>SSR</b>	<b>SSR</b>	<b>QL</b>
<b>Deniliquin Rice Growers Sdg</b>	Dep			16:30
<b>Moira BP</b>				17:53*
<b>Henwood BP</b>				18:55*
<b>Echuca</b>	Arr			19:10
	Dep			19:55
<b>Hunter Block Point</b>				20:30*
<b>Epsom BP</b>				21:20*
<b>North Bendigo Junction</b>				21:26*
<b>Bendigo Car Sidings</b>		17:35	17:35	
<b>Bendigo</b>	Arr	17:37	17:37	21:32
	Dep	17:42	17:42	21:36
<b>Golden Square</b>		17:44*	17:44*	21:39*
		E	E	E
<b>Kangaroo Flat</b>		17:47*	17:48*	21:44*
<b>Ravenswood</b>		17:56*	17:57*	21:55*
		W	E	E
<b>Harcourt</b>		18:02*	18:18*	22:09*
<b>Castlemaine</b>		18:13*	18:29*	22:24/22:32
<b>Elphinstone</b>		18:23*	18:39*	22:47*
		E	E	E
<b>Taradale</b>		18:37*	18:44*	22:54/23:07
<b>Kyneton</b>		18:49*	18:56*	23:25*
		E	E	E
<b>Gisborne</b>		19:11*	19:18*	23:50*
<b>Sunbury MTM Boundary</b>		19:30*	19:38*	00:09*
<b>Sunbury</b>		19:32*	19:40*	00:12*
	Plat	1A	1A	1
<b>Watergardens</b>		19:44*	19:52*	00:25*
<b>Albion Junction</b>		19:53*	20:01*	00:36*
<b>Anderson Road Junction</b>		19:54*	20:02*	00:38*
<b>Sunshine</b>		19:55*	20:04*	00:39*
		RRL	RRL	UG
<b>Tottenham Junction</b>				00:44*
<b>Tottenham Yard</b>				00:49*
<b>West Footscray Junction</b>				00:54*
<b>Sims Street Junction</b>				01:05*
<b>Dynon Jct.</b>	Dep			
<b>Sth Dynon Junction</b>				01:09*
<b>Appleton Dock Jct.</b>				01:18*
<b>WestGate Port Sdg</b>	Arr			01:20
<b>South Kensington Junction</b>		20:04*	20:13*	
<b>Spion Kop</b>		20:05*	20:14*	
<b>West Tower</b>		20:09	20:17	
<b>South Dynon Loco</b>	Arr	20:22	20:27	
<b>Forms</b>		OFF	OFF	OFF



## APPENDIX E LEGISLATION AND GUIDELINES

### Railway noise

The *Victorian Passenger Rail Infrastructure Noise Policy* was released in April 2013. Section 5 of the policy sets out the conditions under which transport bodies must apply the policy.

The policy sets ‘investigation thresholds’ for the assessment of noise. These are noise levels, which if exceeded, indicate that noise mitigation should be considered. It states that:

*In considering changing land use near an existing passenger rail corridor, transport bodies and planning authorities should consider the receivers set out in Table B in Attachment 2. Transport bodies and planning authorities should consider whether the noise level produced at these receivers will exceed the investigation thresholds for the periods specified in Table B in Attachment 2. [Table B of Attachment 2 is reproduced below as Table 9 in this report.]*

*If an assessment shows the investigation thresholds are not exceeded, noise impacts should be considered a secondary matter. This means no further action need be considered under this policy.*

The investigation thresholds are defined in terms of:

- $L_{Aeq,16h}$  – equivalent continuous daytime (0600-2200hrs) noise level
- $L_{Aeq,8h}$  – equivalent continuous night-time (2200-0600hrs) noise level
- $L_{Amax}$  – maximum noise level.

Investigation thresholds for the redevelopment of land near existing rail infrastructure are presented in Table 9.

**Table 9: Investigation thresholds for changing allowable land use near an existing rail corridor**

Time	Type of receiver	Investigation thresholds		
Daytime (0600-2200hrs)	Residential dwellings including aged person homes, hospitals, motels, caravan parks, and other buildings where people sleep.  Noise sensitive community buildings including schools, kindergartens, libraries	65dB $L_{Aeq,16h}$	or	85dB $L_{Amax}$
Night-time (2200-0600hrs)	Residential dwellings including aged person homes, hospitals, motels, caravan parks, and other buildings where people sleep.	60dB $L_{Aeq,8h}$	or	85dB $L_{Amax}$

The VPRINP requires the maximum railway noise be based on the 95<sup>th</sup> percentile of the maximum for all measured events.

Note that should the investigation thresholds be exceeded the VPRINP does not set criteria for habitable spaces. For this assessment the requirements of the PSP have been used.

APPENDIX F RAIL NOISE SURVEY RESULTS

Figure 6: Measured rail noise levels Position 1; 95<sup>th</sup> percentile maximum 200 events

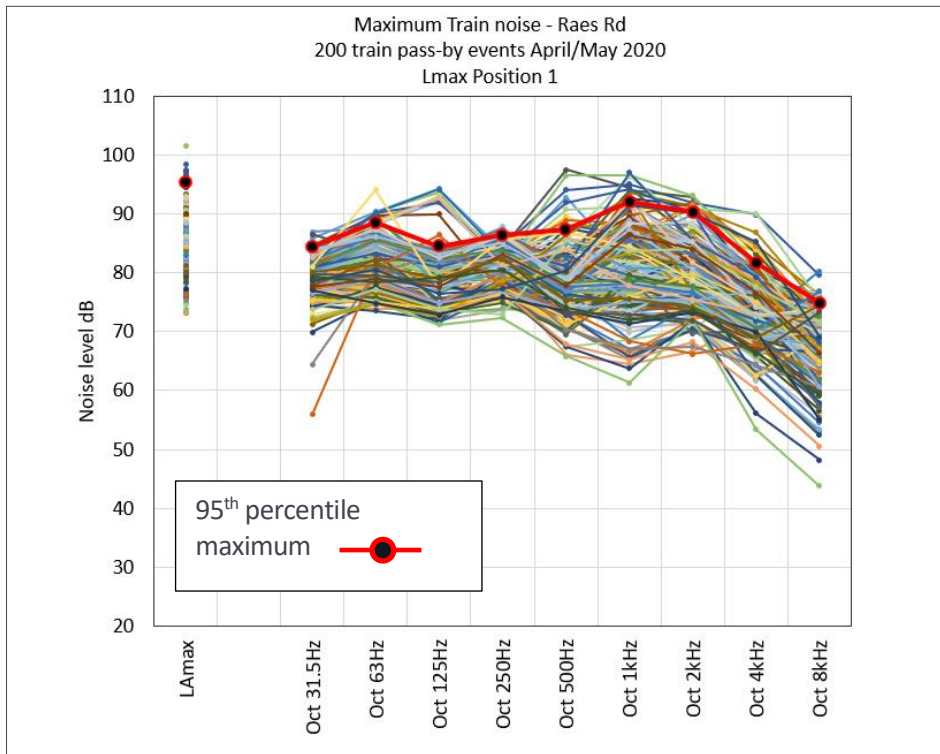


Figure 7: Measured rail noise levels Position 1; 2 x Freight train passes

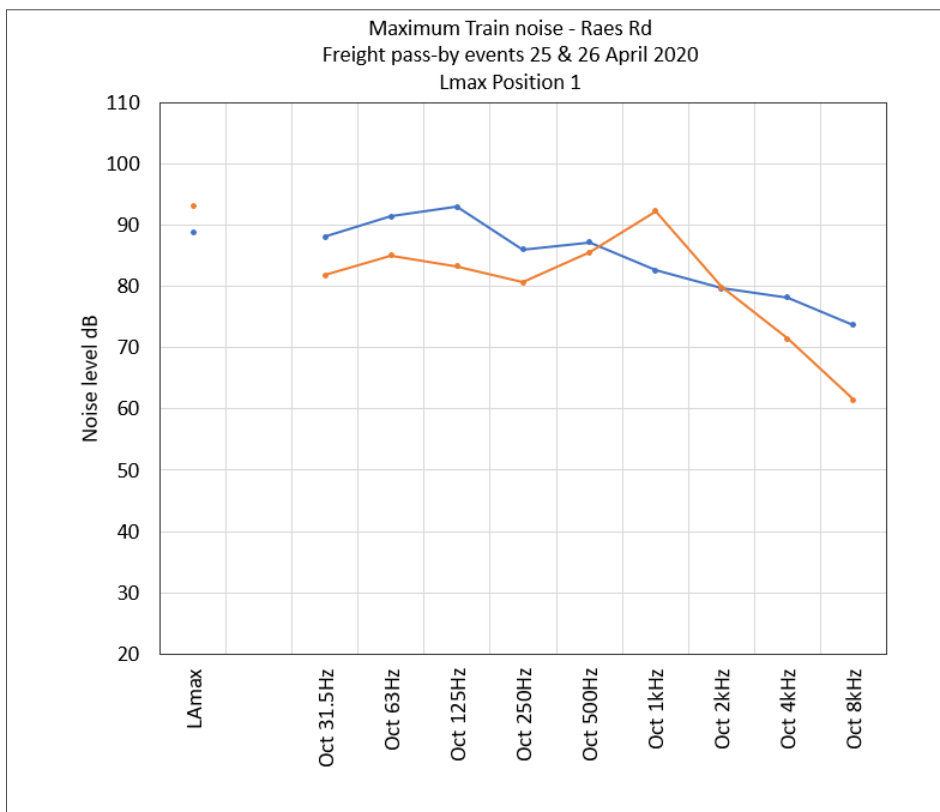


Figure 8: Measured rail noise levels Position 2; 95<sup>th</sup> percentile maximum 200 events

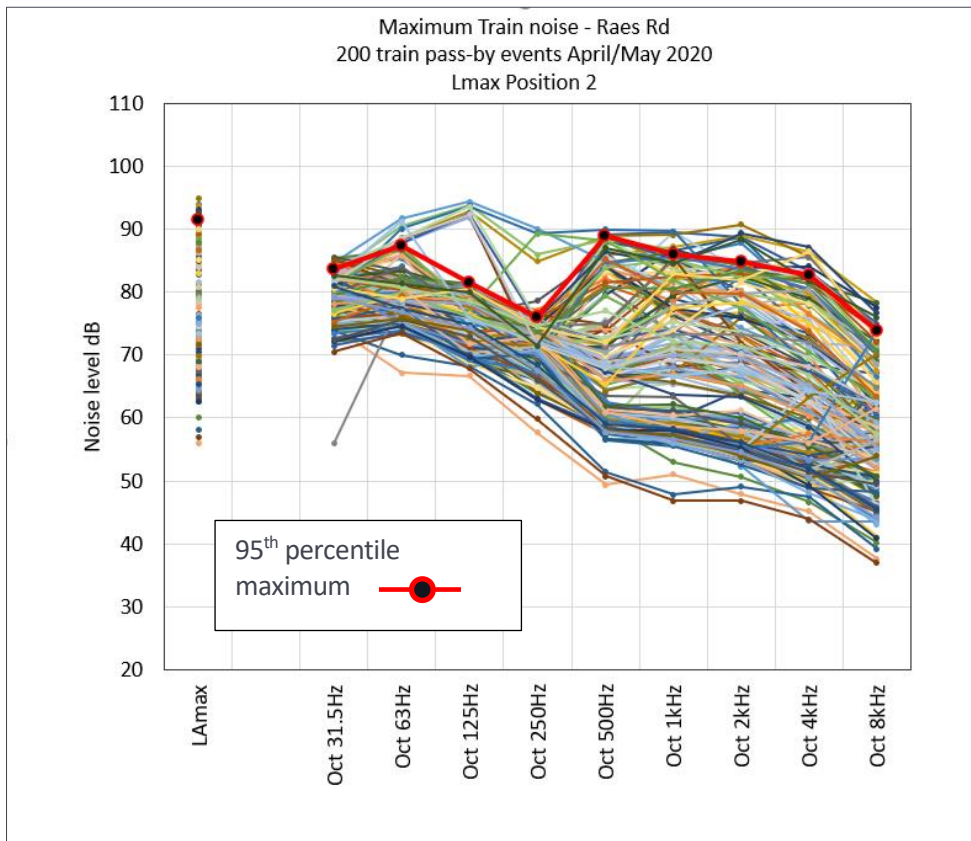


Figure 9: Measured rail noise levels Position 2; 2 x Freight train passes

