



Noise and Vibration Impact Assessment

Toongabbie Road Improvements
Cumberland City Council

November 2025

25008-NV-RP-1-0

Acknowledgment of country

Hutchison Weller acknowledges the Aboriginal and Torres Strait Islander peoples of this nation. We recognise the Borogegal and Cammeraigal people as the traditional custodians of the land on which we work and their continuing connection to and ongoing care of the land and waterways.



Noise and vibration impact assessment

Client	Cumberland City Council
Project	Toongabbie Road Improvements
Document no.	25008-NV-RP-1-0
Revision	Rev 0
Date	10 November 2025
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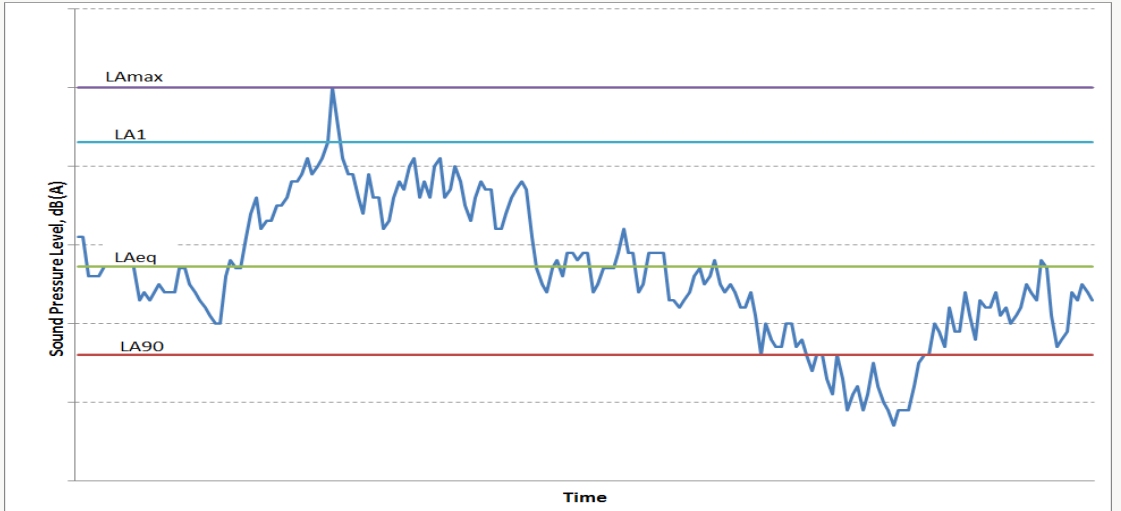
Revision history

0	10 November 2025	Draft report to client
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Definition of terms

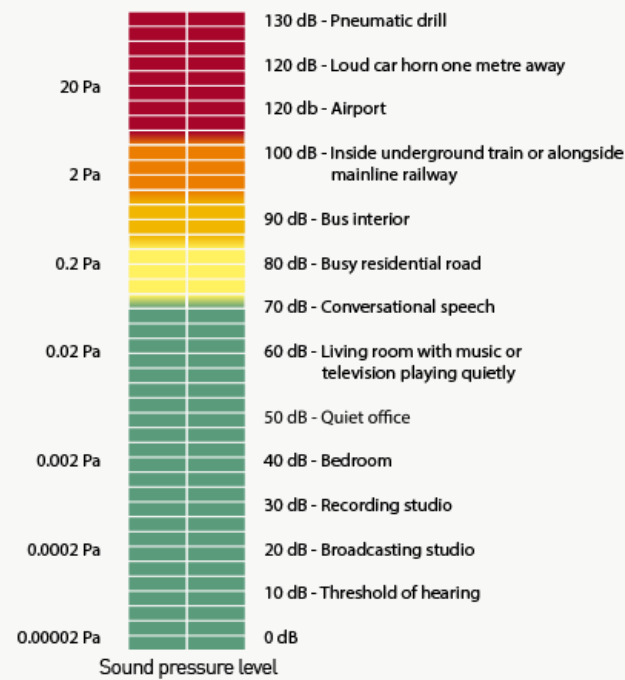
Assessment period	The period in a day over which assessments are made.
Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation.
Decibel (dB)	A measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm (to base 10) of the ratio of a given sound power to a reference power.
dB(A)	Unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear.
dB(C)	Unit used to measure 'C-weighted' sound pressure levels, an adjustment made to sound level to approximate low frequency noise between 10 Hz and 200 Hz.
Extraneous noise	Noise resulting from activities that are not typical of the area such as construction, and traffic generated by holiday periods or special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Noise assessment criteria	A standard rule or test by which the acceptability of the nature and characteristics of noise may be judged or evaluated. Criteria are generally based on guidelines or standards developed by Government agencies (eg EPA) to protect the majority of people for the majority of the time from adverse impacts.
Noise level statistics	L_{A90} - The A-weighted sound pressure level exceeded 90% of the monitoring period. This is considered to represent the background noise. L_{Aeq} - The equivalent continuous A-weighted noise level—the level of noise equivalent to the energy average of noise levels occurring over a measurement period. L_{A1} - The A-weighted sound pressure level exceeded 1% of the monitoring period. L_{Amax} - The maximum A-weighted noise level associated with the measurement period.
Sound Power Level (SWL)	 The A-weighted sound power level is a logarithmic ratio of the acoustic power output of a source relative to 10^{-12} watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.

Sound Pressure Level (SPL)

This is the level of noise, usually expressed in dB(A), as measured by a standard sound level meter with a pressure microphone. The sound pressure level in dB(A) gives a close indication of the subjective loudness of noise.

A technical definition for the sound pressure level, in decibels, is 20 times the logarithm (base 10) of the ratio of any two quantities related to a given sound pressure to a reference pressure (typically 20 μ Pa equivalent to 0 dB). Examples of typical sound pressure levels are shown below.

Threshold of pain



Source: https://www.osha.gov/dts/osta/otm/noise/health_effects/soundpropagation.html

Tonal noise

Noise with perceptible and definite pitch or tone

1. Introduction

1.1 Overview

Cumberland City Council (CCC) proposes to deliver improvements to the road network around Wentworth Avenue, Toongabbie, to improve traffic flow. The proposal involves works at two locations with key features of the proposal including the following. An overview of the proposal is shown in Figure 1-1.

- Road widening on Wentworth Avenue at the intersection with Cornelia Road and The Portico, with:
 - additional southbound lane on Wentworth Avenue at its intersection with Cornelia Road and The Portico
 - a four-metre-high retaining wall adjacent to the northbound carriageway on Wentworth Avenue for about 120 metres
 - a rigid safety barrier along the retaining wall
 - a crash barrier on the north-western verge of the intersection of Wentworth Avenue and Cornelia Road
 - Mill and re-sheeting, line marking and signage changes within the road corridor to accommodate the new road layout
 - Utility readjustments, both above and below ground
- A pedestrian crossing on Portico Parade, with:
 - Provision of a southern pedestrian crossing on Portico Parade, just south of the intersection with The Portico
 - Mill and re-sheeting and signage changes within the road corridor to accommodate the new road layout

Construction is expected to commence in Q1 2026 and be completed by Q2/Q3 2027.

The proposal is subject to assessment under a review of environmental factors (REF) under Part 5, Division 5.1 of Environmental Planning and Assessment Act 1979 (EP&A Act).

This report has been prepared to support the REF through assessment of noise and vibration impacts from the proposal and recommendation of appropriate safeguards and controls during construction and operation. The report:

- Describes the existing environment with respect to noise and vibration
- Assesses the noise and vibration impacts of constructing and operating the proposal
- Recommends measures to mitigate and manage the potential impacts.



Toongabbie Road Improvements

Project Overview

Legend

- Road widening on Wentworth Avenue
- Pedestrian crossing on Portico Parade

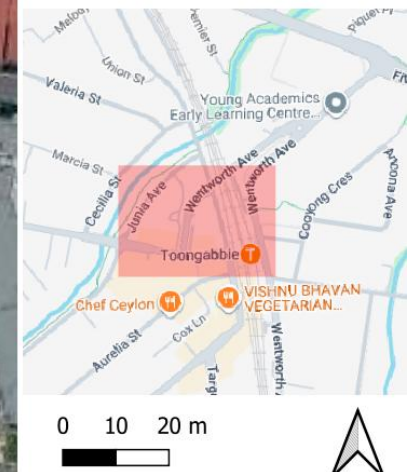


Figure 1-1 Site Location

2. Existing environment

2.1 Sensitive receivers

The proposal consists of two sites: the main site on Wentworth Avenue (site 4), and the pedestrian crossing site on Portico Parade (site 5) (illustrated in Figure 2-1).

Receivers potentially sensitive to noise and vibration can be categorized as residential dwellings, commercial/industrial buildings (including small businesses and transport), or other sensitive land uses which include educational.

Land uses surrounding Site 4 include residential receivers to the north east and north west of Wentworth Avenue, with the nearest residents to the east at 25 Portico Parade and to the west at 1 and 2 Junia Avenue. Commercial receivers are in Portico Parade and Junia Avenue, and an educational receiver (tutoring service) is on Junia Avenue.

Site 5 is bounded by the Toongabbie Train Station to the east and the nearest residential receivers are 60m away at Toongabbie Hotel. Commercial receivers are adjacent to the site on The Portico and Aurelia Street.

Heritage items are identified in the vicinity of the proposal include the Toongabbie Railway Station, Portico Park, both adjacent to Site 5. A Railway Duct and St Ednas Church are around 120 metres and 150 metres respectively from Site 4.

Buried utilities identified in the vicinity of the proposal are summarised in

Table 2-1 Buried utilities

Asset Type	Asset Owner	Location
Electrical	Endeavour Energy	Site 4 – Proposed intersection upgrade at Wentworth Avenue and Cornelia Road Site 5 – Presence of streetlighting ducts at the Portico Parade and Cornelia Road intersection
Traffic Control Signal	Transport	Site 4 and Site 5
Sewer	Sydney Water	Site 4 – Retaining wall construction within zone of influence of existing concrete-encased DN225 PVC gravity sewer
Potable Water	Sydney Water	Site 5 – Proposed pram ramp upgrade adjacent to DN100 CICL and DN150 oPVC water mains
Medium Pressure Gas (210kPa)	Jemena	Site 4 – Road works may impact 210kPa medium pressure gas main Site 5 – Likely no impact to 210 kPa medium pressure gas main at the Portico Parade and Cornelia Road intersection
Comms	Telstra	Site 4 and Site 5 – For both sites, proposed works are not likely to impact Telstra pits or cables

2.2 Existing noise environment

The area around the proposed works is heavily influenced by transport corridors including road and rail.

Given the scope of the proposal, background noise was not measured to establish the existing acoustic environment. Instead, typical background noise levels applicable to an urban area have been adopted from Table D1 of the CNVG-R (reproduced in Table 2-2). Considering the busy road with heavy peak hour traffic, proximity to rail transport and concentration of commercial land uses, an urban area type is an appropriate selection.

Table 2-2 Typical background noise levels

Area type	Description of area surrounding road project	Day 7am to 6pm	Evening 6pm to 10pm	Night 10pm to 7am
Urban	Areas with medium density transportation or some commerce or industry. Typically, traffic is moving from one area to another (light and heavy vehicles) with heavy peak-hour traffic movement. May be close to bus route or light rail.	50	45	40



Figure 2-1 Proposal location and sensitive receivers

3. Assessment criteria

3.1 Guidelines and Policies

Relevant guidelines and policies for assessment and management of noise and vibration for construction and operation of the proposal include the following.

Airborne construction noise

- Interim Construction Noise Guideline (ICNG) (DECC 2009)
- Construction Noise and Vibration Guideline – Roads (CNVG-R) (Transport for NSW 2025)

Road noise

- Road Noise Policy (RNP) (DECCW 2011)
- Noise Criteria Guideline (NCG)(Transport for NSW 2025)
- Noise Mitigation Guideline (NMG) (Transport for NSW 2025)

Vibration

- Environmental Noise Management Assessing Vibration: A Technical Guideline (DECC 2006)
- BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2 (BSI 1993)
- DIN 4150: Part 3 – 2016 Structural Vibration – Effects of vibration on structures (DIN 2016)

3.2 Construction noise

In NSW, noise impacts arising from construction activities are managed in accordance with the ICNG, which was developed to assist with the management of noise impacts, rather than to present strict numeric noise criteria for construction. The ICNG recommends Noise Management Levels (NMLs) at receiver locations adjacent to the works, based on an acceptable increment on background noise levels. Where the NML may be exceeded and there is potential for adverse noise impacts to occur, appropriate management measures would be implemented.

Table 3-1 details the method for determining NMLs for residential receivers during and outside standard working hours. NMLs applicable to the project are presented in with criteria for non-residential receivers. Non-residential receivers identified as potentially affected by construction noise include commercial properties, recreational areas and educational facilities.

Table 3-1 Construction noise management levels – residential receivers (ICNG, DECC 2009)

Hours	Noise Management Level (NML)	Description
Recommended standard hours: Monday to Friday 7am– 6pm Saturday 8am– 1pm	Noise affected RBL +10 dB(A)	The noise affected level represents the point above which there may be some community reaction to noise. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.

Hours	Noise Management Level (NML)	Description
No work on Sundays or public holidays)	Highly noise affected 75 dB(A)	The highly noise-affected level represents the point above which there may be strong community reaction to noise and the relevant authority may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for work near schools, or mid-morning or mid- afternoon for work near residences). 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours ('out-of-hours' work)	Noise affected RBL +5 dB(A)	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should then undertake negotiations with the community.

Using the background noise data in Table 2-2 and the ICNG requirements for residential receivers in Table 3-1, NMLs have been determined for specified construction periods and are presented in Table 3-2. NMLs for non-residential sensitive receivers are also shown in the table. All NMLs apply externally and only when in use for non-residential receivers.

Table 3-2 Construction NMLs

Receiver	Construction Noise Management Level, $L_{Aeq(15min)}$ dB(A)			
	Standard hours	Outside standard hours		
	Day	Weekend day	Evening	Night
Residential receivers	60	55	50	45
Passive recreation	60	60	60	-
Active recreation	65	65	65	-
Commercial	70	70	70	70
Industrial	75	75	75	75

The ICNG recommends where works are likely to occur over more than two consecutive nights, maximum noise levels should be analysed in terms of the extent and number of times the maximum noise exceeds the RBL. Additionally, the DECCW (2011) *Road Noise Policy* discusses a guideline aimed at limiting the level of sleep disturbance due to environmental noise: an $L_{A1, 1 \text{ minute}}$ or L_{Amax} level of any noise should not exceed the ambient L_{A90} noise level by more than 15 dB(A).

The *Road Noise Policy* also suggests maximum internal noise levels below 50-55 dB(A) are unlikely to awaken people from sleep and one or two noise events per night, with maximum internal noise levels of 65-70 dB(A) are not likely to affect health and wellbeing significantly.

Based on this guidance, a sleep awakening criterion of 55 dB(A) (internal) has been adopted for the works. Given that noise attenuation of 10 dB(A) is typically provided by an open window, a sleep awakening criterion of 65 dB(A) (external) has been applied to residential bedroom façades.

Hence, a screening criterion for sleep disturbance of $RBL + 15 \text{ dB(A)}$ and an awakening criterion of 65 dB(A) , measured as $L_{A1, 1 \text{ minute}}$ or L_{Amax} , will be applied in this assessment. Exceedance of the screening criterion should trigger additional consideration of the nature and frequency of disturbances whilst the awakening criterion should act as a maximum noise goal not to be exceeded on more than a couple of occasions.

3.3 Operational Noise

The NSW Road Noise Policy (RNP) (DECCW 2011, provides a framework for assessing and managing road traffic noise across New South Wales and is applicable to new road proposals, road redevelopments, and traffic-generating developments. Implementation of the RNP is in conjunction with Transport for NSW guidelines such as the Noise Criteria Guideline (NCG)(2025), Noise Mitigation Guideline (NMG) (2015), and Noise Validation Guideline (2025).

Road proposals such as minor road realignments and improvements for safety, such as straightening curves or installing traffic control devices are considered in the RNP as minor works and are excluded from the Policy. Similarly, under the RNCG, minor works are described as primarily intended to improve safety or facilitate better flow, with intersection widening and turning bay extensions coming under the definition. These works are not considered redeveloped or new under the RNP since they aren't intended to increase the traffic carrying capacity of the road or accommodate increases in heavy vehicle traffic.

Though the RNP does not apply to minor works proposals, the RNCG applies existing road noise criteria from the RNP where there is an increase in noise level of more than 2.0 dB(A) at the worst affected receiver relative to existing noise levels. These criteria are summarised in Table 3-3.

Table 3-3 Road traffic noise assessment criteria for residential land uses

Road category	Type of Proposal/land use	Assessment Criteria	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway/ arterial/ sub-arterial roads	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/sub-arterial roads 3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq, 15 \text{ hour } 60}$ (external)	$L_{Aeq, 9 \text{ hour } 55}$ (external)

Where the road traffic noise level is greater than 2 dB(A) compared with existing levels and the RNP criteria are exceeded, noise mitigation is considered, where feasible and reasonable, in line with the NMG.

For assessment purposes, the year of opening is the assessment timeline for the comparative 'build' and 'no build' scenarios and the noise catchment area should include all receivers where the noise level increases (which may be less than 600 metres).

3.4 Vibration

3.4.1 Human Comfort

When establishing appropriate criteria for assessing human exposure to vibration, the CNVG requires vibration goals in line with *Environmental Noise Management Assessing Vibration: A Technical Guideline* (DECC 2006).

Construction activities typically generate vibration of an intermittent nature, which is assessed using a Vibration Dose Value (VDV). Acceptable values of vibration doses are presented in Table 3-4 for sensitive

receivers. Where these are exceeded, the method for assessing the estimated VDV (eVDV) in DECC 2006 should be implemented to allow for consideration of vibration duration and dominant frequency.

Table 3-4 VDV Vibration Criteria

Receiver type	Peak particle velocity	
	Preferred (mm/s)	Maximum (mm/s)
Residential buildings – 15 hour day (7am to 10pm) ¹	0.20	0.40
Residential buildings – 9 hour night (10pm to 7am) ¹	0.13	0.26

Note 1: Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am.

3.4.2 Building Damage

Potential building damage requires the application of values in BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2. These values are presented in Table 3-5 and relate to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings.

Table 3-5 Guideline values for vibration velocity for the effects of short-term vibration on structures (BS 7385).

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50	
Unreinforced or light framed structures Residential or light commercial type buildings	15 at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz to 50 mm/s at 40 Hz and above

Where vibration may give rise to magnification due to resonance, especially at lower frequencies where lower guide values apply, the guide values may be reduced by 50%. The CNVG describes rock breaking/hammering and sheet piling activities as having potential to cause dynamic loading in some structures (e.g. residences).

For activity involving rock breakers, piling rigs, vibratory rollers, excavators, vibration predominantly occurs at frequencies in the 10 Hz to 100 Hz range. On this basis, a conservative vibration damage screening level is:

- reinforced or framed structures: 25.0 mm/s
- unreinforced or light framed structures: 7.5 mm/s

3.4.3 Heritage

Heritage buildings and structures would be assessed under a conservative cosmetic damage objective of 2.5 mm/s peak component particle velocity (from DIN 4150).

Where vibration levels at heritage items are identified as exceeding this screening level, structural assessment would be completed by the Project team to confirm the structure's sensitivity to vibration.

If a heritage building or structure is found to be structurally unsound (following inspection) the conservative criterion would stand. Where the structure is sound, the guideline values from Table 3-5 would be applicable.

3.4.4 Minimum working distances

Minimum working distances for typical vibration intensive construction equipment are provided in the CNVG-R and are summarised in Table 3-6. The minimum working distances are for cosmetic damage (from BS 7385 and DIN 4150) and human comfort (from the NSW EPA Vibration Guideline). They are calculated from empirical data which suggests that where works are further from receivers than the quoted minimum distances then impacts are not likely.

Table 3-6 Recommended minimum working distances from vibration intensive plant

Equipment	Approx. Size/ Weight/ Model	Cosmetic Damage (BS 7385)	Heritage items (DIN 4150)	Human Response (Vibration Guideline)
Vibratory roller	1-2 tonne	5 m	11 m	15 m to 20 m
	2-4 tonne	6 m	13 m	20 m
	4-6 tonne	12 m	15 m	40 m
	7-13 tonne	15 m	31 m	100 m
	13-18 tonne	20 m	40 m	100 m
	> 18 tonne	25 m	50 m	100 m
Hydraulic hammer	Small - 300 kg (5 to 12t excavator)	2 m	5 m	7 m
	Medium - 900 kg (12 to 18t excavator)	7 m	15 m	23 m
	Large - 1600 kg (18 to 34t excavator)	22 m	44 m	73 m
Pile driver	Vibratory Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Piling rig	Bored ≤ 800 mm	2 m (nominal)	5 m	N/A
Jackhammer	Handheld	1 m (nominal)	3 m	Avoid contact with structure

4. Construction assessment

4.1 Activities and staging

Construction would take place over a period of around 18 months. Anticipated representative construction activities and equipment are summarized in Table 4-1 for Site 4 and Table 4-2 for Site 5. Equipment may vary once works commence. However, the estimated sound powers are suitable for assessment purposes. Works are likely to be undertaken concurrently at each site.

An ancillary site would also be operating throughout construction, and this would be located within the construction footprint of Site 4.

Works are proposed primarily during standard construction hours; however, to minimise traffic disruption, or where safety and quality factors demand, works may take place outside standard hours including evenings, nights and weekends.

Anticipated overall $L_{Aeq\ 15\ minute}$ sound power levels from equipment during each activity are presented in the tables, providing worst case emission estimates for the identified activities. Usage factors have been applied to the sound power levels to account for the expected proportion of 'on time' of each item of equipment over the assessment period (15 minutes).

Activities and equipment were included in the noise model as area sources across the proposal, assumed to be present at any point within the proposal boundary. Activities likely to represent negligible noise, resulting in no impacts to surrounding receivers are excluded from the table.

4.2 Noise modelling

SoundPlan noise modelling software was used to calculate noise impacts in accordance with the ISO9613 prediction method at all identified noise-sensitive receivers. The model included:

- Topography – 1 metre DEM based on the latest LPI Lidar data. Some point cloud data was also used to better resolve relative levels around the bridge abutments.
- Individual buildings with associated building heights have been included to account for shielding and reflections. Façade noise was calculated at each floor and façade of each building at 1.5 metres above ground for each affected floor at 1 metre from the façade.
- Construction noise sources modelled as area sources with activity sound power levels listed in Table 4-1 and Table 4-2.
- Study area – noise predictions to 600 metres radius from the works
- The maximum predicted L_{Aeq} noise level within each work area was identified for each receiver.
- Meteorology – worst-case conditions (gentle breeze from source to receiver and stable conditions).

Table 4-1 Construction plant and equipment – Site 4

Construction Phase	Construction Activity		Construction Equipment	SWL dB(A)	Usage %	Activity SWL dB(A) ¹
Site Establishment	1a	Clearing	Chainsaw (Petrol)*	112	20	119
			Excavator (30 t)	109	40	
			Chipper (15"-20")*	114	60	
	1b	Compound Establishment	Excavator (20-30t)	109	40	106
			Generator / power pack	98	100	
			Mobile Crane (Franna)	98	40	
			Truck (12-15 tonne)	100	30	
	1c	Compound daily activities	Generator / power pack	98	100	100
			Road Truck	90	100	
			Forklift	100	20	
	1d	Utility Relocation	Vac Truck	109	40	106
			Excavator (10 t)	99	40	
Plate Compactor*			100	20		
Small Truck			100	30		
1e	Demolition	Excavator (20-30t)	109	40	106	
		truck	100	30		
		concrete saw*	99	20		
Retaining walls	2a	Bored Piles	Piling rig / drill rig	107	40	110
			Excavator (10 t)	99	40	
			Support crane (30-50 t)	109	40	
			Delivery Truck	100	30	
	2b	Footing pours	Small concrete pump	108	30	111
			Concrete vibrators	100	40	
			Concrete agitator	103	30	
	2c	Pile Breakback	Jackhammer*	111	20	109
	2d	Retaining Wall	Small concrete pump	108	30	108
			Concrete vibrators	100	40	
			Concrete agitator	103	30	
			Hand Tools	94	20	
Crane			100	40		
EWP			89	30		
Earthworks and Drainage	3a	Earthworks - Peak	Excavator (20-30t)	109	40	117
			Tipper Truck	98	40	
			Plate Compactor*	100	20	

Construction Phase	Construction Activity		Construction Equipment	SWL dB(A)	Usage %	Activity SWL dB(A) ¹
			Padfoot roller*	109	60	
			Smooth drum roller*	109	40	
			Grader	108	40	
			Truck and dog	108	20	
			Dozer D9	116	40	
			Excavator (14-20 t)	105	40	
			Water cart	103	40	
	3b	Earthworks - Typical	Excavator (20-30t)	109	40	115
			Padfoot roller*	109	60	
			Water cart	103	40	
Pavement	4a	Barriers and kerbs	Slip Form Paving Machine	110	100	112
			Concrete agitator	103	30	
			Concrete vibrators)	100	40	
			Power screeds / floats	105	100	
			Concrete saw*	114	20	
			Water Cart	92	100	
	4b	Profiling	Road Profiler	114	60	112
			Tipper Truck	98	40	
			Road Saw*	99	20	
			Bobcat	107	30	
	4c	Paving	Spray Seal Truck	106	40	111
			Asphalt Truck	108	40	
			Paving Machine	112	60	
			Multi Tyred Pneumatic Roller	111	40	
Smooth Drum Roller*			100	40		
Bobcat			107	30		
Finishing Works	5a	Line marking and landscape	Line marking plant	93	40	95
			Delivery Truck	93	30	
			Post hole tools	100	20	

*denotes equipment that has an added 5dB penalty to account for 'annoying' characteristics in line with the ICNG.

Table 4-2 Construction plant and equipment – Site 5

Construction Phase	Construction Activity		Construction Equipment	SWL dB(A)	Usage Factor%	Activity SWL dB(A) ¹
Pedestrian Crossing	7a	Surface preparation	Road sweeper/broom	100	40	108
			Pressure washer	105	40	
			Blowers	110	20	
			Sandblasting/scarifying equipment	108	40	
		Line marking, layout, application	Line marking plant	93	40	89
Remaking concrete kerb ramp	8a	Demolition/Removal (old kerb ramp)	Jackhammer*	111	20	109
			Sledge hammer	94	20	
			Concrete saw / cutoff saw*	99	20	
			Excavator	99	40	
	8b	Excavation / Site preparation	Skid steer	100	40	103
			Compaction plate	100	20	
			Hand compactor*	108	20	
	8c	Form Reo Pour	Hand tools	94	20	106
			Screed	105	100	
			Concrete agitator - discharging	103	30	
			Concrete vibrators (hand-held immersion)	95	100	

*denotes equipment that has an added 5dB penalty to account for ‘annoying’ characteristics in line with the ICNG.

4.3 Predicted noise levels

4.3.1 Site 4 - Standard hours

Predicted noise levels and exceedances of the NML for standard hours are summarized in Table 4-3. Detailed predictions are provided in Appendix A **Error! Reference source not found..**

Clearing, piling, concrete pours and earth works as well as profiling and paving are predicted to have a high noise impact (>75 dBA) at up to four receivers during standard hours.

The closest residential receivers to the proposal footprint are 15 - 25 metres from the proposal boundary. Predictions indicate the nearest receivers would experience moderate levels of noise when works are at or close to the boundary. Several commercial receivers are closer to the works (in some cases directly abutting) so would experience higher noise levels from works at their worst-case position.

Most construction activities present a moderate risk of impact, with the NML for standard hours likely to be exceeded by 10-20 dB(A) during all construction activities except line marking.

Noise contours illustrating noise impacts from the piling and paving scenarios are presented in Figure 4-1 and Figure 4-2 respectively.

Table 4-3 Predicted construction noise levels and exceedances for standard hours – Site 4

Construction Activity			Maximum level dB(A)		No. highly noise affected (>75 dBA)	Predicted no. receivers with exceedance of NML dB(A)			
			Residential ¹	Non-residential		Standard hours			
Site Establishment	1a	Clearing	90	111	3	79	13	8	1
	1b	Compound Establishment	78	99	2	7	7	1	0
	1c	Compound daily activities	71	92	0	7	1	1	0
	1d	Utility Relocation	78	99	2	7	7	1	0
	1e	Demolition	78	98	1	8	6	1	0
Retaining wall	2a	Bored Piles	81	102	2	14	7	2	1
	2b	Concrete pours	83	104	3	22	8	2	1
	2c	Pile Breakback	81	101	2	14	6	2	1
	2d	Retaining Wall	80	100	2	12	7	1	0
Earthworks and Drainage	3a	Earthworks - Peak	85	90	4	63	14	6	0
	3b	Earthworks - Typical	83	88	4	45	13	2	0
Pavement	4a	Barriers and kerbs	80	84	3	24	13	0	0
	4b	Profiling	81	85	3	23	13	1	0
	4c	Paving	79	84	3	20	12	0	0
Finishing Works	5a	Line marking	64	68	0	4	0	0	0

Note (1) – Residential represents residential receivers and mixed-use receivers (with residential). Non-residential represents all other sensitive receivers: commercial, industrial, educational, community, recreational, etc.

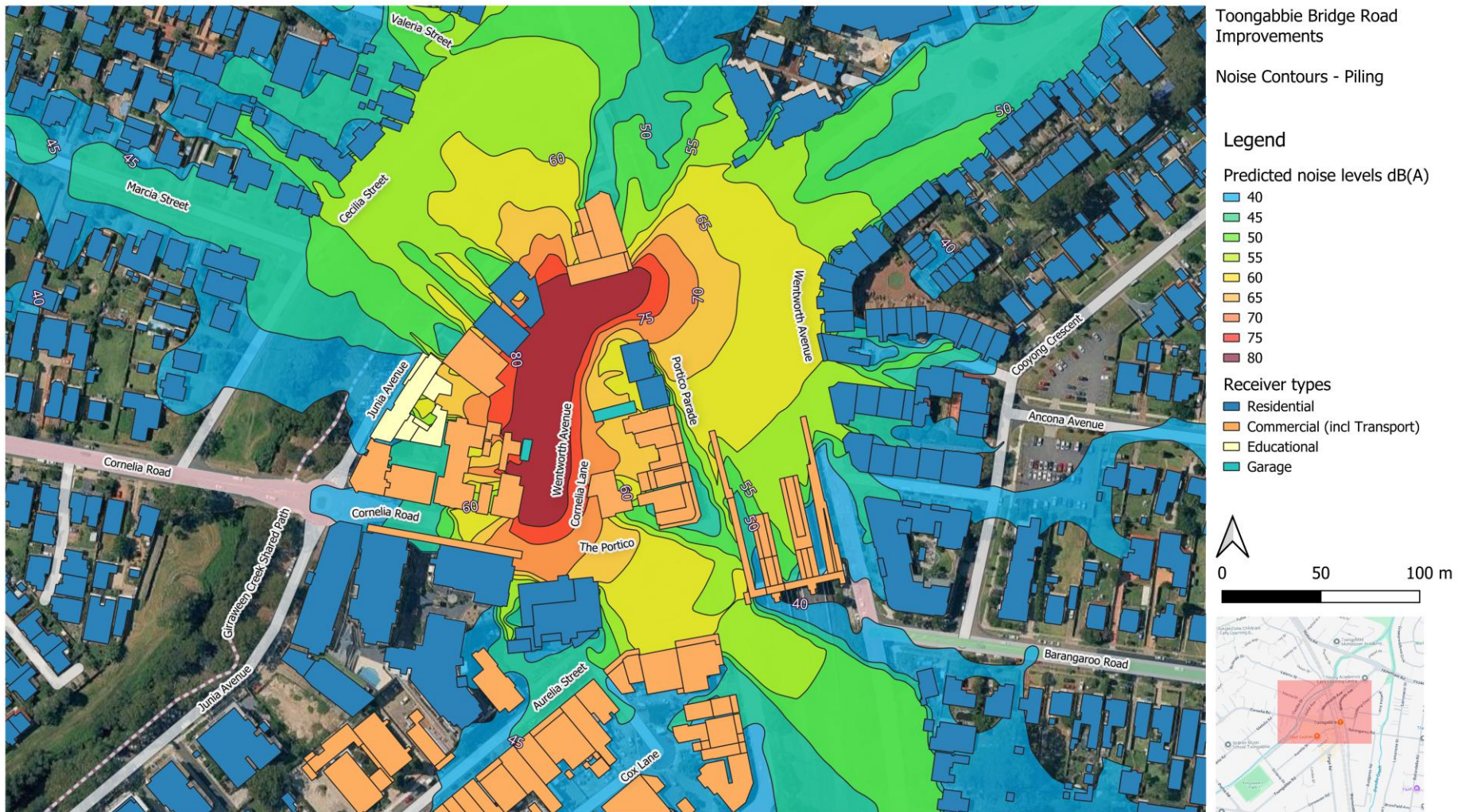


Figure 4-1 Noise Contours (All periods) L_{Aeq} – Site 4 piling

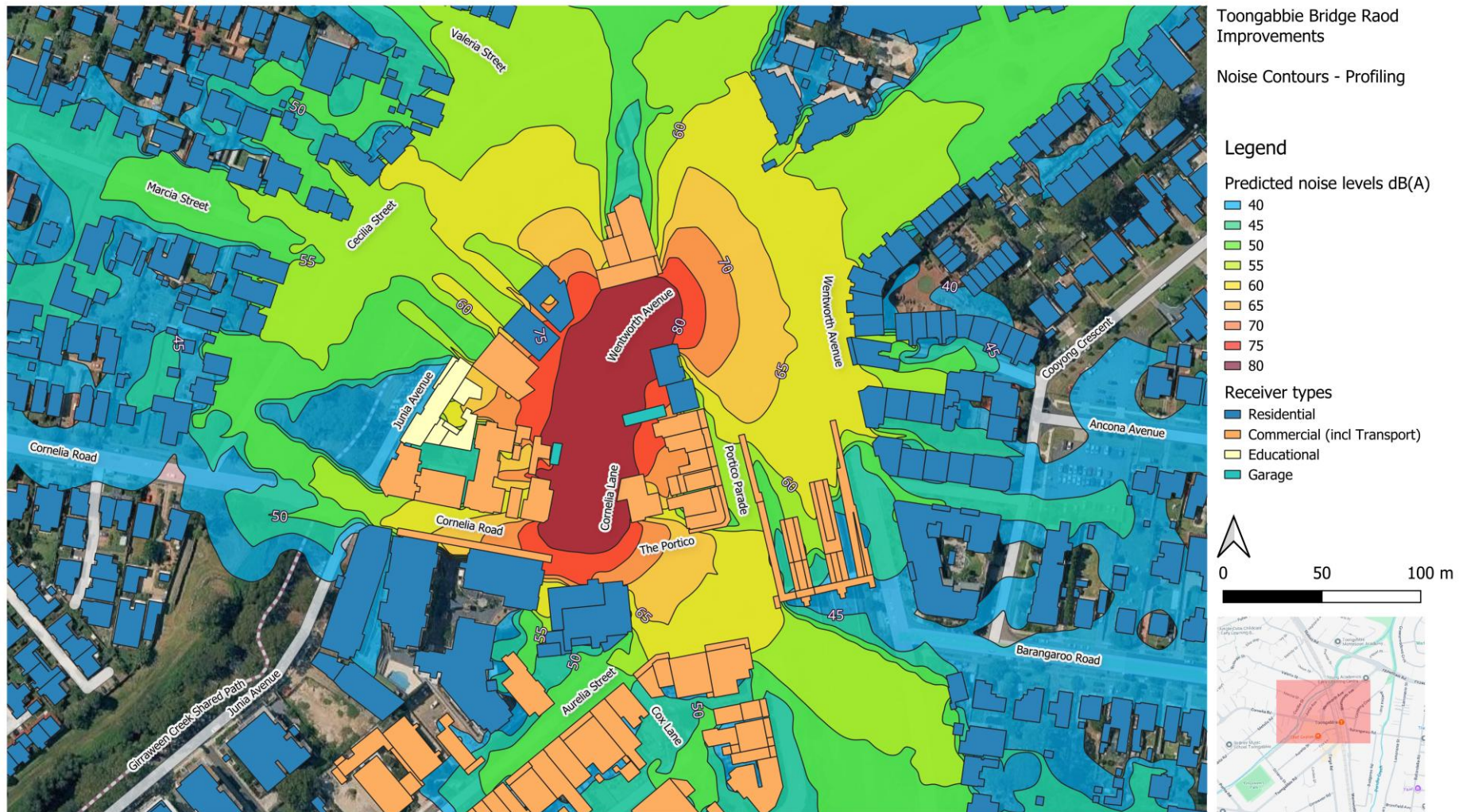


Figure 4-2 Noise Contours (All periods) L_{Aeq} – Site 4 profiling

4.3.2 Site 4 – Outside standard hours

When construction works are conducted outside the standard operating hours, the predicted noise levels remain largely consistent with those observed during standard periods. However, the potential impact on the surrounding environment and nearby sensitive receivers is expected to be greater during these times due to reduced background noise in the evening and night, which makes any additional noise more noticeable. Furthermore, people are generally more sensitive to noise during these periods, resulting in a lower Noise Management Level (NML) and a heightened risk of disturbance.

Predicted noise levels associated with the road works in this area outside standard hours are presented in Table 4-4.

Most construction activities present a moderate risk of impact. Clearing and earthworks represent the highest risk of affecting receivers during the evening and night period. Where possible, these activities should be limited to standard hours. Mulching of cleared vegetation was assumed in the modelling to occur during standard hours.

Table 4-4 Predicted construction noise levels outside standard hours (evening and night-time)

Construction Activity			Predicted No. of receivers with predicted noise levels above NML							
			Outside standard hours - evening				Outside standard hours - night			
			0-5	5-15	15-25	25+	0-5	5-15	15-25	25+
Site Establishment	1a	Clearing	239	278	74	13	260	415	156	29
	1b	Compound Establishment	85	49	3	4	135	118	15	5
	1c	Compound daily activities	20	13	4	1	69	31	4	2
	1d	Utility Relocation	85	50	3	4	139	119	15	5
	1e	Demolition	85	44	4	3	124	113	15	5
Retaining wall	2a	Bored Piles	104	88	13	5	188	172	31	6
	2b	Concrete pours	136	117	19	5	220	218	48	7
	2c	Pile Breakback	101	81	11	4	183	162	27	6
	2d	Retaining Wall	100	69	8	4	165	153	20	6
Earthworks and Drainage	3a	Earthworks - Peak	231	358	61	9	237	460	174	21
	3b	Earthworks - Typical	263	259	39	8	242	433	117	14
Pavement	4a	Barriers and kerbs	229	153	18	6	236	340	50	9
	4b	Profiling	238	187	17	7	225	375	61	9
	4c	Paving	204	134	14	6	251	302	41	8
Finishing Work	5a	Line marking	9	6	2	0	30	9	6	0

4.3.3 Site 4 – Sleep Disturbance

For works outside standard hours, predicted exceedances of the sleep disturbance screening and awakening criteria are summarized in Table 4-5. The sleep disturbance screening criteria would be exceeded for all activities proposed during the night with the worst-case, peak earthworks, likely to exceed this threshold at around 300 receivers.

The awakening noise level, >65dB(A), would likely be exceeded by up to 48 nearby receivers during peak earthworks.

Table 4-5 Predicted sleep disturbance (maximum noise) levels

Activity		Sleep disturbance criteria	
		Screening (RBL + 15)	Awakening (>65 dBA)
1a	Clearing	150	30
1b	Compound Establishment	78	12
1c	Compound daily activities	11	4
1d	Utility Relocation	26	4
1e	Demolition	78	12
2a	Bored Piles	78	12
2b	Concrete pours	150	30
2c	Pile Breakback	150	30
2d	Retaining Wall	58	10
3a	Earthworks - Peak	308	48
3b	Earthworks - Typical	160	21
4a	Barriers and kerbs	111	14
4b	Profiling	231	31
4c	Paving	129	20
5a	Line marking	9	5

4.3.4 Site 5 – Standard hours

Predicted noise levels and exceedances of the NML for standard hours are summarized in Table 4-6. Detailed predictions are provided in Appendix A.

Most construction activities present a low to moderate risk of impact at the sensitive receivers.

Demolition/Removal of the old kerb and ramp is the noisiest activity; however no residential receivers are predicted to be highly noise affected, with the highest prediction 65dBA.

Construction activities: surface preparation and repair (involving sand/grit blasting) and the removal of existing pedestrian path and rail components (involving the use of a jackhammer) represent a low risk of impact to the surrounding residential receivers.

Noise contours for the demolition scenario are presented in Figure 4-3.

Table 4-6 Predicted construction noise levels and exceedances for standard hours – Pedestrian Crossing

Construction Activity		Maximum level dB(A)		Rec. >75	Predicted no. receivers with exceedance of NML			
					Standard hours			
		Residential ¹	Non-residential		0-10	10-20	20+	30+
7a	Surface preparation	63	92	0	2	0	1	0
7b	Line marking, layout, application	45	74	0	1	0	0	0
7c	Demolition/Removal (old kerb ramp)	65	94	0	4	0	1	0
8a	Excavation / Site preparation	58	87	0	1	1	0	0
8b	Form Reo Pour	62	91	0	2	0	1	0

Note (1) – Residential represents residential receivers and mixed-use receivers (with residential). Non-residential represents all other sensitive receivers: commercial, industrial, educational, community, recreational, etc.



Figure 4-3 Noise Contours (All periods) L_{Aeq} – Site 5 demolition

4.3.5 Site 5 – Outside standard hours

Where works are required outside standard hours, although the predicted noise levels would be similar, the level of impact would increase due to lower background noise and a higher sensitivity of sensitive receivers at those times, i.e. lower NML.

Predicted exceedances of the NML for construction activities proposed outside standard hours are summarized in Table 4-7.

Surface preparation, demolition/removal, and concreting pours represent a low to moderate risk of noise impacts to the surrounding receivers.

Other construction activities represent a low risk of impact to the surrounding residential receivers.

Table 4-7 Predicted construction noise levels outside standard hours (evening and night-time) – Pedestrian Crossing

Construction Activity		Predicted no. receivers with exceedance of NML											
		Outside standard hours - Day				Outside standard hours - eve				Outside standard hours - night			
		0-5	5-15	15-25	25+	0-5	5-15	15-25	25+	0-5	5-15	15-25	25+
7a	Surface preparation	5	2	1	0	2	7	1	0	25	8	2	0
7b	Line marking, layout, application	1	0	0	0	1	0	0	0	1	0	0	0
8a	Demolition/Removal (old kerb ramp)	4	4	1	0	3	8	1	0	35	8	4	0
8b	Excavation / Site preparation	2	0	1	0	5	1	1	0	4	5	1	0
8c	Form Reo Pour	4	2	1	0	2	6	1	0	13	7	2	0

4.3.6 Site 5 – Sleep Disturbance

For works outside standard hours, predicted exceedances of the sleep disturbance screening and awakening criteria are summarized in Table 4-8. The sleep disturbance screening criteria would be exceeded for most activities proposed during the night. The awakening noise level, >65dBA, would likely be exceeded by up to 7 nearby receivers during demolition.

Table 4-8 Predicted sleep disturbance (maximum noise) levels – Pedestrian Crossing

Activity		Sleep disturbance criteria	
		Screening (RBL + 15)	Awakening (>65 dBA)
7a	Surface preparation	12	3
7b	Line marking, layout, application	0	0
8a	Demolition/Removal (old kerb ramp)	38	7
8b	Excavation / Site preparation	5	3
8c	Form Reo Pour	6	1

4.4 Cumulative impacts

Cumulative construction noise impacts may occur when more than one activity takes place near a particular receiver at the same time. For example, where Site 4 and Site 5 are underway concurrently, there's a chance that the combined noise could affect some nearby receivers to a greater extent than predicted levels indicate. In the worst case, two activities of similar noise level may combine to increase by 3 dB (i.e. logarithmic addition of two noise sources).

However, it is more likely one activity will be the dominant influence and mask noise from the other site. Noise levels at any spot on the site will rise and fall, usually staying well below the worst-case estimate.

4.5 Construction-Related Traffic Noise

The delivery of construction materials and plant is expected to generate additional road traffic in the project area. This increase in traffic has the potential to elevate road traffic noise levels experienced by nearby receivers.

However, a significant increase in traffic volumes—approximately 60%—is necessary to give a perceptible rise in noise levels of around 2 dB(A). For increases in road noise of less than 2 dB(A), most people would not notice any change in the sound environment.

Current traffic volumes on the primary roads that would be used for construction traffic, namely Wentworth Avenue and Cordelia Road, are already substantial, with counts of approximately 1,200 to 1,500 vehicles per hour (peak). Given these high baseline traffic volumes, the relative contribution from construction-related vehicles is expected to be minimal.

Consequently, it is unlikely that the construction traffic will cause a sufficient increase in overall road traffic volume to result in a noticeable change in road traffic noise in the area.

4.6 Vibration

Vibration-intensive works would include compacting and rolling as well as pile break-back with a jack hammer. At this stage no impact piling or rock breaking is anticipated.

Table 3-6 reproduces the minimum working distances and demonstrates large rollers should meet the cosmetic damage and human comfort thresholds within 25 m and 100 metres respectively. Smaller compactors would meet the thresholds within around 5 metres and 15 to 20 metres respectively.

Maps showing projected safe working distances for large and small rollers are presented in Figure 4-4 and Figure 4-5 respectively in relation to nearby sensitive receivers. Buildings are evidently within these distances, with compaction by a large roller potentially exceeding the cosmetic damage threshold at around nine buildings. Use of a smaller roller reduces this number to one building.

Toongabbie Bridge Road Improvements

Vibration Buffer - Compaction

Legend

Large Roller

Cosmetic Damage (25m)

Heritage Cosmetic Damage (50m)

Human Comfort (100m)

Proposal Areas

Main site (Site 4)

Pedestrian Crossing (Site 5)

Dummy

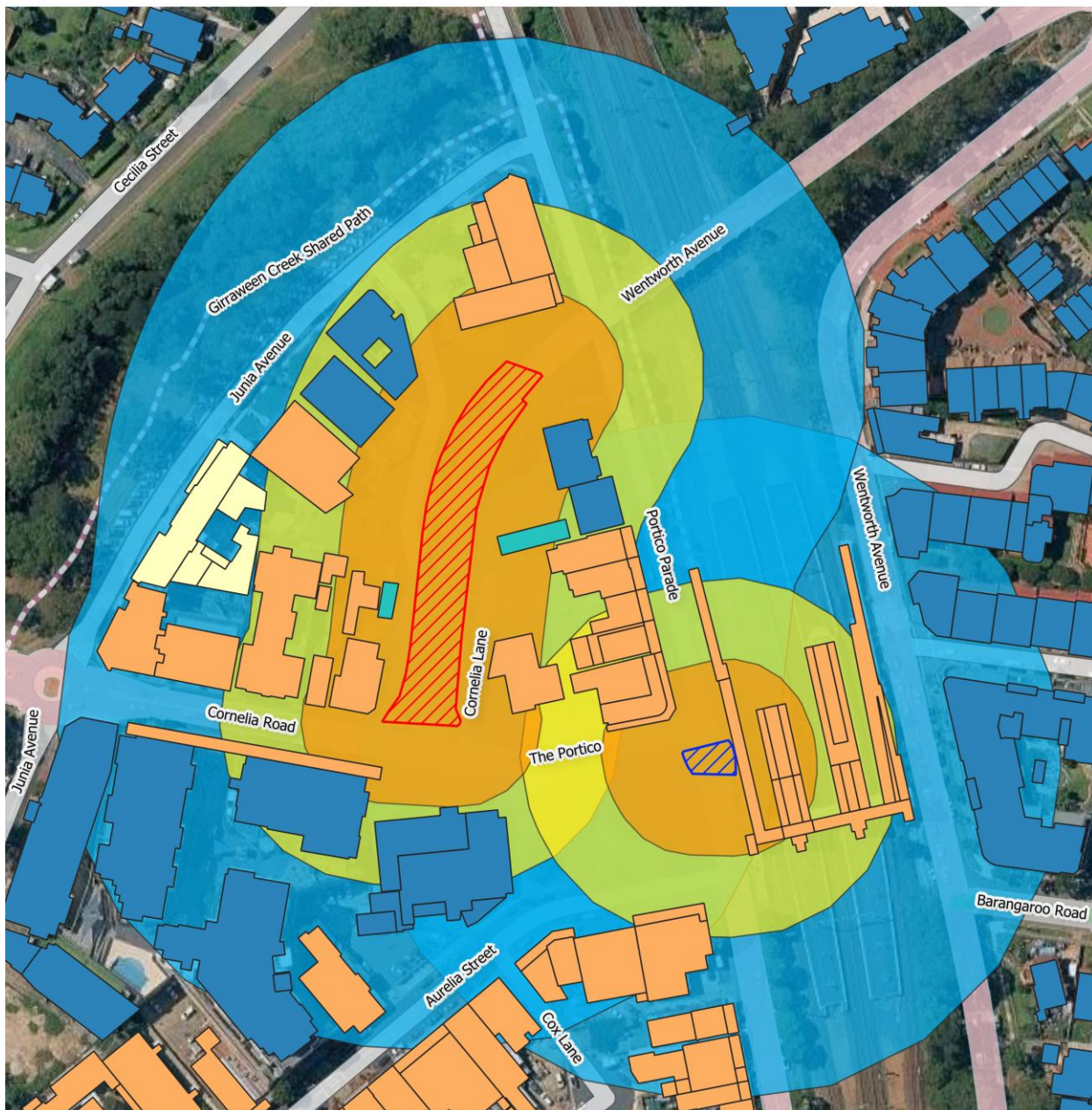
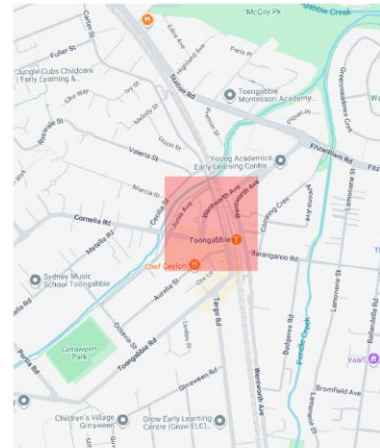


Figure 4-4 Minimum working distances for large roller for human comfort, heritage items and building damage

Toongabbie Bridge Road Improvements

Vibration Buffer - Compaction

Legend

Small Roller

Cosmetic Damage (5m)

Heritage Cosmetic Damage (11m)

Human Comfort (15m)

Human Comfort (20m)

Proposal Areas

Main site (Site 4)

Pedestrian Crossing (Site 5)

Dummy



0 25 50 75 m

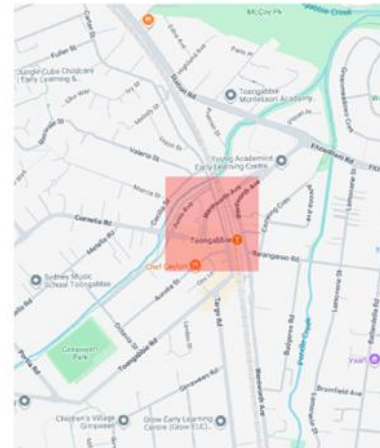
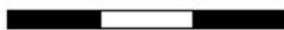


Figure 4-5 Minimum working distances for small roller for human comfort, heritage items and building damage

5. Operational assessment

5.1 Road traffic noise

An assessment was conducted to determine whether any nearby sensitive receivers would experience an increase in road traffic noise greater than 2 dB(A) as a result of the proposal. In instances where an increase exceeding 2 dB(A) is predicted, reasonable and feasible mitigation measures would be considered in accordance with the Noise Mitigation Guidelines. If projected noise increases are less than 2 dB(A), further consideration of mitigation for road traffic noise would not be required.

To evaluate the potential change in road traffic noise, an operational noise model was developed utilizing SoundPlan v9.0 acoustic modelling software. The model employed the Calculation of Road Traffic Noise (CoRTN) algorithm (UK Department of Transport 1988), adapted for New South Wales conditions.

Two scenarios were analysed for comparison:

- 'No build' scenario: Assumes the proposal does not proceed and incorporates projected increases in traffic volumes for the Year of Opening (2027).
- 'Build' scenario: Assumes the proposal proceeds and includes projected increases in traffic volumes for the Year of Opening (2027).

Road noise levels were predicted based on several key factors, including the vertical and horizontal alignment of the proposal (including the bridge), traffic volumes, traffic compositions and speeds, road gradients, and pavement surface types.

The modelling also considered the propagation of noise from source to the receiver, accounting for the intervening distance, the heights of the source and receivers, shielding and reflections from topographical and structural barriers, ground and air absorption, and worst-case meteorological conditions. The worst-case conditions included a gentle breeze blowing from source to receiver and the presence of a temperature inversion.

A summary of the key modelling parameters used in the assessment is provided in Table 5-1. No model validation was performed, as this is a minor works assessment based on a straightforward comparison between two road alignments.

Figure 5-1 presents a diagram of the comparison of the horizontal alignment. The diagram shows the northbound lane of Wentworth Avenue would shift laterally approximately 3.5 meters to the west. Additionally, the southbound lanes would be divided into separate left and right turning lanes, with the right turn lane assuming the position of the former northbound lane.

Based on traffic projections, summarised in Table 5-2 and adopted from the it is anticipated that 34% of southbound traffic would utilize the left-turn lane, while 66% would use the right-turn lane.

Table 5-1 Key modelling parameters and assumptions

Parameter / assumption	Description
Design	Existing and proposed designs provided by Turnbull Engineering in 2D format. For vertical elevations, these were layered onto the digital terrain model, with the existing terrain adjusted to accommodate the proposed design.
Ground topography	Design elements provided by Turnbull Engineering Surrounding terrain based on LIDAR data
Existing structures	Building footprints with land use and building heights were sourced from a third-party provider. Footprints defined from aerial photography, building heights from lidar datasets and site surveys
Traffic volumes, composition and speeds	Volumes and compositions adopted for the AM Peak as provided in the Toongabbie Fitzwilliam Road and Wentworth Avenue Intersection Upgrade - Traffic Impact Assessment, prepared by Stantec (2025). Projections were based on intersection counts of the AM Peak period and projected for the 2027 assessment year. These values are summarised in Table 6 for the no-build and build scenarios, which are very similar. Speeds based on signposted speed limits.
Source heights and corrections	Three-source height with light vehicles at 0.5m and 0 dB correction Heavy vehicles at 1.5m (-2.4 dB correction) and 3.6 m (-8.5 db correction)
Receiver heights	Ground floor – 1.5 metres above ground level First floor – 4.5 m above ground level Other level – 1.5 m above floor level
Façade receiver positions	1 metre from façade
Road pavement	Existing and proposed future pavement surfaces are modelled as Dense Grade Aggregate (DGA) with 0 dB correction applied for both assessment scenarios.
Ground absorption	Ground absorption factor of 0.5 used throughout. This is representative of suburban areas
Façade corrections	+2.5dB for locations at 1m from the façade of a building. L10 to Leq correction + 3dB Considering this is a comparative study, no other corrections were applied.

Table 5-2 Traffic flows

Road	Direction	AM PEAK Vehicle numbers		
		Total flow	HV	LV
2027 – No build				
Wentworth Avenue	NB	944	17	927
	SB	864	21	864
Cornelia Road	EB	674	9	665
	WB	635	11	624
The Portico	EB	326	10	316
	WB	373	9	364
2027 – Build				
Wentworth Avenue	NB	938	17	921
	SB	865	21	844
Cornelia Road	EB	668	9	659
	WB	635	10	625
The Portico	EB	326	10	316
	WB	373	9	364

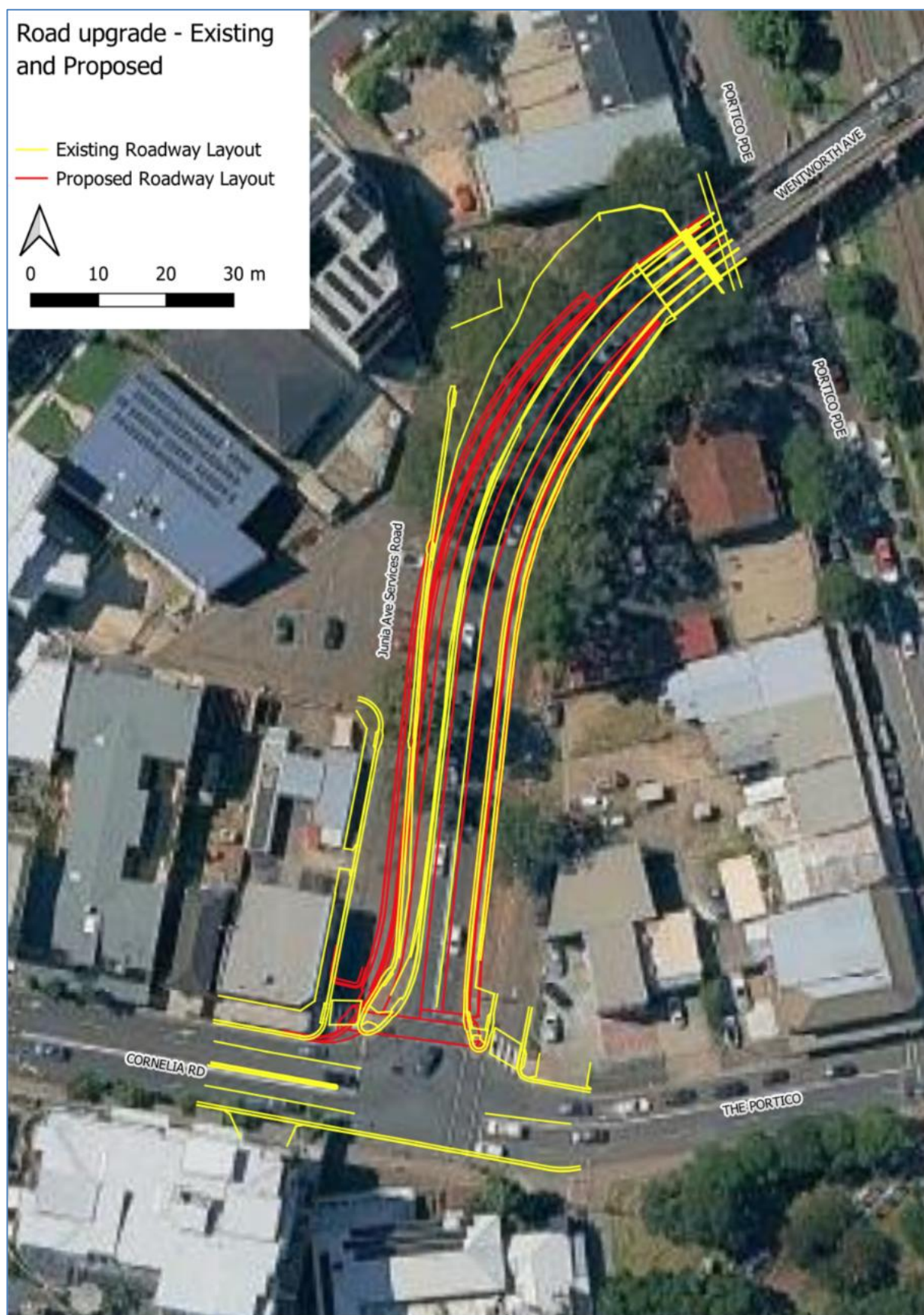


Figure 5-1 Change in road alignment, proposal vs existing

Predicted road noise levels are expected to increase by less than 2 dB(A) for all receivers. The highest predicted increase would be 1.2 dB(A) to the east of the proposal on The Portico and Wentworth Avenue, and at the intersection of Cornelia Road and Wentworth Avenue. Noise is likely to decrease to the northeast. Maps depicting relative increases in noise for each receiver building at 1.5 and 4.5 metres above ground level are shown in Figure 5-3 and Figure 5-4 respectively. These maps account for the maximum predicted increase for each building.

A summary of comparative predicted road noise levels for the proposal is presented in Figure 5-2, which shows most increases would be between 0.1 and 0.2 dB with only a small number exceeding a 1 dB increase. This demonstrates the proposal represents minor works and increases in traffic noise should be imperceptible to most people.

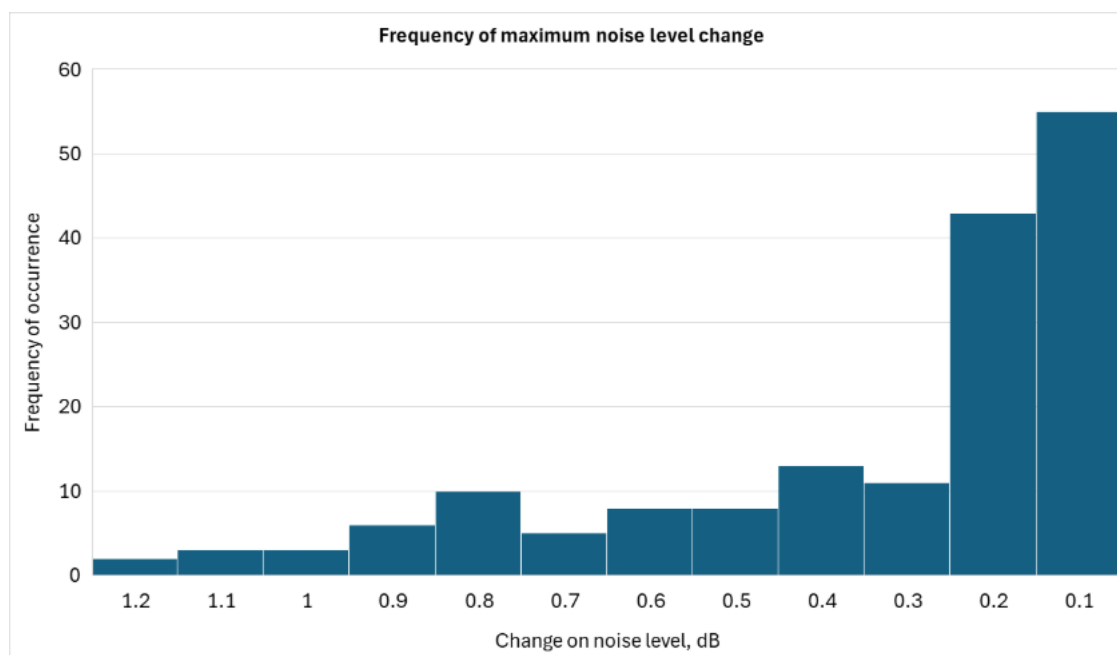


Figure 5-2 Frequency of predicted noise level increases

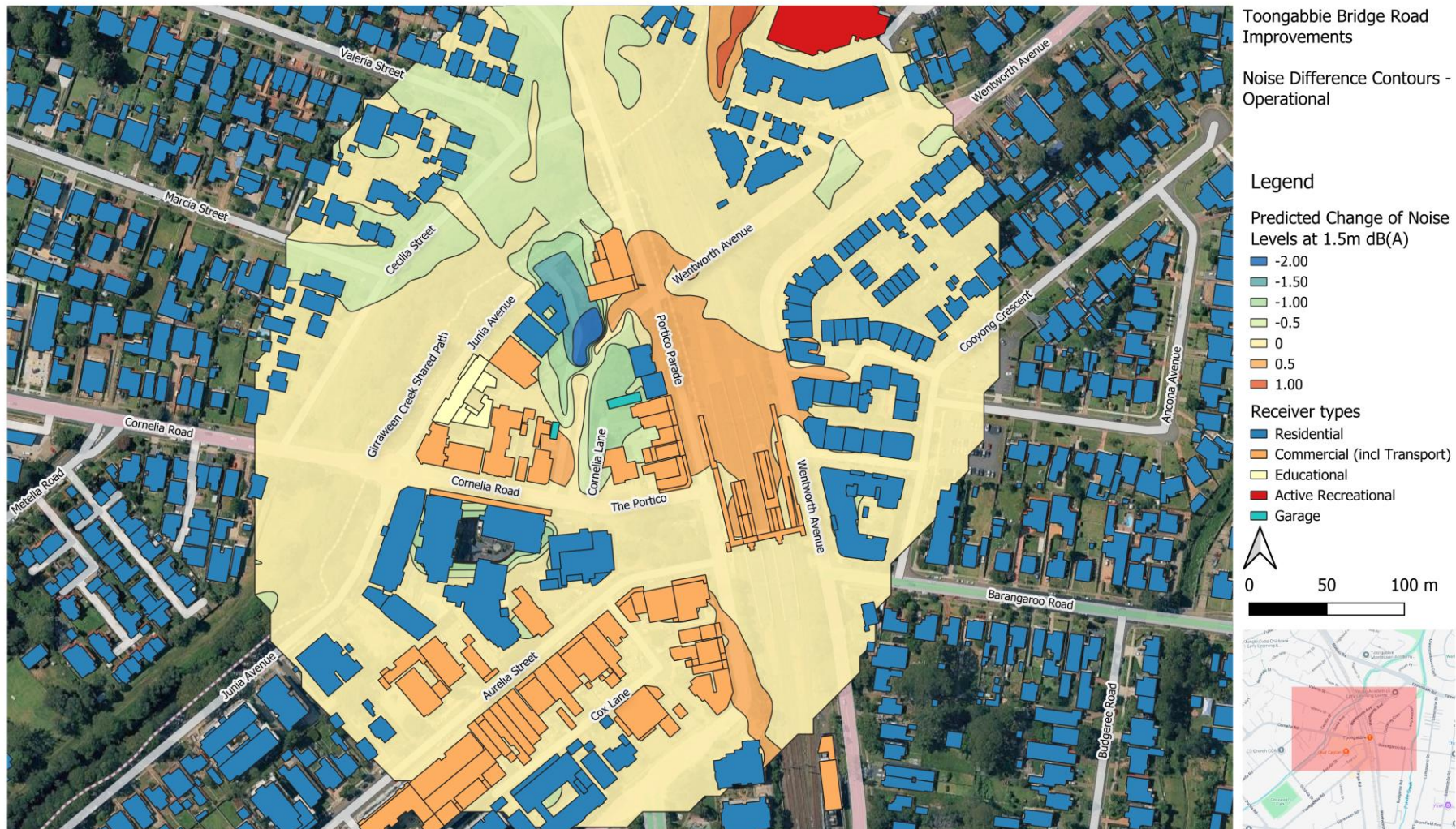


Figure 5-3 Change in road traffic noise with proposal (1.5 m above ground level)

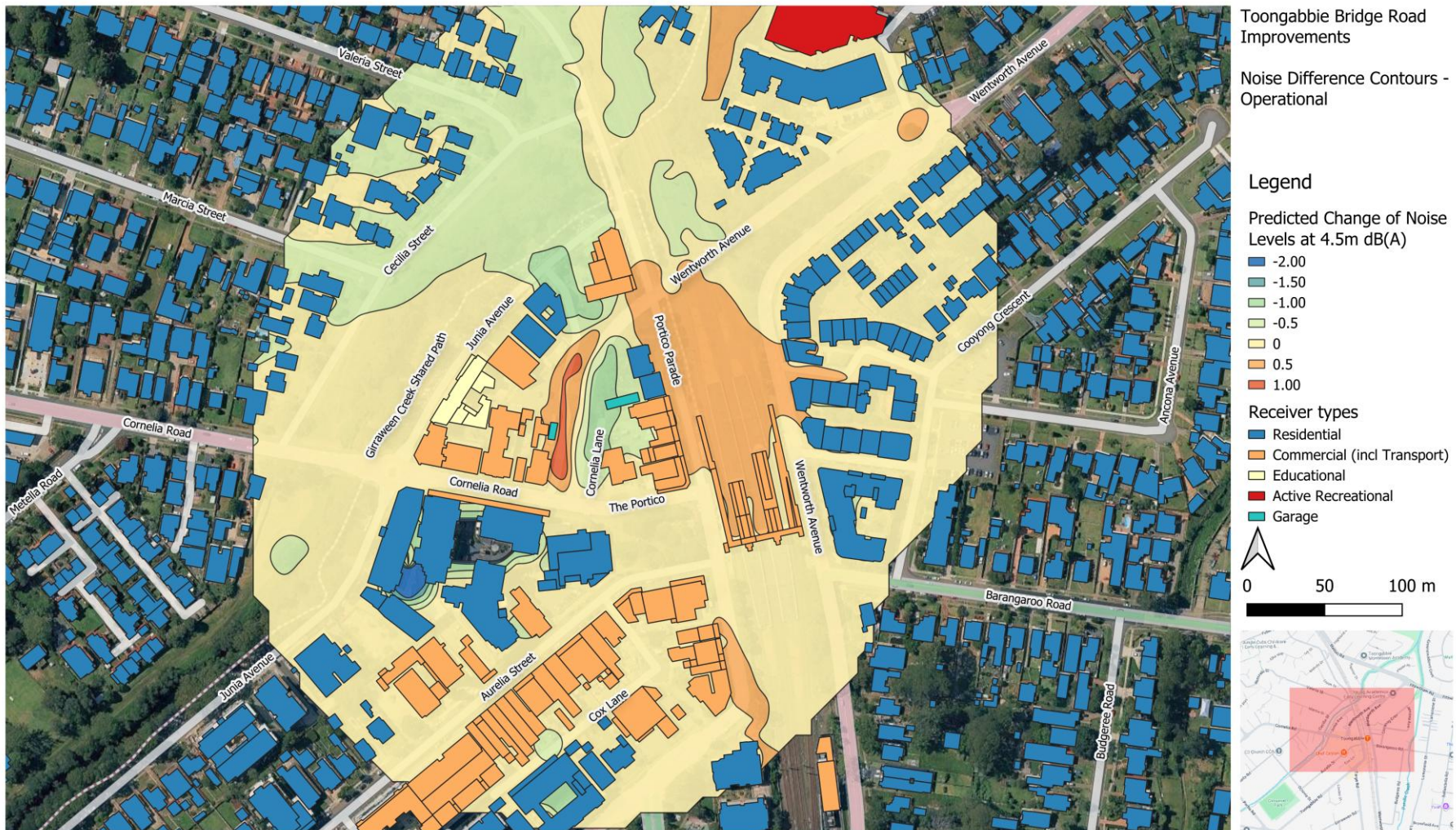


Figure 5-4 Change in road traffic noise with proposal (4.5 m above ground level)

5.2 Vibration

Ground vibration levels from traffic on surface roads are generally very low. The main factors that influence the level of vibration experienced by receivers close to a road include:

- the distance from the house to the road,
- the road surface condition,
- traffic conditions (volume, speed and mix of heavy vehicles)

The South Australian Government's Department for Infrastructure and Transport (DIT) Document *Guideline for the Management of Noise and Vibration: Construction and Maintenance* quotes magnitudes of vibration from roads, which fall within two bands:

- Truck traffic over maintained road surfaces – 0.2 mm/s at 10 m
- Truck traffic over irregular surfaces – 2 mm/s at 10 m

People can feel vibration at levels around 10 times lower than the level where minor building damage may occur. Even at the lower vibration level for a well-maintained road, homes within 10 metres may experience vibration, but these levels would not risk any damage to a building.

The nearest receiver to the proposal (2 Junia Avenue 2) is around 20 metres from the nearside lane. Therefore, with a well-maintained surface, the risk of human impacts and building damage are low.

Any rattling of windows perceived by building occupants are likely due to airborne acoustic excitation from low frequency noise radiated from large truck or bus exhausts rather than from ground vibration.

The following measures would help to avoid unnecessary vibration generation:

- ensure finished pavement surfaces are smooth,
- avoid placement of service pits in traffic wheel paths,
- select appropriate expansion joints such as finger plate types, which allow for large movements in structures, and aluminium strip seal systems, which can be installed to provide a flush surface true to the profile of any ramp / bridge decks.

6. Summary and recommendations

The proposed works during standard hours present a low risk of adverse impacts on sensitive receivers.

Exceedances would be largely limited to 5 dB(A) above the NML with only a small group of receivers expected to experience higher noise levels. Appropriate mitigation measures would reduce the numbers of affected receivers.

Outside standard hours, the level of impact would expand substantially with similar works undertaken during these periods representing moderate to high noise impacts, with vegetation clearing and earthworks identified as the highest risk.

Works should be completed during standard hours as far as practicable. Where unavoidable, any particularly noisy works such as use of chainsaws, concrete saws and jack hammers should be completed before midnight.

Recommended mitigation measures for these works are listed in Table 6-1. Additional measures identified in the CNVG are required if predicted noise levels remain above the relevant criteria after standard mitigation has been applied.

Table 6-1 Standard mitigation measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
General construction noise and vibration	A construction noise and vibration management plan (CNVMP) would be prepared for the proposal to mitigate and manage noise and vibration impacts during construction and would form part of the Construction Environmental Management Plan (CEMP). The CNVMP would be implemented for the duration of construction of the proposal and would: • Identify nearby sensitive receivers • Include a description of the construction equipment and working hours • Identify relevant noise and vibration performance criteria for the project and license and approval conditions • Identify relevant sleep disturbance screening levels • Outline noise and vibration objectives, standard and additional mitigation measures from the Construction Noise and Vibration Guideline (CNVG) (Roads and Maritime Services, 2025) and information about when each would be applied • Outline requirements for noise and vibration monitoring that would be carried out to monitor project performance associated with the noise and vibration criteria • Describe community consultation and complaints handling procedures in accordance with the Community Communication Strategy to be developed for the project • Outline measures to manage sleep disturbance during night time work	Contractor	Prior to commencement of construction, and during construction	ICNG and CNVG

	Outline measures to manage noise impacts associated with construction heavy vehicle movements both on and off site. All personnel working on site would receive training to ensure awareness of requirements of the CNVMP. Site-specific training would be given to personnel when working in the vicinity of sensitive receivers			
Construction hours	Proposed works should be completed during standard hours as much as practicable.	Contractor	During construction	ICNG and CNVG
High noise activities and out of hours work	Location and activity specific noise and vibration impact assessments should be carried out prior to activities: - With the potential to result in noise levels above 75 dBA at any receiver - Required outside Standard Construction Hours likely to result in noise greater than the relevant Noise Management Levels - With potential to exceed relevant criteria for vibration. The assessments should be performed once detailed construction methods have been developed to confirm the predicted impacts at the relevant receivers in the vicinity of the activities to aid the selection of appropriate management measures, consistent with the requirements of the CNVG	Contractor	Prior to commencement of construction, and during construction	ICNG and CNVG
High noise activities and out of hours work	Concrete cutting and mulching of cleared vegetation should be limited to standard hours where possible.	Contractor	During construction	CNVG
General vibration impacts	Where works are within the minimum working distances for vibration intensive equipment and considered likely to exceed the cosmetic damage objectives in the CNVG at adjacent receivers, construction work would not proceed unless: - A different construction method with lower source vibration levels is used, where feasible - Attended vibration measurements are carried out to determine any exceedances and if further mitigation is required.	Contractor	During construction	CNVG
Buried utilities	Where works are within 25 metres of buried utilities (e.g. water, power, gas, telecoms), consult with asset owners to establish appropriate vibration limits and management requirements, prepare a detailed vibration assessment for buried assets once detailed construction methods have been developed.	Contractor	During construction	Best practice
Heritage items	Heritage items within 50 metres of vibration intensive work are to be considered on a case-by-case basis to establish structural integrity of each item and determine reasonable and feasible mitigation measures.	Contractor	During construction	Best practice
Condition surveys	Building condition surveys should be completed before and after the work where buildings are within the minimum working distances and considered likely to exceed the cosmetic damage criteria during the use of vibration intensive equipment.	Contractor	During construction	Best practice



Appendix A Detailed noise predictions

Site 4

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Site 5

Receivers			NML						Sleep disturbance	7a	7b	8a	8b	8c	
Ref	Address		Standard hours	Weekend day	Evening	Night	LAeq, 15min	Lmax	Surface preparation	Line marking, layout, application	Demolition/Removal (old kerb ramp)	Excavation / Site preparation	Form Reo Pour		
Exceedence Legend			> 75 dBA	0-10dB	10-20dB	>20dB	>30dB	Standard Hours Exceedences - Day							
911	2/27 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	19	23		
912	10 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	35	16	37	30	33		
913	10/45-49 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	30	23	26		
914	14A METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	23		
915	7/18 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	23		
916	12A METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	7	27	20	24		
917	5/22 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	29	10	31	24	27		
918	19 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	29	22	25		
919	7/23-25 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	37	18	39	32	35		
920	53 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	33	26	30		
921	1/3 IVY ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	28	21	24		
922	5/22 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	29	10	30	23	27		
923	COMMERCIAL USE 64-72 AURELIA ST, TOONGABBIE NSW 2146	COM	70	70	70	70	70	70	32	13	34	27	30		
924	24 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	34	15	35	29	32		
925	21 ANCONA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	27	20	24		
926	20 COOYONG CR, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	30	23	27		
927	2/27 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	25	18	22		
928	4/8-10 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	23		
929	202/56-60 AURELIA ST, TOONGABBIE NSW 2146	COM	70	70	70	70	70	70	39	20	40	33	37		
930	12 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	29	10	31	24	27		
931	19/8-10 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	20	23		
932	59 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	13	33	26	30		
933	38 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	24	18	21		
934	28 COOYONG CR, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	29	22	26		
935	2/27 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	25	19	22		
936	6/18-20 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	32	13	34	27	31		
937	7/18 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	28	21	25		
938	20/8-10 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	28	21	25		
939	4/20 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	24		
940	20 COOYONG CR, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	10	30	23	27		
941	12 WENTWORTH AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	29	10	30	24	27		
942	UNIT 4 45-47 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	33	27	30		
943	7 HARVEY PL, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	29	22	25		
944	24 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	33	14	35	28	31		
945	6 STATION RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	29	23	26		
946	13/17 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	29	10	30	23	27		
947	7/67 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	41	22	43	36	40		
948	14 LAMONERIE ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	26	19	22		
949	78A AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	34	15	35	28	32		
950	12 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	32	13	33	26	30		
951	7/18 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	27	21	24		
952	UNIT 6 15-19 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	35	16	36	29	33		
953	27/42 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	34	15	35	28	32		
954	9C/35-43 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	29	10	31	24	27		
955	13/17 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	33	26	29		
956	6/18-20 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	32	13	33	26	30		
957	78A AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	47	28	49	42	46		
958	6/18-20 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	29	10	30	24	27		
959	3 WOODLAWN DR, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	20	23		
960	61 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	29	10	31	24	27		
961	33 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	35	16	36	30	33		
962	UNIT 4 45-47 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	31	25	28		
963	14 LAMONERIE ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	22	3	23	17	20		
964	13/17 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	29	10	30	24	27		
965	16 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	32	25	29		
966	UNIT 5 23 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	29	22	25		
967	15 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	5	25	18	22		
968	6/18-20 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	33	14	34	27	31		
969	24 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	19	23		
970	36 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	6	26	19	23		
971	27A MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	26	19	22		
972	5 COOYONG CR, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	24	18	21		
973	28 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	33	14	35	28	31		
974	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	22	3	24	17	20		
975	34 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	27	20	24		
976	29 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	26	19	22		
977	21 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	27	21	24		
978	31 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	33	14	35	28	31		
979	26 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	14	34	27	31		
980	1A LINDEN ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	33	26	29		
981	1 FRENCH AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	24		
982	31 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	37	18	38	32	35		
983	9C/35-43 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	36	18	38	31	35		
984	40 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	26	29		
985	10 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	25	18	22		
986	33 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	37	18	38	31	35		
987	4/20 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	23		
988	4/20 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	27	20	24		
989	19 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	30	23	26		
990	14/11-13 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	25	29		
991	#N/A	RES	60	55	50	45	55	65	24	5	25	18	22		
992	19 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	23		
993	4/20 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	19	23		
994	8 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	22	3	24	17	20		
995	445A WENTWORTH AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	32	25	28		
996	14 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	24	18	21		
997	7/18 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	5	25	18	22		
998	4 LAMONERIE ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	21	2	22	16	19		
999	1/233 TARGO RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	29	10	31	24	27		
1000	29 MARCIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	25	19	22		
1001	1 MIMOSA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	31	25	28		

Receivers			NML						Sleep disturbance	7a	7b	8a	8b	8c
										Surface preparation	Line marking, layout, application	Demolition/Removal (old kerb ramp)	Excavation / Site preparation	Form Reo Pour
Ref	Address		Standard hours	Weekend day	Evening	Night	LAeq, 15min	Lmax						
Exceedence Legend			> 75 dBA	0-10dB	10-20dB	>20dB	>30dB	Standard Hours Exceedences - Day						
1002	7/23-25 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	33	27	30	
1003	7 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	24	17	21	
1004	12 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	25	18	21	
1005	13/17 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	29	22	26	
1006	51 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	13	33	26	30	
1007	19 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	26	19	22	
1008	50 ROSSVALE ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	22	4	24	17	21	
1009	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	7	27	20	24	
1010	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	26	7	27	20	24	
1011	7 WOODLAWN DR, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	7	27	20	24	
1012	28 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	25	29	
1013	42 ANCONA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	19	23	
1014	9C/35-43 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	31	24	28	
1015	9C/35-43 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	33	26	30	
1016	61 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	34	16	36	29	33	
1017	6/18-20 GIRRAWEEEN RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	27	8	29	22	26	
1018	1/84-86 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	36	18	38	31	35	
1019	4/92 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	42	23	43	36	40	
1020	65 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	33	14	35	28	32	
1021	UNIT 2 88-90 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	37	18	39	32	35	
1022	23 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	29	23	26	
1023	1/2-4 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	33	26	29	
1024	22 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	26	29	
1025	12/5-7 MIMOSA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	29	22	25	
1026	UNIT 2 88-90 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	38	19	40	33	37	
1027	4/20 VALERIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	26	19	22	
1028	38 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	33	14	35	28	32	
1029	36A TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	33	27	30	
1030	9C/35-43 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	34	27	31	
1031	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	25	18	22	
1032	13 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	25	18	21	
1033	49 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	31	25	28	
1034	#N/A	EDU	55	55	55	55	55	55	24	5	25	18	22	
1035	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	24	17	21	
1036	9 GILDA WAY, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	22	3	24	17	20	
1037	10/45-49 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	25	29	
1038	UNIT 2 88-90 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	25	29	
1039	UNIT 2 88-90 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	29	22	25	
1040	1 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	29	23	26	
1041	40 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	34	27	30	
1042	UNIT 10 8-10 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	34	15	35	29	32	
1043	10/45-49 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	30	23	27	
1044	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	22	3	24	17	20	
1045	40 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	14	34	27	31	
1046	20 JUNIA AV, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	33	26	30	
1047	19/46 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	14	34	27	31	
1048	27/42 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	13	33	26	30	
1049	UNIT 2 88-90 AURELIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	31	12	32	26	29	
1050	6 HARVEY PL, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	9	29	22	26	
1051	1/46 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	32	13	34	27	30	
1052	3 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	30	11	32	25	29	
1053	20 BUDGEREE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	23	4	25	18	21	
1054	1 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	28	9	29	23	26	
1055	10/17-19 METELLA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	21	2	22	16	19	
1056	9/45-47 CORNELIA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	24	5	25	18	22	
1057	#N/A	RES	60	55	50	45	55	65	27	8	29	22	25	
1058	14 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	27	8	28	22	25	
1059	4/46 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	20	23	
1060	40 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	27	20	23	
1061	2/225 TARGO RD, GIRRAWEEEN NSW 2145	RES	60	55	50	45	55	65	24	5	25	19	22	
1062	10A OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	42	24	44	37	41	
1063	1/2-4 OCTAVIA ST, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	19	23	
1064	5/46 TOONGABBIE RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	25	6	26	19	23	
1065	9/45-47 CORNELIA RD, TOONGABBIE NSW 2146	RES	60	55	50	45	55	65	21	2	22	15	19	