



STATE ROAD TRAFFIC NOISE ASSESSMENT
PROPOSED RECONFIGURATION OF A LOT
57-65 COACH ROAD
MORAYFIELD

Prepared for:
Odds Lots Morayfield Pty Ltd

Prepared by:
MWA Environmental

16 December 2021

Max Winders & Associates Pty Ltd tas MWA Environmental
Level 15, 241 Adelaide St, Brisbane GPO BOX 3137, Brisbane Qld 4001
P 07 3002 5500 F 07 3002 5588 E mail@mwaenviro.com.au
W www.mwaenviro.com.au
ABN 94 010 833 084

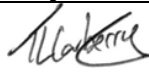
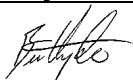
DOCUMENT CONTROL SHEET

MWA Environmental		Job Name:	Morayfield
Level 15 241 Adelaide Street GPO Box 3137 Brisbane 4001		Job No:	21-171
Telephone:	07 3002 5500	Original Date of Issue:	16 December 2021
Facsimile:	07 3002 5588		
Email:	mail@mwaenviro.com.au		

DOCUMENT DETAILS

Title:	State Road Traffic Noise Assessment – Proposed Reconfiguration of a Lot – 57-65 Coach Road, Morayfield
Principal Author:	Mr Travis Carberry
Client:	Odd Lots Morayfield Pty Ltd
Client Contact:	Mr Bill Lambert

REVISION/CHECKING HISTORY

Version Number	Date	Issued By		Checked By	
1 Report	16.12.21	TC		BH	
2					
3					
4					
5					
6					
7					
8					

DISTRIBUTION RECORD

Destination	Version Number								
	1	2	3	4	5	6	7	8	9
1. Client (electronic)	1								
2. Land Partners (electronic)	1								
File Copy	1								
MWA Library									

CONTENTS	PAGE
1.0 INTRODUCTION.....	1
1.1 STUDY BRIEF	1
1.2 SITE DESCRIPTION	1
1.3 PROPOSED DEVELOPMENT	1
2.0 EXISTING NOISE ENVIRONMENT.....	2
2.1 EXISTING NOISE LEVELS	2
3.0 RELEVANT NOISE CRITERIA.....	3
3.1 STATE CODE 1 NOISE ASSESSMENT CRITERIA.....	3
3.2 QUEENSLAND DEVELOPMENT CODE – MP4.4 BUILDINGS IN A TRANSPORT NOISE CORRIDOR.....	4
4.0 ROAD TRAFFIC NOISE IMPACT ASSESSMENT.....	5
4.1 TRAFFIC NOISE MODEL.....	5
4.2 TRAFFIC NOISE MODEL VALIDATION.....	6
4.3 TRAFFIC NOISE MODELLING RESULTS.....	7
4.4 PREDICTED QDC MP4.4 NOISE CATEGORIES	8
5.0 CONCLUSION	9

FIGURES

ATTACHMENTS

1.0 INTRODUCTION

1.1 STUDY BRIEF

MWA Environmental has been engaged to undertake a Road Traffic Noise Assessment to for the proposed reconfiguration of a lot development at 57-65 Coach Road, Morayfield.

The assessment addresses the traffic noise impact of the Bruce Highway on the proposed development against the relevant State Code 1 noise criteria.

1.2 SITE DESCRIPTION

The subject site is located at 57-65 Coach Road and has a real property description of Lots 8 and 9 on RP87981.

The Bruce Highway (state-controlled roadway) is located at least 80 metres to the east of the subject site.

The Bruce Highway is in cut past the subject site and there is an existing acoustic fence, generally 3 metres high, along the edge of the Highway road reserve. These topographical and structural features provide acoustic shielding at the subject site.

The site location and aerial photograph showing the location and extent of the subject site is shown on **Figure 1**.

1.3 PROPOSED DEVELOPMENT

The proposed development is for a reconfiguration of a lot development to provide 66 residential allotments over the subject site.

The proposed development plan is included as **Attachment 1**.

The road traffic noise modelling presented in this report has been based upon proposed residential allotment pad levels as per the Lambert & Rehbein drawing included in **Attachment 2**. If the civil earthworks design changes such that relevant residential pad levels change then an updated road traffic noise assessment report will be prepared.

2.0 EXISTING NOISE ENVIRONMENT

2.1 EXISTING NOISE LEVELS

Noise datalogging was conducted from 15 to 23 November 2021 at the eastern part of the subject site at a location as shown on **Figure 2**. The monitoring location was selected as representative of the nearest proposed residential allotments to the Bruce Highway. The monitoring location was 'free-field' i.e. not affected by façade reflections from nearby structures.

The noise datalogger used was a Norsonic Nor139 with NATA calibration, programmed to provide statistical analysis results. The datalogger was pre-calibrated to 94 dB at 1kHz using a Bruel & Kjaer Sound Level Calibrator, Type 4231, and displayed a deviation of less than ± 0.5 dB from this level at post-calibration.

The recorded noise levels are presented as statistical components, which are described as:

- L₁₀: Noise level exceeded for 10 percent of the measurement period, referred to as the averaged maximum sound pressure level.
- L₉₀: Noise level exceeded for 90 percent of the measurement period. AS1055.1–1997¹ notes that the L₉₀ is described as the background sound pressure level.

Key statistical noise levels recorded at the noise datalogger are summarised in **Table 1** below. Rain affected monitoring results from 18 and 22 November 2021 have not been included in the summary table.

Table 1: Recorded Range of Statistical Noise Levels – dB(A)

DAY	DATE	RECORDED AVERAGE NOISE LEVELS - dB(A)		
		L10(18 hour)	L90(18 hour)	L90(8 hour)
Tuesday	16 November 2021	57.1	52.2	44.9
Wednesday	17 November 2021	58.7	53.4	41.5
Thursday	18 November 2021	-	-	
Friday	19 November 2021	56.5	51.7	42.5
Monday	22 November 2021	-	-	-
WEEKDAY AVERAGE		57.4	52.4	42.9

The complete results from the noise dataloggers are presented as traces of noise level versus time for the statistical noise level descriptors L₁₀ and L₉₀ as **Attachment 3**.

¹ Australian Standard AS 1055.1-1997 Acoustics – Description and measurement of environmental noise, Part 1: General procedures

3.0 RELEVANT NOISE CRITERIA

3.1 STATE CODE 1 NOISE ASSESSMENT CRITERIA

The relevant criteria for the assessment of noise impacts from the Bruce Highway are outlined in *SDAP State Code 1: Development in a state-controlled road environment*, Table 1.2.2, as follows:

Performance outcomes	Acceptable outcomes
Noise	
Accommodation activities	
<p>PO23 Development involving an accommodation activity or land for a future accommodation activity minimises noise intrusion from a state-controlled road or type 1 multi-modal corridor in habitable rooms.</p>	<p>AO23.1 A noise barrier or earth mound is provided which is designed, sited and constructed:</p> <ol style="list-style-type: none"> to meet the following external noise criteria at all facades of the building envelope: <ol style="list-style-type: none"> ≤60 dB(A) L₁₀ (18 hour) façade corrected (measured L₉₀ (8 hour) free field between 10pm and 6am ≤40 dB(A)) ≤63 dB(A) L₁₀ (18 hour) façade corrected (measured L₉₀ (8 hour) free field between 10pm and 6am >40 dB(A)) in accordance with chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013. <p>Note: To demonstrate compliance with the acceptable outcome, it is recommended that a RPEQ certified noise assessment report is provided, prepared in accordance with the SDAP Supporting Information: Environmental emissions in a state-controlled road environment, Department of Transport and Main Roads, 2017.</p> <p>If the building envelope is unknown, the deemed-to-comply setback distances for buildings stipulated by the local planning instrument or relevant building regulations should be used.</p>
<p>PO24 Development involving an accommodation activity or land for a future accommodation activity minimises noise intrusion from a state-controlled road or type 1 multi-modal corridor in outdoor spaces for passive recreation.</p>	<p>AO24.1 A noise barrier or earth mound is provided which is designed, sited and constructed:</p> <ol style="list-style-type: none"> to meet the following external noise criteria in outdoor spaces for passive recreation: <ol style="list-style-type: none"> ≤57 dB(A) L₁₀ (18 hour) free field (measured L₉₀ (18 hour) free field between 6am and 12 midnight ≤45 dB(A)) ≤60 dB(A) L₁₀ (18 hour) free field (measured L₉₀ (18 hour) free field between 6am and 12 midnight >45 dB(A)) in accordance with chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice – Volume 1 Road

The site noise monitoring conducted by MWA Environmental demonstrates that the L₉₀ (8 hour) noise levels are >40dB(A) and the L₉₀ (18 hour) are >45dB(A). On this basis, the relevant road traffic noise criteria are:

- **63 dB(A) L₁₀ (18 hour) façade corrected external to a dwelling façade, as per AO23.1; and**
- **60 dB(A) L₁₀ (18 hour) free-field at outdoor spaces for passive recreation, as per AO24.1.**

3.2 QUEENSLAND DEVELOPMENT CODE – MP4.4 BUILDINGS IN A TRANSPORT NOISE CORRIDOR

Since implementation in August 2010, assessment of internal road traffic noise amenity (i.e. within habitable rooms) for dwellings adjacent to state-controlled roads is regulated by the Queensland Development Code (QDC) MP4.4 *Buildings in a Transport Noise Corridor* (“**QDC MP4.4**”).

It is noted that the State Planning Policy (SPP) Interactive mapping indicates that land within 250 metres of the current Bruce Highway carriageway adjacent to the site has been designated as being within a transport noise corridor. The extent of the gazetted transport noise corridor and the default noise categories are shown on **Figure 3**. Any allotment building envelopes within the transport noise corridor trigger acoustic treatment of dwellings in accordance with QDC MP4.4.

When building a dwelling on an allotment within a gazetted transport noise corridor there is the option to either accept the default mapped QDC MP4.4 noise category or to undertake a ‘site-specific assessment’ to consider the shielding effect of intervening terrain, the dwelling structure etc. Traffic noise modelling may be applied to provide a ‘site-specific assessment’ of noise categories.

This report provides an assessment of which QDC MP4.4 noise categories are appropriate for proposed allotments within the transport noise corridor extent (i.e. within 250 metres). The criteria for determining the relevant noise category are presented in **Table 2** below.

Table 2: QDC MP4.4 Noise Categories

NOISE CATEGORY	LEVEL OF TRANSPORT NOISE (L_{A10} , 18hr) FOR STATE-CONTROLLED ROADS AND DESIGNATED LOCAL GOVERNMENT ROADS
Category 4	≥ 73 dB(A)
Category 3	68 - 72 dB(A)
Category 2	63 – 67 dB(A)
Category 1	58 - 62 dB(A)
Category 0	≤ 57 dB(A)

4.0 ROAD TRAFFIC NOISE IMPACT ASSESSMENT

4.1 TRAFFIC NOISE MODEL

The Bruce Highway to the east of the subject site is a three lane in each direction divided carriageway. The adjacent road level is noted to be below the site level with an existing 3.0 metre high acoustic barrier located at the top of an embankment approximately above road level. The existing terrain (including the embankment) and the existing acoustic barrier have been represented in the SoundPLAN model. The existing dwelling structures along the Highway frontage have been represented in the SoundPLAN model.

A year 2021 traffic volume count for the Bruce Highway past the site (Traffic count site 20797 (10A - 800m South of Buchanan Road)) has been obtained from TMR. The obtained traffic count was from 1 March to 27 June 2021 and is considered suitable for use to validate against the recorded November 2021 traffic noise levels and also for use to estimate future traffic volumes past the site. The 2021 weekday traffic volume counts were 113,984 vehicles per day and 104,486 vehicles per 18 hour (6am to 12midnight).

A year 2019 Annual Volume Report for the Bruce Highway past the site (Traffic count site 20797 (10A - 800m South of Buchanan Road)) was obtained from the Queensland Government traffic census for the Queensland state-declared road network for the purpose of obtaining commercial vehicle percentage. A commercial vehicle percentage of 11.2% was obtained from the 2019 Annual Volume Report.

In order to estimate future traffic volumes, as a conservative approach, the 2021 traffic volume data was extrapolated at a 3% per annum growth rate to the Year 2033 ten year design horizon with reference to historical growth rates.

The relevant traffic volumes for the Bruce Highway past the site are summarised in **Table 3**.

Table 3: Existing and Design Horizon Traffic Volumes Used for Assessment

ROADWAY	EXISTING AND ULTIMATE TRAFFIC				POSTED SPEED LIMIT	CV%
	Weekday AADT 2021	Year 2021 18 Hour Volume	Weekday AADT 2033	Year 2033 18 Hour Volume		
Bruce Highway	113,984	104,486	162,514	148,972	100	11.2

Adjustment of CoRTN predictions has been made for Australian roads as per the Department of Transport and Main Roads - Code of Practice guidance. Corrections of -0.7 dB for free-field predictions and -1.7 dB for façade adjusted predictions have been applied.

A road surface correction of -2 dB(A) has been applied based upon visual inspection of the Bruce Highway surface being an open graded asphalt.

4.2 TRAFFIC NOISE MODEL VALIDATION

The first step in the predictive traffic noise modelling process is to validate the model to the recorded noise levels, i.e. the aim being to predict to within ± 2 dB of the recorded level, with selected parameters used in the future traffic (ten year horizon) noise modelling scenarios.

The model used in the traffic noise modelling process was SoundPLAN 8.2. The CoRTN methodology for traffic noise prediction has been applied and is accepted by regulatory bodies in Queensland.

The average weekday free-field $L_{10(18 \text{ hour})}$ noise level measured at the noise monitoring location was 57.4 dB(A). The model prediction for this monitoring location was an $L_{10(18 \text{ hour})}$ of 58.9 dB(A) (59.6 dB(A) – 0.7 dB(A) correction). The validation prediction is within the acceptable ± 2 dB validation range and is considered conservative and acceptable for future traffic noise modelling scenarios.

The SoundPLAN validation model layout and results are provided in **Attachment 4**.

4.3 TRAFFIC NOISE MODELLING RESULTS

10-year design horizon (nominally Year 2033) traffic noise predictions have been made across the subject land without any acoustic barrier structures to the boundary of the subject land. The modelling has considered the proposed residential allotment pad levels as per the Lambert & Rehbein drawing included in **Attachment 2**.

The SoundPLAN model was used to calculate design horizon traffic noise levels across the subject land for the following specific parameters as per the *Transport Noise Management Code of Practice* (November 2013) for assessment against the relevant State Code 1 noise criteria:

External Facades

- L₁₀ (18 hour) façade reflection adjusted for Ground Level (+1.8m) height
- L₁₀ (18 hour) façade reflection adjusted for Upper Level (+4.6m) height

Private Open Space

- L₁₀ (18 hour) free-field for Ground Level (+1.5m) height

Preliminary noise modelling determined that acoustic barriers are required to achieve compliance with the noise criteria for single storey dwellings and the outdoor recreation space criteria for the eastern most proposed residential allotments.

As such, traffic noise mitigation measures are required to achieve the noise criteria. Through an iterative noise modelling process, it has been determined that the following acoustic barrier structure is required to comply with the relevant traffic noise criteria:

- **2.4 metre high (above lot pad levels) acoustic barrier** located along the northern part of the eastern site boundary with a **2.0 metre high (above lot pad levels) return** along part of the northern site boundary, as shown on **Figure 4**.

The modelled acoustic barrier coordinates and top of barrier reduced levels (RLs) based on recommended acoustic barrier heights are supplied in **Attachment 5** and are graphically displayed on **Figure 5**.

It is recommended that the acoustic barrier design be reviewed at the operational works stage to ensure that barrier heights are set appropriately based on the final civil earthworks design.

The acoustic barrier should be constructed in accordance with the requirements of the *Main Roads Technical Standard MRTS15 – Noise Fences* and *Main Roads Specification MRS15 – Noise Fences*.

The results of the Year 2033 traffic noise modelling with the proposed acoustic barrier structures are presented in **Attachment 6** and demonstrate that:

- The 63 dB(A) L_{10} (18 hour) façade corrected criterion will be satisfied external to future single storey house facades on all residential allotments; and
- The 60 dB(A) L_{10} (18 hour) free-field criterion will be satisfied for private open space on all proposed residential allotments.

On this basis, all proposed residential allotments will achieve the relevant traffic noise criteria with the recommended acoustic barrier structures shown on **Figure 4**.

4.4 PREDICTED QDC MP4.4 NOISE CATEGORIES

Site-specific road traffic noise modelling including the shielding effect of the proposed acoustic barrier was carried out to determine the appropriate QDC MP4.4 'noise categories' for the proposed residential allotments within the currently designated transport noise corridor under ten year design horizon traffic conditions.

The SoundPLAN model predictions are presented in **Attachment 7** as plots of predicted Year 2033 L_{10} (18 hour) traffic noise levels (including +2.5dB façade reflection) and QDC MP4.4 Noise Categories with the proposed acoustic barrier for ground level and upper level dwelling façade receptors.

The site-specific assessment relates to QDC MP4.4 Noise Category 1 for single storey houses and Noise Categories 1 and 2 for the upper level facades of any highest houses within the currently designated transport noise corridor.

5.0 CONCLUSION

MWA Environmental has been engaged to undertake a Road Traffic Noise Assessment to for the proposed reconfiguration of a lot development at 57-65 Coach Road, Morayfield.

The assessment determines the noise attenuation measures required to achieve the relevant State Code 1 noise criteria based upon ten year design horizon traffic on the Bruce Highway, which is a state-controlled road. The state planning policy mapping indicates a designated transport noise corridor associated with the Bruce Highway affecting part of the subject land.

It has been determined that the following acoustic barrier is required to achieve compliance with the external façade noise criteria and the outdoor recreation space criteria:

- **2.4 metre high (above lot pad levels) acoustic barrier** located along the northern part of the eastern site boundary with a **2.0 metre high (above lot pad levels) return** along part of the northern site boundary, as shown on **Figure 4**.

The top of barrier reduced levels (RLs) as represented in the noise modelling are presented in **Attachment 5** and are shown graphically on **Figure 5**.

The acoustic barrier should be constructed in accordance with the requirements of the Main Roads Technical Standard MRTS15 – Noise Fences and achieve the minimum heights and top RLs specified in **Attachment 5**.

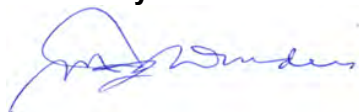
With the proposed acoustic barrier, the traffic noise modelling indicates that:

- The 63 dB(A) L_{10} (18 hour) façade corrected criterion will be satisfied external to future single-storey house facades on all residential allotments; and,
- The 60 dB(A) L_{10} (18 hour) free-field criterion will be satisfied for private open space on the proposed residential allotments.

The road traffic noise modelling has been applied to determine site-specific Queensland Development Code MP4.4 'noise categories' over the proposed development with the proposed acoustic barrier (refer **Attachment 7**).

MWA Environmental
16 December 2021

Verified by:



M.F. Winders - RPEQ 642

FIGURES

LEGEND
 — SITE LOCATION
 — DRAWING REFERENCE
 © THE STATE OF QUEENSLAND
 DNR&E QLDGLOBE



CLIENT
 ODD LOTS MORAYFIELD PTY LTD

PROJECT
 STATE ROAD TRAFFIC
 NOISE ASSESSMENT
 PROPOSED RECONFIGURATION
 OF A LOT
 57-65 COACH ROAD
 MORAYFIELD QLD

TITLE
 SITE LOCATION
 AND SURROUNDING
 LAND USES

JOB	MORAYFIELD	FIGURE 1
JOB NO	21-171	DWG NUMBER
DATE	16/12/21	SCALE
REV.	1	21-171-1



Mwa, Winters & Associates Pty Ltd has MWA Environmental
 Level 15, 241 Adelaide St Brisbane, QLD 4001
 P 07 3002 5500 F 07 3002 5588 E mail@mwaenviro.com.au
 www.mwaenviro.com.au
 ABN 94 01033 034



LEGEND

- SITE LOCATION
- NOISE DATALOGGER LOCATION

DRAWING REFERENCE
© THE STATE OF QUEENSLAND
DNR&E QLD GLOBE.



CLIENT
ODD LOTS MORAYFIELD PTY LTD

PROJECT
**STATE ROAD TRAFFIC
NOISE ASSESSMENT
PROPOSED RECONFIGURATION
OF A LOT
57-65 COACH ROAD
MORAYFIELD QLD**

TITLE
**NOISE MONITORING
LOCATION**

JOB	MORAYFIELD	FIGURE 2
JOB NO	21-171	DWG NUMBER
DATE	16/12/21	SCALE
REV.	21-171-2	



Mrs. Widdas & Associates Pty Ltd has MWA Environmental
Level 15, 241 Adelaide St Brisbane, QLD 4001
P 07 3002 5500 F 07 3002 5588 E mail@mwaenviro.com.au
www.mwaenviro.com.au
ABN 94 01033 084



LEGEND

SITE LOCATION

TRANSPORT NOISE CORRIDOR
STATE CONTROLLED ROAD
(MANDATORY AREA)

Category 0 Noise Level < 58 dB(A)	Category 1 59 dB(A) =< Noise Level < 63 dB(A)	Category 2 63 dB(A) =< Noise Level < 68 dB(A)	Category 3 68 dB(A) =< Noise Level < 73 dB(A)	Category 4 Noise Level >= 73 dB(A)
--------------------------------------	--	--	--	---------------------------------------

DRAWING REFERENCE
 © THE STATE OF QUEENSLAND,
 DSDMP, SPP INTERACTIVE MAPPING
 TRANSPORT NOISE CORRIDOR,
 MANDATORY.



CLIENT
ODD LOTS MORAYFIELD PTY LTD

PROJECT
STATE ROAD TRAFFIC
NOISE ASSESSMENT
PROPOSED RECONFIGURATION
OF A LOT
57-65 COACH ROAD
MORAYFIELD QLD

TITLE
SPP TRANSPORT
NOISE CORRIDOR

JOB	MORAYFIELD	FIGURE 3
JOB NO	21-171	DWG NUMBER
DATE	16/12/21	SCALE
REV.	21-171-3	



MWA
 MWA, Winkler & Associates Pty Ltd has MWA Environmental
 Level 15, 241 Adelaide St Brisbane, QLD 4001
 P 07 3002 5500 F 07 3002 5588 E mail@mwaenviro.com.au
 W www.mwaenviro.com.au
 ABN 94 01033 084



Includes material © State of Queensland (Department of Resources)

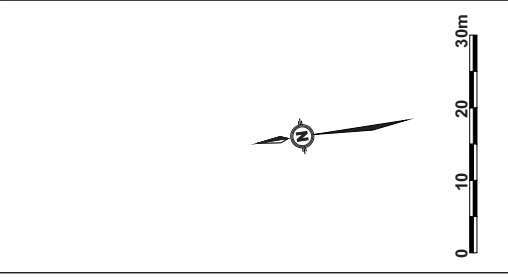
Approved Subject to Conditions of Development Permit DA/2021/5255



17/05/2022

LEGEND
 BARRIER HEIGHT ABOVE PROPERTY BOUNDARY RL
 ACUSTIC BARRIER
 2.4m
 TOP OF BARRIER RL
 BARRIER NODE LOCATION
 BARRIER NODE ID
 21.9
 7

DRAWING REFERENCE
 LANDPARTNERS, PROPOSED RECONFIGURATION OF LOTS 8 ON RP87981 (57-65 COACH ROAD, MORAYFIELD)
 REF BRSS8061-000-11-1.



CLIENT
 ODD LOTS MORAYFIELD PTY LTD

PROJECT
 STATE ROAD TRAFFIC NOISE ASSESSMENT PROPOSED RECONFIGURATION OF A LOT 57-65 COACH ROAD MORAYFIELD QLD

TITLE
 ACUSTIC BARRIER DETAILS

JOB MORAYFIELD
FIGURE 5

JOB NO 21-171
DWG NUMBER 16/12/21
DATE 16/12/21
SCALE 1:1000 (A4)
REV. 21-171-5

MWA
 Wides & Associates Pty Ltd
 Level 15, 241 Adelaide St Brisbane, QLD 4001
 P 07 3002 5500 F 07 3002 5588 E mail@mwaenviro.com.au
 www.mwaenviro.com.au
 ABN 94 010333 084

