

APPENDIX 8. INVESTIGATIONS – ENVIRONMENTAL NOISE ASSESSMENT

550-560 Main North Road

Acoustic Assessment

Planning and Design Code Amendment

S7037C3

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Acoustic Assessment – Planning and Design Code Amendment

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1. INTRODUCTION

A Planning and Design Code Amendment (**Code Amendment**) is being considered for 550-560 Main North Road, Evanston (**the Affected Area**). The proposed amendment seeks to rezone land within the Affected Area to an *Employment Zone*. A concept plan for the Affected Area has been prepared in support of the Code Amendment, and is provided in Appendix A.

The Affected Area is currently within a *General Neighbourhood Zone* in accordance with the Planning and Design Code (**the Code**). The Affected Area and the current zoning within the locality are shown in Figure 1 below.

Figure 1: Affected Area and surrounding locality.



This assessment considers the environmental noise impacts associated with the proposed Code Amendment.

The assessment determines the suitability of the noise criteria that will result from the Code Amendment, and also considers the likely acoustic treatment measures that would be required based on the understanding that the most intensive form of development likely to occur on a land parcel of this size and configuration in an *Employment Zone* is a bulky goods retail complex (including a large bulky goods outlet as an anchor tenant complemented by a number of smaller tenancies).

2. CRITERIA

The proposed Code Amendment will result in the Affected Area being changed from a *General Neighbourhood Zone* to an *Employment Zone* in accordance with the Code. The closest noise sensitive locations to the Affected Area comprise residences to the north, east and south which will remain within the *General Neighbourhood Zone*.

Planning and Design Code

The Planning and Design Code has been reviewed, and the following provisions apply to environmental noise.

Part 4 - General Development Policies

Interface between Land Uses

Assessment Provisions (AP)

Desired Outcome (DO)

DO 1: *Development is located and designed to mitigate adverse effects on or from neighbouring and proximate land uses.*

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
General Land Use Compatibility	
<p><i>PO 1.2 Development adjacent to a site containing a sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers is designed to minimise adverse impacts.</i></p>	<p><i>DTS/DPF 1.2 None are applicable.</i></p>
Activities Generating Noise or Vibration	
<p><i>PO 4.1 Development that emits noise (other than music) does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers).</i></p>	<p><i>DTS/DPF 4.1 Noise that affects sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria.</i></p>

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
<p><i>PO 4.2</i> <i>Areas for the on-site manoeuvring of service and delivery vehicles, plant and equipment, outdoor work spaces (and the like) are designed and sited to not unreasonably impact the amenity of adjacent sensitive receivers (or lawfully approved sensitive receivers) and zones primarily intended to accommodate sensitive receivers due to noise and vibration by adopting techniques including:</i></p> <ol style="list-style-type: none"> <i>1. locating openings of buildings and associated services away from the interface with the adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers</i> <i>2. when sited outdoors, locating such areas as far as practicable from adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers</i> <i>3. housing plant and equipment within an enclosed structure or acoustic enclosure</i> <i>4. providing a suitable acoustic barrier between the plant and / or equipment and the adjacent sensitive receiver boundary or zone.</i> 	<p><i>DTS/DPF 4.2</i> <i>None are applicable.</i></p>

Environment Protection (Noise) Policy 2007

The *Activities Generating Noise or Vibration* PO 4.1 references the *Environment Protection (Noise) Policy 2007 (the Policy)*. The Policy provides goal noise levels to be achieved by noise from a site at nearby noise sensitive receivers (residences).

The goal noise levels are based on the principally promoted land uses of the zones in which the subject site and the noise sensitive receivers are located.

Goal Noise Levels Resulting from the Planning and Design Code Amendment

The proposed amendment will require that any *new development* within the Affected Area achieve the following allowable external (outdoor) goal noise levels at receivers within the *General Neighbourhood Zone*:

- an average (L_{eq}) noise level of 51 dB(A) during the daytime (7am to 10pm);
- an average (L_{eq}) noise level of 44 dB(A) at night (10pm to 7am); and,
- a maximum (L_{max}) noise level of 60 dB(A) at night (10pm to 7am).

When measuring or predicting noise levels for comparison with the Policy, adjustments may be made to the average goal noise levels for each “annoying” characteristic of tonality, impulsiveness, low frequency, and modulation of the noise source. The characteristic must be dominant in the existing acoustic environment and therefore the application of a penalty varies depending on the assessment location, time of day, the noise source being assessed, and the predicted noise level.

Noise from bulky good outlets at a minimum would usually comprise a modulating character associated with vehicle movements, deliveries and other activities within loading dock areas; a 5dB(A) adjustment would typically apply to these activities (where they are the dominant noise source) and would need to be considered based on the particular circumstances of any future development considered for the site (along with any further potential adjustments for other annoying characteristics).

Suitability of the Goal Noise Levels

To assess the suitability of the goal noise levels reference is made to the *World Health Organisation Guidelines (the WHO Guidelines)* to prevent annoyance, sleep disturbance and unreasonable interference on the amenity of an area.

The WHO Guidelines provide the following recommendations for external (outdoor) noise:

- an average (L_{eq}) noise level of 50-55 dB(A) to protect against annoyance in an outdoor areas during the day;
- an average (L_{eq}) noise level of 45 dB(A) to protect against sleep disturbance at night; and,
- a maximum (L_{max}) noise level of 60 dB(A) to protect against sleep disturbance at night.

It is also noted that a comparable *Employment Zone* already exists in the vicinity of the Affected Area approximately 600 metres to the south. Consistent with the Affected Area, this *Employment Zone* also shares substantial interfaces with the *General Neighbourhood Zone*. The allowable noise levels that would result from the proposed Code Amendment are consistent with those that already apply to development within the existing *Employment Zone* when assessed at noise sensitive receivers within the *General Neighbourhood Zone*.

Based on the above, the Policy external (outdoor) goal noise levels that apply in the *General Neighbourhood Zone* will satisfy the noise level recommendations of the WHO Guidelines, and achieve a comparable level of amenity to existing residences within the *General Neighbourhood Zone* in the vicinity of the nearby existing *Employment Zone*.

3. ASSESSMENT

For a development within the Affected Area, the most important noise sensitive receivers (residences) from an acoustic perspective will be those located within the *General Neighbourhood Zone* to the south and east of the subject site, and to a lesser extent those opposite the site across Sherriff Street to the north.

Likely Acoustic Treatment Measures

Although the final proposed use of the site is not yet confirmed, an indicative assessment has been based on the proposed concept plan that has been prepared for the site, and is provided in Appendix A.

The indicative assessment considers noise associated with a bulky goods retail complex comprising a large bulky goods retail outlet and a number of smaller tenancies. It is expected that such a complex is representative of the most intensive land use likely to be able to be accommodated on the site and as such the assessment is conservative.

The assessment has considered the following level of activity (representative of a bulky goods retail complex) within a 15-minute period¹:

- Continuous operation of air conditioning plant associated with the large bulky goods tenancy and smaller retail tenancies;
- Activity associated with a single delivery to the large bulky goods retail tenancy within a dedicated loading area;
- A single delivery vehicle arriving or departing the loading area associated with the large bulky goods tenancy;
- A single delivery to loading areas associated with the smaller retail tenancies;
- Activity associated with a vehicle movement into or out of a representative number of car parking bays (100 bays);
- A representative number of light passenger vehicle movements through the car parking area (100 vehicle movements).

The sound power levels associated with each of the above noise sources are provided in Appendix B.

Based on the above noise sources and the assumed representative level of activity, the following indicative practical acoustic treatment measures are likely to be required to achieve the Policy goal noise levels following the Code amendment:

¹ Default assessment period of the Policy

- Boundary fencing to a height of 4.5 metres in the vicinity of any loading areas adjacent to the southern and eastern site boundaries. The fencing would likely need to be constructed from minimum 6mm thick fibre cement sheeting or an alternative material with the same or greater surface density (in kg/m²).
- Acoustic absorption material, with a *Noise Reduction Coefficient (NRC)* of at least 0.8 installed to the full practical extent of the 4.5 metre high fencing in the vicinity of loading areas adjacent to the southern and eastern boundaries (facing the loading areas). An example of a suitable acoustic absorption material comprises minimum 50mm thick 32kg/m³ insulation installed behind a perforated sheet metal facing with an open area of at least 15%.
- Boundary fencing to a height of up to 3.5 metres to the balance of the southern and eastern site boundaries. The fencing should be constructed from minimum 0.48mm *base metal thickness (BMT)* profiled sheet steel ('Colorbond' or similar) or an alternative material with the same or greater surface density (in kg/m²).
- Boundary fencing to a height of 2.4 metres along the northern site boundary. The fencing should be constructed from minimum 0.48mm *base metal thickness (BMT)* profiled sheet steel ('Colorbond' or similar) or an alternative material with the same or greater surface density (in kg/m²).
- Restricting deliveries to the hours of 7:00am to 10:00pm;
- Ensuring that only electric forklifts are used within loading areas;
- Ensuring that forklifts or other mobile plant/equipment used on the site are fitted with broadband reversing alarms;
- Ensuring that delivery vehicles do not idle while being loaded or unloaded;
- Restricting rubbish collection to the least sensitive period of the day.

With practical acoustic treatments in place, consistent with the indicative treatments described above, noise from a bulky goods retail complex constructed on the site would readily be able to achieve the Policy goal noise levels at all nearby residences within the *General Neighbourhood Zone*.

As noted above, the treatments are based on an indicative assessment which considers a bulky goods retail complex (representative of the most intensive land use likely to be able to be accommodated on the site). As such, the final treatment measures required for a specific development will vary based on the proposed activity and location on the subject land.

The above measures are consistent with those which would be required for similar development within the existing *Employment Zone*, and will result in a comparable level of amenity at nearby residences.

4. SUMMARY

An assessment has been made to consider the environmental noise criteria that would result from the proposed Planning and Design Code Amendment (**Code Amendment**) being considered for 550-560 Main North Road, Evanston (**the Affected Area**).

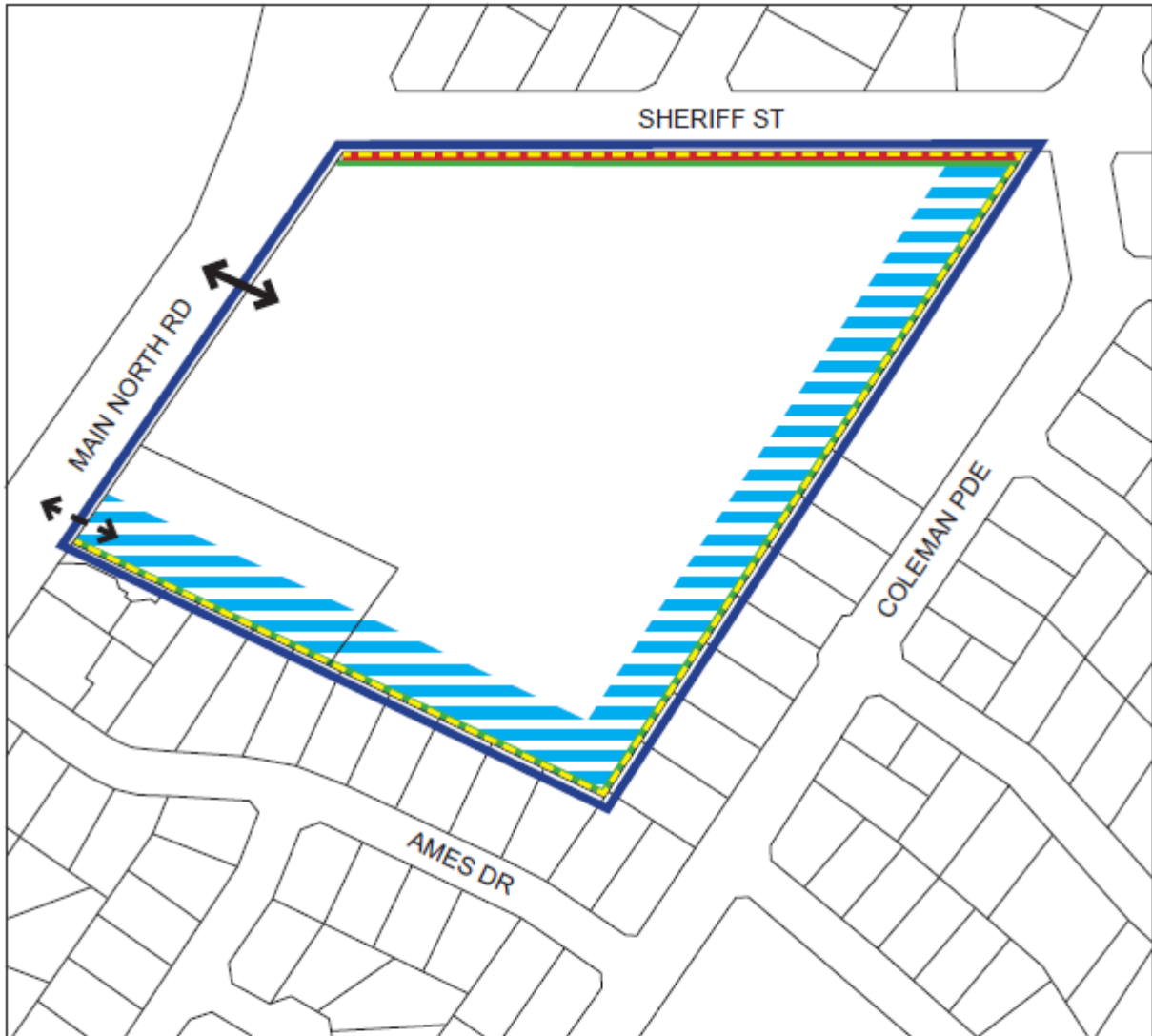
The goal noise levels which would apply to development within the Affected Area following the Code Amendment have been determined in accordance with the *Environment Protection (Noise) Policy 2007* and are summarised in Section 2 of this report.








The proposed amendment to rezone the Affected Area to an *Employment Zone* will result in noise criteria consistent with the recommendations of the *World Health Organisation Guidelines*. Compliance with these levels will prevent annoyance, sleep disturbance and unreasonable interference on the amenity of an area. The resulting goal noise levels are also consistent with those that already apply within a nearby area of the *General Neighbourhood Zone* for development within the *Employment Zone* approximately 600 metres to the south of the Affected Area.

An indicative acoustic assessment has been conducted, which considers noise associated with a bulky goods retail complex (expected to be representative of the most intensive land use likely to be able to be accommodated on the site). The assessment provides indicative practical acoustic treatments which could be applied to such a development on the site to achieve compliance with the goal noise levels which would apply under the Policy following the Code Amendment (described in Section 3 of this report). The treatments are consistent with those which would apply to a similar development in other areas of the *Employment Zone*, and will result in a comparable level of amenity at nearby residences.

Based on the above, the existing *General Development Policies (Interface between Land Uses)* provide a suitable level of acoustic amenity at residences, and will result in the incorporation of practical acoustic treatment measures which are typical for similar developments located adjacent to residences.

APPENDIX A – Proposed Concept Plan



-  Concept Plan Boundary
-  No vehicle access
-  Landscaping (minimum depth of 1.5 metres)
-  Acoustic barrier (on boundary)
-  Building Exclusion Area (9 metres from boundary)
-  Primary vehicle access
-  Secondary vehicle access



Concept Plan #
MAIN NORTH ROAD

APPENDIX B – Noise Sources and Sound Power Levels

	Equipment/Activity	Sound Power Level
Car Park Activity	General activity	83 dB(A)
	Moving car	82 dB(A)
Mechanical Plant	Commercial Evaporative Cooler	82 dB(A)
Delivery Activity	Forklift	98 dB(A)
	Electric Forklift	84 dB(A)
	Moving truck	101 dB(A)
	Truck Idling	97 dB(A)