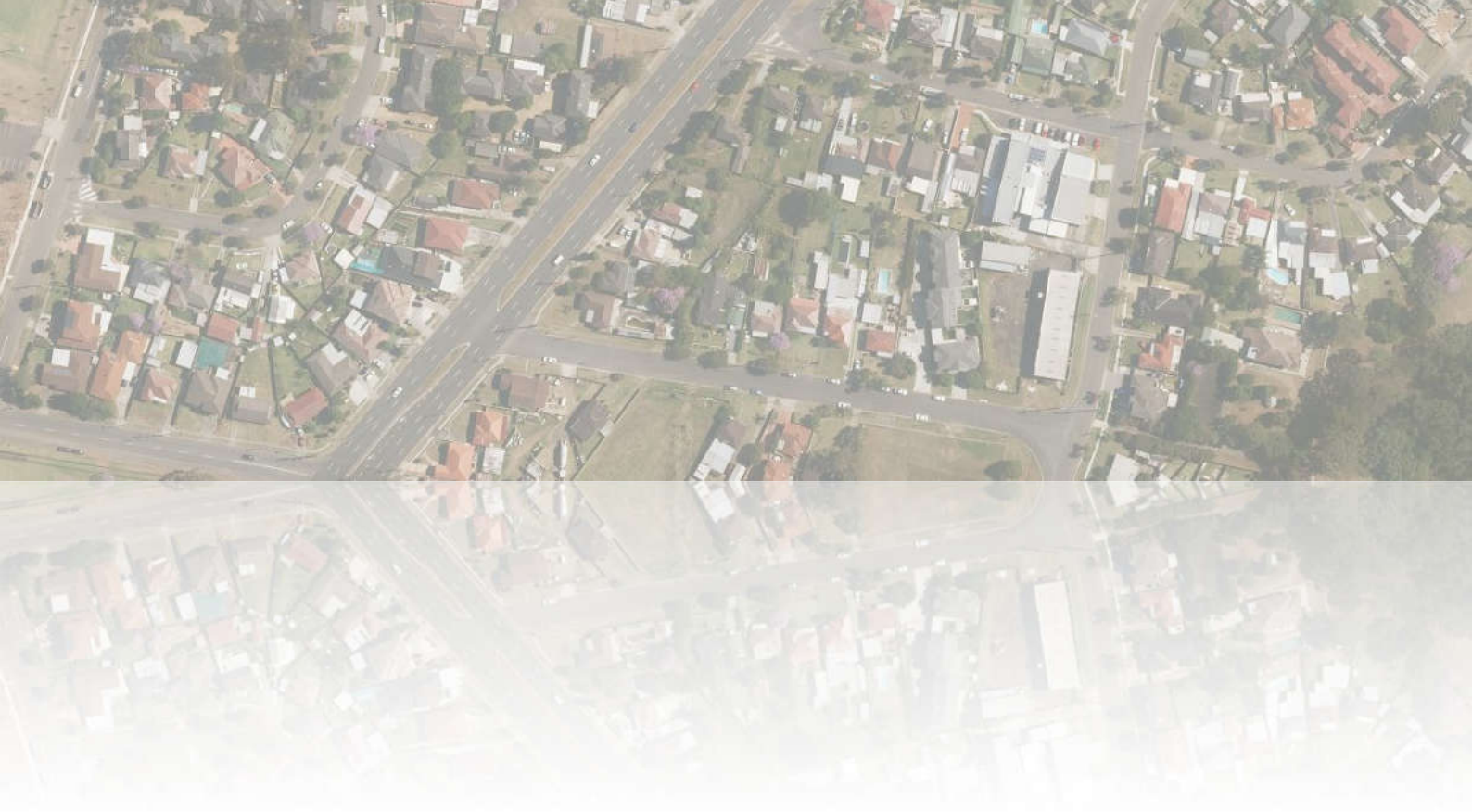


LAND USE DEVELOPMENT ROAD SAFETY AUDIT (THEMATIC)
OF

PROPOSED RESIDENTIAL AGED CARE FACILITY

AT 11-15 LANG ROAD, 76-80 MARSH PARADE, 536-542 HUME HIGHWAY, CASULA

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: +61 2 8355 2440
Fax: +61 2 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

18142.02FA - 24th July 2018

Development Type: **Proposed Residential Aged Care Facility**

Site Address: **11-15 Lang Road, 76-80 Marsh Parade, 536-542 Hume Highway, Casula**

Prepared for: **Catholic Healthcare**

Document reference: **18142.02FA**

Status	Issue	Prepared By	Checked By	Date
Draft	A	DW		18th July 2018
Final	A	LS	CM	24th July 2018

TABLE OF CONTENTS

1 PROJECT OVERVIEW

1.1 Inception

Project	Proposed Residential Aged Care Development
Audit Reference	2018/142
Audit Stage	Thematic - Land Use Development
Client	Catholic Healthcare
Project Manager(s)	Tony Chung
Roads Authorities	Liverpool City Council - Local Roads Roads & Maritime Services (RMS) - Hume Highway
Lead Auditor	Craig M^{C}Laren
Audit Team	• Lead Auditor Mr Craig M^{C}Laren (Level 3) Road Safety Auditor identification 02-0263 • Team Member Mr Matthew McCarthy (Level 1) Road Safety Auditor Identification #02-1197
Initial Meeting	N/A
Any previous audit conducted	No

1.2 Reference Materials

The following plans / information were reviewed as part of this detailed design audit:

1. *Assessment of Traffic and Parking Implications* as prepared by Transport and Traffic Planning Associates dated February 2017;
2. *Supplementary Traffic and Parking Assessment* as prepared by Transport and Traffic Planning Associates dated 21 February 2018;
3. Correspondence with Adam Fahey dated 6 March 2018;
4. Correspondence between Adam Fahey and David Percival dated 15 February 2018;
5. Drawing No. *DA-2000 – Ground Floor Plan* as prepared by Group GSA dated 22/05/18;
6. *Proposed Residential Aged Care Facility (RACF) Casula Response to RSA* as prepared by Colston Budd Rogers & Kafes Pty Ltd dated 7 June 2018;
7. Swept Paths *No. 1-5 Ref: 10911* Drawn by CBRK Pty Ltd dated 8 June 2018.

The Thematic Road Safety Audit (RSA) of the proposed Residential Aged Care Facility (RACF) has been undertaken with due consideration to the following documents:

8. *"Road Safety Audit",* AUSTROADS Publication No. AP-30/94, SAA HB43-1994;
9. *"Road Safety Audit"*, AUSTROADS Publication No. AP-G30/02, SAI/NZS HB43-2001;

10. Guide to Road Safety Part 6: Road Safety Audit AUSTROADS Publication No. AGRS06/09;

11. NSW Transport Roads & Traffic Authority *Guidelines for Road Safety Audit Practices* July 2011;

12. AS2890.1 (2004) *"Parking facilities- Part 1: Off-street car parking*" (Clause 3.2.3 & Figure 3.1);

13. AS2890.2 (2002) "*Parking facilities- Part 2: Off-street commercial vehicle facilities*" (Clause 2.2 & 3.2.2);

14. RTA's Technical Direction for Road Safety Practitioners, TD 2003/RS03, Version 2 - August 2005 *"Policy for Road Safety Audits of Construction and Reconstruction Projects";*

15. NSW Government's *State Environmental Planning Policy (Infrastructure) 2007* (*ISEPP 2007*) - Clause 101 (2).

16. *"Source Book for Australian Roads"* by M.G. Lay - Australian Road Research Board.

17. RMS *"Guide to Traffic Generating Developments October 2002".*

2 INTRODUCTION

2.1 Description

Mr Craig M^{C}Laren, an accredited Level 3 Road Safety Auditor with *M^{C}Laren Traffic Engineering* (MTE), was commissioned in March 2018 by *Catholic Healthcare* to undertake a Thematic Audit of proposed access (vehicular & pedestrian) serving the proposed residential aged care facility at 11-15 Lang Road, 76-80 Marsh Parade, 536-542 Hume Highway, Casula. Council has recommended that an independent Road Safety Audit is to be carried out to assess the road safety implications of the proposed access arrangements, prior to the determination of the development application.

2.2 Purpose

The brief for the Road Safety Audit is to:

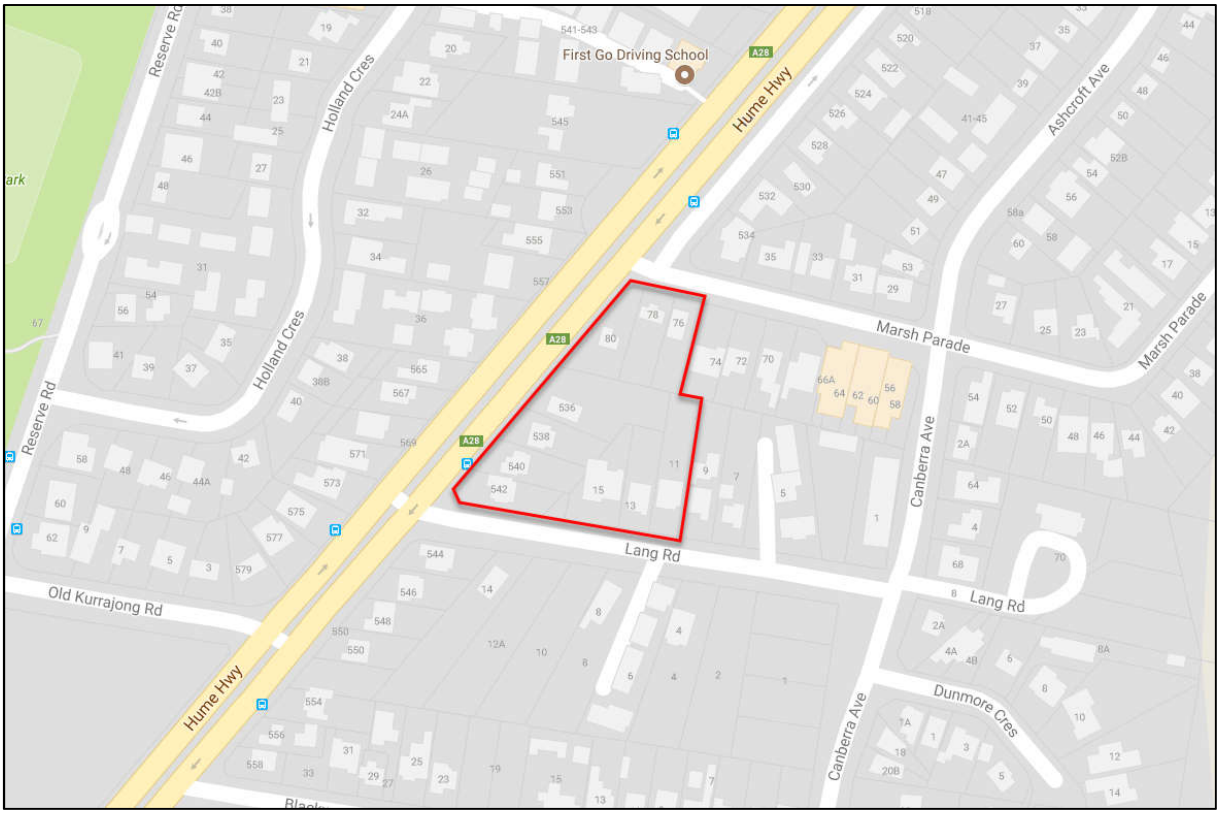
- Identify relevant risks to all road users with respect to the proposed site access design;
- Suggest best design outcomes relevant to the traffic / pedestrian characteristics of the proposal;
- Identify any potential hazards for vehicles and pedestrians with respect to the proposed design;
- Improve safety risks associated with the proposed design.

2.3 Existing Site Location & Facilities

The subject site is currently a vacant block with frontages onto the Hume Highway, Marsh Parade and Lang Road. The proposed site location covered in this audit is shown in **Figure 1** and **Figure 2**. **Annexure A** provides a ground floor plan of the proposed development.

Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2.4 Road Hierarchy

Hume Highway is an RMS classified STATE Road (Highway No. 2) with signposted 70km/h speed limit and approximately 24m wide (including a 4m wide median) in the vicinity of site. The road accommodates 3 lanes in each direction, with clearway zones in effect between the hours of 6am-10am and 3pm-7pm and no parking at any other time on both sides of the road.

Marsh Parade is a local residential road with a signposted 50km/h speed limit and approximately 7.5m wide. The road accommodates one lane of traffic in each direction with unrestricted kerbside parking on both sides of the road. To the north of site, a one way 'unnamed road' provides access to residential dwelling, with access off Marsh Parade and onto the Hume Highway.

Lang Road is a local residential road with a signposted 50km/h speed limit and approximately 11m wide. The road accommodates one lane of traffic in each direction with unrestricted kerbside parking on both sides of the road.

2.5 Existing Traffic Management

- Give-way controlled intersection of Marsh Parade / Hume Highway, with a median prohibiting right turn manoeuvring in and out of Marsh Parade;
- Give-way controlled intersection of Lang Road / Hume Highway, with no restrictions on turning movements in/ out of Lang Road.
- Give-way controlled intersection of Marsh Parade / Canberra Avenue.

3 ROAD SAFETY AUDIT PROCEDURE

Thematic Road Safety Audits are a type of audit that focuses on a specific area of concern. These may be a facility based (e.g. audit of road shoulders, safety barriers, proposed access) or road user based (e.g. audit with respect to motorcycle safety or pedestrian safety).

The following extracts from the RTA's Technical Direction for Road Safety Practitioners, TD 2003/RS03, Version 2 - August 2005 *"Policy for Road Safety Audits of Construction and Reconstruction Projects"*:

> *"A thematic audit is conducted for specific road users or specific road features for existing roads. It focuses on specific road safety problems that may be associated with particular road user groups or particular types of road features. The outcomes of the audit may be used as input to other safety and/or traffic programs.*
>
> *One advantage of thematic audits is that they focus on individual areas of concern. They can be used to focus on a number of different themes, including clear zones, roadside fixed objects (e.g. guard rail terminals), or mid-block signal compliance audits. Thematic audits can also be adopted to audit specific routes from the perspective of a given road user group. For example, a motorcycle thematic audit for a route would focus on the potential safety hazards that may be encountered by motorcyclists for the route being audited. Alternatively, truck-accident-prone areas may be audited on high volume heavy vehicle routes. In general, selection of thematic audit topics should aim to focus on recurrent problematic issues. These*

themes can be nominated by road safety practitioners to drive continuous improvement via progressive thematic auditing of the road network.

Thematic audits require the audit team to customise audit checklists, by selecting components of the checklists that address the facility/theme being audited. Once the tailored checklist is selected, the audit can be continued in the conventional manner, assessing the safety performance of the facility/theme and identifying deficiencies.

Thematic audits may typically examine the following example target groups:

- *Heavy vehicles (including buses)*
- *Pedestrians*
- *Cyclists*
- *Motorcyclists*
- *Roadside furniture*
- *Road shoulders*
- *Street-lighting*
- *Line marking*
- *Land use developments."*

Reference is also made to the term "safety conscious planning" that is contained within AUSTROADS *"Guide to Road Safety, Part 6: Road Safety Audit"*, 2009 that *"seeks to input safety engineering into the earliest planning phases of developments and transport networks, in order to minimise exposure, risk and conflicts."*

4 ROAD SAFETY AUDIT FINDINGS & RECOMMENDATIONS

Section 3.1 documents the general findings of the specialised road safety audit. The CV's of the auditors are presented in **Annexure B** for reference.

This audit reviews the proposed residential aged care facility layout with specific regard to the proposed driveway access location, pedestrian access provision associated with bus stops, internal design layout and external traffic / pedestrian impacts. The audit includes, if necessary recommended features and treatments which can be implemented to improve or reduce risks to vehicles and pedestrians.

4.1 Access Planning

4.1.1 Vehicular Access

An audit of the proposed vehicle access driveway serving the site has been recommended by Liverpool City Council. Council recommended '*that an alternative driveway off Lang Road be preferable as it will be located further from the Hume Highway and unrestricted movements are available at the intersection of Lang Road and Hume Highway*'.

Of particular relevance is the term "safety conscious planning" that is contained within AUSTROADS *"Guide to Road Safety, Part 6: Road Safety Audit"*, 2009 that *"seeks to input safety engineering into the earliest planning phases of developments and transport networks, in order to minimise exposure, risk and conflicts."*

It is noted from the lodged traffic report and letter of advice that risks associated with pedestrians accessing bus stop (Stop ID 2170352) located in the narrow median between the east side of the Hume Highway and the unnamed access road north of Marsh Parade are not addressed. Other matters raised in this audit are not adequately addressed by the lodged traffic report and letter.

In essence, the most appropriate vehicular access point to site is determined with reference the following documents:

1. State Environmental Planning Policy (Infrastructure) 2007 - Clause 101 (2):

   (2) The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:

   (a) where practicable, vehicular access to the land is provided by a road other than the classified road, and

   (b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:

   (i) the design of the vehicular access to the land, or

   (ii) the emission of smoke or dust from the development, or

   (iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and

   (c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

2. AS 2890.1 - 2004 : Clause 3.2.3 & Figure 3.1: (refer to **Annexure C**)

Using the relevant sections referenced above it has been deemed that:

- It is not suitable to have an access driveway from Hume Highway;
- It is not suitable to have an access driveway from Marsh Parade in the currently proposed location, due to the following considerations:
  1. The proposed vehicular access (including proposed driveway splays) is located within prohibited driveway locations, with reference to *Clause 3.2.3* & *Figure 3.1* of *AS2890.1-2004*. Refer to **Annexure D** for an illustration of non-compliant driveway locations.
  2. The swept path tests drawn by CBRK Pty Ltd dated 8 June 2018 show the MRV left turn onto Marsh Parade from the site driveway passes over the BB centre lines. An MRV passing over the centre line of the road has the potential to cause vehicle conflicts between the exiting vehicle and a vehicle traveling eastbound along Marsh Parade, resulting in potential side swipe or head on collisions.
  3. Additionally, the median within the Hume Highway prohibits right turn ENTRY and right turn EXIT to and from Marsh Parade.
  4. Northbound vehicles leaving site are likely to choose to access Hume Highway via the unnamed access road at its traffic signalised control opposite De Meyrick Avenue. This unnamed access road provides direct access to frontage residential lots and no assessment has been provided of the

additional traffic load within this unnamed access road and potential for localised blockage of this road by vehicles (including service vehicles) associated with the RACF at the traffic signal access point with kerbside parking of vehicles included.

- The following options could be considered for potential solutions to the location of the driveway;
    1. Prohibit vehicles greater than 6.4m in length turning left out of the site.
        - Modify / reduce the proposed driveway splay to accommodate left turn exit movements for vehicles up to a 6.4m SRV as per Clause 2.2 (a) of AS2890.2. The modification shall reduce the splay such that the driveway does not encroach into the prohibited driveway locations as per Clause 3.2.3 & Figure 3.1 of AS2890.1. It is expected that deliveries to the proposed development are occasional in nature, therefore service vehicles are capable of using the full width of the access driveway as per Clause 3.2.2 (d) of AS2890.2;
        - Install "NO LEFT TURN - VEHICLES UNDER 6.4m EXCEPTED" signage internally on the exit side of the site driveway;
        - Implement a Plan of Management (PoM) for all deliveries by service vehicles to occur outside of peak arrival and departure times for visitors and staff;
        - A concept driveway and signage layout plan is shown in **Annexure E** for reference.
    2. Relocate site driveway to Lang Road
        - Approximately 95m of road frontage suitable for an access driveway to be located;
        - Additionally, the Lang Road / Hume Highway intersection provides unrestricted turning access to / from either approach of Hume Highway;
        - Also allows for vehicles to turn left out of site and head north along Canberra Avenue and Ashcroft Avenue for alternate access to Hume Highway.

4.1.2 Pedestrian Access

Pedestrian access to / from the site is proposed via a footpath on the northern side of site, onto Marsh Parade. As a result, for pedestrians to access the nearest bus stop on the Hume Highway, Marsh Parade will need to be crossed at the 'unnamed road' intersection where the existing footpath requires pedestrians to cross approximately 17m of road, via a direct desire path. More so, the proposed location of the pedestrian crossing is impacted from the influence of vehicle movements from the proposed driveway, the intersection of Marsh Pde / Hume Hwy and the intersection of Marsh Pde / 'unnamed road'. This is not safe for pedestrians, particularly the elderly or children and does not meet the requirements of *Clause 4.1* of *AS2890.1:2004 1* (Refer to **Annexure C**). An RACF facility will attract visitation by family members (including children and the elderly), some of which will utilise the nearby public bus services along the Hume Highway. Some staff will also utilise the Hume highway bus services.

More suitably, a bus stop is located near the south-western corner of site, on the site boundary. Pedestrian access should be provided here as it provides direct access to the

bus network and does not require pedestrians visiting to cross any road on arrival. It is recommended that the internal building design layout be altered to maximise safe pedestrian access. The introduction of a PoM to ensure both staff and visitors use the southern bus stop shall be introduced.

If such a PoM cannot guarantee to prevent pedestrians of the proposed development from using the northern bus stop than the proposed footpath shall be altered. The alterations of the footpath to the northern bus stop shall direct pedestrians to cross Marsh Parade to the east of the site, providing crossing at the narrower, straight section of the Marsh Parade. The existing footpath shall be extended around the corner of Marsh Parade / 'unnamed road' and connect to the bus stop through a crossing on the 'unnamed road'. The introduction of such a footpath would require additional footpaths, pram ramps and fencing to be constructed in consultation with Council.

4.1.3 Line Marking

Separation between egress and ingress vehicles should be considered to reduce the likelihood of conflict between entering and exiting vehicles. It is recommended that the site driveway be line marked down the centre with BB lines starting at the edge of the gutter to provide separation of entering and exiting vehicles, refer to **Annexure E** concept.

Additionally, the BB centre lines along Marsh Parade near the proposed site driveway has faded as shown in **Figure 3** below. The increase in vehicle turning movements at the proposed site driveway increases the need for the centre lines to be visible to reduce the likelihood of vehicles passing onto the opposite side of the road. It is recommended that the BB lines be reline marked to improve the visibility of lane separation.

FIGURE 3: FADED LINE MARKING ALONG MARSH PARADE

4.2 Safety Conscious Planning Outcomes

After reviewing the proposed plans, specifically the proposed access driveway and pedestrian access plus public bus stop integration, it is considered that safety conscious

planning outcomes have not been undertaken with respect to vehicular and pedestrian access for the proposed development. Section 5 of this audit contains recommendations consistent with a safety conscious planning approach. Road and pedestrian safety considerations should govern and not be diminished by other factors of lesser weight.

5 CONCLUDING STATEMENT

A review and audit has been carried out on the proposed plans of the residential aged care facility in Casula. The audit findings are contained in **Section 4** of this report with options for investigation included therein. To summarise:

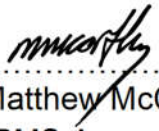
1. Modify the proposed driveway splay to accommodate a 6.4m SRV for left turn exit from the site and prohibit left turn exit for vehicles greater than 6.4m in length, **OR** remove site access driveway from Marsh Parade and relocate it to the Lang Road frontage.
2. Consider providing a line marked driveway centre line starting from the gutter to provide separation between entering and exiting vehicles. Additional line marking shall also be reapplied to the centre BB lines along Marsh Parade adjacent to the proposed site driveway.
3. Remove proposed pedestrian access onto Marsh Parade so as not to encourage use of the bus stop (Stop ID 2170352) located in the narrow median between the east side of the Hume Highway and the unnamed access road north of Marsh Parade. Encourage by redesign provision of pedestrian access to bus stop (Stop ID 2170558) located in front of 540-542 Hume Highway. The introduction of a Plan of Management to encourage the use of the southern bus stop shall be implemented.

The recommendations raised in this audit are based upon the independent opinions and judgements of the authors. It should be noted, however, that it is ultimately the responsibility of the Project Manager (refer to Section 1.1) and Road Authorities (Liverpool City Council and Roads & Maritime Services (RMS)) to determine how best to respond to identified road safety issues.

……..

Craig M^{C}Laren

(RMS Accredited Level 3 Road Safety Auditor) July 2018



……..

Matthew McCarthy

(RMS Accredited Level 1 Road Safety Auditor) July 2018

ANNEXURE A: PLANS

(SHEET 1 OF 1)

ANNEXURE B: CIRRICULUM VITAE

(SHEET 1 OF 2)

Craig McLaren (Director)

RPEQ 19457

Craig is an acknowledged traffic consultant since the company inception in 1995. The company's primary function has been to serve both the public and private sectors focusing on traffic impact assessments, transport planning, special event transport planning, local area traffic management, road safety and expert evidence at Land and Environment Court, Supreme Court and the Commission of Inquiry.

Qualifications

Bachelor of Civil Engineering, UNSW, 1985

Graduate Diploma in Traffic Engineering, University of New South Wales, 1991

Accredited Level 3 Road Safety Auditor, 1998

Risk Management Workshop, September 2014

Professional Engineers Australia. RPEng 2017

Registered Professional Engineer Queensland 2017 RPEQ 19457

RMS Accredited Traffic Management Plan Designer [2018]

Affiliations:

Member, Australian Institute of Traffic Planning and Management - AITPM

Member, Institute of Transportation Engineers USA (Australian Branch) – ITE

Papers at Conferences

"Safe & Liveable Communities, Can You Have Both?" Georgia Institute of Transportation Engineers, St Simons Island, Georgia USA July 1999.

Experience:

McLAREN TRAFFIC ENGINEERING
1995 to date:
Director and experienced traffic engineer responsible for the conduct of all facets of traffic impact assessment ranging from report preparation, design advice and giving evidence at the Land and Environment Court.

SINCLAIR KNIGHT MERZ
1994 to 1995:
Executive Traffic Engineer. Responsible for the conduct of all facets of traffic impact assessment ranging from report preparation, design advice and giving evidence at the Land and Environment Court.

TRANSPORTATION PLANNING WORKSHOP
1989 to 1994:
Senior Associate. Responsible for the conduct of a vast number of traffic impact assessment report and gained invaluable experience in giving expert evidence before the Land and Environment Court.

ROADS AND TRAFFIC AUTHORITY, NSW
1988 to 1989:
Technical Secretary to the Regional Traffic Committee, Traffic Engineer, Traffic Engineering Section, involved in traffic/transport research, policy development and assisting councils in the application of the Authority's guidelines.

OVE ARUP TRANSPORTATION PLANNING
1985 to 1988:
Traffic Engineer. Involved in the preparation of traffic impact reports for a wide range of projects.

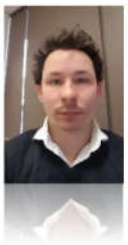
GUTTERIDGE HASKINS & DAVEY
1980 to 1982:
Trainee Civil Engineer. Involved in assisting with road and subdivision design and field surveying.

Curriculum Vitae March 2018

ANNEXURE B: CIRRICULUM VITAE

(SHEET 2 OF 2)

Matthew McCarthy (Traffic Engineer)



Qualifications

Bachelor of Civil Engineering,
University of New South Wales Australia
2013

Masters of Engineering Science (Civil)
Majoring in Transport Engineering
University of New South Wales Australia
2015

RMS Accredited level 1 Road Safety Auditor (RSA-02-1197)
RMS Accredited Work Zone Traffic Management Plan Designer

Experience

MCLAREN TRAFFIC ENGINEERING
2016 to date

Traffic Engineer for the preparation and review of traffic impact assessments for a wide range of land uses and scales. Duites also include traffic modelling and analysis, preparation of road safety audits, engaged in traffic and transport planning, provision of detailed design advice for small and large scale developments and experience as an expert witness acting for Council in the NSW Land and Environment Court

Skills

- AutoCAD 2016, including vehicle tracking
- Sidra Intersection Modelling 7.0
- Invarian Rapid Plan
- Aimsun

McLaren Traffic Engineering
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
Ph 61-2-8355-2440

3.2.3 Access driveway location

To keep conflicts between frontage road traffic and car park traffic to an acceptable minimum, the following requirements and recommendations apply:

(a) *Driveway Categories 1 and 2* At unsignalized intersections of sub-arterial, collector or local streets with each other or with an arterial road, access driveways in Categories 1 and 2 (see Table 3.1) shall not be located in the sections of kerb shown by heavy lines in Figure 3.1. This requirement shall not apply to accesses to domestic driveways in the kerb section opposite the entering road at any intersection including signalized intersections. Furthermore, it shall not apply to any access driveway serving a property which would otherwise be denied access due to the physical impossibility of meeting the requirement.

At signalized intersections, the minimum distance from the intersection, measured from the property boundary along both legs, shall be increased as necessary to locate access driveways beyond the influence of normal queue lengths at the intersections. If this is not practicable, it may be necessary to provide—

(i) an arrangement which confines traffic to turning left when either entering or leaving the car park;

(ii) a signalized driveway with signals coordinated with the intersection signals; or

(iii) other traffic management means of providing for safe and efficient operation of the driveway.

(b) *Driveway Categories 3 and 4* Driveways in categories 3 and 4 (see Table 3.1) shall not be located—

(i) on arterial roads unless entrances and exits are designed and constructed as intersection treatments catering adequately for all projected traffic flows;

(ii) closer to intersections than permitted for Category 1 and 2 driveways (see Item (a));

(iii) opposite other developments generating a large amount of traffic, unless all projected traffic flows are provided for in a properly designed and constructed intersection treatment, including the installation of signals if necessary;

(iv) where there is a heavy and constant pedestrian movement along the footpath, unless this can be adequately catered for by some form of positive control, e.g. traffic signals;

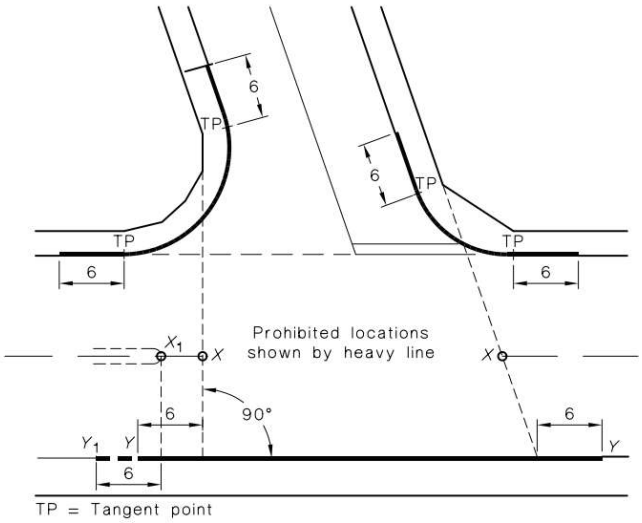
(v) where right turning traffic entering the facility would obstruct through traffic; or

(vi) where traffic using the driveways will interfere or block the operations of bus stops, taxi ranks, loading zones or pedestrian crossings.

NOTE: In these instances, it may be appropriate to move the bus stop or other facility, if this would result in the best overall design.

Entry for left turning vehicles into driveways in Categories 3 and 4 should be gained by the first vehicular driveway reached, and by using the kerbside lane.

NOTE: Guidance on capacity provision at entry and exits at large car parks is given at Appendix D.



NOTES:

1 Accesses to domestic driveways are excluded from the prohibition in respect of the kerb section marked *Y-Y* (see Clause 3.2.3(a)).

2 The points marked X_1 and *X* are respectively at the median end on a divided road and at the intersection of the main road centre-line and the extensions of the side road property lines shown as dotted lines, on an undivided road. On a divided road, dimension *Y-Y* extends to Point Y_1.

DIMENSIONS IN METRES

FIGURE 3.1 PROHIBITED LOCATIONS OF ACCESS DRIVEWAYS

3.2.4 Sight distance at access driveway exits

Access driveways need to be located and constructed so that there is adequate entering sight distance to traffic on the frontage road and sight distance to pedestrians on the frontage road footpath for traffic entering the frontage road, as follows:

(a) *Entering sight distance* Unsignalized access driveways shall be located so that the intersection sight distance along the frontage road available to drivers leaving the car park or domestic driveway is at least that shown in Figure 3.2.

A1

(b) *Sight distance to pedestrians* Clear sight lines as shown in Figure 3.3 shall be provided at the property line to ensure adequate visibility between vehicles leaving the car park or domestic driveway and pedestrians on the frontage road footpath.

SECTION 4 OTHER CONSIDERATIONS

4.1 PEDESTRIAN SERVICE

4.1.1 General

Parking areas shall be designed so that through-traffic is excluded, and pedestrian entrances and exits are separate from vehicular entrances and exits.

Where pedestrians must cross busy circulation roadways, they shall be guided to a safe crossing point which shall have adequate sight distance and shall be provided with appropriate signs and pavement markings (see AS 1742.10 (in Australia) or NZ Manual of Traffic Signs and Markings (in New Zealand)).

4.1.2 Parking structures

NOTE: Requirements for pedestrian access and egress including stairs, lifts and exits are given in relevant building codes and Standards.

In split-level car parks, a stairway or pedestrian ramp shall be located at the split-level for pedestrian access between levels and so that pedestrians do not have to use vehicular ramps.

4.1.3 Surface car parks

When considering pedestrian provisions in the planning of surface car parks, the following principles apply:

(a) Pedestrians shall be directed and encouraged to cross circulating aisles and roadways at right angles at points were there is acceptable sight distance to circulating traffic.

NOTE: Crossing points should be provided at locations remote from the major concentrations of vehicular movement.

(b) Service yards shall be accessed separately from the car park.

4.2 BICYCLE PARKING

Guidance on provision for the parking and safe storage of bicycles at a car park, is given in AS 2890.3.

4.3 SIGNPOSTING

4.3.1 General

All operations in a car park shall be directed by suitable directional, informative, regulatory or warning signs.

NOTE: The term 'regulatory signs' relates to the descriptions and functions of these types of sign given in AS 1742.1 and The Manual of Traffic Signs and Markings (NZ).

Signs are required for the following purposes:

(a) To control traffic movement and driver behaviour (e.g. speed).

(b) To warn against hazards to personal safety or potential damage to vehicles.

(c) To identify sections or rows of parking spaces so that pedestrians can easily find their parked vehicles.

(d) To direct and inform drivers entering and circulating within the car park about vehicular entry points, exits and parking locations.

(e) To direct pedestrians to lifts, stairs, amenities and other parts of the building.

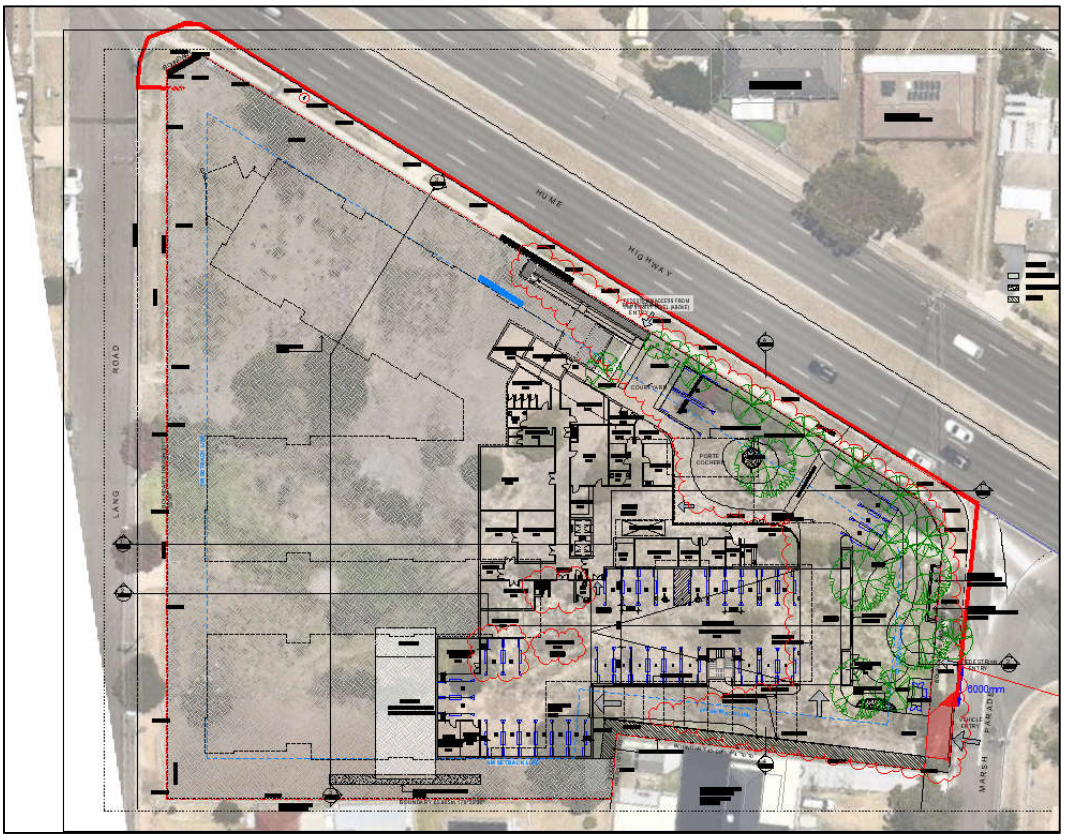
NOTE: This Clause does not cover EXIT signs required for emergency evacuation of buildings.

ANNEXURE D: NON-COMPLIANT DRIVEWAY LOCATIONS

(SHEET 1 OF 1)

Key: Non-compliant driveway location

Proposed driveway shaded red.

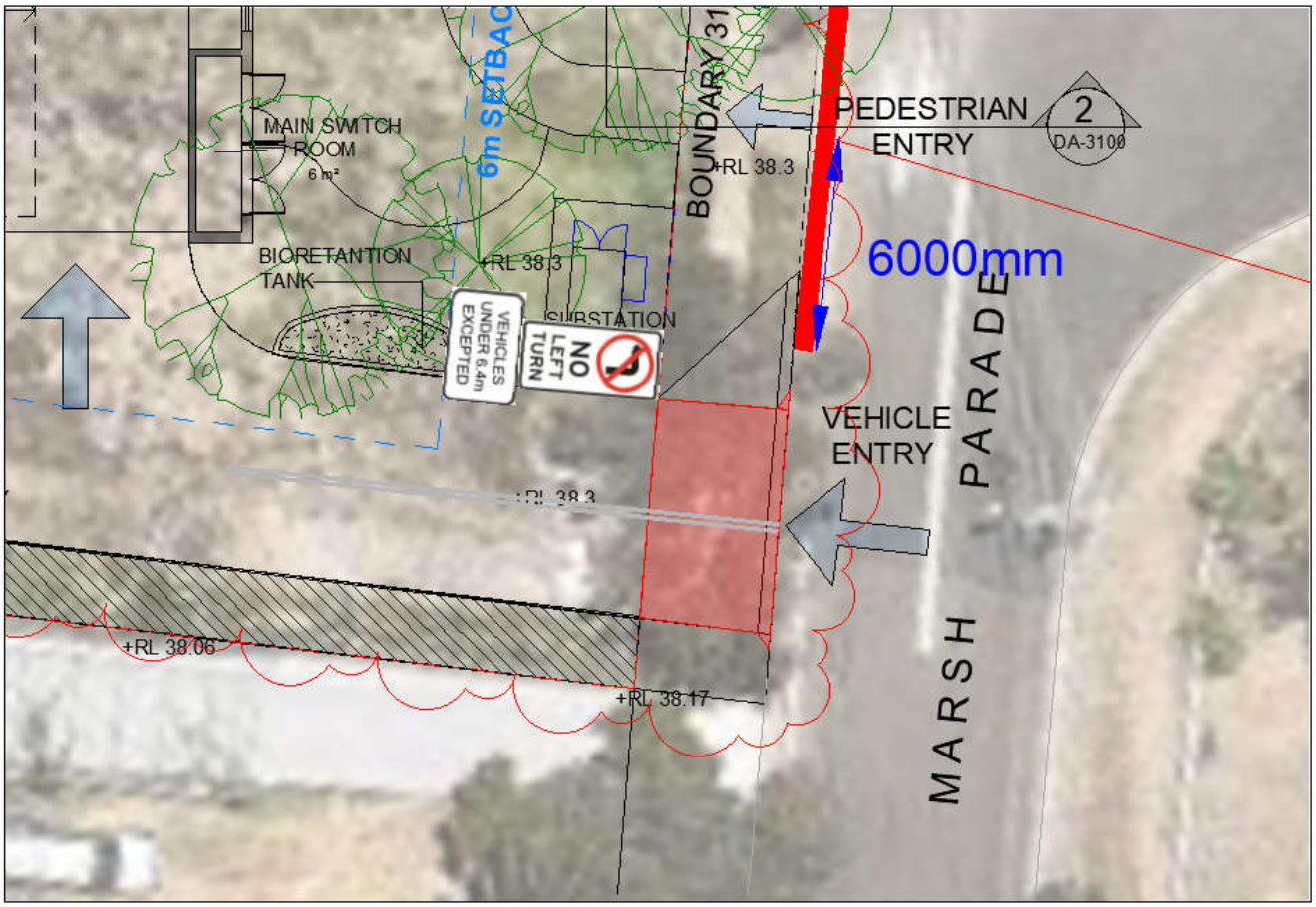


Key: Non-compliant driveway location

Proposed driveway shaded red.

ANNEXURE E: CONCEPT DRIVEWAY AND SITE LAYOUT PLAN

(SHEET 1 OF 2)

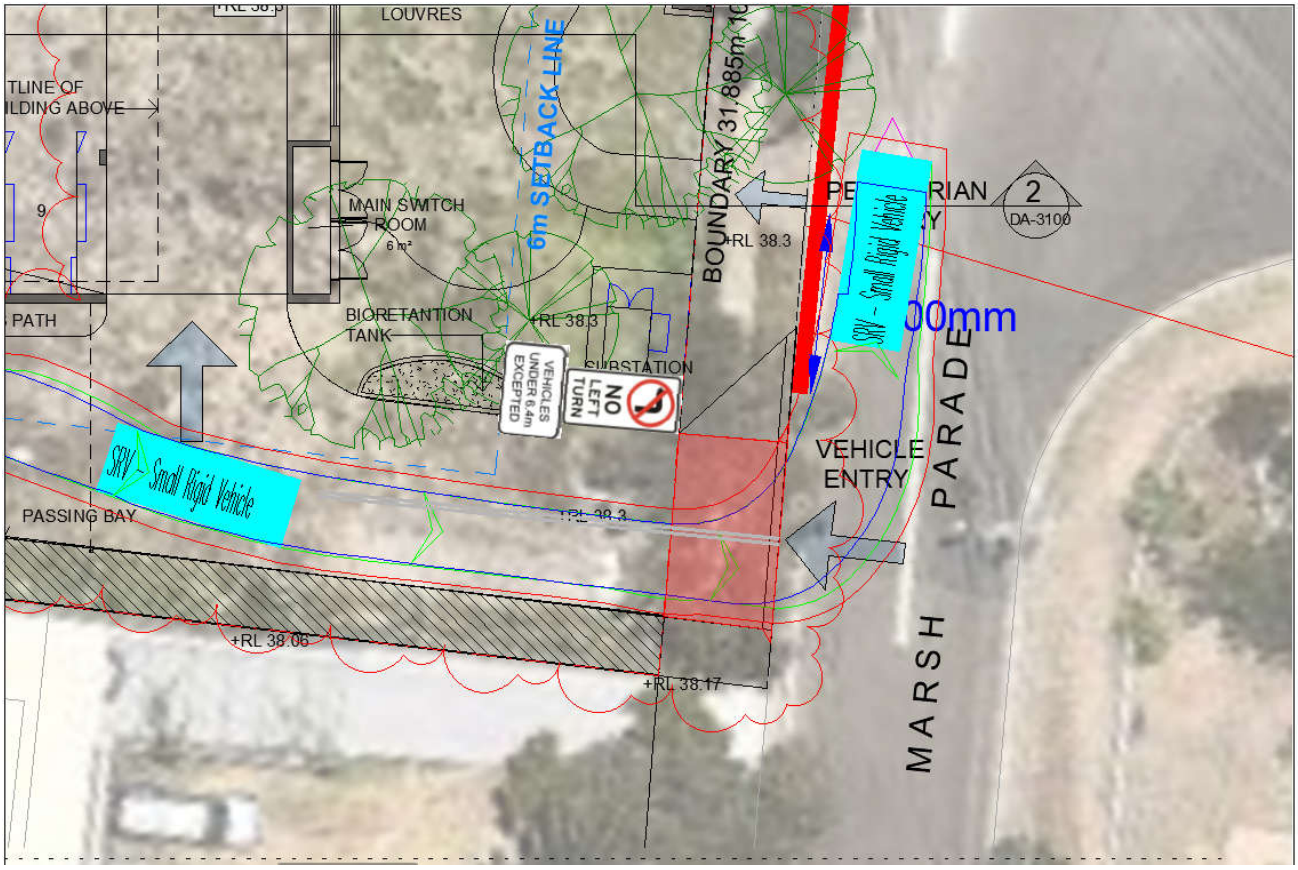


Key: Non-compliant driveway location

Concept driveway shaded red, splay for MRV left entry still requires detailing.

ANNEXURE E: CONCEPT DRIVEWAY AND SITE LAYOUT PLAN

(SHEET 2 OF 2)



SRV LEFT turn from site driveway onto Marsh Parade
Tested @ 5km/h
Successful

Blue – Wheels
Green – Vehicle body
Red – 500mm clearance