Concept Design Road Safety Audit

Hurlstone Agricultural High School (Hawkesbury)

Campus Drive and Blacktown Road

Prepared for NSW Department of Education c/o Mace Australia Pty Ltd / 10 August 2018

161108 TAAE

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Structural
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Traffic
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Audit Summary

Report Number	161108 TAAE
Audit for	NSW Department of Education c/o Mace Australia Pty Ltd
Address	Suite 1703, Level 17, 44 Market Street, Sydney, NSW 2000
Telephone	02 9958 1474
Project Representative	Bevan Botha (Mace)
Audit Team	Jason Scoufis (Team Leader)
	Aaron Walton (Team Member)
	Grace Carpp (Team Member)
Audit Type	Concept
Commencement Meeting	Wednesday 27th June, 2018
Audit Date	Thursday 28th June, 2018
Completion Meeting	Friday 10th August, 2018
Previous Audit Numbers	No previous audits have been conducted.

1.0 Introduction

1.1 Project Overview

The NSW Department of Education c/o Mace have engaged Taylor Thomson Whitting (TTW) to undertake a Concept Design audit for the access intersection of Campus Drive/Blacktown Road to the proposed Hurlstone Agricultural High School (Hawkesbury). The project is proposing to construct a school that will accommodate 1,500 students.

The proposed school will be located within the Western Sydney University Hawkesbury Campus in Richmond. The scope of this audit is limited to the following:

- The T-intersection of Blacktown Road/Campus Drive.
- The additional traffic volumes anticipated when the proposed school is in operation.

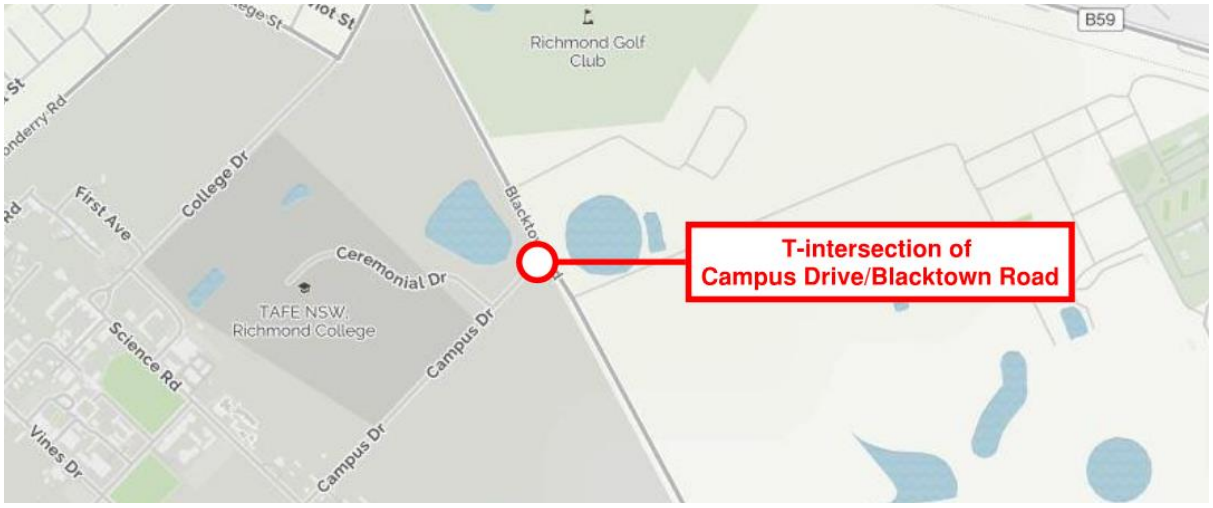


Figure 1.1: Audit Site Location

1.2 Supporting Documentation

This RSA reviews the following:

- The site as presented on Thursday 28th June 2018 under day and night conditions
- Civil Engineering plans prepared by Taylor Thomson Whitting
- Transport and Accessibility Impact Assessment prepared by Taylor Thomson Whitting

Appendix A of this report also details the documentation available for review by the audit team.

1.3 Reference Material

This RSA has generally been carried out in accordance with, and with reference to, the following documents:

- Austroads Guide to Road Safety, particularly Part 6: Road Safety Audit
- Austroads Guide to Traffic Management
- RMS Supplements to Austroads
- RMS Delineation Guides
- Relevant Australian Standards
- Relevant RMS Technical Directions

2.0 Audit Process

2.1 Team Members

This RSA was carried out by the following team:

Audit Role	Name	Qualification	Registration
Team Leader	Jason Scoufis	Level 3 Road Safety Auditor	RSA-02-0220
Team Member	Aaron Walton	Level 3 Road Safety Auditor	RSA-02-0501
Team Member	Grace Carpp	Level 1 Road Safety Auditor	RSA-02-1091

Members of this audit team have had no involvement in the design of the surrounding intersections subject to this audit. Audit team members from TTW operate independently of the engineering and design team from TTW responsible for the design of the site.

2.2 Program

The audit included a commencement meeting at TTW offices on 27th June 2018 between the audit team and the following project representatives:

- Bevan Botha (Mace Australia – Project Manager)
- Michael Babbage (TTW – Traffic Engineer)

Commencement discussions involved an overview of key project details and the scope of the audit.

A site inspection was undertaken by the audit team on Thursday 28th June 2018. The site was observed during both daylight hours and after last light under intermittent rainy weather conditions.

A completion meeting was held with the project representative Bevan Botha and Michael Babbage on the 10th August, 2018. This completion meeting involved discussion of the audit findings and an explanation of the recommended next steps for a Road Safety Audit.

As set out in the Austroads Road Safety Audit Guidelines, responsibility rests with the client organisations for implementing and/or accepting or rejecting the audit findings, comments and recommendations. The client is under no obligation to accept all the audit findings and comments. The role of the audit team is not to respond to the audit findings, nor to agree or approve of the client's response to any audit findings. Rather, the audit provides the opportunity to highlight potential problems and risks, and to have them formally considered by the client in conjunction with all other road management considerations.

3.0 Risk Assessment

The level of risk associated with each audit finding is developed based on a risk matrix approach. This approach considers both the likelihood and consequence of an incident occurring as a result of any particular design component. The tables below are extracted from Austroads Guide to Road Safety Part 6 and have been used in the assessment of risk for this audit.

Table 1: Incident Frequencies
Source: Austroads Guide to Road Safety Part 6, Table 4.1

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 2: Incident Severities
Source: Austroads Guide to Road Safety Part 6, Table 4.2

Severity	Description	Examples
Catastrophic	Likely multiple deaths	High-speed, multi-vehicle crash on a freeway. Car runs into crowded bus stop. Bus and petrol tanker collide. Collapse of a bridge or tunnel.
Serious	Likely death or serious injury	High or medium-speed vehicle/vehicle collision. High or medium-speed collision with a fixed roadside object. Pedestrian or cyclist struck by a car.
Minor	Likely minor injury	Some low-speed vehicle collisions. Cyclist falls from bicycle at low speed. Left-turn rear-end crash in a slip lane.
Limited	Likely trivial injury or property damage only	Some low-speed vehicle collisions. Pedestrian walks into object (no head injury). Car reverses into post.

Table 3: Level of Risk Matrix
Source: Austroads Guide to Road Safety Part 6, Table 4.3

	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

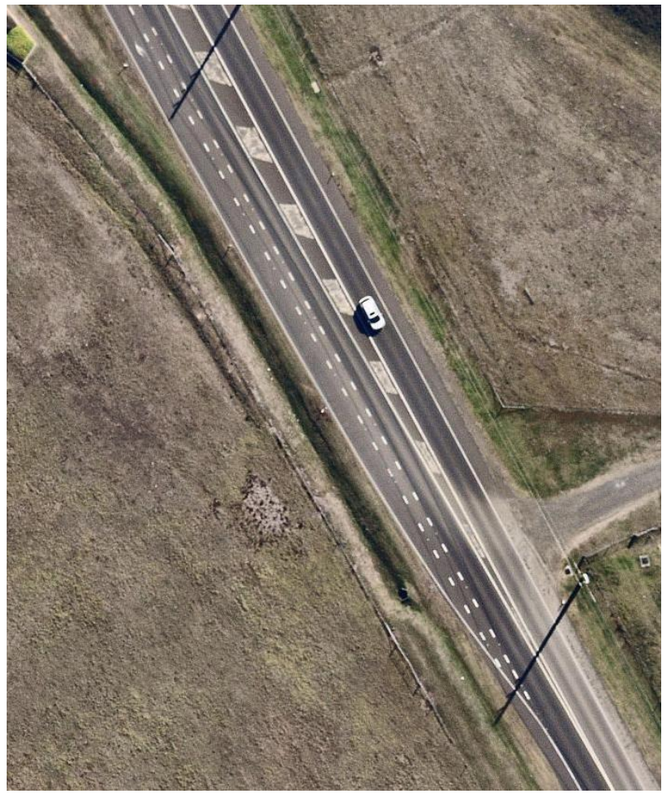
4.0 Audit Findings

Item	Location	Identified Risks	Photographic Record	Frequency Severity **Risk**	***Accept / Reject***	***Corrective Actions***
INTERSECTION OF CAMPUS DRIVE/BLACKTOWN ROAD						
14	**Campus Drive**	Limited drainage infrastructure has been provided adjacent to Campus Drive. There is a risk that ponding water adjacent to the roadway may encroach travel lanes and result in vehicles aquaplaning and losing control. There is also a risk that drivers may swerve to avoid driving through water. These risks could lead to side impact or rear end collisions.		Improbable Minor **Low**	A	*Severe aquaplane risks are not considered to be evident at this location.* *Existing issue is unlikely to be worsened by additional traffic.* *Operation is considered satisfactory.* ***No further action.***
15	**Campus Drive**	No centre line has been line marked on Campus Drive. There is a risk that vehicles may encroach into the oncoming travelling lane which may lead to head on collisions. This risk is further exacerbated by the road alignment of Campus Drive which includes reverse curves on approach to the intersection with Blacktown Road which may encourage straight line driving and increased speeds.		Improbable Minor **Low**	A	***Centre line to be added to detailed design.*** *(Action by Civil Engineer)*

Item	Location	Identified Risks	Photographic Record	Frequency Severity **Risk**	***Accept / Reject***	***Corrective Actions***
16	**Campus Drive**	No edge line or kerb has been installed on Campus Drive providing no clear delineation of the edge of the roadway. This may result in drivers travelling close to the edge of the pavement and potentially overrunning into the grassed area. This has the potential to result in vehicle damage from collisions with roadside objects.	 	Improbable Minor **Low**	A	***Edge line to be added to detailed design.*** *(Action by Civil Engineer)*

Item	Location	Identified Risks	Photographic Record	Frequency Severity **Risk**	***Accept / Reject***	***Corrective Actions***
17	**Campus Drive**	No give way line marking has been provided on the Campus Drive approach to the intersection with Blacktown Road. Drivers approaching the intersection may encroach into the travelling lane on Blacktown Road which may result in front end or side impact collisions.		Occasional Serious **High**	A	***Hold line to be added to detailed design. Associated changes to Give Way signage to be reviewed if necessary.*** *(Action by Civil Engineer)*
18	**Campus Drive**	Street signage for Campus Drive is difficult to read due to poor maintenance and the sign is located approximately 15m from the intersection with Blacktown Road. There is a risk that the street signage may not be sighted by a passing motorist until late resulting in sudden deceleration and possible rear end collisions. It is noted that there is advance warning signage for the turn for the "Richmond College of TAFE" which may reduce the incidence of events.		Improbable Minor **Low**	R	*Campus Drive is private road to university which is utilised by regular users. New users are also alerted by significant University signage at intersection (visible in site photo).* *Additional site traffic for school will also be regular users.* *Signage for school to be investigated separately.*

Item	Location	Identified Risks	Photographic Record	Frequency Severity **Risk**	***Accept / Reject***	***Corrective Actions***
19	**Blacktown Road**	Line markings of turning arrows and chevrons are faded on Blacktown Road. During night or adverse weather conditions turning arrows may be difficult to identify. There is a risk that drivers may not be aware of the turning bays and may brake suddenly to enter these bays or cross the bays to turn into Campus Drive. This could result in a rear end collision.	 	Occasional Serious **High**	A	*Line marking can be renewed as part of line marking works at Campus Drive intersection.* ***To be investigated with RMS during detailed design and approval process.*** *(Action by Civil Engineer)*

Item	Location	Identified Risks	Photographic Record	Frequency Severity **Risk**	***Accept / Reject***	***Corrective Actions***
20	**Blacktown Road**	On Blacktown Road, cyclists are permitted to ride within the shoulder on the western edge. On approach to Campus Drive there is a left turn bay and these cyclists are expected to continue riding a straight path adjacent to this turning bay. While the continuation of the cycle path has been indicated by line marking, no bicycle symbols, coloured pavement or signage are provided within this cycle lane. There is a risk that drivers may be confused about which line marking applies to them and their vehicles may encroach into the bicycle lane. This may lead to vehicle-bicycle collisions. This risk is further exacerbated by the faded left turn arrow line marking. There is also a risk that cyclists may be confused about which alignment to travel through the intersection which may lead to vehicle-bicycle collisions.		Improbable Serious **Medium**	A	*Line marking can be renewed as part of line marking works at Campus Drive intersection.* ***To be investigated with RMS during detailed design and approval process.*** *(Action by Civil Engineer)*
21	**Campus Drive**	During night conditions there is one light pole not functioning near to the intersection with Blacktown Road. There is a risk that vehicles, pedestrians and/or cyclists on Campus Drive may be difficult to see during night conditions. This could lead to collisions.		Improbable Serious **Medium**	A	***Maintenance to be referred to WSU as part of regular procedures.*** *(Action by Client)*

Item	Location	Identified Risks	Photographic Record	Frequency Severity **Risk**	***Accept / Reject***	***Corrective Actions***
22	**Campus Drive**	No reflectors are provided on Campus Drive which results in the location of travel lanes being difficult to determine during night or adverse weather conditions. This could lead to vehicles overrunning the paved roadway. This is further exacerbated by the poor lighting of Campus Drive and the lack of line marking.		Improbable Limited **Low**	A	*Reflectors can be renewed as part of line marking works at Campus Drive intersection.* ***To be investigated with RMS during detailed design and approval process.*** *(Action by Civil Engineer)*

5.0 Conclusion

5.1 Responding to the Audit

The role of the audit team in the Road Safety Audit process is to highlight risks identified within the site or plans as presented to the audit team. Responsibility for addressing these risks and implementing any corrective actions rests with the project team and any other relevant organisations working with the project team.

The project manager is under no obligation to accept all of the findings presented in the audit, nor is the audit team responsible for approving any proposed comments or responses from the project manager and design team.

Note that this audit will be recorded on the NSW Register of Road Safety Auditors and the Project Representative will receive an email notification from the register to confirm the audit has been carried out.

5.2 Concluding Statement

We declare that we have examined the plans and documents listed in Appendix A. We have inspected the site during both day and night conditions. Upon review of the relevant documentation and the site we have identified what we considered to be elements of the proposal which could be altered or removed to improve safety for road users. The identified issues have been detailed in the Table of Audit Findings within this report. We recommend that the issues noted here be investigated, with responses and corrective actions to be considered and implemented as soon as practicable.

The auditable material at the site was restricted to the scope of the audit agreed upon during the commencement meeting.

It is noted that while every effort has been made to identify potential safety hazards, no guarantee can be made that every deficiency has been identified. This Road Safety Audit should not replace standard Safety in Design practices and is not intended to provide full engineering and design judgement relevant to the context of the particular site.

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Appendix A

Reference List

Discipline and Type	Author	Reference Number	Title	Revision	Date
Civil Engineering Drawing	Taylor Thomson Whitting	HASH-00-CD-CE-DR-C340	Vines Drive Site Works Plan Sheet 1 of 5	P8	05.04.18
Traffic Engineering Report	Taylor Thomson Whitting	HASH-00-SD-TR-RP-180111	Transport and Accessibility Impact Assessment	1	11.01.18