Moriah War Memorial College Association

Moriah War Memorial College

Existing Conditions Road Safety Audit

August 2019

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1. Introduction

1.1 Background

On 15 July 2019 the Secretary's Environmental Assessment Requirements (SEARs) (SSD10352) for the project were received from the Department of Planning Environment and Industry (DPIE). At Section 7 the SEARs required:

> *"a road safety audit of existing conditions, during the AM and PM school peak periods, along the following sections of road:*
>
> - *York Road, between Queens Park Road and Baronga Avenue*
> - *Queens Park Road, between York Road and Baronga Avenue*
> - *Baronga Avenue, between Queens Park Road and York Road*
>
> *Note: any road safety audit would need to be undertaken by a suitably qualified audit team that is independent from the project team."*

This Road Safety Audit Report has been prepared to provide information for the Planning Agency Head to assist them in determining the application.

- The proposed state significant development at Moriah War Memorial College includes the following:
- Staged construction of new school buildings. Including a new part 3 and part 4 storey STEAM building and construction of a 3 storey Early Learning Centre (ELC) building and administration offices.
- Staged student population increase from 1680 students on the site to 2020 students across ELC primary and high school.

This report outlines the Existing Conditions Road Safety Audit undertaken and associated findings.

1.2 Purpose of this report

This report has been prepared to document the safety deficiencies identified during the Existing Conditions Road Safety Audit (RSA) (Austroads 2019) for the road network adjacent to Moriah War Memorial College as defined in the study extent. This audit aims to identify potential safety conditions with respect to user interaction within the road environment.

The audit may identify unusual features that may or may not lead to safety deficiencies, but inconsistent or unexpected road features can be a hazard to users and therefore engineering judgment is to be applied.

The RSA is carried out by a team of independent auditors who can provide an unbiased and objective safety review.

1.3 Road safety audit process

The RSA followed the process below:

- A commencement meeting was undertaken on Tuesday 6 August 2019 to identify project history and outline the RSA process. The meeting was attended by:
  - Kate Lyons (Aver Development and Project Management C/- Moriah War Memorial College Association – Senior Project Manager)

– Michael Carbone (Aver Development and Project Management C/- Moriah War Memorial College Association – Project Manager)
– Sean Clarke (GHD – Lead Road Safety Auditor),

- A site inspection was carried out by the audit team during the AM and PM School Zone periods on Thursday 8 August 2019.
- An audit report was produced by the audit team following the site inspection.
- A completion meeting would be held where the findings were discussed.

1.4 Project location

Moriah War Memorial College is located in Queens Park east of Centennial Parklands. The Road Safety Audit study area incorporated the adjacent road network as shown in Figure 1-1 which includes:

- York Road, between Queens Park Road and Baronga Avenue.
- Queens Park Road, between York Road and Baronga Avenue.
- Baronga Avenue, between Queens Park Road and York Road.

Figure 1-1 Road Safety Audit Study Area

Source: Google maps – modified by GHD

1.4.1 Existing road network

The existing road network adjacent to the Moriah War Memorial College include the following site conditions.

York Road

York Road is a local collector road orientated in a north-south direction, providing a link between the suburb of Randwick to the south and Syd Enfield Drive, Bondi Junction to the north. Within the study area, York Road has the key characteristic as outlined in Table 1.

Table 1 York Road key characteristics

Feature	Description
Carriageway	Two-way undivided carriageway with a single travel lane in each direction. Left turn lane southbound into Gate 1 during the school periods via the implantation of No Parking 7:00 am – 8:30 am and 2:30 pm – 4:00 pm School Days restriction.
Parking	Eastern kerbline: Typically No Parking 7:00 am – 8:30 am and 2:30 pm – 4:00 pm School Days. Western kerbline: Typically 4P 8 am – 6 pm Daily.
Speed Limit	50 km/h with 40 km/h School Zone 7:00 am – 8:30 am and 2:30 pm – 4:00 pm School Days.
Pedestrian Facilities	Pedestrian path on the eastern kerb and pedestrian refuge north of Gate 1 providing access to Centennial Parklands.
Bicycle Facilities	On-road mixed environment.
Public Transport	No dedicated facilities.
School Access	Gate 1 provides secure pedestrian and vehicle access with a link to an internal drop off pick up facility within the school ground. Gate 4A provides secure pedestrian access to the school, and link to the school prick up drop off facility along the northern kerb of York Road. Gate 4 provides secure vehicle access to the school.

Baronga Avenue

Baronga Avenue is a local road orientated in a north-south direction, providing a link between York Road to the west and Council Street to the east. Within the study area, Baronga Avenue has the key characteristic as outlined in Table 1.

Table 2 Baronga Avenue key characteristics

Feature	Description
Carriageway	Two-way undivided carriageway with a single travel lane in each direction.
Parking	Eastern kerbline: Typically No Parking 7:00 am – 8:30 am School Days or Bus Zone 2:30 pm – 4:00 pm School Days (within a designated lay-by). Western kerbline: Unrestricted parking
Speed Limit	50 km/h with 40 km/h School Zone 7:00 am – 8:30 am and 2:30 pm – 4:00 pm School Days.
Pedestrian Facilities	Pedestrian paths on the eastern and western kerb and raised pedestrian zebra crossing opposite Gate 3 providing access to Queens Park (sporting oval).
Bicycle Facilities	On-road mixed environment.

Feature	Description
Public Transport	Bus Zone on the western kerb within a designated lay-by (utilised by school bus services only).
School Access	Gate 3 provides secure pedestrian access with a link to the drop off pick up/bus zone facility located within the designated layby. Gate 3A provides secure pedestrian access with a link to the drop off pick up/bus zone facility located within the designated layby.

Queens Park Road

Queens Park is a local road orientated in an east-west direction, providing a link between York Road to the south and Queens Park Road to the north. Within the study area, Queens Park Road has the key characteristic as outlined in Table 1.

Table 3 Queens Park Road key characteristics

Feature	Description
Carriageway	Two-way undivided carriageway with a single travel lane in each direction.
Parking	Northern kerbline: Typically 2P 8 am – 6 pm Daily (Permit Holders Exempted as part of the Resident Parking Scheme) Southern kerbline: No Stopping 7:00 am – 8:30 am and 2:30 pm – 4:00 pm School Days
Speed Limit	50 km/h with 40 km/h School Zone 7:00 am – 8:30 am and 2:30 pm – 4:00 pm School Days.
Pedestrian Facilities	Pedestrian paths on the northern and southern and pedestrian zebra crossing opposite Gate 2.
Bicycle Facilities	On-road designated cycle lane in both directions.
Public Transport	Bus Zone on the northern and southern kerb (utilised by public bus services).
School Access	Gate 2 provides secure pedestrian access. Although this access is restricted to staff only. Adjacent to the pedestrian gate is a secure gated system to a staff parking area.

2. Objectives, process and evaluation criteria

2.1 Objectives of the road safety audit

A RSA is “a formal examination of a future road or traffic project or an existing road, in which an independent, qualified team reports on the project’s crash potential and safety performance” (Guide to Road Safety, Part 6A: Implementing Road Safety Audits - Austroads 2019).

2.2 Process of the road safety audit

The RSA followed standard practice in identifying safety related issues. It involved a site visit during day and night period. Standard issues such as sight distance, speed zones, lighting, safety barriers, approach road alignment, delineation, line marking and signage, intersection layout and conditions (amongst others) were assessed with respect to safety. The audit is structured around a standard checklist provided in the “Guide to Road Safety, Part 6A: Implementing Road Safety Audits”, Austroads 2019 and Roads and Maritimes Services “Guidelines for Road Safety Audit Practices, July 2011”.

2.3 Criteria used to assess the levels of risk

Risk levels have been assigned for each deficiency identified along the route by the audit team and are based on the criteria set out in the Austroads guide. These risk levels have been determined based on the deficiency’s frequency and severity. Definitions of the different levels of frequency and severity have been reproduced in Table 4 and Table 5 below from Austroads Guide to Road Safety, Part 6A: Implementing Road Safety Audits, 2019.

Table 4 Summary of frequency descriptions

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 5 Summary of severity descriptions

Severity	Description
Catastrophic	Likely multiple deaths
Serious	Likely death or serious injury
Minor	Likely minor injury
Limited	Likely trivial injury or property damage only

Austroads Guide to Road Safety, Part 6A: Implementing Road Safety Audits, 2019, provides definitions for four different levels of risk, namely, “intolerable”, “high”, “medium” or “low”. Extracts of the risk assessment matrix from Austroads are provided below in Table 6.

Table 6 Summary of levels of risk

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

It is noted that as a consequence of the Austroads guide not adopting a more objective risk ratings process, the risk rating reported in all Road Safety Audits are subjective. As a result, the audit findings can be skewed towards reporting risks as “high” and “intolerable”. Care should be taken by the appropriate decision maker when using these results to justify an outcome.

Care should be taken by the appropriate decision maker when using these results to justify an outcome.

Of the four possible risk rating levels (i.e. Intolerable, high, medium or low) a description of their priority are defined below in Table 7.

Table 7 Priority to levels of risk

Level of Risk	Description of Priority to Risk Rating
Intolerable:	A significant road safety risk requiring immediate urgent attention.
High:	A high road safety risk requiring immediate or urgent attention.
Medium:	A road safety risk that may lead to crashes and that requires attention as soon as reasonably practicable.
Low:	A lower road safety risk that requires attention. Remedial action may be carried out on a non-urgent basis, such as in conjunction with routine road maintenance or other planned work.

2.4 Road safety categories

RSA categories are utilised to assist the management of corrective actions and the monitoring of road safety deficiency trends. A list of the available categories is scheduled in Table 8 below which has been derived from the Roads and Maritime Services road safety categories information sheet.

Table 8 Road safety audit categories

Category	Examples
Access Impact	Property developments, traffic generators, rest areas, emergency vehicles, service vehicles, maintenance, vehicles breakdowns, etc.
Auxiliary Lanes	Overtaking lanes, passing lanes, tapers, merges, etc.
Bridge Structures	Road bridge, pedestrian bridge, rail bridges etc.
Bus Infrastructure	Bus lanes, bus facilities, bus stops etc.
Cycle Infrastructure	Cycleways, on-road facilities, off-road facilities, cycle routes etc.
Delineation	Guide posts, pavement markings, reflectors, warning signs etc.
Heavy Vehicle Infrastructure	Inspection bays, facilities, provisions, routes etc.
Intersection	Roundabouts, T-junctions, cross junctions etc.
Landscaping	Shrubs, trees etc.
Lighting	Street lighting, tunnel lighting etc.
Miscellaneous	Matters not covered by categories listed.
Network Effects	Road function, traffic composition, traffic volume, traffic characteristics, route choice, impact of continuity with the existing network etc.
Special Road User Infrastructure	Trains, ferries, trams, equestrian, stock, special events etc.
Pedestrian Infrastructure	Pathways, pedestrian crossings, pedestrian fencing etc.
Road Alignment and Cross Section	Sight distance, visibility, readability by drivers, glare, widths, shoulders, crossfalls, batter slopes, drains etc.
Road Pavement	Pavement defects, skid resistance, ponding, loose stones material etc.
Roadside Activities	Roadside advertising, road side designs, vending etc.
Roadside hazards	Clearzones, utility poles, culverts, bridge structures, trees etc.
Speed Zones	Speed limits, speed zones, design peed, school zones etc
Traffic Management and Operation	Staging of works, temporary traffic control, detours, peak tidal flows, clearways, parking etc.
Traffic Management Devices	Threshold treatments, road humps, kerb extensions, slow points etc.
Traffic Signals	Signal phasing, bus signals, bicycle signals pedestrian signals etc.
Traffic Signs	Regulatory signs, warning signs, guide signs etc.
Tunnel Structures	Road tunnels, pedestrian tunnels, cycle tunnels etc.

2.5 Road safety audit team

The RSA team comprised of the following accredited auditors with the NSW Centre for Road Safety's Register of Road Safety Auditors:

Audit Team Leader

Sean Clarke	GHD Pty Ltd, Sydney.
Auditor ID:	RSA-02-0891
Level of Certification:	3

Audit Team Member

Mazyar Razmavar	GHD Pty Ltd, Sydney.
Auditor ID:	RSA-1378
Level of Certification:	2

2.6 Site inspection and audit

2.6.1 Commencement meeting

A project commencement meeting was undertaken on Tuesday 6 August 2019 between Kate Lyons and Michael Carbone (Aver Development and Project Management, representatives of Moriah War Memorial College Association) and Sean Clarke (Road Safety Audit Team).

The purpose of the meeting was to be inducted into the project and discuss the project scope, status, limitations, safety and any other relevant project information. The background information for the project was provided by Michael Carbone.

2.6.2 Time and date

A day inspection and audit were undertaken by the audit team to incorporate the AM and PM school peak periods. The inspections were undertaken on 8 August 2019 during the following times:

- 7:15 am to 9:00 am
- 2:00 pm to 4:00 pm

2.6.3 Weather conditions

The weather conditions during the site visit were clear skies and a dry road surface.

2.6.4 Completion meeting

A completion meeting was held on the 20 August 2019 at Moriah War Memorial College to discuss the issues identified during the road safety audit as outline in section 3. The following people were in attendance:

- Rabbi Smukler (Moriah War Memorial College)
- Roberta Goot (Moriah War Memorial College)
- Trevor Johnson (Moriah War Memorial College)
- Kate Lyons (Aver Development and Project Management)
- Michael Carbone (Aver Development and Project Management)
- Ken Hollyoak (The Transport Planning Partnership)

- Jessica Ng (The Transport Planning Partnership)
- Sean Clarke (GHD)

2.7 References

- Roads and Maritime Guidelines for Road Safety Audit Practices, July 2011.
- Austroads “Guide to Road Safety, Part 6: Road Safety Audit”, 2009.
- Austroads “Guide to Road Safety, Part 6A: Implementing Road Safety Audits”, 2019.

2.8 Documentation audited

The audit was in reference to background information provided by Aver Development and Project Management including:

- High level sketch of the works area of “Site Opportunities and Constraints“ extract from fjmt studio figure dated 17.06.19.
- Planning Secretary’s Environmental Assessment Requirements (SSD-10352) Section 7.
- Development Application Stamped consent (DA-163/2017) and approved Plan of Management dated 18 September 2017.
- Existing and future staff and student numbers.

2.9 Previous road safety audits

No previous road safety audits were provided

2.10 Limitations of this audit

The following limitations are associated with this audit and report:

- Any background information subsequent to the commencement of the RSA.
- Traffic volume and crash data were not used for assessment.
- Occupational Health and Safety limitations (site inspections were completed from the road reserve only).
- Visual conditions witnessed on site at the time of the audit.

3. Road safety audit findings

3.1 Visibility of signage

The site inspection identified a number of existing signs were made of a non-reflective material, damaged or were obstructed by vegetation. Such issues may interfere with advance warning or traffic conditions to be conveyed to the driver, resulting in a variety of crash types involving vehicles, pedestrians or cyclists.

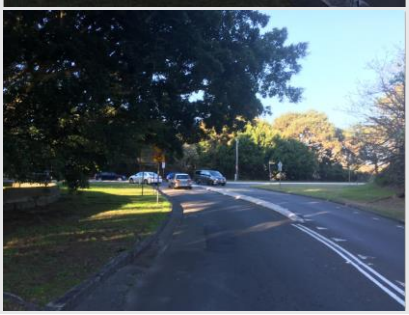
Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Traffic Signs

Table 9 outlines (but not limited to) the signs identified as part of this finding.

Table 9 Outline of signage visibility

Location	Finding	Photo
York Road – eastern kerb	Non reflective material on sign	
York Road – eastern and western kerb	No advance warning sign of pedestrian refuge	
York Road – eastern kerb	Signs obstructed by vegetation. “School Beware of Queuing Vehicles” sign not place in advance of the potential end of queue.	 

Location	Finding	Photo
		
York Road – central median	Sign not correctly positioned	
Baronga Avenue – northern and southern kerb	Non reflective material on sign and obstructed by vegetation	 
Baronga Avenue – northern kerb	Non reflective material on sign	
Baronga Avenue – southern kerb	Non reflective material on sign	

Location	Finding	Photo
Queens Park Road – southern kerb	Damaged and non reflective material on sign	
Queens Park Road – southern kerb	Damaged and non reflective material on sign	
Queens Park Road – southern kerb	School Zone sign partially obstructed by pole	
Queens Park Road – southern kerb	Dislodged sign	
Queens Park Road – southern kerb	Deterioration of sign visibility and reflectivity	
Queens Park Road – central median	Non-standard sign type	

3.2 Linemarking / Delineation deterioration

The site inspection identified some of the existing delineation (linemarking) has deteriorated (not clearly visibly) or missing. Such issues may result in drivers not appreciating the road environment and not follow the intended path of travel and bring about a variety of crash types.

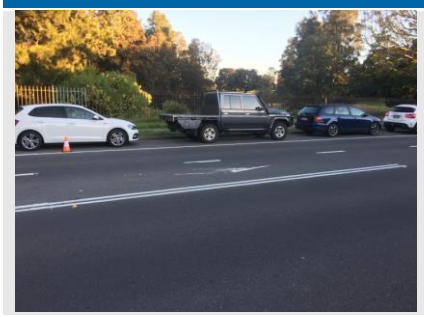
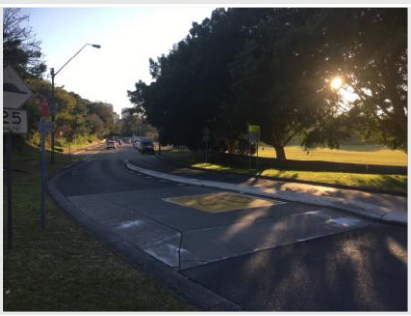
The following outlines (but not limited to) the delineation/linemarking identified as part of this finding.

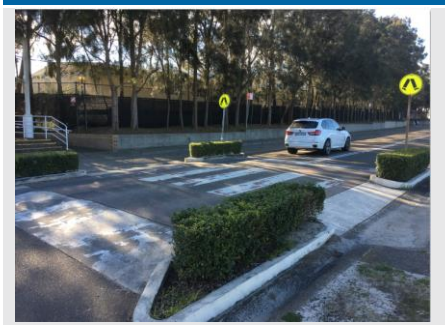
Risk Rating	
Severity	Minor
Frequency	Occasional
Risk	Medium

Special Road User Infrastructure
Delineation

Table 10 outlines (but not limited to) the delineation identified as part of this finding.

Table 10 Outline of linemarking / delineation deterioration areas

Location	Finding	Photo
York Road – southbound right turn lane into Queens Park Road	Deterioration of arrow linemarking	
York Road – southbound	Deterioration of 40 km/h School Zone patch	
Baronga Avenue – southern end	Hump missing “piano keys” to warn motorists	
Baronga Avenue – southern end	Missing Give Way line (TB) to advise motorists of intersection priority and appropriate vehicle waiting location	

Location	Finding	Photo
Baronga Avenue – mid block	Hump and pedestrian zebra crossing delineation deteriorating.	
Queen Park Road – mid block	Pedestrian zebra crossing and advance zig-zag delineation deteriorating.	 
Queen Park Road – western end	Hump missing “piano keys” to warn motorists	

3.3 Deterioration of pavement

The site inspection identified that some of the existing pavement areas has deteriorated resulting is cracking and subsidence within the roadway. Such issues may result in drivers, particularity motorcycles and cyclist potentially losing control of their vehicle on impact of the degraded pavement areas. Such pavement areas are susceptible to further degradation due to water penetration into the pavement and vehicle movements.

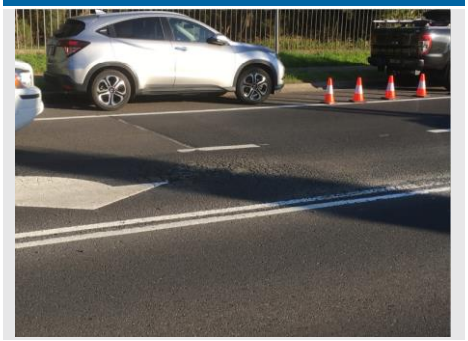
Additionally trip hazards are evident as a result of pavement subsidence of repairs along pedestrian paths. This can result in pedestrian injuring themselves on the trip hazards created.

Risk Rating	
Severity	Minor
Frequency	Occasional
Risk	Medium

Special Road User Infrastructure
Road Pavement

Table 11 outlines (but not limited to) the delineation identified as part of this finding.

Table 11 Outline of determination of pavement areas

Location	Finding	Photo
York Road – Right turn lane into Queens Park Road	Road pavement degradation	
York Road – Southbound on curve	Road pavement degradation	
York Road – Southbound within School drop off pick up area (Gate 4A)	Footpath pavement degradation	

Location	Finding	Photo
Baronga Avenue – southern end	Road pavement and pit degradation	
Queens Park Road – southern kerb	Footpath pavement degradation	
Queens Park Road – southern kerb (western end)	Footpath pavement degradation in front of bus stop	

3.4 York Road – Pedestrian Refuge

3.4.1 Pedestrian Refuge Layout

The site inspection identified the pedestrian refuge was not aligned to the current design from Roads and Maritimes Services Technical Direction for a pedestrian refuge, in that the island width is narrower than outlined in the Technical Direction (refer to Figure 3-1). It was evident at the inspection that a large amount of school children utilise this pedestrian refuge location to cross between the school and the Centennial Parklands opposite.

The narrowed pedestrian width, is not sufficient to accommodate the volume of school children resulting in an alternate pedestrian/vehicles control operation (refer to section 3.4.2 for further details) with potential risk to children and teachers colliding with through travelling vehicles.

Additionally, the narrow width would not accommodate the width required for people with bicycles or prams, resulting in bicycles or prams protruding into the through travel lane, while waiting within the refuge area.

Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Pedestrian Infrastructure

Figure 3-1 York Road Pedestrian refuge

3.4.2 Pedestrian refuge crossing operation

Typical operation of a pedestrian refuge is that pedestrians are to give way to through travelling vehicles, with the refuge island providing a waiting area mid-way to offer opportunity for the pedestrian to give way to one direction of traffic at any one time.

The site inspection identified that a large volume of students were required to cross at the pedestrian refuge to travel between the school and Centennial Parklands (refer to Figure 3-2). Due to the number of students, it was observed that a single teacher would stop traffic to allow students to cross York Road in groups.

The following safety issues are identified with this alternate pedestrian/traffic operation at the pedestrian refuge:

- The priority of vehicles and pedestrians is manually altered by the teacher (traffic controller) which is different from typical operational procedures. There is risk drivers may not be aware of the alternate operation (as there are no advance warning) and continue to travel in the through travel lane as a teacher steps out from the kerb, resulting in pedestrian / vehicle conflict.
- There is no advance warning to drivers (i.e. advanced signage) of the alternate operations undertaken or traffic control within the road environment, resulting in pedestrian / vehicle conflict.
- A single teacher is controlling both directions of traffic flow without operating signage. There is risk drivers may not observe the teacher, resulting in pedestrian / vehicle conflict.
- The teacher is not wearing high visibly clothing and is controlling traffic movement through the area. There is risk drivers may not observe the teacher, resulting in pedestrian / vehicle conflict.
- Teachers may not be appropriately trained and qualified to control traffic within public roads. There is certifications and requirements for traffic controllers to manage traffic movement within the road environment. Such training outlines safety and operational procedures permitted. Teachers may not be aware, unless suitably trained, in the appropriate traffic management procedure, resulting in potential injury to the teacher or students and impact on vehicles through the area.

Risk Rating	
Severity	Catastrophic
Frequency	Occasional
Risk	Intolerable

Special Road User Infrastructure
Pedestrian Infrastructure

Figure 3-2 York Road pedestrian refuge – Alternate operation

3.5 Baronga Avenue – Raised pedestrian crossing

3.5.1 Change in priority at Baronga Avenue pedestrian crossing

There is currently a through travel lane and an adjacent through travel lane within a layby facility at the pedestrian zebra crossing on Baronga Avenue (refer to Figure 3-3).

The pedestrian zebra crossing is evident only in the through travel lane on Baronga Avenue and not the adjacent lay-by facility. There is risk that pedestrians may not be aware of the change in priority (in that the pedestrian is required to give way to through vehicles) within the layby. There is risk that through travelling vehicles may collide with a pedestrian.

Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Pedestrian Infrastructure

Figure 3-3 Baronga Avenue pedestrian crossing – Change in priority

3.5.2 Dual through travel lanes – visibility obstruction

Notwithstanding the findings outlined in section 3.5.1, it was observed however, that typically vehicles (notably busses) travelling through the layby, would stop to give way to pedestrians crossing the layby and Baronga Avenue carriageway or stop in immediate approach to the crossing area crossing (i.e. within the pedestrian crossing “No Stopping” restriction), while waiting in queue to collect children north of the pedestrian (refer to Figure 3-4).

The position of the vehicle (notably buses) within the layby would restrict visibility between pedestrians and drivers of northbound through travelling vehicles on approach to the pedestrian crossing. There is risk that through travelling drivers along Baronga Avenue carriageway may not clearly identify a pedestrian approaching the pedestrian crossing (and visa-versa), due to the stop vehicles adjacent, resulting in pedestrian/vehicle conflict.

Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Pedestrian Infrastructure

Figure 3-4 Baronga Avenue – Visibility obstruction to pedestrians

3.5.3 Lighting

The site inspection was only carried out during the daylight period during the school peak AM and PM peak pick up and drop off times, therefore current operation of the lighting was not able to be observed. However, it was identified at the pedestrian zebra crossing on Baronga Avenue had lighting for crossing on angle that may create artificial glare to southbound vehicles on approach to the pedestrian zebra crossing (refer to Figure 3-5). Such glare may affect the visibility of opposing approaching vehicles or pedestrians on the pedestrian zebra crossing resulting in potential pedestrian/vehicles impact or head on crash of approaching vehicles.

Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Lighting

Figure 3-5 Baronga Avenue – Lighting

3.6 Gate 4A pick up operation

3.6.1 Gate 4A vehicle queue

It was observed at the site inspection, that vehicles were in queue from 2:40 pm to pick up students from gate 4A on York Road, with pick up operations commencing at 3:15 pm. This resulted in:

- An extended period of time for the queuing of vehicles prior to the release of school students.
- The vehicle queue was in advance of the “School Beware of Queuing Vehicles” advanced warning sign located on the southbound travel lane on York Road and therefore did not provide advance warning of the queue to approaching traffic (refer to Figure 3-6).
- It was also observed at the site visit that vehicles within the queue did not always position close to the rear of vehicle in front. This resulted in:
- A longer than necessary queue of vehicles.
- Vehicles attempting to “jump the queue”, causing the rear of the vehicle to be within the through traffic lane (refer to Figure 3-7).

There is risk that such queue operation may result in rear end type crashes on the curve or longer vehicle queue, adversely impacting on traffic movement.

Risk Rating	
Severity	Minor
Frequency	Occasional
Risk	Medium

Special Road User Infrastructure
Network Effects / Roadside Hazard

Figure 3-6 Gate 4A vehicle queue – Vehicle queue reaching the queue advance warning sign

Figure 3-7 Gate 4A vehicle queue – Vehicles jumping the queue

3.6.2 Traffic controller safety

It was observed at the site inspection a traffic controller was positioned to assist in the egress of vehicles from the pickup facility at Gate 4A to merge into the through travel lane. The traffic controller, while wearing high visibility clothing, was positioned between the pickup vehicles and the through traffic (to manoeuvre traffic cones). Refer to Figure 3-8. This position of the traffic controller adjacent to through traffic flow will have restricted emergency egress path in the event of an errant vehicle. Additionally there is no advance warning to approaching traffic that a traffic controller is within the road area.

There is risk a vehicle may impact the traffic controller and an emergency egress path may not be available for the traffic controller in the event of an errant vehicle.

Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Traffic Management and Operation

Figure 3-8 Gate 4A vehicle queue – Traffic controller safety

3.6.3 Safety to waiting people within the vehicle queue

It was observed at the site inspection, that as a result of drivers arriving prior to the released of students, time was available for drivers to alight from their vehicle to talk to other drivers while waiting. Conversations occurred adjacent to the through traffic lane (refer to Figure 3-9).

There is risk, especially on the curve, that through travelling vehicles may collide with people adjacent to the queued vehicles and there is no means of emergency egress path in the event of an errant vehicle.

Risk Rating	
Severity	Serious
Frequency	Occasional
Risk	High

Special Road User Infrastructure
Traffic Management and Operation

Figure 3-9 Gate 4A vehicle queue – Waiting people safety

3.7 Gate 4 access operation

It was observed at the site inspection, that to gain vehicle access through Gate 4, drivers were required to alight from their vehicles in order to insert a pin number to open the gate. Such operation created delays, with other vehicles waiting to access through Gate 4 required to queue within the through travel lane on York Road (refer to Figure 3-10).

There is risk of a rear end type crash to vehicles within the queue.

Risk Rating	
Severity	Serious
Frequency	Improbable
Risk	Medium

Special Road User Infrastructure
Traffic Management and Operation

Figure 3-10 Gate 4 vehicle queue

3.8 Baronga Avenue – Existing barrier end treatment

It was observed at the site visit, the existing barrier end treatment on Baronga Avenue at the intersection with Queens Park Road was damaged (refer to Figure 3-11).

There is risk the current condition of the barrier end treat may not operate as intended during impact, resulting in injury to the occupants within the vehicles.

Risk Rating	
Severity	Serious
Frequency	Improbable
Risk	Medium

Special Road User Infrastructure
Roadside Hazard

Figure 3-11 Baronga Avenue – Barrier end treatment

3.9 Temporary traffic management devices

It was observed at the site inspection that temporary traffic control devices (i.e. cones and bollards) were utilised on the public road to manage temporary pick up and drop off operations or to prevent parking in areas (i.e. as in front of school gates). Some of the devices utilised were not in line with current standards for temporary traffic control devices. Such items include:

- Bollards that did not contain reflective bands and were cut shorter and now less than the minimum 750 mm height (refer to Figure 3-12).
- Cones without non reflective bands (refer to Figure 3-12).

Utilising temporary traffic control equipment not to the current standard may not be visible to drivers and therefore be impacted and become a hazard.

This was observed on one occasion on site at Gate 3A where a driver exiting from the lay-by did not see the bollard in front of the vehicle and run directly over it, moving it closer to the traffic lane.

Risk Rating	
Severity	Limited
Frequency	Occasional
Risk	Low

Special Road User Infrastructure
Traffic Management and Operation

Figure 3-12 Temporary traffic control devices

4. Audit Statement

We certify that the audit was carried out by a team of independent auditors who can provide an unbiased and objective safety review.

We certify that in carrying out this audit we have reviewed the available information and have endeavoured to identify features in order to improve safety, although it must be recognised that safety cannot be guaranteed since no road can be regarded as absolutely safe.

The issues identified have been noted in this report and readers are urged to seek further specific technical advice on matters raised and not rely solely on the report.

Signed  Date: 21 August 2019

Audit Team Leader

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Signed  Date: 21 August 2019

Audit Team Member

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