

Cranbrook High School

Traffic Management Plan

Roadworks road safety audit (plan-based)



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Author

Damien Chee



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This report has been prepared for Cranbrook High School.

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1 Introduction

1.1 Project and audit details

Details of the audit have been summarised in Table 1.

Table 1 Details of the road safety audit.

Audited project	Proposed pick up and drop off zone and traffic management plan associated with Cranbrook High School, at Bellevue Hill.
Client/ contact	<u>Client</u> Cranbrook High School 5 Victoria Road Bellevue Hill NSW 2023 <u>Contact</u> David Hull Facilities Manager Mob: 0411 853 798
Audit type	<i>Roadworks</i> road safety audit. Note: This audit is referred to as a <i>roadworks</i> road safety audit since there are both design elements as well as traffic management practices that are involved in the pick up and drop off practices associated with the school. <i>Roadworks</i> road safety audits is the category of audits concerning all projects where temporary traffic management practices are involved, such as the traffic management system proposed with student drop off and pick up.
Purpose	A <i>roadworks</i> road safety audit was required to identify potential safety risks prior to the construction and implementation stage.
Background	Parking and Traffic Consultants has prepared a <i>Traffic and Parking Plan</i> for Cranbrook High School. The proposed civil works, and the proposed traffic management arrangements at the drop off and pick up times of the school, were required to be formally reviewed via this road safety audit. A <i>roadworks</i> road safety audit was required to identify potential safety risks prior to the construction and implementation stage.
Audit team details	Damien Chee, DC Traffic Engineering, Level 3, lead road safety auditor – RSA-02-0094. Linda Chee, DC Traffic Engineering, Level 2 road safety auditor – RSA-02-1069. Andrew Morse, Parking and Traffic Consultants.
Audit methodology	The audit was undertaken using the following methodology: <ul style="list-style-type: none">▪ A review of the auditable materials listed in <i>scope of project/audit</i> was carried out on 11/12/2018.▪ A site inspection was carried out on 10/12/2018. This was only for the purposes of contextualising the auditable materials against the existing road, traffic and land use conditions.▪ The road safety audit findings have been documented in this report in accordance with the NSW Centre for Road Safety's <i>Guidelines for Road Safety Audit Practices</i> (2011).▪ This report includes completed <i>checklist 5 –roadworks stage audit</i> as sourced from the Austroads <i>Guide to Road Safety Part 6: Road Safety Audit</i>.
Meeting and assessment details	Audit carried out on 11/12/2018. Site inspection carried out on 10/12/2018.

Scope of project/ audit	<p>The following materials were issued to the audit team and regarded as the auditable materials:</p> <ul style="list-style-type: none"> ▪ <i>Traffic and Parking Plan</i>, prepared by Parking and Traffic Consultants (version 3 dated 21/9/2018). Although this document discussed the traffic, parking, pedestrian access and bus stop issues for the entire site, the focus of this audit was on the porte cochere (driveway) which extends from the Victoria Road gate to the Rose Bay Avenue gate. ▪ Landscaping plans as follows (the plan revision numbers are in square brackets) <ul style="list-style-type: none"> ▪ 17-48CB-318[E] ▪ 17-48CB-319[E] ▪ 17-48CB-320[E] ▪ 17-48CB-321[E] ▪ Swept path model for port cochere registered as CC-001 Rev 1.
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1.2 Responding to the audit report

Road safety audits provide the opportunity to highlight potential road safety problems and have them formally considered by the project manager in conjunction with all other project considerations.

The responsibility for the project rests with the project manager, not with the auditor. The project manager is under no obligation to accept the audit findings. Also, it is not the role of the auditor to agree to, or approve the project manager's responses to the audit.

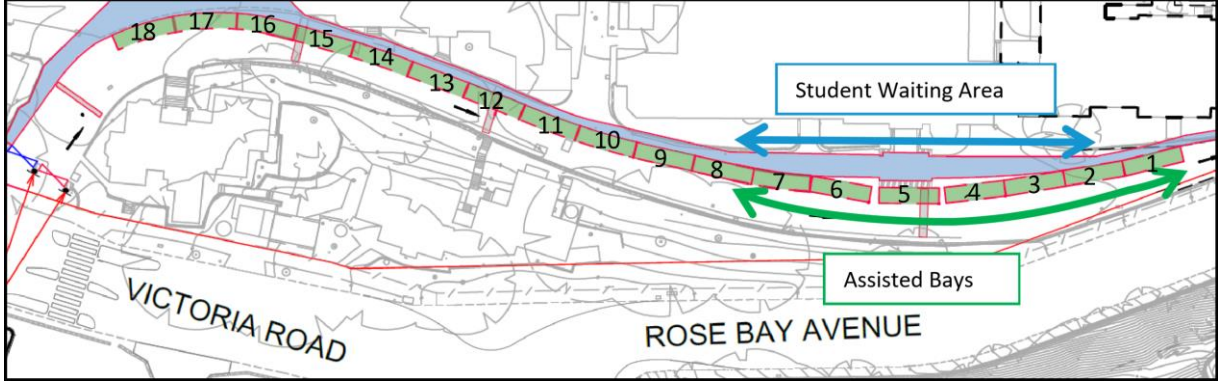
1.3 Previous audits

There were no previous road safety audit reports of direct relevance issued to the audit team.


2 Safety audit findings


The road safety audit findings are presented in Table 2.

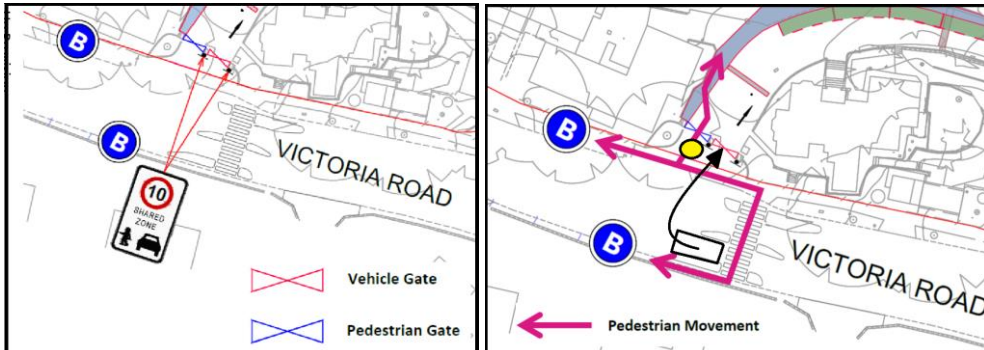
Table 2 Road safety audit findings.



Ref	Location	Road safety audit finding	Priority
1a	General – Safe operation of the drop off and pick up zone.	<p>The drop off/ pick up zone will be positioned in the existing porte cochere stemming off Victoria Road and emerging onto Rose Bay Avenue. An 18-space queuing and pick up line would be established as shown below. The assisted bays would be used mainly by younger students that require assistance when boarding or alighting from vehicles.</p> <p>Much of the success of the assisted drop off/ pick up zone depends on the chain-of-processes involved, the on-site management of students and cars, and the behaviours of the drivers (including queuing behaviour and etiquette). Ideally, under perfect operating conditions during pick up times, vehicles would arrive in bays 1-8 in the designated northbound direction, then load in an efficient manner, and then leave the bays <u>in the same order</u> and proceed to the Rose Bay Avenue gate. This would then allow the vehicles that were originally in bays 9-15 to progress to bays 1-8 and load and leave in the same order. However, in reality the vehicles would not always leave the pick up bays in the same order that they arrived. Similarly, many vehicles would not be ready to leave in the same order if they take longer to load or are required to wait longer. For example, if vehicles 1-7 are loading, but vehicles 4 and 5 are ready to leave well before the others, these drivers may tend to pull out into the circulating lane. This would create additional and unnecessary crash conflicts such as <i>rear-end</i> and <i>side-swipe</i> crashes due to vehicles 4 and 5 pulling out into the circulating lane. There would also be <i>rear-end</i> crash conflicts as vehicle 4 pulls out believing that the circulating lane is free, only to have vehicle 5 pull out at the same time (or even momentarily before).</p> <p>By pulling out of the line before the leading vehicles clear out of the pick up area, it also encourages trailing drivers to pass around the queue to enter those empty spaces. This also creates crash conflicts typical of parking manoeuvres. It would also cause frustration as many drivers would consider this to be “pushing in”, “jumping the queue” etc. Pockets of empty spaces would be more prevalent in the unassisted bays (bays 9-18) as these pick up transactions would be much quicker than the assisted bays.</p>  <p>Above: Extract from the Traffic and Parking Plan showing the designated drop off and pick up bays.</p>	Medium


Ref	Location	Road safety audit finding	Priority
1b	General – Safe operation of the drop off and pick up zone. Continued from item 1a.	<p>Further to item 1a...</p> <p>Section 2.7.2 of the <i>Traffic and Parking Plan</i> states “the drop off will operate as a ‘head of queue’ operation, where vehicles join the queue of vehicles and students alight when the vehicle reaches the end of queue”. In reality, this is unlikely to happen. Drop off transactions tend to be quicker than pick up transactions. When dropping off, the passenger alights from the vehicle with their bags/ possessions and the driver tends to leave immediately. By contrast, pick up transactions are longer since the driver inevitably needs to wait the additional time for the passenger to walk to the vehicle (unless they happen to be standing at the exact point where the pick up vehicle arrives). Also, when dropping off, drivers tend to have onward journeys such as going to work, and therefore tend to rush more.</p> <p>The orderliness of the drop off zone would be affected by these factors. Drivers would tend to set down their passengers at the first convenient kerbed area. The set down point could also be determined by where the student needs to go (eg. if proceeding to the gym, they would tend to set down at the southern end of the drop off zone). After setting down the student, the driver would then pull out of the queue and enter the circulating lane where there would be crash conflicts associated with pulling out and passing around the stationary queue. As the orderliness of the drop off and pick up line are affected, the relative safety performance will decline since this sort of behaviour inevitably creates more crash conflicts.</p>	Medium
2a	General – Lack of passing clearance along the circulating aisle of the porte cochere (adjacent to the drop off and pick up zone).	<p>There are several points throughout the porte cochere where there may be restricted passing clearance, especially if there are vehicles stopped or moving slowly along the drop off and pick up bays. Examples are depicted below with description in the captions.</p>  <p>Above: Towards the northern (departure) end of the porte cochere, the circulation aisle tapers to a narrower formation. The white polygon in the left-hand image is the indicative location of the first drop off/ pick up parking space. As shown, there is limited passing clearance at this point, especially if there are vehicles parked along the eastern side of the circulation aisle as shown here. The limited width may increase the risk of nuisance impacts with parked/ stopped cars. This is especially if drivers attempt to leave the queue before the leading vehicles in the queue have cleared out from the drop off/ pick up zone. Again, this is largely dependent on the management of internal traffic, driver courtesy/ etiquette and prevailing demands/ conditions. The right-hand image shows a NO PARKING sign which contains a single sided arrow. This points to the south, which indicates that vehicles are allowed to park/ stop to the north of this sign. This is inappropriate as any vehicles stopped on the downstream side of this sign would block the egress path.</p>	Medium


Ref	Location	Road safety audit finding	Priority
2b	<p>General – Lack of passing clearance along the circulating aisle of the porte cochere (adjacent to the drop off and pick up zone).</p> <p>Continued from item 2a.</p>	<p>Continued from item 2a...</p>  <p>Left: The portion of the porte cochere near the Alumni Building. The yellow polygons are the indicative locations of drop off/ pick up parking bays 17 and 18. If vehicles are stopped in these bays at the same time as a vehicle is parked at the red polygon, there would be very little residual passing clearance between these vehicles (see white arrow). One scenario where this could occur is if a driver is picking up or dropping off a pedestrian at this point, and a trailing driver intends to continue to the assisted bays to pick up younger children. The restricted passing clearance may increase the risk of side-swipe crashes.</p> <p>Right: The portion of the porte cochere downstream of the Kitchen Deliveries loading lane. There would be reduced passing clearance throughout this section due to (i) the proposed kerbed walkway on the western side of the porte cochere which will occupy more driveway width, (ii) vehicles stopped in the drop off/ pick up bays (bays 8 and 9), and (iii) if vehicles are parked/ stopped on the eastern side of the driveway as shown.</p>	Medium

Ref	Location	Road safety audit finding	Priority
2c	<p>General – Lack of passing clearance along the circulating aisle of the porte cochere (adjacent to the drop off and pick up zone).</p> <p>Continued from item 2a.</p>	<p>Continued from item 2a...</p>  <p>Left: The sheltered entry area to the Mackay Room and Chapel juts out into the porte cochere driveway. The proposed drop off/ pick up bay will extend along the outside of this entry foyer. The white polygon is the approximate position of drop off/ pick up bay 5. As shown, if a vehicle is stopped at this location whilst there are vehicles stopped/ parked along the eastern side of the porte cochere, there would be very little residual driveway width for other vehicles to pass through this gap. This could also lead to side-swipe and nuisance impacts.</p> <p>Right: The audit team also notes that the pre-existing sandstone wall creates a blind corner where pedestrians may emerge suddenly into the path of a vehicle progressing along the drop off/ pick up bays. This could increase the risk of vehicle-pedestrian crashes. Furthermore, this is in the assisted drop off/ pick up area where there would be more likelihood of younger (and hence shorter) students. These children may be at more risk of being concealed by the sandstone wall. The mitigation of this issue through lateral offsets of the vehicle stream has tradeoffs. The greater the offset of the vehicle stream from the wall, the better the sight line and separation to conflicting pedestrians who may suddenly move out into the vehicle stream. However, this would further reduce the passing clearance between the drop-off/pick up vehicles and vehicles parked on the eastern side of the porte cochere. The audit team also notes that unless some lateral offset is provided at the sandstone wall, there may not be sufficient door-opening clearance. This has further safety flow-on effects as pedestrians may be forced to use the driver-side doors rather than the passenger-side doors. Even if doors can be opened with sufficient clearance, there may not be residual offset available for pedestrians to walk around the opened doors.</p>	Medium

Ref	Location	Road safety audit finding	Priority
3a	Entry gate from Victoria Road.	<p>The <i>Traffic and Parking Plan</i> indicates that the vehicle entry gate would be on the right-hand side of the pedestrian gate if the gate is viewed from the outside looking in. The audit team notes the following concerns:</p> <ul style="list-style-type: none"> Typically, drivers are accustomed to entering on the left-hand side of a given channel due to the left-hand drive rule. The designation of the right-hand channel as the entry path could reduce the legibility of the gate. This could result in driver hesitation, confusion and indecision. Also, pedestrians would be accustomed to seeing oncoming traffic approach on the left-hand side of the driver-viewed channel (the right-hand side of the pedestrian-viewed channel from inside the property). If inbound vehicles are designated to the right-hand gate, this could also be counter-intuitive for pedestrians on the footpath and using the porte cochere driveway. As shown in the right-hand image, one likely pedestrian desire line would be from the internal footpath to the zebra crossing across Victoria Road. As such, these pedestrians would be required to cross the inbound driveway. These pedestrians would be exposed to impacts by inbound vehicles, especially vehicles turning right into the porte cochere. Such right-turning drivers would tend to look to the west to judge gaps in the eastbound traffic stream. In doing so, they may fail to check for pedestrians crossing the inbound gate. This could result in <i>right-turn on pedestrian</i> crashes between the inbound vehicle (black arrow) and pedestrians (yellow dot). The right-hand channel at the entry gate has more pronounced vertical grades and grade changes (see photo on next page). The abrupt changes in grade could result in under-carriage scraping or bottoming out, especially by vehicles with low ground clearance. If entering the right-hand channel at the gate, the driver would have less forward visibility to the driveway conditions ahead. This includes reduced awareness of where the back of queue is located. This could increase the risk of <i>rear-end</i> crashes. It may also lead to right-turning drivers attempting the right turn when there is insufficient downstream clearance within the property. This could therefore increase the risk of queues spilling back <i>through</i> the gate and across the footpath. This could force pedestrians onto the roadway and the back of queue may also be exposed to <i>rear-end</i> crashes if the right-turning vehicle is stranded in the control area of the intersection with no opportunity to pass around the queued vehicles in the road ahead. If the right-hand channel is used, there is more likely to be queue spillback from the westbound lane of Victoria Road back across the zebra crossing. This would be due to westbound right-turners stopping to turn right and being in such close proximity to the zebra crossing. It would also be due to the lack of passing clearance for trailing westbound vehicles as the kerb blister impedes this passing path. <div>  <p>Far left: The <i>Traffic and Parking Plan</i> indicates that the right-hand channel at the entry gate would be used by vehicles and the left-hand channel would be used by pedestrians. Near left: The risk of right-turn on pedestrian crashes at the gate. The inbound right-turning vehicle would tend to look to the west to check for gaps. In doing so, they may fail to see pedestrians crossing the gate and moving to/from the zebra crossing.</p> </div>	Medium

Ref	Location	Road safety audit finding	Priority
3b	Entry gate from Victoria Road. Continued from item 3a...	<p>Continued from item 3a...</p>   <p>Left: Looking eastbound along Victoria Road at the entry driveway. Note the abrupt change in grade of the right-hand gate (as viewed from the outside) where vehicles may have increased risk of undercarriage scraping and bottoming out. Right: Extract from the swept path model showing how a right-turning vehicle entering the right-hand channel of the entry gate would have marginal clearance from the nose of the median island at "X".</p>	Medium

Ref	Location	Road safety audit finding	Priority
4	Visibility along the porte cochere.	<p>Generally, there is a lack of unobstructed line of sight along the 18 proposed drop-off/ pick up bays. This is due to the numerous horizontal curves and sight-obstructing elements adjacent to the road as well as on the road (parked and queued cars). This would restrict the ability of on-site traffic management personnel (the Traffic and Parking Plan states that there will be four staff members on duty to supervise drop off/pick up operations). For example, without a clear line of sight from the assisted pick up spaces, staff members would not be able to judge whether an early arriving driver can wait in place or if they need to leave the system and re-circulate back to the Victoria Road gates. The <i>Traffic and Parking Plan</i> states that early arriving drivers would be directed to leave. However, this would not be necessary if there is a small queue of cars further upstream in the port cochere. Recycling this traffic back to the start point would create unnecessary crash conflicts associated with entering Rose Bay Avenue, negotiating the route back to Victoria Road, making a right-turn at Victoria Road and another right turn into the Victoria Road gate. A clear line of sight would enable more sensible judgement calls to be made.</p> <p>A clear line of sight would also be helpful in safeguarding pedestrians and other vehicles. If problems were detected, the on-site staff could slow down the call-up process, or halt the call-up process altogether.</p> <p>As line of sight is unlikely to be achieved through physical measures, as a result of the pre-existing physical constraints, compensatory measures could be used such as positioning staff members at strategic points and using two-way radios to establish a communication link at least between the head of queue and entry gate. This practice is used extensively in queue-generating traffic control plans across the road network.</p>  <p>Above: An example of an obstructed line of sight along the porte cochere. From this point near the start of the proposed drop off/ pick up zone, there is a lack of clear sight line to the head of queue (bay 1) as well as to the sheltered area at the entry to the Mackay Room and Chapel.</p>	Medium

Ref	Location	Road safety audit finding	Priority
5	Safety of the egress gate.	<p>The porte cochere re-emerges onto the external road network at Rose Bay Avenue. Since the porte cochere has a near-parallel alignment with Rose Bay Avenue, this has resulted in a sharp turn in the porte cochere in its immediate approach to Rose Bay Avenue. This has created a number of road safety concerns, as follows:</p> <ul style="list-style-type: none"> ▪ The sharp angle between the porte cochere and Rose Bay Avenue, and the significant elevation difference from Rose Bay Road (higher elevation) and the porte cochere (lower elevation) has required the boundary fence to continue all the way up to the driveway opening (to safeguard pedestrians and prevent fall injuries). This fence therefore restricts driver visibility to pedestrians on the external footpath. This could have corresponding risks of <i>vehicle-pedestrian</i> crashes at the gate. ▪ The egressing vehicle would tend to be aligned at an acute angle to Rose Bay Avenue when stopped to judge gaps. The viewing angle to the eastbound traffic stream is difficult and some vehicles (eg. delivery trucks and utes) may have poor inter-cabin visibility such that the sightline is not even achievable. ▪ Kerbside parking is allowed on the western side of Rose Bay Avenue. As shown in the right-hand image, parked cars would tend to compromise the <i>minimum gap sight distance</i> (MGSD) sight line such that the egressing driver may not be able to detect and select safe gaps to complete the movement. This could result in poor gap selection and consequential <i>cross traffic</i> crashes. ▪ Kerbside parking is also allowed on the eastern side of Rose Bay Avenue. These vehicles restrict the space available for egressing right-turning vehicles. The vehicle would need to perform a 180-degree hard right-turn. Furthermore, they would be required to commence this turn from the extreme left-hand side of the porte cochere channel. There would be risks of <i>side-swipe</i> crashes between right-turning egressing vehicles and parked cars on the eastern side of Rose Bay Avenue. <div data-bbox="519 742 1646 1193">  </div> <p>Left: Looking from the porte cochere channel to the outbound gate where there is limited visibility to pedestrians on the external footpath. Right: The MGSD sight line from the egress driveway is compromised by (i) the poor viewing angle and (ii) parked cars on the western kerbline of Rose Bay Avenue.</p>	Medium

Ref	Location	Road safety audit finding	Priority
6	Egress driveway on Rose Bay Avenue.	<p>The driveway from the porte cochere to Rose Bay Avenue would default to a permanent outbound (egress) only driveway. The audit team cannot envisage situations where this could ever feasibly operate as an inbound driveway. This is especially since many entering vehicles would come from the west and would be required to perform a hard 180-degree left-hand turn from Rose Bay Avenue into the driveway. This would not be achievable by the full range of light and people mover vehicles. If this operates as an <i>outbound only</i> driveway, consideration should be given to placing R2-3 NO ENTRY signs to prohibit undesirable entry movements at this location. Any entry movements in error could result in <i>head-on</i> crashes with other vehicles in the porte cochere, or the need for the erroneous vehicle to reverse back out onto Rose Bay Avenue, which would be at risk of reversing-related collisions.</p> <div data-bbox="517 432 1532 884" data-label="Image"> <p>The image block contains two side-by-side visual elements. On the left is a technical plan view diagram of a road intersection and driveway. It shows a road with a dashed line indicating a lane change or boundary. A red arrow points from a 'SHARED ZONE' sign (which also has 'END' written on it) towards the driveway area. On the right is a photograph of a real-world scene. It shows a dark-colored car parked on a paved area that appears to be a driveway or a narrow lane. In the background, there are other vehicles and a building.</p> </div> <p>Left: Despite the Rose Bay Avenue driveway most probably defaulting to an outbound only driveway, there are no entry restriction signs such as NO ENTRY, NO RIGHT TURN and NO LEFT TURN signs. Right: There are no entry restriction signs at this driveway.</p>	Low

Ref	Location	Road safety audit finding	Priority
7	Proposed boom gate near the start of the drop off/ pick up zone.	<p>The landscaping drawings indicate that a boom gate would be installed near the start of the drop off/ pick up zone. This would inevitably require an intercom/ keypad on the driver (right-hand) side of the port cochere. This would not be accessible if there are cars parked along the eastern side of the porte cochere. Some degree of parking and stopping restriction may be required to ensure that drivers can access these facilities.</p> <div data-bbox="519 323 1030 826" data-label="Image"> <p>This is a technical drawing from landscaping plans. It shows a site plan with various colored lines representing different paving types and a proposed boom gate. Labels include 'BOOM GATE TYPE B01 Refer Detail' and 'PAVING TYPE P5 Refer Detail' and 'PAVING TYPE P2 Refer Detail'. The drawing shows the layout of the port cochere and the intended placement of the boom gate and paving areas.</p> </div> <div data-bbox="1037 323 1671 826" data-label="Image"> <p>This is a photograph of the actual site. It shows the eastern side of the port cochere, which is a paved area. There are several cars parked along the edge. A 'No Parking' sign is visible on the left. The area is bordered by a stone wall and some landscaping. The photograph illustrates the issue mentioned in the finding: parking along the eastern side of the port cochere, which could block access to facilities on the driver's side.</p> </div> <p>Left: Extract from the landscaping drawings showing the proposed boom gate. Right: Parking is permitted at various marked and signposted locations along the eastern side of the porte cochere. This would limit driver access to any intercom and keypad facilities.</p>	Low

3 Concluding statement

DC Traffic Engineering has undertaken a *roadworks* road safety audit of this project in accordance with the methodology outlined in Section 1 of this report.

Issues identified have been noted in this report for the Project Manager to review, assess, and where appropriate, make the necessary recommendations to improve safety.



Damien Chee
Audit Team Leader
DC Traffic Engineering Pty Ltd

Appendix A

Road Safety Audit Checklist

Issue	Comments
5.1 General items	
1 Alignment <ul style="list-style-type: none"> Are the road works located safely with respect to horizontal and vertical alignment? If not, does works signing cater for this? Are the transitions from the existing road to the road works safe and clearly laid out? 	Pre-existing horizontal curves along the porte cochere limit the line of sight along the pick up/ drop off parking spaces.
2 Turning radii and tapers <ul style="list-style-type: none"> Are turning radii and tapers constructed in accordance with guidelines? Are the tapers delineated by roadworks cones where necessary? Are the widths of the lanes satisfactory for the traffic using the works area? Are the alignment of kerb, traffic islands and medians satisfactory? 	Sharp right-turn egress at Rose Bay Avenue gate. Sharp right-turn entry movement at the Victoria Road gate.
3 Traffic lane safety and visibility <ul style="list-style-type: none"> Is the work area clearly defined? Are the travel paths for both directions of traffic clearly defined? Is the work area appropriately separated from passing traffic? Are centre lines/lane lines/edge lines clear and unambiguous? Are sight and stopping distances adequate at works and at intersections and driveways? Are bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility? Can passengers safely walk to and from bus stops? 	Yes.
4 Night safety <ul style="list-style-type: none"> Is appropriate street lighting or other delineation provided at the road works to ensure that the site is safe at night? (Night inspection essential.) Is the works area safe for pedestrians and cyclists at night? 	Night time inspection not yet conducted as this was a plan-based road safety audit where the traffic management plan was the subject of this road safety audit. The traffic scheme has not yet been set up on site.
5 Maintenance <ul style="list-style-type: none"> Can the road be maintained safely during construction (consider workers and the public)? Is the road surface likely to be free of gravel, mud or other debris? 	Yes.
6 Access to property <ul style="list-style-type: none"> Do the roadworks safely accommodate property access? 	Yes.
7 Safety barriers <ul style="list-style-type: none"> Are safety barriers used where required to separate works areas from public areas? Are safety barriers used where required to shield traffic from other hazards? Are the barriers of an approved type for the purpose and located and assembled correctly? 	Yes.

Issue	Comments
<ul style="list-style-type: none"> Are safety barriers erected in a manner which: does not, <ul style="list-style-type: none"> Make them a hazard to traffic? Obstruct visibility? 	
8 Inspections <ul style="list-style-type: none"> Has the site been inspected day and night? 	No. the subject of the audit was the traffic management plan, not the site as set up under traffic control. The site traffic scheme is not yet in place.
5.2 Traffic management	
1 Traffic controls <ul style="list-style-type: none"> Are appropriate traffic management controls in place? Have the needs of cars, trucks, pedestrians, bicyclists, motorcyclists and bus users been considered? Is sight distance to traffic controllers adequate? Have parking and clearway matters been considered? Have the police and other emergency services been consulted? 	Relevant issues raised.
2 Speed management <ul style="list-style-type: none"> Are speed limit signs required for these works? If so, are they correctly applied? Are speed limit signs required to be maintained all day and at night? Are motorists informed of the need to slow down through the road works site? 	Yes.
3 Work site access <ul style="list-style-type: none"> Are site entrances and exits safely located with adequate sight distance? Are traffic merges/exits/entries/turns properly delineated and controlled? Are adequate merge lengths provided? Are appropriate traffic controls in place where works traffic and public traffic interact? 	NA.
5.3 Signs and pavement markings	
1 Signs <ul style="list-style-type: none"> Are all necessary regulatory, warning and direction signs in place? Are they correctly placed, clean and conspicuous? Do they conform in general with AS 1724.3 - 1996 and other guidelines? If chevron alignment markers are installed, have the correct types been used? Have unnecessary signs been removed when works are not in progress (eg. at night)? Are traffic signs correctly located and properly with adequate lateral and vertical clearance? Are signs placed to not restrict sight distance, particularly for turning vehicles? 	Several signage issues noted.
2 Day/night sign requirements <ul style="list-style-type: none"> Are the correct signs used for each situation including at night where 	See previous comment.

Issue	Comments
required, and is each sign necessary?	
3 Traffic control <ul style="list-style-type: none"> Are other traffic control devices according to standards and used correctly? Are flagmen or temporary traffic signals provided where required - where, when and how? 	Yes.
4 Delineation and reflective markers <ul style="list-style-type: none"> Are traffic lanes clearly delineated? Have temporary reflective markers been installed? Where coloured reflective markers are used, have they been installed correctly? 	Yes.
5 Pavement marking <ul style="list-style-type: none"> Are all necessary pavement markings installed in accordance with guidelines? Are vehicle paths through the works area clear to motorists? Are works areas clearly defined and clear of through traffic when flagmen are not used? Have any issues of site difficulties for motorcyclists (day or night) been addressed? 	Yes.
6 Detours <ul style="list-style-type: none"> Do temporary detours cater for heavy vehicles and buses to safely manoeuvre in their designated lane? 	NA.
5.4 Traffic signals	
1 Temporary traffic signals <ul style="list-style-type: none"> Are the temporary traffic signals clearly visible to approaching motorists? Are signs warning of temporary traffic signals adequate? Has the need for additional warning signs been considered? Will the ends of vehicle queues be visible to motorists so that they may stop safely? 	NA.
2 Location <ul style="list-style-type: none"> Are traffic signals operating correctly? Is the number and location of signal displays adequate? 	NA.
3 Visibility <ul style="list-style-type: none"> Have any visibility problems caused by the rising or setting sun been addressed? Do any site works or any construction equipment create visibility problems for traffic signals? 	NA.
4 Signal display <ul style="list-style-type: none"> Are signal displays shielded so they can be seen only by the motorists for whom they are intended? 	NA.

Issue	Comments
5 Traffic movements <ul style="list-style-type: none"> Are all movements, including pedestrians, catered for by the temporary traffic signals? 	NA.
5.5 Pedestrians and cyclists	
1 General <ul style="list-style-type: none"> Have the effects of the works areas on pedestrians and cyclists been considered? Are appropriate travel paths and crossing points provided for pedestrians and cyclists? Are pedestrians and cyclists adequately warned of obstructions and temporary works hazards on their travelled way? 	Pedestrian issues noted at the Victoria Road gate. Blind corner noted at the Mackay Room entry shelter.
2 Elderly and disabled access <ul style="list-style-type: none"> Are there adequate safety access provisions for the elderly, disabled, children, wheel chairs and prams (eg. holding rails, kerbs and median crossings, ramps)? 	Pedestrian conditions would need to be checked in more finite detail at the implementation phase.
3 Cyclists <ul style="list-style-type: none"> Is the route available for bicycles continuous and free of squeeze points or gaps? 	Yes.
5.6 Road pavement	
1 Pavement defects <ul style="list-style-type: none"> Is the pavement free of defects (eg. excessive roughness or rutting, potholes, loose material, etc.) which could result in safety problems like loss of steering control for: <ul style="list-style-type: none"> Car drivers? Cyclists? Motorcyclists? Heavy vehicle drivers? 	Routine checks are needed.
2 Skid resistance <ul style="list-style-type: none"> Does the pavement appear to have adequate skid resistance, especially on steep descents? 	Routine checks are needed.
3 Ponding <ul style="list-style-type: none"> Is the pavement free of areas where ponding or sheet flow of water may cause safety problems? 	Routine checks are needed.