Atlassian Office and Hotel Development (SSD-10405) – Response to Submissions

JMT Consulting has been commissioned by Atlassian (the Applicant) to prepare this document in response to the issues raised in by government agencies, community organisation groups and the public during the public exhibition of the proposed Atlassian Central State Significant Development (**SSD**) application (SSD-10405) in relation to the site at 8-10 Lee Street, Haymarket. The application was placed on public exhibition from 16th December 2020 to 3rd February 2021.

This document has been prepared to respond to the transport related issues raised by Transport for NSW (TfNSW) in their correspondence to DPIE dated 14 July 2021. TfNSW requested that a Stage 2 (Concept Plan) Road Safety Audit (RSA) for the proposed Lee Street access arrangement, Lee Street pick and drop off arrangement and the proposed access arrangement be undertaken in accordance with Austroads Guide to Road Safety Part 6: Managing Road Safety Audits and Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits by an independent TfNSW accredited road safety auditor

Consistent with TfNSW's recommendation, a Road Safety Audit has been prepared by Damien Chee of DC Traffic Engineering which is reproduced in Appendix A of this document. Damien is an accredited Level 3 Road Safety Auditor and was engaged to provide an independent review of any safety issues associated with the current design. The RSA did not identify any safety issues associated with the future No Parking zone on Lee Street which TfNSW had previously raised concerns about. Discussions with DC Traffic Engineering have confirmed that this No Parking zone was considered in the audit and no safety issues were deemed to be of significance in this regard.

In relation to the items raised in the RSA we provide this response:

- Item 1 – The driveway will be restricted to left in / left out only in accordance with the recommendation of the safety audit. This will be reinforced through appropriate signage which will be noted on the detailed design plans when developed
- Item 2 – The existing roadway arrangement has been modified to service inbound and outbound vehicle movements in line with the recommendation of the safety audit. To further address concerns raised in the safety audit all trucks leaving the site will be instructed to stop at the top of the ramp and give way to any vehicle that may be entering the site. This would provide priority for entering vehicles over exiting vehicles so they do not impede traffic flow on Lee Street. This will also allow for the extremely rare occurrence when an MRV is entering the site at the same time an MRV is exiting the site.
- Item 3 – Consistent with the recommendations of the safety audit, the immediate approach-departure length in Upper Carriage Lane will be kept free of obstructions to allow for the safe and efficient flow of vehicles into and out of the site
- Item 4 – All vehicles will be instructed to stop at the top of the ramp and give way to pedestrians on Lee Street. From this position at the site boundary (and not directly adjacent to Lee Street) they will be afforded good sight lines looking south on Lee Street from where they can view all oncoming traffic including the small number of vehicles that exit via Railway Colonnade Drive.

We note that TfNSW have separately recommended a condition of consent requiring the high and medium priority items noted in the RSA to be further considered prior to a Construction Certificate being issued, with mitigation measures to be proposed to the satisfaction of TfNSW. No objection is raised to this proposed condition.

Please do not hesitate to contact the undersigned should you have any questions.

Regards

Josh Milston

Director | JMT Consulting

MIE AustCPEng

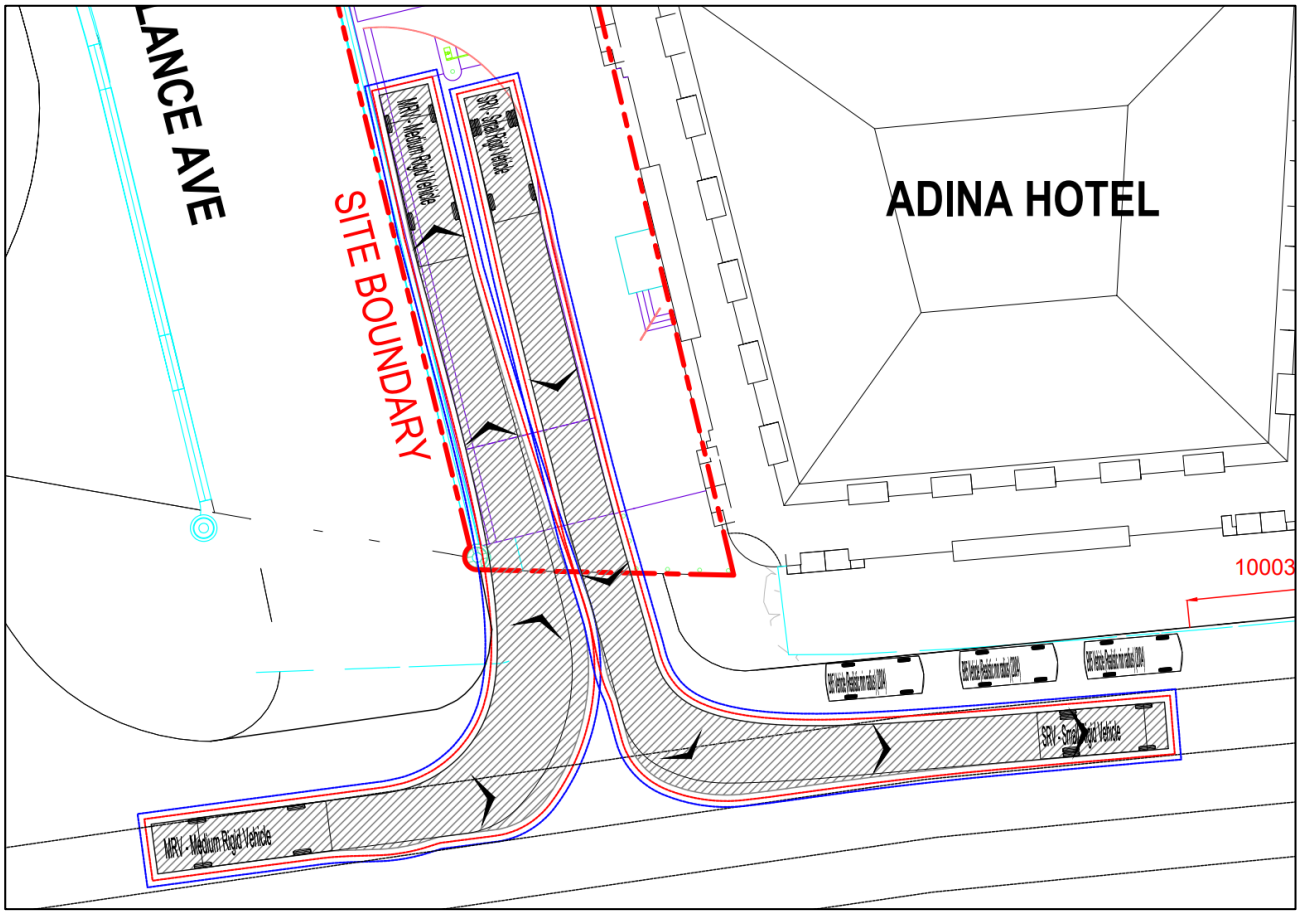
Appendix A: Road Safety Audit

TRAFFIC ENGINEERING

JMT Consulting

Atlassian Central

Concept design road safety audit



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Atlassian Central

Concept design road safety audit

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Report No JMT-PROJ-0001-01 CD RSA ATLASSIAN REV 1

Date 16/6/2021

This report has been prepared for JMT Consulting.

CONTENTS

Appendices

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 use of Upper Carriage Lane as the access-egress to the future Atlassian Development, in Haymarket.
Client/ contact	Josh Milston Director JMT Consulting Ph: 0415 563 177 E: josh.milston@jmtconsulting.com.au
Audit type	*Concept design* road safety audit.
Purpose	A *concept design* road safety audit was required to identify potential safety issues associated with the proposed modified use of Upper Carriage Lane as the access-egress to the future Atlassian Development.
Background	Tech Central is an earmarked 24-hectare precinct from Central Railway Station to Cleveland Street where technology start-up companies, universities and research institutions, and the community will collaborate to deliver technology research and innovation projects. This precinct is proximate to many pre-existing stakeholders such as the University of Sydney, University of Technology Sydney (UTS), CSIRO's Data 61, the Australian Technology Park, and Royal Prince Alfred Hospital. The Western Gateway will be a sub-precinct within Tech Central and located on the western side of Central Railway Station. This will include the Atlassian Headquarters, a 40-storey tower as well as Dexus and Frasers Property with two office towers of 37 storeys and 30 storeys, on an adjacent land parcel. The Atlassian development plans to use the existing Upper Carriage Lane (which stems off the eastern side of Lee Street) as its vehicle access-egress through a new dive ramp structure. Traffic forecasting analysis indicates that there could be up to 15 inbound and 15 outbound movements in the busiest hour of the day. This is comprised of 11 light vehicle movements and four heavy vehicle movements (two-way movements). The concept to use the existing Upper Carriage Lane formation via a new dive ramp structure as the access-egress to the Atlassian development was required to be formally examined via a *concept design* road safety audit. This was also to fulfil a requirement from Transport for NSW (TfNSW). In these respects, this report documents the process and findings of the *concept design* road safety audit.
Scope of project/ audit	This audit involved examination of the modified use of Upper Carriage Lane as a vehicle access and egress to the future Atlassian development. Although this road already exists, this was considered to be a *concept design* road safety audit (rather than an *existing stage* road safety audit) since the road would be examined and critiqued under its future function, demands and design. Notwithstanding the above, two sets of plans were provided which were more associated with illustrating the concept to re-use Upper Carriage Lane in these respects. These were not engineering or construction plans. These plans were: ▪ DA-09A-XXX-10 [Rev 2] – Site analysis plan including proposed bicycle access routes via Lower Carriage Lane. This roadway will be de-commissioned as a vehicular right-of-carriageway and converted to a shared space for pedestrians and cyclists. ▪ Drawing numbers SKT24 to SKT28 [All dated 31/5/2021) including swept path models for left-in-left-out movements into Upper Carriage Lane. The above plans are very conceptual and lack many of the finer details of a civil design package (eg. signs, lines, drainage, landscaping, set outs, cross sections, long section and grading, streetlighting, utilities and pavement).

Audit team details	Damien Chee, DC Traffic Engineering (level 3 and lead auditor – RSA-02-0094). Linda Chee, DC Traffic Engineering (level 2 road safety auditor - RSA-02-1069).
Audit methodology	The audit was undertaken using the following methodology: ▪ A familiarisation site inspection was carried out on 13/6/2021. The supporting plans were reviewed whilst on site. ▪ The road safety audit findings have been documented in this report in accordance with the NSW Centre for Road Safety's *Guidelines for Road Safety Audit Practices* (2011). The audit findings are documented in Section 3. ▪ This report includes completed *checklist 2 –concept design stage audit* as sourced from the Austroads *Guide to Road Safety Part 6A: Implementing Road Safety Audits*.
Material supplied	See *Scope of audit*.
Meeting and assessment details	Review of plans carried out on 13/6/2021. Site inspection carried out on 13/6/2021.

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

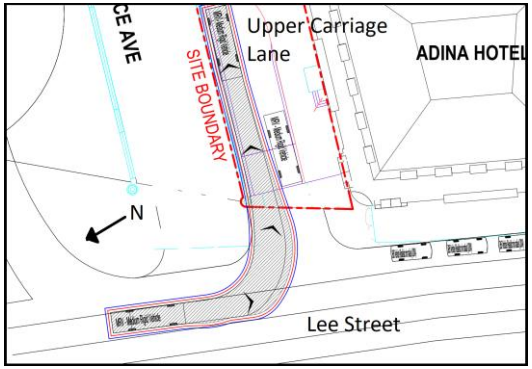
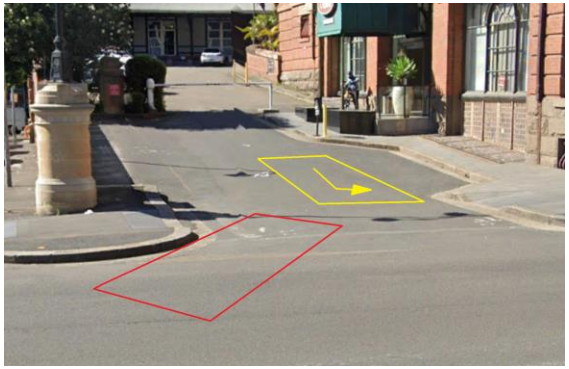
There were no previous road safety audit reports of direct relevance to the proposed upgrades that were issued to the audit team.

2 Safety audit findings

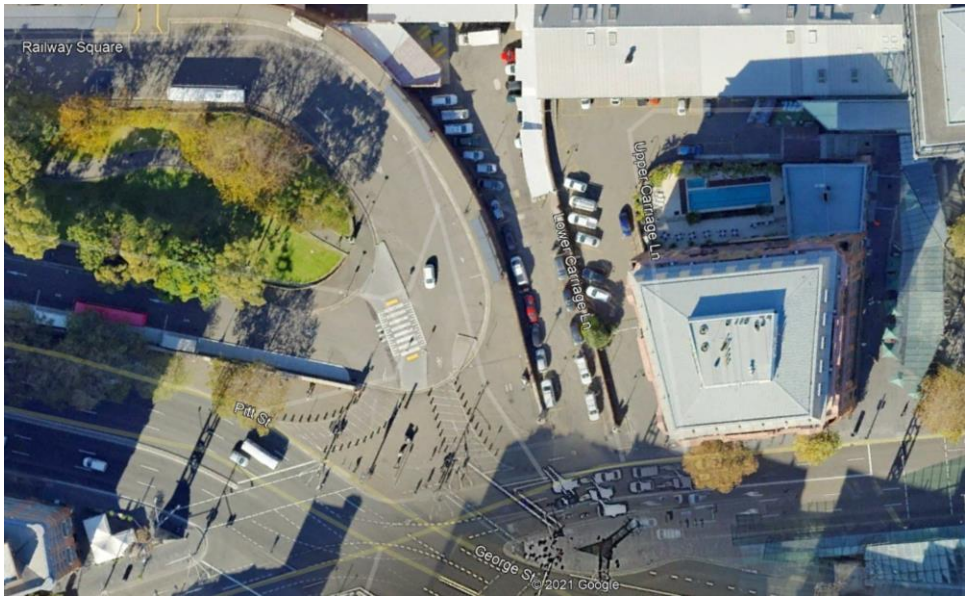
The road safety audit findings are presented in Table 2.

Table 2 Road safety audit findings.

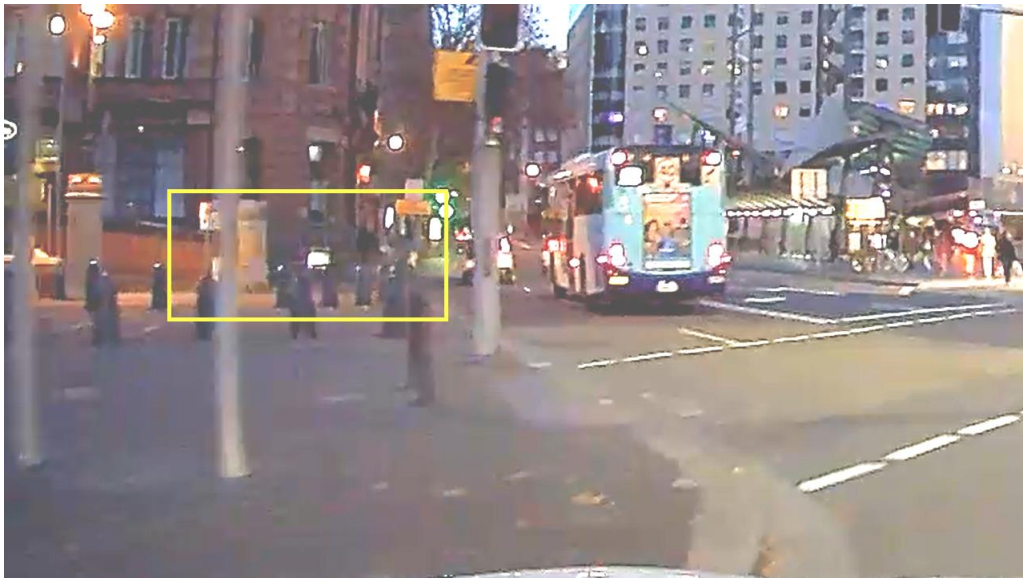
Ref	Location	Road safety audit finding	Priority
1	Right turn movements into and out of Upper Carriage Lane.	At present, there are no signposted restrictions on turning right into or out of Upper Carriage Lane. Northbound vehicles on Lee Street are not physically inhibited from making a right-turn into this side road. Similarly, outbound vehicles from Upper Carriage Lane are not physically inhibited from making a right-turn to egress from this side road. Whilst there is a BB double barrier centreline on Lee Street, this is only considered a deterrent, but not a physical inhibitor. With the proposed modified function of Upper Carriage Lane, including access for the Atlassian development, there should be more stringent controls and prohibitions against these right-turn movements. Furthermore, there should be physical inhibitors in place such as a raised median. If right-turns are not physically inhibited, the audit team assumes that these will happen at some point (even if on a very occasional frequency). This imposes the following risks: ▪ Northbound right-turners heading into Upper Carriage Lane would mostly likely need to stop in the right-most northbound lane of Lee Street to wait for suitable gaps. By doing so, they would be exposed to *rear-end* impacts by trailing traffic. They would also obstruct this lane for the duration that they are required to wait. This could have significant traffic operational flow-on effects including reducing the capacity of the George Street/ Pitt Street/ Lee Street intersection. ▪ The same northbound right-turning drivers would be required to detect and select gaps in two southbound lanes of Lee Street. This includes any left-turning vehicles from Pitt Street which may be outside the right-turning driver's field of view. This is a challenging gap acceptance requirement and would have considerable *right-thru* crash risks. ▪ Egressing right-turning vehicles from Upper Carriage Lane would need to view and judge gaps in two southbound traffic lanes, and at least one of the northbound traffic lanes. Furthermore, they would need to assess for *coinciding gaps* in these lanes. With high traffic demands throughout the day, these coinciding gaps may simply not present themselves and the driver is likely to resort to using small gaps. As stated above, many of the conflicting southbound vehicles may be left-turning vehicles from Lee Street which may not be easily seen due to the curved approach alignment from Pitt Street to Lee Street. ▪ The Upper Carriage Lane intersection is also very close to the George Street/ Pitt Street/ Lee Street intersection. This puts these two intersections, as possible crash conflict points, in close proximity to each other. Any conflicts from one intersection may affect safety and operations at the other. For example, the start-stop-release pattern of the signalised intersection at the George Street/ Pitt Street/ Lee Street intersection may result in variable approach speeds in the southbound direction of Lee Street when approaching Upper Carriage Road. This may also make it difficult to assess and accept suitable gaps. Consideration should be given to restricting the Lee Street/ Upper Carriage Road intersection to *left-in-left-out* only (via NO RIGHT TURN signs) and providing appropriate physical inhibitors to further deter and discourage such turning movements. For example, a raised median could be provided on Lee Street immediately at this cross over point into and out of Upper Carriage Lane.	High

Ref	Location	Road safety audit finding	Priority
2a	Lee Street/ Upper Carriage Lane intersection.	The development proposes to use Upper Carriage Lane as its vehicular access and egress. The kerb-to-kerb width of Upper Carriage Lane is approximately 6.0m. This width would impose the following safety risks: ▪ With 6.0m of width, there is limited passing clearance for two-way traffic movements. This is especially since both inbound and outbound vehicles are likely to be performing turning movements and hence would have a wider footprint. There would be risks of *head-on* collisions between inbound and outbound vehicles. ▪ Alternatively, and more realistically due to the low-speed environment, opposing vehicles will tend to come head-to-head without incident but one or both vehicles would be required to stop to allow the other to pass through first. If the inbound vehicle is forced to stop, it could be left stranded and exposed to *rear-end* collisions by other trailing vehicles on Lee Street. This is illustrated in the right-hand image with the inbound vehicle (red) being forced to stop midway through the turn to provide clearance for the outbound vehicle (yellow) to egress first. Whilst waiting in this position, the red vehicle would be exposed to *rear-end* impacts by other southbound vehicles on Lee Street. It may even be forced to reverse back out into Lee Street to create more clearance. This reversing movement is fraught with risk since many approaching vehicles would not be easily seen by this reversing driver. In particular, any southbound vehicles from Pitt Street that turn into Lee Street would be difficult to see. It is emphasised that even if the two opposing vehicles are able to spatially clear each other, in reality, most drivers will stop if there is a perceived risk of impacting the other vehicle. This even applies to minor impacts with more trivial consequences (scraped side panels, damaged wing mirror etc). ▪ The above risk is further exacerbated since the outbound vehicle (yellow) may not be able to continue their egressing movement if they cannot see the approaching southbound traffic on Lee Street, if their visibility is blocked by the stopped inbound vehicle. This side road may need to be widened to better service the inbound and outbound traffic demands. Since Lower Carriage Lane will be re-developed as a shared environment, this presents an opportunity to modify the ramp structure of Upper Carriage Lane.   ***Left:*** *Extract from the swept path model showing the swept path envelope of an inbound medium rigid vehicle. The model strongly indicates that the left-turning inbound vehicle would cross over the "centreline" of Upper Carriage Lane and would be likely to impose a head-on crash risk with outbound vehicles. Under this model, the outbound medium rigid vehicle is forced to stop and allow the inbound vehicle to complete the movement first. Also, note that this vehicle is required to stop well upstream of the interface with Lee Street. If the outbound vehicle stops any further west of this point, they may block the inbound path.* ***Right:*** *Looking inbound into Upper Carriage Lane where an inbound vehicle (red) is forced to stop to provide clearance for the outbound vehicle to clear this point first.*	High

Ref	Location	Road safety audit finding	Priority
2b	Lee Street/ Upper Carriage Lane intersection.	Continued from item 2a…  ***Above:*** *Looking eastbound into Upper Carriage Lane (right-hand channel) from Lee Street. The kerb-to-kerb width is approximately 6m wide. This imposes an isolated squeeze point for inbound and outbound traffic where width is critically needed for swept path and clearance requirements. Consideration should be given to widening this channel.*	High

Ref	Location	Road safety audit finding	Priority
3a	Inbound movements into Upper Carriage Lane.	Further to the issues described in item 2, any obstructions to the inbound traffic flows into Upper Carriage Lane, particularly when departing from Lee Street, could have queue spillback risks into Lee Street. Any vehicle that is left standing partially or wholly in Lee Street (and forced to wait due to the obstruction), could be exposed to *rear-end* impacts by trailing southbound vehicles on Lee Street. Some examples of obstructions include: ▪ Any parking/ stopping manoeuvres: This includes vehicles stopping and reversing into a kerbside parking position within Upper Carriage Lane. ▪ Any stopping required for dropping off or picking up passengers. This includes legal stopping as well as double parking. ▪ Low-speed movements by drivers looking for parking spaces or opportunities to stop. It is noted that the Adina Hotel lobby is located on the southern side of Upper Carriage Lane and would generate stopping movements, particularly in the outbound direction. ▪ Any u-turning or three-point turning movements which hold up other vehicles. On this note, the audit team has also assumed that there are sufficient opportunities in the site to turn around and head outbound in a forward direction. This includes any inbound movements in error, which then require the driver to turn around. For example, at present under pre-project conditions, there is a boom gate in place a short distance into Upper Carriage Lane. Any drivers that enter this side road in error would be inclined to reverse back out into Lee Street since there is a lack of space to perform a safe u-turn movement. The immediate approach-departure length in Upper Carriage Lane should be kept free of obstructions such as parked cars, stopped buses and vans, deliveries, drop off/pick up transactions etc. Any stopping needs should be confined to further inside this side road well away from the intersection with Lee Street.  ***Above:*** *There is currently a considerable demand for stopping and kerbside parking in Upper Carriage Lane. Such parked vehicles would pose as obstructions and may lead to queues forming and building up. In particular, any queues in the inbound direction could spill back towards Lee Street.*	High

Ref	Location	Road safety audit finding	Priority
3b	Inbound movements into Upper Carriage Lane.	Continued from item 3a…  ***Above:*** *Looking eastbound in Upper Carriage Lane under current, pre-project conditions. If features such as the boom gate and kerbside parking are retained in the post-build scenario, these could result in vehicles stopping and generating queues that could spill back into Lee Street. Similarly, any drop off/ pick up transactions at the Adina Hotel could also generate similar stopping behaviour.*	High

Ref	Location	Road safety audit finding	Priority
4	Egressing movements from Upper Carriage Lane.	All egressing drivers from Upper Carriage Lane re required to look to the north to assess and judge for gaps in the southbound traffic stream. However, as shown below (which is the reverse direction of this sight line), the *minimum gap sight distance* (MGSD)* from Upper Carriage Lane to the north could be blocked by an outbound vehicle from the Central Station Country Link drop off road (outbound vehicle superimposed by yellow rectangle). Any poor gap acceptance could lead to *cross traffic* crashes between egressing vehicles from Upper Carriage Lane and southbound vehicles on Lee Street. This is particularly the case when the southbound vehicle is approaching from Pitt Street. As shown below, a view from a driver in Pitt Street, this sight line crosses over the outbound lane from the Country Link terminal. Furthermore, the close proximity of the Country Link outbound lane and the Upper Carriage Lane means there will be two conflict points in close succession. For example, if outbound left-turners from the Country Link terminal and outbound left-turners from Upper Carriage Lane move into Lee Street at the same time, there may be a *rear-end* crash conflict as a result. This is especially since both vehicles are likely to use the common gap in southbound traffic to complete this turning movement. ** MGSD is the sight line required by a driver in a side road to view traffic on the main road and judge for safe gaps in which to complete their turning movement. It is a time-based gap where critical minimum gap times are required for drivers to perform their desired turning movement.*  ***Above:** Looking southbound from Pitt Street towards the subject access road - Upper Carriage Lane. If an outbound vehicle is stopped in the Country Link egress lane (yellow rectangle). This would block the sight line between the southbound driver on Pitt Street and the outbound driver from Upper Carriage Lane. This includes the MGSD sight line needed by the outbound vehicle from Upper Carriage Lane to detect and select safe gaps to turn into.*	Medium

3 Concluding statement

DC Traffic Engineering has undertaken a *concept design* 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	Comment
2.1 General topics	
1 Changes since previous audit ▪ Do the conditions for which the scheme was originally designed still apply? (eg. no changes to the surrounding network, area activities or traffic mix) ▪ Has the general form of the project design remained unchanged since previous audit (if any)?	There were no previous road safety audit reports of direct relevance to this project that were issued to the audit team.
2 Drainage ▪ Will the scheme drain adequately? ▪ Has the possibility of surface flooding been adequately addressed, including overflow from surrounding or intersecting drains and water courses?	Presumably, a full schedule of drainage pits would be included as part of the detailed design of the works.
3 Climatic conditions ▪ Has consideration been given to weather records or local experience which may indicate a particular problem? (eg. snow, ice, wind, fog).	Yes.
4 Landscaping ▪ If any landscaping proposals are available, are they compatible with safety requirements (eg. sight lines and hazards in clear zones)?	Landscaping plans not provided.
5 Services ▪ Does the design adequately deal with buried and overhead services (especially in regard to overhead clearances, etc)? ▪ Has the location of fixed objects or furniture associated with services been checked, including the position of poles?	Utility plans not provided.
6 Access to property and developments ▪ Can all accesses be used safely? (entry and exit/merging). ▪ Is the design free of any downstream or upstream effects from accesses, particularly near intersections? ▪ Have rest areas and truck parking accesses been checked for adequate sight distance, etc.?	All issues were associated with the Lee Street/ Upper Carriage Lane intersection.
7 Adjacent developments ▪ Does the design handle accesses to major adjacent generators of traffic and developments safely? ▪ Is the drivers' perception of the road ahead free of misleading effects of any lighting or traffic signals on an adjacent road?	Yes.
8 Emergency vehicles and access ▪ Has provision been made for safe access and movements by emergency vehicles? ▪ Does the design and positioning of medians and vehicle barriers allow emergency vehicles to stop & turn without unnecessarily disrupting traffic?	Yes.

Issue	Comment
9 Future widening and/or realignments ▪ If the scheme is only a stage towards a wider or dual carriageway is the design adequate to impart this message to drivers? (Is the reliance on signs minimal/appropriate, rather than excessive?) ▪ Is the transition between single and dual carriageway (either way) handled safely?	Unknown.
10 Staging of the scheme ▪ If the scheme is to be staged or constructed at different times: ▪ Are the construction plans and program arranged to ensure maximum safety? ▪ Do the construction plans and program include specific safety measures, signing; adequate transitional geometry; etc. for any temporary arrangements?	Unknown.
11 Staging of the works ▪ If the construction is to be split into several contracts, are they arranged safely?	Unknown.
12 Maintenance ▪ Can maintenance vehicles be safely located?	Yes.
2.2 Design issues (general)	
1 Design standards ▪ Is the design speed and speed limit appropriate (eg. consider the terrain; function of the road)? ▪ Has the appropriate design vehicle and check vehicle been used?	Yes.
2 Typical cross sections ▪ Are lane widths, shoulders, medians and other cross section features adequate for the function of the road? ▪ Is the width of traffic lanes and carriageway suitable in relation to: • ▪ Alignment? ▪ Traffic volume? ▪ Vehicle dimensions? ▪ The speed environment? ▪ Combinations of speed and traffic volume? ▪ Are overtaking/climbing lanes provided if needed? ▪ Have adequate clear zones been achieved?	The retained use of the existing width of Upper Carriage Lane may not be wide enough for two-way traffic movements and passing clearance.

Issue	Comment
3 The effect of cross sectional variation ▪ Is the design free of undesirable variations in cross section design? ▪ Are crossfalls safe? (particularly where sections of existing highway have been utilised or there have been compromises to accommodate accesses, etc.) ▪ Does the cross section avoid unsafe compromises such as narrowings at bridge approaches or past physical features?	The opening to Upper Carriage Lane is narrow for two-way movements, especially considering that these would be turning vehicles.
4 Roadway layout ▪ Are all traffic management features designed so as to avoid creating unsafe conditions? ▪ Is the layout of road markings and reflective materials able to deal satisfactorily with changes in alignment? (particularly where the alignment may be substandard.)	Yes.
5 Shoulders and edge treatment ▪ Are the following safety aspects of shoulder provision satisfactory: ▪ Provision of sealed or unsealed shoulders? ▪ Width and treatment on embankments? ▪ Cross fall of shoulders? ▪ Are the shoulders likely to be safe if used by slow moving vehicles or cyclists? ▪ Are any rest areas and truck parking areas safely designed?	Yes.
6 Effect of departures from standards or guidelines ▪ Any approved departures from standards or guidelines: is safety maintained? ▪ Any hitherto undetected departures from standards: is safety maintained?	Yes.
2.3 Alignment details	
1 Geometry of horizontal and vertical alignment ▪ Does the horizontal and vertical design fit together correctly? ▪ Is the design free of visual cues that would cause a driver to misread the road characteristics (eg. visual illusions, subliminal delineation such as lines of trees, poles, etc.)? ▪ Does the alignment provide for speed consistency?	Yes.

Issue	Comment

2 Visibility; sight distance
▪ Are horizontal and vertical alignments consistent with the visibility requirements?
▪ Will the design be free of sight line obstructions due to:
  ▪ Safety fences or barriers?
  ▪ Boundary fences?
  ▪ Street furniture?
  ▪ Parking facilities?
  ▪ Signs?
  ▪ Landscaping?
  ▪ Bridge abutments?
  ▪ Parked vehicles in laybys or at the kerb?
  ▪ Queued traffic?
▪ Are railway crossings, bridges and other hazards all conspicuous?
▪ Is the design free of any other local features which may affect visibility?
	Likely poor MGSD from Upper Carriage Road to the north, especially to Pitt Street, where some of the approaching conflicting traffic may come from.

3 New/existing road interface ▪ Does the interface occur well away from any hazard? (eg. a crest, a bend, a roadside hazard or where poor visibility/distractions may occur.) ▪ If carriageway standards differ, is the change effected safely? ▪ Is the transition where the road environment changes (eg. urban to rural; restricted to unrestricted; lit to unlit) Is it done safely? ▪ Has the need for advance warning been considered?	Yes.
4 'Readability' of the alignment by drivers ▪ Will the general layout, function and broad features be recognised by drivers in sufficient time? ▪ Will approach speeds be suitable and can drivers correctly track through the scheme?	Yes.
2.4 Intersections	

Issue	Comment

1 Visibility to and visibility at intersections
▪ Are horizontal and vertical alignments at the intersection or on the approaches to the intersection consistent with the visibility requirements?
▪ Will drivers be aware of the presence of the intersection (especially on the minor road approach)?
▪ Will the design be free of sight line obstructions due to:
  ▪ Safety fences or barriers?
  ▪ Boundary fences?
  ▪ Street furniture?
  ▪ Parking facilities?
  ▪ Signs?
  ▪ Landscaping?
  ▪ Bridge abutments?
▪ Are railway crossings, bridges and other hazards near intersections conspicuous?
▪ Will the design be free of any local features which adversely affect visibility?
▪ Will intersection sight lines be obstructed by permanent or temporary features such as parked vehicles in laybys, or by parked or queued traffic generally?
	Likely poor MGSD from Upper Carriage Road to the north, especially to Pitt Street, where some of the approaching conflicting traffic may come from.

2 Layout, including the appropriateness of type ▪ Is the type of intersection selected (cross roads, T, roundabout, signalised, etc.) appropriate for the function of the two roads? ▪ Are the proposed controls (Give Way, Stop, Signals, etc.) appropriate for the particular intersection? ▪ Are junction sizes appropriate for all vehicle movements? ▪ Are the intersections free of any unusual features which could affect road safety? ▪ Are the lane widths and swept paths adequate for all vehicles? ▪ Is the design free of any upstream or downstream geometric features which could affect safety? (eg. merging of lanes.) ▪ Are the approach speeds consistent with the intersection design? ▪ Where a roundabout is proposed: ▪ Have pedal cycle movements been considered? ▪ Have pedestrian movements been considered? ▪ Are details regarding the circulating carriageway sufficient?	Lack of right turn prohibitions into and out of Upper Carriage Lane.

Issue	Comment
3 Readability by drivers ▪ Will the general type, function and broad features be perceived correctly by drivers? ▪ Are the approach speeds and likely positions of vehicles as they track through the scheme safe? ▪ Is the design free of sunrise or sunset problems which may create a hazard for motorists?	Yes.
2.5 Special road users	
1 Adjacent land ▪ Will the scheme be free of adverse effects from adjacent activity and intensity of land use? (If not, what special measures are needed?	Yes.
2 Pedestrians ▪ Have pedestrian needs been satisfactorily considered? ▪ If footpaths are not specifically provided, is the road layout safe for use by pedestrians (particularly at blind corners or on bridges)? ▪ Are pedestrian subways or footbridges sited to provide maximum use? (i.e. Is the possibility of pedestrians crossing at grade in their vicinity minimised?) ▪ Has specific provision been made for pedestrian crossings, school crossings or pedestrian signals? ▪ Where present, are these facilities sited to provide maximum use with safety? ▪ Are pedestrian refuges/kerb extensions provided where needed? ▪ Has specific consideration been given to provision required for special groups (eg. young, elderly, disabled, deaf or blind)?	No comments were made regarding pedestrian safety, as it was assumed that these would be similar to existing conditions. The audit team notes that there is a *left-turn on pedestrian* crash conflict that already exists. The exposure-by-volume may increase, but this is not considered to be a new issue. Also, with significantly more pedestrian traffic generated into and out of this precinct, the audit team expects that more substantial pedestrian amenity and thoroughfare provisions will be addressed at the subsequent design stages.
3 Cyclists ▪ Have the needs of cyclists been satisfactorily considered, especially at intersections? ▪ Have cycle lanes been considered? ▪ Are all cycleways of standard or adequate design? ▪ Where a need for shared pedestrian/cycle facilities exists, have they been safely treated? ▪ Where cycleways terminate at intersections or adjacent to the carriageway, has the transition treatment been handled safely? ▪ Have any needs for special cycle facilities been satisfactorily considered? (eg. cycle signals)	Similar to position taken with pedestrians.

Issue	Comment
4 Motorcyclists ▪ Has the location of devices or objects which might destabilise a motorcycle been avoided on the road surface? ▪ Will warning or delineation be adequate for motorcyclists? ▪ Has barrier kerb been avoided in high speed areas? ▪ In areas more likely to have motorcycles run off the road is the roadside forgiving or safely shielded?	Yes.
5 Equestrians and stock ▪ Have the needs of equestrians been considered, including the use of verges or shoulders and rules regarding the use of the carriageway? ▪ Can underpass facilities be used by equestrians/stock?	NA.
6 Freight ▪ Have the needs of truck drivers been considered, including turning radii and lane widths?	Passing clearance and head-on crash risk identified as risks.
7 Public transport ▪ Has public transport been catered for? ▪ Have the needs of public transport users been considered? ▪ Have the manoeuvring needs of public transport vehicles been considered? ▪ Are bus stops well positioned for safety?	Needs to be examined more at detailed design stage.
8 Road maintenance vehicles ▪ Has provision been made for road maintenance vehicles to be used safely at the site?	Yes.
2.6 Signs and lighting	
1 Lighting ▪ Is this project to be lit? Will safety be maintained if the project is not lit? ▪ Is the design free of features which make illuminating sections of the road difficult (eg. Shadow from trees or overbridges)? ▪ Has the question of siting of lighting poles been considered as part of the general concept of the scheme? ▪ Are frangible or slip-base poles to be provided? ▪ Are any special needs created by ambient lighting? Will safety be maintained if special treatments are not provided? ▪ Have the safety consequences of vehicles striking lighting poles (of any type) been considered?	Lighting plans not shown.

Issue	Comment
2 Signs ▪ Are signs appropriate for their location? ▪ Are signs located where they can be seen and read in adequate time? ▪ Will signs be readily understood? ▪ Are signs located so that visibility to and from accesses and intersecting roads is maintained? ▪ Are signs appropriate to the driver's needs (eg. destination signs, advisory speed signs, etc.)? ▪ Have the safety consequences of vehicles striking sign posts been considered? ▪ Are signs located so that drivers' sight distance is maintained? ▪ Any signs to be located in the clear zone: are they frangible or adequately shielded by a crash barrier?	Signage plan not provided at this stage.
3 Marking and delineation ▪ Has the appropriate standard of delineation and marking been adopted? ▪ Are the proposed markings consistent with the works in the adjoining section of the route? ▪ Are the previous/adjacent markings to be upgraded? If not, will safety be maintained?	Linemarking plan not provided at this stage.
2.7 Traffic management	
1 Traffic flow and access restrictions ▪ Can traffic volumes from the proposed scheme be safely accommodated on existing sections of road? ▪ Has parking provision and parking control been adequately considered? ▪ Can any turn bans be implemented without causing problems at adjacent intersections? ▪ Has the effect of access to future developments been considered? ▪ Any traffic diverting to other roads (eg. to avoid a traffic control device): is safety maintained?	The inbound traffic should not be forced to stop and queue as this has risks of queue spillback to Lee Street.

Issue	Comment
2 Overtaking and merges ▪ Is overtaking sight distance and stopping distance adequate? ▪ Have suitable shoulder widths been provided at lane drop merges? ▪ Have standard signs and markings been provided for any lane drop? ▪ Has adequate sight distance been provided to any lane drop? ▪ Are shoulders wide enough opposite access points and intersections?	NA.
3 Rest areas and stopping zones Are there sufficient roadside stopping areas, rest areas and truck parking areas? Are any entries and exits to rest areas or truck parking areas safe?	NA.
4 Construction and operation ▪ If the scheme is to be constructed "under traffic", can this be done so safely? ▪ Can the scheme be safely constructed? ▪ Have the maintenance requirements been adequately considered? ▪ Is safe access to and from the works available?	This would need to be examined from construction staging plans (not available as part of this audit).
2.8 Additional questions to be considered for development proposals	Questions omitted as this audit was only confined to the Lee Street/ Upper Carriage Lane intersection, and not the internal road and parking, loading etc facilities.
2.9 Any other matter	
1 Safety aspects not already covered ▪ Will there be special events? Have any consequent unusual or hazardous conditions been considered? ▪ Is the road able to safely handle oversize vehicles, or large vehicles like trucks, buses, emergency vehicles, road maintenance vehicles? ▪ If required, can the road be closed for special events in a safe manner? ▪ If applicable, are special requirements of scenic or tourist routes satisfied?	Yes. Within reason.