REPORT

ST ASAPH STREET
CONCEPT DESIGN ROAD SAFETY AUDIT

Prepared for Christchurch City Council

3 August 2017

Beca

MWH now part of Stantec

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Christchurch City Council

St Asaph Street

Concept Design Road Safety Audit

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1 Introduction

1.1 Executive Summary

The existing roadway layout of St Asaph Street between Antigua and High Streets appear to be operating reasonably well based on recent site inspections undertaken throughout the working day. These site visits were undertaken to consider the safety aspects of the proposed CBD Business Group "Option3a". Observed parking demand was average and varied through the projects length with the greater demand west of Durham Street and east of Manchester. However this parking demand will vary throughout the day and is likely to increase as nearby developments are completed.

Unfortunately "Option 3a" has numerous inaccuracies, including proposed raised separators or parking bays across existing driveways and accesses. If this option was to be considered further, it is strongly recommended a thorough walkover is undertaken by the designers to ensure the design can actually be built as intended, and to more accurately locate the positions of separators and number of parking bays that can realistically be accommodated.

It is strongly recommended that any changes to the existing road environment is gradual and carefully considered as this section of St Asaph Street is still under development and has experienced a reasonable change of character since the audit undertaken earlier this year. From the recent site observations, there are numerous "easy wins" that can be incorporated to the existing layout that will improve safety.

It is very important that any proposed changes take into consideration all transport modes and routine street maintenance and operations such as buses, cars, cyclists, pedestrians, emergency vehicles, rubbish collection etc. Future developments and laneways must also be included in any design changes.

Many of the "easy win" items were also identified in the earlier (March 2017) Post Construction road safety audit.

We also consider there are some roadway elements that should not be adjusted such as:

- Maintain the separated cyclepath on the south side (optimises safety for the cyclists)
- Retain the existing kerb lines (otherwise expensive with known and potentially service clashes and stormwater issues)
- Retain existing footpath widths (already minimal width allowing for power poles, parking meters, rubbish bins, signboards, projected pedestrian volumes etc)

We recommend any changes are staged and should occur gradually as the street environment changes with the adjacent developments.

An indicative sequence could be:

Stage 1 - Low cost improvements to be implemented now:

1. Install the 30km/h speed limit (with gated signs and pavement 'roundels'
2. Renew the centreline pavement markings
3. Install continuous edgeline markings (create 3m traffic lanes, increasing the buffer to the parking lanes)
4. Install centreline (and possibly edgeline) reflective raised pavement markers
5. Ensure adequate carpark setbacks are provided to all existing entranceways

Stage 2: - Medium cost improvements to be implemented over the next 6-12 months (and in consultation with some of the key businesses/developers)

1. Rationalising the kerb build-outs and tree pits, with the build-outs to be opposite each other and include "vertical features" such as rubbish bins, advertising signs, cycle stands, laneway signage etc. This will better create speed thresholds and traffic calming features.
2. Improve the kerb build-out geometry to provide better entry angles into the parking bays.
3. Removal of some tree pits and the inclusion of some additional parking (this needs careful assessment).

The following Road Safety Audit expands further on these comments.

1.2 Safety Audit Definition and Purpose

A road safety audit is a term used internationally to describe an independent review of a future road project to identify any safety concerns that may affect the safety performance. The audit team considers the safety of all road users and qualitatively reports on road safety issues or opportunities for safety improvement.

A road safety audit is therefore a formal examination of a road project, or any type of project which affects road users (including cyclists, pedestrians, mobility impaired etc.), carried out by an independent competent team who identify and document road safety concerns.

A road safety audit is intended to help deliver a safe road system and is not a review of compliance with standards.

The primary objective of a road safety audit is to deliver a project that achieves an outcome consistent with Safer Journeys and the Safe System approach, which is a safe road system increasingly free of death and serious injury. The road safety audit is a safety review used to identify all areas of a project that are inconsistent with a Safe System and bring those concerns to the attention of the client so that the client can make a value judgement as to appropriate action(s) based on the risk guidance provided by the safety audit team.

The key objective of a road safety audit is summarised as:

'to deliver completed projects that contribute towards a safe road system that is increasingly free of death and serious injury by identifying and ranking potential safety concerns for all road users and others affected by a road project.'

A road safety audit should desirably be undertaken at project milestones such as:

- concept stage (part of business case);
- scheme or preliminary design stage (part of pre-implementation);
- detail design stage (pre-implementation or implementation); or
- pre-opening or post-construction stage (implementation or post-implementation).

A road safety audit is not intended to be a technical or financial audit and does not substitute for a design check of standards or guidelines. Any recommended treatment of an identified safety concern is intended to be indicative only, and to focus the designer on the type of improvements that might be appropriate. It is not intended to be prescriptive and other ways of improving the road safety or operational problems identified should also be considered.

In accordance with the procedures set down in the NZTA Road Safety Audit Procedures for Projects Guidelines - Interim release May 2013 the audit report should be submitted to the client who will instruct the designer to respond. The designer should consider the report and comment to the client on each of any concerns identified, including their cost implications where appropriate, and make a recommendation to either accept or reject the audit report recommendation.

For each audit team recommendation that is accepted, the client will make the final decision and brief the designer to make the necessary changes and/or additions. As a result of this instruction the designer shall action the approved amendments. The client may involve a safety engineer to provide commentary to aid with the decision.

Decision tracking is an important part of the road safety audit process. A decision tracking table is embedded into the report format at the end of each set of recommendations. It is to be completed by the designer, safety engineer, and client for each issue, and should record the designer's response, client's decision (and asset manager's comments in the case where the client and asset manager are not one and the same) and action taken.

A copy of the report including the designer's response to the client and the client's decision on each recommendation shall be given to the road safety audit team leader as part of the important feedback loop. The road safety audit team leader will disseminate this to team members.

1.3 The Project

The following section details the nature of the project.

Source: 15-42-PublicInformationLeaflet-StAsaphStreet-fromFerryRoadtoAntiguaStreet

This is the first project in Phase 2 of An Accessible City. The proposal connects Central City cycleways to other Major Cycleway Routes in Christchurch. It is also required to complete the one-way system westbound through the Central City.

Enhanced cycling network:

A separated cycleway is proposed on St Asaph Street between Ferry Road and Antigua Street. This is in preparation for future connectivity with proposed Major Cycle Routes. The proposed cycleway will also connect to other Central City key cycle routes.

One of these is the cycleway already being constructed on Tuam Street. When finished the major east-west cycle routes at the southern end of Central City will be completed.

Enhanced one-way street network:

St Asaph Street is currently one-way and forms part of a westbound one-way main distributor street pairing with Tuam Street (carrying eastbound traffic). As an essential component of the travel network in the Central City, St Asaph Street remains a one-way corridor for the majority of its length with two westbound general traffic lanes throughout, supplemented by turning lanes at some intersections. This maintains the efficiency of St Asaph as a priority car and bus route.

Enhanced environment:

As outlined in the consultation plans, some enhancements to the landscaping are included such as new median islands and build-outs, replacement trees and improved lighting.

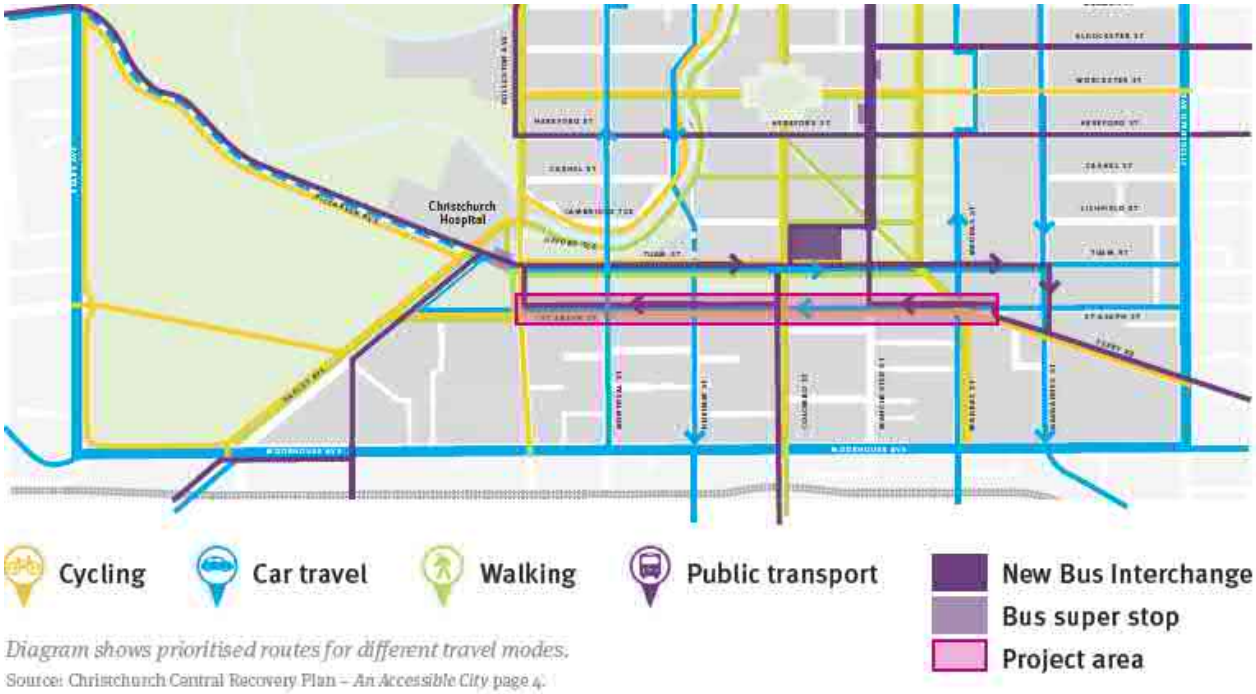

Figure 1-1: Project Location

Source: 15-42-PublicInformationLeaflet-StAsaphStreet-fromFerryRoadtoAntiguaStreet

1.4 The Road Safety Audit Team

This road safety audit has been carried out in accordance with the NZTA Road Safety Audit Procedure for Projects Guidelines – Interim release May 2013, by:

Name	Position	Company
Dave Aldridge	Technical Director – Civil Engineering	Beca
Oliver Brown	Senior Transportation Engineer	MWH Stantec

1.5 Previous Road Safety Audits

A Post Construction Road Safety Audit was undertaken in March 2017 with Dave Aldridge a team member. The Post Construction report provided included designer responses, however did not include client decisions.

1.6 Scope of This Road Safety Audit

This is a Concept Design Safety Audit. The SAT has generally limited their comments to the concept layout identified as CBD Business Group "Option 3a" as prepared by TDG, which proposes changes to mitigate safety concerns raised to Council. The SAT has been requested to consider the extent to which Option 3a addresses safety concerns compared to the existing layout.

The SAT therefore have utilised principles outlined in the accepted Safety Audit and Network Functionality (SANF) review process.

The methodology for this Road Safety Audit (RSA) is in–line with that specified in the "*NZTA Road Safety Audit Procedures for Projects Guideline",* (Interim release May 2013)"), which utilises the Safe Systems approach. This approach includes the Safe System objectives that focus on the provision of forgiving roads and roadsides that are more accommodating of human error, and managing the crash forces to a level that the human body can tolerate without serious injury. It is recognised that while road safety audits of projects tend to be focused on the road and interrelationship of the driver with the road, all cornerstones of a safe system are important and intertwined. Key to the safe system approach is the consideration of vulnerable road users (pedestrians and cyclists) along with motorised road users.

As defined in the NZTA guideline, the focus of the Safe System approach in Safety Auditing includes:

- Provide forgiving roads and roadsides
- Limit crash forces to prevent fatal and serious injuries
- Understand road user perception of roads and roadsides
- Consider both historic and predictive modelling

The process used by the auditors included:

1. Undertaking a desktop analysis of the supplied plans,
2. Undertaking an on-site review of the design to identify the impacts of the proposed design on the form and function of the road environment,
3. Observe the behaviours of all road users,
4. Undertaking an initial assessment of the items identified and the impacts on the road network, including an assessment of the ranking of concerns in accordance with the NZTA RSA Guidelines (2013 Interim Release),
5. Compiling a formal report for presentation to the project team.

1.7 Report Format

The potential road safety problems identified have been ranked as follows.

The expected crash frequency is qualitatively assessed on the basis of expected exposure (how many road users will be exposed to a safety issue) and the likelihood of a crash resulting from the presence of the issue. The severity of a crash outcome is qualitatively assessed on the basis of factors such as expected speeds, type of collision, and type of vehicle involved.

Reference to historic crash rates or other research for similar elements of projects, or projects as a whole, have been drawn on where appropriate to assist in understanding the likely crash types, frequency and likely severity that may result from a particular concern.

The frequency and severity ratings are used together to develop a combined qualitative risk ranking for each safety issue using the concern assessment rating matrix in Table 1-1. The qualitative assessment requires professional judgement and a wide range of experience in projects of all sizes and locations.

Table 1-1: Concern Assessment Rating Matrix

Severity (likelihood of death or serious injury)	**Frequency** (probability of a crash)			
	Frequent	Common	Occasional	Infrequent
Very likely	Serious	Serious	Significant	Moderate
Likely	Serious	Significant	Moderate	Moderate
Unlikely	Significant	Moderate	Minor	Minor
Very unlikely	Moderate	Minor	Minor	Minor

While all safety concerns should be considered for action, the client or nominated project manager will make the decision as to what course of action will be adopted based on the guidance given in this ranking process with consideration to factors other than safety alone. As a guide a suggested action for each concern category is given in Table 1-2.

Table 1-2: Concern Categories

Concern	Suggested action
Serious	Major safety concern that must be addressed and requires changes to avoid serious safety consequences.
Significant	Significant safety concern that should be addressed and requires changes to avoid serious safety consequences.
Moderate	Moderate safety concern that should be addressed to improve safety.
Minor	Minor safety concern that should be addressed where practical to improve safety.

In addition to the ranked safety issues it is appropriate for the safety audit team to provide additional comments with respect to items that may have a safety implication but lie outside the scope of the safety audit. A comment may include items where the safety implications are not yet clear due to insufficient detail for the stage of project, items outside the scope of the audit such as existing issues not impacted by the project or an opportunity for improved safety but not necessarily linked to the project itself. While typically comments do not require a specific recommendation, in some instances suggestions may be given by the auditors.

The SANF review is required to fulfil two purposes; a road safety audit that takes into account all users, and an assessment of the network functionality of the MCR for all users. To fulfil the requirements of a safety audit the team has adopted the assessment system of the Road Safety Audit Procedures for Projects (Interim release May 2013- refer to Appendix B) with the ranking of each issue raised on a progressive scale of importance from minor, moderate, significant to serious.

In accordance with this formal process, the SANF review includes under each safety issue identified a decision tracking box to document how each safety issue is addressed, and the decisions required of the design team going forward in the design.

1.8 Documents Provided

The SAT was provided with the following documents for this audit.

Plan Reference	Sheets	Title	Rev
14661_C1B-SHT 1 - 5	5	No Title – Identified in Council briefing email as Central Business Group "Option 3a" prepared by TDG	No Rev

1.9 Disclaimer

The findings and recommendations in this report are based on an examination of available relevant plans, the specified road and its environs, and the opinions of the SAT. However, it must be recognised that eliminating safety concerns cannot be guaranteed since no road can be regarded as absolutely safe and no warranty is implied that all safety issues have been identified in this report. Safety audits do not constitute a design review nor are they an assessment of standards with respect to engineering or planning documents.

Readers are urged to seek specific technical advice on matters raised and not rely solely on the report.

While every effort has been made to ensure the accuracy of the report, it is made available on the basis that anyone relying on it does so at their own risk without any liability to the safety audit team or their organisations.

2 Safety Concerns

The reader is advised that many of these issues are inter-related, and as such the issues cannot be read in isolation. The SAT advise that technical advice from the relevant experts should be sought to fully understand the nature and extent of the issues raised.

This Road Safety Audit has been presented to generally identify the road safety concerns raised as a result of the inspections. The SAT have met with Council project staff to discuss these issues, and to discuss verbally some of the remedial treatments proposed to address concerns identified.

2.1 General Issues

Comment

The SAT undertook a series of site inspections at different times of the day, over a series of days, to assess the operating environment for different levels of traffic flows and times. This included morning peak, off-peak (daytime) and evening peak (night time). To fully understand the look and feel of the street, the SAT undertook numerous opportunities to drive through, park and cycle through the network to appreciate the environment first hand.

This allowed the SAT to observe the operation and configuration of the street under different conditions, to determine if any identified issue is common to all times of the day, or specific to an isolated time frame or operating condition.

The following sections outline issues that the SAT have observed, and offer a commentary on the specifics of the issues.

2.2 Speed Environment / Operating Speed

Significant

The Post Construction RSA Section 2.1.1 evaluated the speed environment and operating speed and recommended that the speed limit be lowered to 30km/h. This aligns the speed limit to the speed environment and observed progression speed governed by the spacing and timing of traffic lights.

The resultant speed environment and operating speed are a combination of multiple factors, such as lane widths, adjacent land use and activity, parking bay width and turnover, traffic calming features and traffic signal timing.

Option 3a proposes minor changes to the existing traffic lane and parking bay widths. However on the north side it removes all tree pit kerb build-outs and modifies the pedestrian build-outs at laneway crossing locations, narrowing them to 1.8m. Removal of the tree pits reduces the level of visual traffic calming (when the trees, or other vertical devices are installed) potentially resulting in higher mid-block operational speeds, while retaining the same overall progression speed. This increases the risk and severity of incidents, particularly for pedestrians and cyclists. It is noted that the number of tree pits could be reduced in some blocks, however removal of all is not supported.

The influence of collision speed on the probability of pedestrian death is well documented[1], with a speed increase from 30km/h to 40km/h increasing the probability of death from 15% to 30%, and 50km/h increasing the probability of death to 70%.

Higher operating speeds increase the difficulty in accessing on-road car parks, due to people parking feeling pressured to quickly enter / exit a park, and thereby increasing crash potential. This also applies at accessways, where left turn in drivers may attempt to enter at higher speeds and not observe cyclists on the separated cycleway.

It is considered fundamental to the safe operation of St Asaph Street, for all users, that lower vehicle operating speeds (particularly mid-block) are encouraged.

[1] Pedestrian planning and design guide, NZTA, October 2009
Down with Speed, ACC and LTSA

Photo 1: Example of new tree pit build-out and constrained road environment.

Recommendation(s)

The SAT recommends:

1. The legal speed limit be lowered to 30 km/h to better reflect the speed environment, match the actual operating speed.
2. The tree pit build-outs located on the north side of St Asaph Street are retained, albeit with rationalisation as recommended below in Section 2.3.

Frequency Crashes are likely to be common	Severity Death or serious injury is likely	Rating The safety concern is significant
Designer response		
Safety Engineer comment		
Client decision		
Action taken		

2.3 Tree pit build-outs / Cycle Separator

Significant

Option 3a proposes changes to tree pit build-outs and the cycleway separator to improve access / egress to on-road car parks and vehicle access ways. It was noted on-site that modifications to kerbs at some locations would be beneficial (to improve vehicle access and increase parking), but not all locations.

Some drivers were observed having difficulty performing the reverse movement into on-road parks, with some requiring more than one attempt. The following traffic either wait behind the parking vehicle, or when traffic flow is lower, move into the adjacent lane. With consideration of the recommendation in Section 2.1.1, the parking movements assists in creating a lower speed environment where through traffic can expect to stop, however is not a sole source of traffic calming.

On the south side Option 3a proposes the removal of most kerb build-outs at driveways and parking bays to permit provision of additional on-road parking and improve access to parking. Multiple locations were observed where the Option 3a layout proposed on-road car parks over existing accessways (such

as St John), over pedestrian laneways, in locations with insufficient length, or via removal of motorcycle parking. Provision of additional on-road parking is supported in some locations, however the upstream kerb extension, with associated no-parking, is considered fundamental to the safe operation of the separated cycleway and must be retained. While the kerb extension does increase difficulty of parking movements, the safety benefits to people on bikes are greater than the operational dis-benefits to vehicles.

Removal of the downstream build-out is supported to improve access to the end car park, however this may lead to drivers illegally parking within the no-stopping area and partially blocking the accessway. This could be mitigated with partial removal of the downstream build-out, say by 1m.

Option 3a also proposes to reduce the no-stopping requirement at accessways (upstream and downstream) to permit additional on-road car parking. This increases the risk to people on bikes, and is not supported on this multimodal corridor with adjacent commercial activity. The Accessway and Parking offset guideline[2] is considered a minimum standard, and the no parking extent needs to be evaluated on the individual access and parking provision basis. It is recommended that some locations, such as the St John access and off-road carpark access, require greater setbacks than presented in the guideline due to the commercial land use, higher volume of vehicle movements, unfamiliar users and potential heavy vehicle use. It is notable that Council have received Customer Service Requests (requests from the public) to investigate increasing the no-parking restrictions at accessways to improve visibility, indicating the existing no-stopping lengths may require increasing.

On the north side, the location of some tree pit build-outs restrict access out of accessways resulting in drivers swinging wide and partially crossing the lane line. This could result in side swipe type crashes, which are typically low severity. From a speed control perspective, retention of some tree pits is required, with typically three per block considered reasonable based on site observations. It is noted that more could be desired from an urban design perspective. The geometry of existing tree pits can be retained, however new ones should incorporate radiuses to improve access / egress and be positioned opposite build-outs on the south side to create a gating effect and greater traffic calming effect.

Removal of accessway kerb extensions will restrict the number of locations that wheelie bins can be placed. This could result with the cycleway being blocked, with cyclists using the footpath or traffic lane, or accessways being blocked and vehicles unable to safely enter.

Photo 2: Example of poor parking discipline.

Photo 3: St John Exit not on Option 3a plans

[2] Accessway and Parking Offsets, MWH and NZTA, 21 September 2015 – prepared for Christchurch City Council

Photo 4: Example of wheelie bins.

Photo 5: New access at No. 248 not on Option 3a plans

Recommendation(s)

1. Retain kerb extensions on south side upstream of accessways. Ensure parking setback is assessed against the parking setback guide. Identify options for removal downstream kerb extension that discourages illegal parking.
2. Review location of north side tree pit build-outs to create gateways with south side and rationalise to three per block. Where possible, retain existing build-outs in current form. Install vertical elements (trees, signs, bins etc) in build-outs.
3. Evaluate opportunity to provide additional on-road parking on north and south sides based on setback requirements and gating of tree pit build-outs. New build-outs to include smoother entry and exit geometry.
4. Show the location of all existing accessways, on-road parking types (taxi, loading, motor cycle) and lane ways.
5. Provide appropriate space and location for placement of wheelie bins.

Frequency **Crashes are likely to be common**	**Severity** **Death or serious injury is likely**	**Rating** **The safety concern is significant**
Designer response		
Safety Engineer comment		
Client decision		
Action taken		

2.4 Pedestrians

Significant

The current level of pedestrian activity varies considerably block to block and by time of day. However, there is continual development within the area including the implementation of pedestrian laneways and plans for an urban school on the St Asaph / Colombo Street intersection. As detailed in Section 2.1, the effect of vehicle collision speed on the probability of pedestrian death is well documented. The provision of facilities that maximise pedestrian safety are imperative.

Option 3a proposes changes that are considered to negatively impact pedestrian provisions and safety as outline below.

1. Reduction of northern footpath width to 2.5m. Given the site location (CBD), The Council IDS requires a minimum clear footpath width of 2.65m (if located adjacent to the kerb), that is an area free of any obstructions such as utility poles, signs etc and the NZTA Pedestrian planning guide recommends 2.4m+ (4.5m from face of kerb to building line). There are also locations with vehicle accesses adjacent to buildings on the property boundary restricting intervisibility. These locations require greater widths to reduce the likelihood of pedestrian incidents.
2. Build-out widths restricted to 1.8m. The proposed width results in a pedestrian being obscured by a parked vehicle (parking bays 2.0m width) thereby encouraging pedestrians to step into the live traffic lane to improve visibility. Build-outs should be widened to the parking bay width.
3. Crossing points restricted to mid-blocks only. Crossing points must be located on pedestrian desire lines to be effective. Eg, there are two lane-ways in the Madras Street to Manchester Street block that should link to appropriate pedestrian crossing facilities.
4. Location of Street Trees within footpath space. As noted in Bullet 1 above restrictions of clear width are not desirable. This proposed layout has been implemented on the south side and results in a discontinuous line of travel for visually impaired people and pinch points for others. Given the likely high pedestrian volumes (due to laneways, school etc) restriction of the footpath width is undesirable and could result in pedestrians choosing to walk within the on-road parking area.

Photo 6: Example of shared laneway expected to cater for high pedestrian volumes

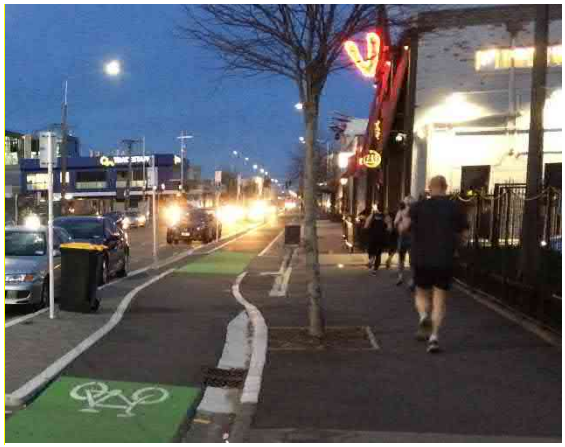

Photo 7: Tree pit narrowing footpath

Recommendation(s)

1. Retain existing width of footpaths, and hence kerb lines
2. Ensure build-out widths match the adjacent parking bay widths.
3. Pedestrian crossing locations are matched to desire lines, such as laneways.
4. Street trees are not located within the footpath

Frequency Crashes are likely to be common	Severity Death or serious injury is likely	Rating The safety concern is significant
Designer response		
Safety Engineer comment		
Client decision		
Action taken		

2.5 Line Marking and Delineation

Moderate

It was observed that there was a very high level of poor road markings, resulting in an inconsistent and inappropriate level of guidance. This would be accentuated at night, especially during inclement weather. During off-peak times vehicles were observed driving down the middle of St Asaph Street over the lane line. Poor road markings are a significant contributor to poor lane discipline for drivers as they will be unable to judge where the actual lane is, and impacts on drivers speeds. This could result in undertaking / overtaking type crashes with drivers familiar with the two-lanes attempting to pass vehicles errantly on the lane line. The lane line requires remarking and installation of RRPM's.

To improve delineation, separation to on-road parking and encourage slower vehicle speeds it is recommended that edge lines with RRPM's be installed. A lower speed would be encouraged via narrowing of the traffic lane to 3.0m, lane position reinforced and offset to the on-road parking area increased to minimise the risk of impact with pedestrians, entering / exiting vehicle occupants and vehicle doors opening.

Delineation of the kerb build-outs and cycle separator are poor with a high number of KTM's missing. These are required particularly during the hours of darkness and inclement weather.

Photo 8: Centreline and RRPMs are worn and not visible, no edgeline guidance, vehicle driving in middle of road

Photo 9: Same location as Photo 8, note no centreline or RRPMs for extended length west of Colombo Street

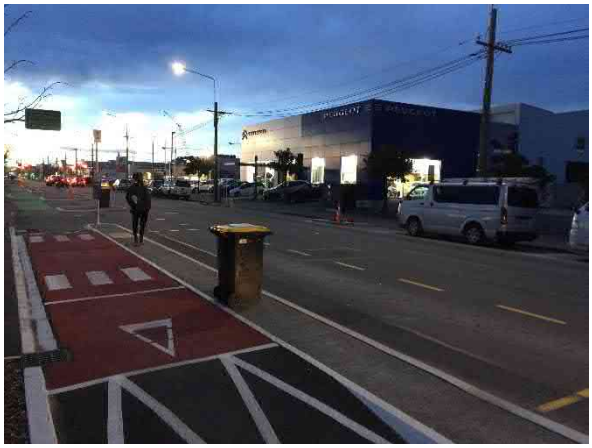

Photo 10: Poor night time delineation

Recommendation(s)

1. That the project length is remarked utilising an appropriate high profiled pavement marking system that performs well in wet and dark conditions.
2. Mark edge lines along the project length.
3. Install appropriate delineation devices to highlight the kerb edges, especially during night time and inclement weather use.
4. Undertake immediate remedial repairs of installed red RRPM's

Frequency	Severity	Rating
Crashes are likely to be occasional	Death or serious injury is likely	The safety concern is moderate
Designer response		
Safety Engineer comment		
Client decision		
Action taken		

3 Audit Statement

We declare that we remain independent of the design team, and have not been influenced in any way by any party during this road safety audit.

We certify that we have used the available plans, and have examined the specified roads and their environment, to identify features of the project we have been asked to look at that could be changed, removed or modified in order to improve safety.

We have noted the safety concerns that have been evident in this audit, and have made recommendations that may be used to assist in improving safety.

Signed  Date 3 August 2017

Dave Aldridge, NZCE (Civil), Technical Director – Civil Engineering, Beca

Signed  Date 3 August 2017

Oliver Brown, BE Civil (Hons), GIPENZ, Senior Transportation Engineer, MWH Stantec

4 Response and Decision Statements

System designers and the people who use the roads must all share responsibility for creating a road system where crash forces do not result in death or serious injury.

4.1 Designer's Responses

I have studied and considered the auditors' safety concerns and recommendations for safety improvements set out in this road safety audit report and I have responded accordingly to each safety concern with the most appropriate and practical solutions and actions, which are to be considered further by the safety engineer (if applicable) and project manager.

Signed ---------- Date ----------

[Designer's name, qualification, position, company]

4.2 Safety Engineer's Comments (if applicable)

I have studied and considered the auditors' safety concerns and recommendations for safety improvements set out in this road safety audit report together with the designer's responses. Where appropriate, I have added comments to be taken into consideration by the project manager when deciding on the action to be taken.

Signed ---------- Date ----------

[Safety Engineer's name, qualification, position, company]

4.3 Project Manager's Decisions

I have studied and considered the auditors' safety concerns and recommendations for safety improvements set out in this road safety audit report, together with the designer's responses and the comments of the safety engineer (if applicable), and having been guided by the auditor's ranking of concerns have decided the most appropriate and practical action to be taken to address each of the safety concerns.

Signed ---------- Date ----------

[Project Manager's name, qualification, position, company]

4.4 Designer's Statement

I certify that the project manager's decisions and directions for action to be taken to improve safety for each of the safety concerns have been carried out.

Signed ---------- Date ----------

[Designer's name, qualification, position, company]

4.5 Safety Audit Close Out

The project manager is to distribute the audit report incorporating the decisions to the designer, safety audit team leader, safety engineer, and project file.

Date:……

Appendix A