

Report

Ilam Road, University Crossings – Post Construction Stage Road Safety Audit

Prepared for Christchurch City Council (Client)

By Beca Ltd (Beca)

23 August 2013

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Revision History

Revision Nº	Prepared By	Description	Date
A	Marcus Brown	Final	23/08/2013

Document Acceptance

Action	Name	Signed	Date
Prepared by	Marcus Brown		23/8/13
Reviewed by	Shane Turner		23/8/13
Approved by	Shane Turner		23/8/13
on behalf of	Beca Ltd		

Table of Contents

1 Introduction..... 1
1.1 Project Background 1
1.2 Safety Audit..... 1
1.3 Disclaimer..... 2
2 Audit Findings 3
2.2 Audit Statement..... 16

APPENDIX A
Design Drawing

APPENDIX B
Decision Tracking Form

1 Introduction

1.1 Project Background

This report presents the findings of a Post Construction Stage Road Safety Audit on Ilam Road, Christchurch.

The audit has been undertaken by Beca Ltd (Beca) at the request of Christchurch City Council (CCC). This report is generally in accordance with current Transfund NZ (now NZTA) Road Safety Audit Procedures for Projects – November 2004 and the CCC Road Safety Audit Procedure (version 1 dated 23/7/09).

Safety issues have been considered against current guidelines, safety experience and practice where relevant.

The field audit and observations were carried out on Monday 20th August 2013 during day and night time conditions.

1.2 Safety Audit

1.2.1 Safety Audit Team

The audit team for the Post Construction Safety Audit were as follows:

- n Marcus Brown Lead Safety Auditor – Senior Road Safety Engineer
- n Shane Turner Road Safety Auditor – Technical Director – Road Safety

1.2.2 Documents Reviewed

The documents supplied by Christchurch City Council reviewed in this Safety Audit were:

- n The scheme design plan (CP501274 R01-6) in **Appendix A**.

1.2.3 Report

Problems identified with the proposal are outlined in **Section 2** of this report. Although all these issues identified are considered to be of sufficient importance to require action, the following ranking system has been adopted.

Serious	Major safety concern that must be addressed and requires changes to avoid serious safety consequences
Significant	Significant concern that should be addressed and requires changes to avoid serious safety consequences
Moderate	Moderate concern that should be addressed to improve safety
Minor	Minor concern that should be addressed where practical to improve safety
Comment	A concern or an action that may be outside the scope of the Road Safety Audit, but which may improve overall design or be of wider significance.

The following risk assessment matrix has been used to determine the ranking of concerns identified.

Table 1: Risk Assessment Matrix

Severity (Likelihood of Death or Serious Injury)	Frequency			
	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

The crash frequency descriptions are set out in **Table 2**.

Table 2: Crash Frequency Description

Crash Frequency	Indicative Description
Frequent	Multiple Crashes (more than one per year)
Common	Once every one to five years
Occasional	Once every five to ten years
Infrequent	Less than one every ten years

In accordance with the Transfund NZ Road Safety Audit Procedures for Projects, it should be noted that this audit is not to be regarded as a "quality/design check" of the project. It is focused essentially on safety issues that are considered significant in regard to the proposed scheme.

The findings, including comments and recommendations, are outlined in this report.

1.3 Disclaimer

The findings and recommendations in this report are based on an examination of available relevant plans, the adjoining roads and its environs, and the opinions of the audit team. However, it must be recognised that safety cannot be guaranteed since no road can be regarded as absolutely safe. 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 strictly on the basis that anyone relying on it does so at their own risk without any liability to members of the audit team or their respective organisations.

2 Audit Findings

2.1.1 Tactile Paving in Vicinity of Rountree Street

Moderate

The tactile paving to the zebra crossing and crossing point adjacent to Kirkwood Avenue are inconsistent. There is no kerbside tactile paving on the eastern side of the zebra crossing and there is no directional paving to the eastern side of the informal crossing point adjacent to Kirkwood Avenue. This may make it more difficult for partially sighted users to determine the location of crossing points which could potentially result in conflict.

Figure 2-1 Note inconsistent tactile paving

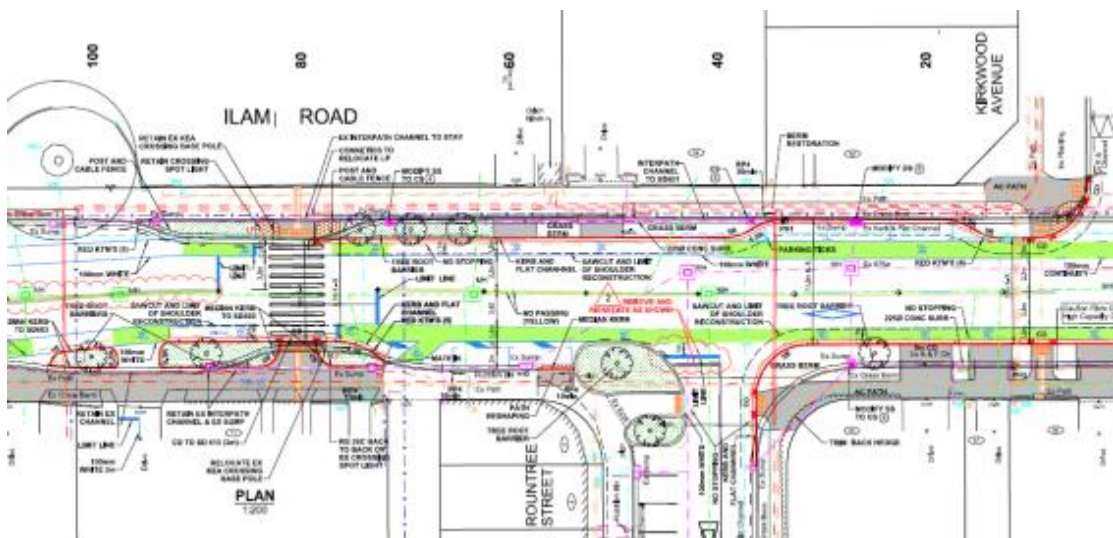


Figure 2-2 Zebra Crossing north of Rountree St. Note missing tactile paving



Figure 2-3 Crossing point adjacent to Kirkwood Avenue. Note no directional paving to crossing point



Recommendation

Consistently apply tactile paving.

2.1.2 Surfacing on approach to zebra crossing, north of Rountree St

Moderate

It is noted that the road surface is binder rich on the approaches to the zebra crossing. This could result in less than desirable skidding resistance which could have considerable impact on a vehicles ability to stop, particularly in wet conditions. The result may be an increased risk of pedestrians being struck on the crossing.

Figure 2-4: Note binder rich surface on approach to the crossing.



Recommendation

Carry out testing to determine the skidding resistance of the surface and rectify if necessary.

2.1.3 Crossing point adjacent to Kirkwood Avenue

Moderate

The surface condition of the road at the crossing point has deteriorated resulting in an uneven surface. This could present a tripping hazard for crossing pedestrians which could in turn increase the risk of conflict with vehicles.

Figure 2-5: Example of Bitumen Flushing



Recommendation

Repair road to provide a smooth level surface.

2.1.4 Concrete separator kerbs to on-road cycle lane - General

Significant

The following issues have been noted in relation to the concrete separator kerbs to the cycle lane;

- The kerbs have sustained damage including missing reflective road studs and marker posts. This is indicative that the kerbs are not as visible as they could be and the reflectors are not robust enough.
- Night time visibility of the kerbs was good where the reflective roads studs remain. However, sections without these and in particular the kerb ends were less visible.
- The cycle lane is not wide enough for cyclists to overtake slower moving cyclists within the lane, The frequency of gaps and position of the kerbs may result in an exaggerated overtaking manoeuvre out into the traffic lane. This may be unexpected by drivers and could potentially result in conflict between cyclists and vehicles.

Figure 2-6 Note damaged kerbs and missing reflective studs



Figure 2-7 Note width of the cycle lane and the kerb restriction may make it difficult for cyclists to overtake



Recommendation

Re-attached the reflective road studs where missing and apply additional studs on the lead end of each run of kerbs in addition to a marker post. Consider applying reflective paint to kerbs, this will increase awareness and maintain visibility where reflective studs and posts become damaged. Should these continue to be struck, then it would be worth considering a mountable option. Note example in Figure 2-8 from Sydney, which has wider segregation kerb, surrounded by a white road marking and green surface in cycleway which improves visibility of facility.

It is recommended that the potential issue with overtaking cyclists is monitored and addressed if necessary.

Figure 2-8: Sydney example of segregated cycle lane



2.1.5 Surface Condition – on road segregated cycle lane

Significant

The surface condition is uneven in places. It has vertical faces down from the surface to the channel, trench reinstatements and drain covers which can make it uncomfortable for cyclists and reduce the effective width of the facility. This issue is exacerbated by the presence of debris in the cycle lane which includes glass, litter and loose material. The safety concerns with this are two-fold; these issues may increase the risk of a cyclist losing control and; potentially cyclists will use the traffic lane to avoid these issues, which may be unexpected by drivers and increase the risk of collision. Some cyclists were observed to be using the traffic lane.

Figure 2-9: Note uneven surface and debris in cycle lane



Recommendation

Ideally provide a smooth and level surface throughout the cycle lanes. As a minimum ensure that the facility has regular cleaning to minimise debris.

2.1.6 South bound bus stop cycle bypass lane - Ramp

Minor

Opposite Homestead Lane there is southbound cycle lane which bypasses the bus stops. The ramp onto the road appears steep and has a small kerb upstand before meeting the camber which rises to the crown of the road. While this facility is continuous, the transition from off-road to on-road is not as smooth as may be expected. This may increase the risk of a cyclist losing control.

Figure 2-10: Note steep ramp on the transition to the on-road cycle lane



Recommendation

Consider providing a smoother and less steep transition in future maintenance works.

2.1.7 Give Way markings on cycle lane adjacent to Homestead Lane

Comment

The give way markings for cyclists are both located on the kerb side of the facility. The width allocated for cyclists at this point is not sufficient for cyclists to pass. This effectively guides cyclists head on with each other. While it is considered unlikely to present a significant safety hazard, should there be pedestrians in the vicinity as well it may make it more difficult to negotiate and/or create confusion.

Figure 2-11: Clarity Required for Shared use Path



Recommendation

Consider setting back street furniture to allow more width for opposing cyclists to pass or switching the give way lines on the southern approach to the left.

The transition from the on-road cycle lane to the off road bypass lane is at an acute angle which when combined with the kerb upstand could result in a cycle wheel catching and the cyclist losing control. This issue may be exacerbated in wet weather conditions.

Figure 2-12: Note



Recommendation

Provide flush kerb between on and off road facility.

There is parking provided on-road on the western side of Ilam Road north of University Drive. Although there are parking bays between the traffic lane and the on-road cycle facility, which effectively segregates the two, kerbed separators have been provided. Parked cars were observed to be located outside of the parking bays in the traffic lane, which has a knock on effect on the position of through traffic. Regular occurrence of larger vehicles was also observed, particularly buses, which tended to track closer to or over the centreline. There are tyre marks on the opposite segregation kerbs which suggests that this is resulting in a pinch point. The intermittent nature of the kerbs adjacent to the parking bays could make it more difficult for drivers to judge their position whilst parking and their ability to avoid striking the kerbs. This may be causing poor positioning of parked cars. The safety concern is that opposing through traffic could be involved in collision.

Figure 2-13: Note parking is influencing position of traffic



Recommendation

Consider removal of separation kerbs or provide regular reflector posts on the kerb so that drivers can more accurately judge the distance to the kerb.

There are a number of road markings and surface changes within the vicinity of the cycle stop box area. These result in a confusing layout and make it difficult to determine the box.

Figure 2-14: Current Visibility of Carrs Road Crossing



Recommendation

Provide green coloured surfacing to the cycle stop box and the lead-in approach to highlight the intended use.

2.1.11 Cycle lane bypasses at Bus Stops - general

Minor

The shared use cycle lane/footpath behind the bus stops is relatively narrow. In addition, the advertising on the bus shelters restricts visibility of pedestrians that may be emerging from buses.

Figure 2-15: Note narrow shared use facility and restricted visibility through bus shelters



Recommendation

Monitor for any issues and if necessary consider removing bus shelter advertising to improve sightlines.

2.2 Audit Statement

We certify that in carrying out this audit we have inspected the site and used the drawings and listed in Appendix A. We have endeavoured to identify features that could be modified or removed in order to improve safety, although it must be recognised that safety cannot be guaranteed since no road can be regarded as absolutely safe.

The problems identified have been noted in this report together with recommendations that should be studied for implementation. Readers are urged to seek further specific technical advice on

matters raised and not rely solely on the report. Where recommended actions are not taken, this should be reported in writing, providing the reasons for that decision.

Signed:Dated:

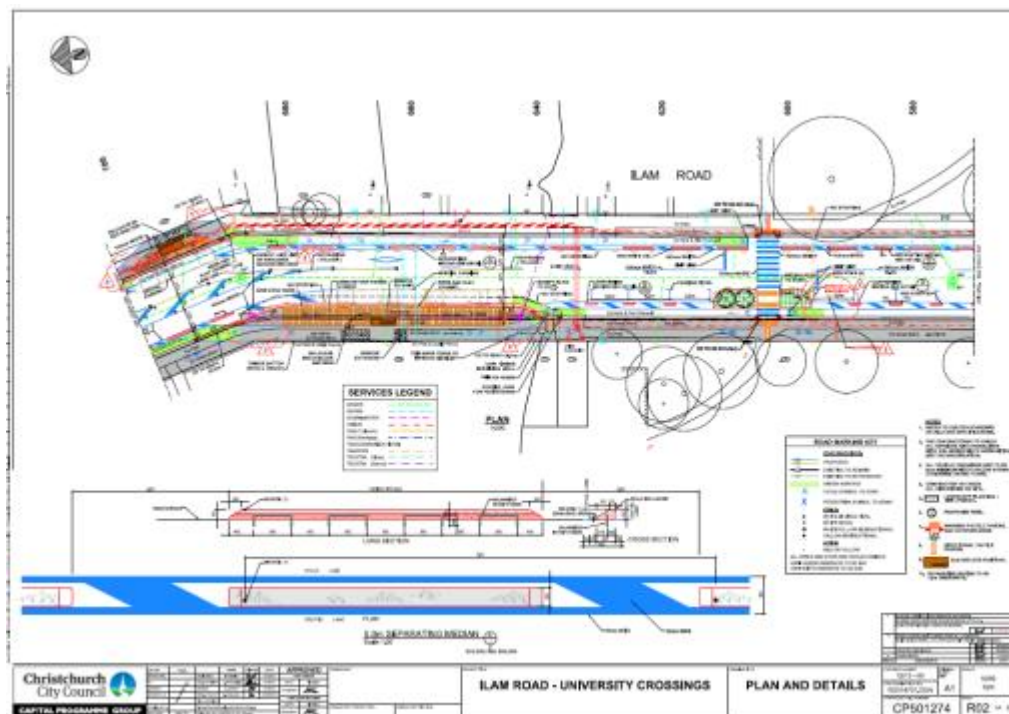
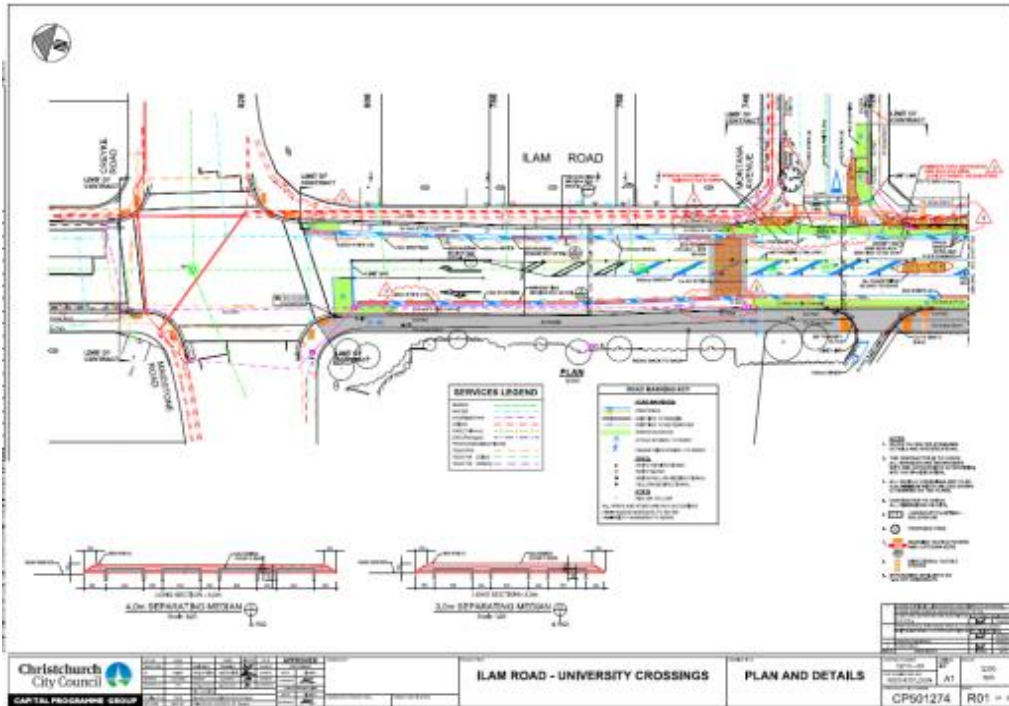
Marcus Brown, Senior Road Safety Engineer
Beca Ltd, Christchurch

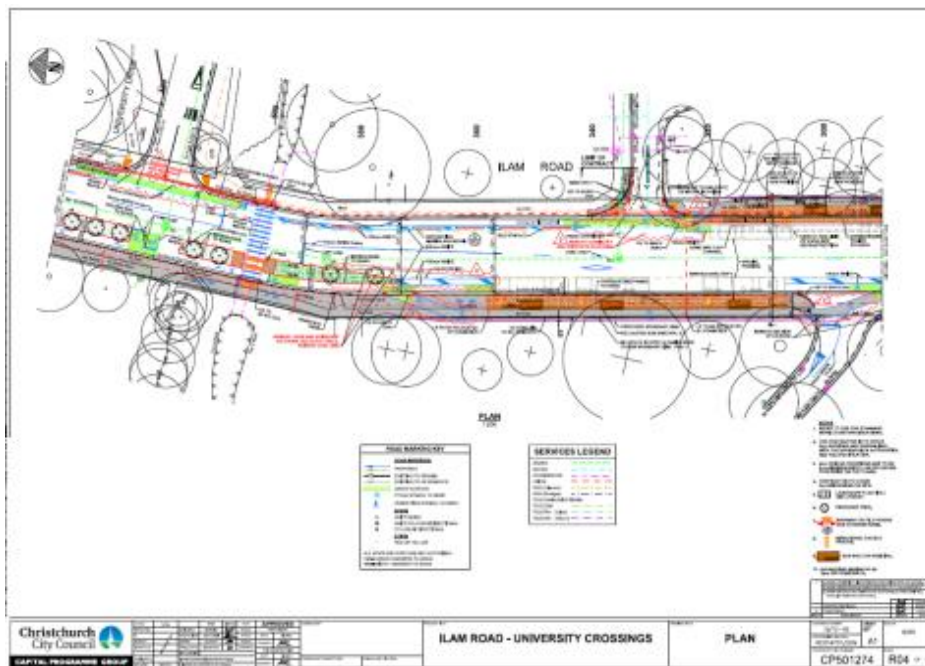
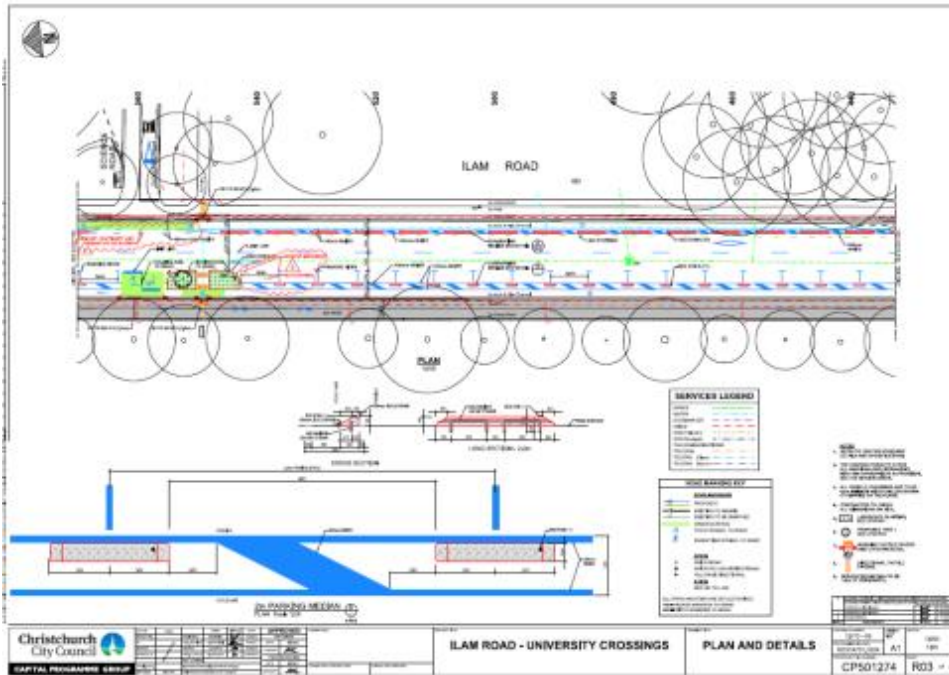
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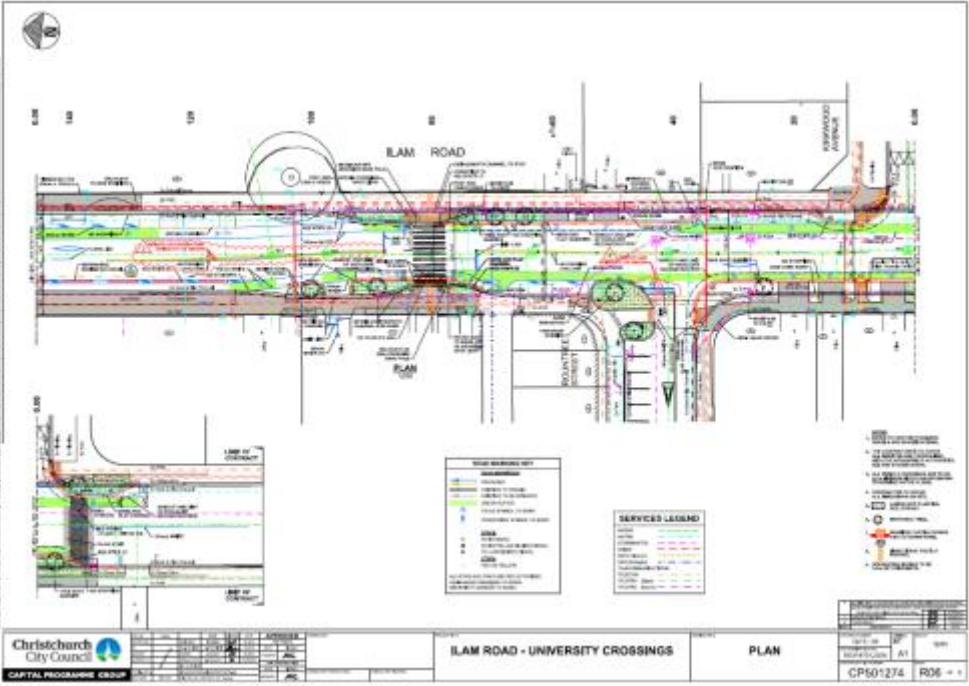
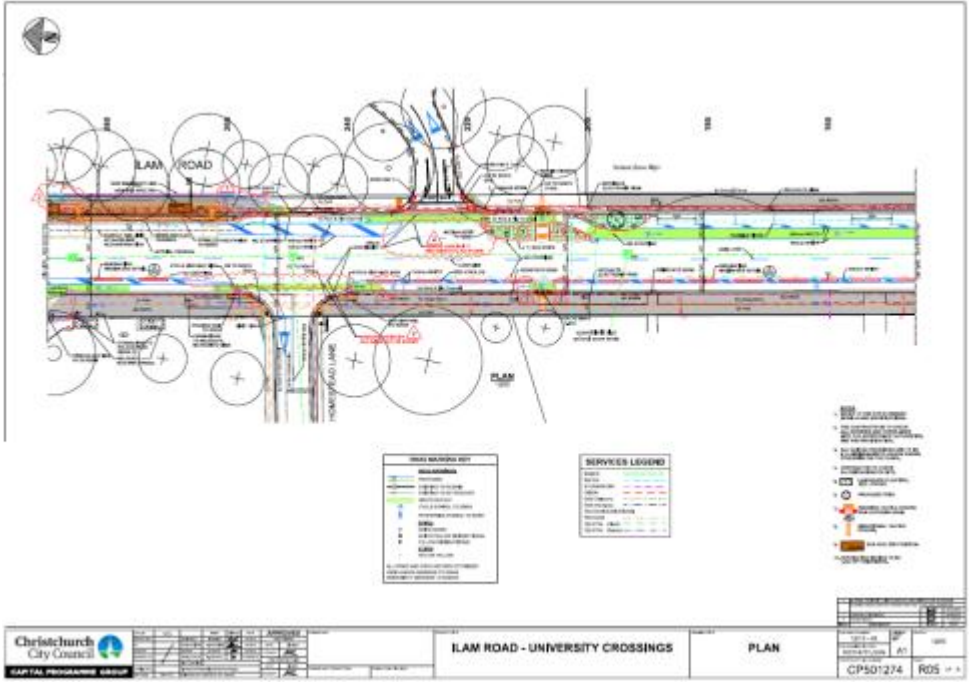
Shane Turner, Technical Director - Safety
Beca Ltd, Christchurch

Appendix A

Design Drawing







Appendix B

Decision Tracking Form

Road Safety Audit Report

DECISION TRACKING FORM (Rev A)

Project Title: Ilam Road University Crossings	Designer: Amo Perelini
Road Safety Audit Stage: Post Construction	Project Manager: Richie Moyle
Road Safety Audit Team: Marcus Brown, Shane Turner	Client: Transport and Greenspace

Report Ref.	Rank.	Recommendation:	Designers Comments	Auditors Comments	Exception Reporting
2.1.1	Moderate	Tactile Paving in Vicinity of Rountree Street Consistently apply tactile paving.	Fig 2.3 Disagree. The layout of the tactile paving conforms to the philosophy of RTS14. Fig 2.2 Agree The missing warning tactile markers will be installed as identified in the issued Defects List	Accept conforms to RTS14. But ideally should be consistent with other crossings in the vicinity. Accept	
2.1.2	Moderate	Surfacing on approach to zebra crossing, north of Rountree St Carry out testing to determine the skidding resistance of the surface and rectify if necessary.	Agree. This work is beyond the scope of this project and will be referred to the Maintenance Team to address as part of its routine maintenance works.	Accept	
2.1.3	Moderate	Crossing point adjacent to Kirkwood Avenue Repair road to provide a smooth level surface.	Agree. This work is beyond the scope of this project and will be referred to the Maintenance Team to address as part	Accept	

Report Ref.	Rank.	Recommendation:	Designers Comments	Auditors Comments	Exception Reporting
			of its routine maintenance works.		
2.1.4	Significant	<p>Concrete separator kerbs to on-road cycle lane - General</p> <p>Re-attached the reflective road studs where missing and apply additional studs on the lead end of each run of kerbs in addition to a marker post. Consider applying reflective paint to kerbs, this will increase awareness and maintain visibility where reflective studs and posts become damaged. Should these continue to be struck, then it would be worth considering a mountable option. It is recommended that the potential issue with overtaking cyclists is monitored and addressed if necessary.</p>	<p>Agree that delineation of separator kerbs should be improved.</p> <ul style="list-style-type: none"> KTMs will be maintained as designed as an interim safety measure. Additional KTMs /reflective paint will not be applied as alternative delineation measures are currently being investigated for implementation The issue of cyclists behaviour will be monitored but deviant behaviour cannot be addressed as part of this project. 	<p>Accept</p> <p>Accept but it is recommended that changes are subject of a safety review.</p> <p>Accept</p>	
2.1.5	Significant	<p>Surface Condition – on road segregated cycle lane</p> <p>Ideally provide a smooth and level surface throughout the cycle lanes. As a minimum ensure that the facility has regular cleaning to minimise debris.</p>	<p>Disagree. The edge of seal edge break and level differential have been rectified (500 lineal meters of mill and fill) and is now trafficable by cyclists.</p> <p>Agree. Periodic cleaning of channels is undertaken (recently done and the issues identified have been resolved)</p>	<p>Accept</p> <p>Accept</p>	
2.1.6	Minor	<p>South bound bus stop cycle bypass lane - Ramp</p> <p>Consider providing a smoother and less steep transition in future maintenance works.</p>	<p>Agree that a minor risk exists. We are not aware of any difficulties existing and will monitor the ramp performance and undertake remedial action if necessary.</p>	<p>Accept 20/1/14.</p>	
2.1.7	Comment	<p>Give Way markings on cycle lane adjacent to Homestead Lane</p>	<p>Disagree. The layout is specifically designed to prevent cycle/pedestrian</p>	<p>Accept</p>	

Report Ref.	Rank.	Recommendation:	Designers Comments	Auditors Comments	Exception Reporting
		Consider setting back street furniture to allow more width for opposing cyclists to pass or switching the give way lines on the southern approach to the left	conflict at this intersection, in accordance with the preconstruction safety audit findings.		
2.1.8	Moderate	Northbound cycle bypass – transition from on to off road Provide flush kerb between on and off road facility.	Agree. The cut down lip shall be ground down to channel level.	Accept	
2.1.9	Significant	On-road parking north of University Drive Consider removal of separation kerbs or provide regular reflector posts on the kerb so that drivers can more accurately judge the distance to the kerb.	Disagree. Poor parking practice will occur as is common throughout the city. We acknowledge the consequences of poor parking and will refer it to/recommend that the enforcement team undertake an educational approach to this.	Agree with the education and enforcement approach. Will be worth monitoring this to see if any improvements are seen. Thereafter design and layout should be refined if appropriate. Provision of a mountable kerb which is less forgiving to manoeuvring traffic may improve parking.	
2.1.10	Minor	Advance cycle stop box Ilam Rd/Creyke Road Provide green coloured surfacing to the cycle stop box and the lead-in approach to highlight the intended use.	Agree. The stop box markings will be corrected in conjunction with the green surfacing work still to be done.	Accept	
2.1.11	Minor	Cycle lane bypasses at Bus Stops - general Monitor for any issues and if necessary consider removing bus shelter advertising to improve sightlines.	Agree. This situation will be monitored. Relocation of advertising panels to the back wall of the shelters will be investigated.	Accept	

If the Safety Auditor does not accept the Lead Designer Response, the issues must be escalated and the decision recorded, and signed off by the following:

Project Manager (on behalf of Project Team):	Resource Unit Manager:	Project Sponsor:
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