Road Safety Audit Report

Picton Town Centre – Pre-Construction Detailed Design Stage Road Safety Audit

80019070

Prepared for Wollondilly Shire Council

28 April 2022





Contact Information	Document Information		
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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
01	06/04/2020	Draft (internal review)	Hayden Calvey / Aaron Walton	Hayden Calvey / Jason Fong

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1 **Project Summary**

Project Number:	80019070
Final Report Date:	TBC
Draft Report Date:	06/04/2020
Title of Audit:	Picton Town Centre – Pre-Construction Detailed Design Stage Road Safety Audit
Location of Audit:	Menangle Street, Prince Street – Picton NSW
Project Description:	The aim of this project is to assess the proposed intersection upgrades at Prince Street / Menangle Road near the Picton town centre.
Purpose of Audit:	The aim of this Road Safety Audit (RSA) is to assess the proposed detailed design drawings against vehicle and pedestrian safety.
State:	NSW
Stage of Audit:	Pre-Construction Detailed Design Stage Road Safety Audit
Client Company:	Wollondilly Shire Council
Client Contact:	Tim Sullivan
Client Phone:	9427 8100
Client Email:	Tim.sullivan@slrconsulting.com.au
Audit Date:	02/04/2020
Audit Team:	Hayden Calvey (Lead Auditor Level 3)
	Aaron Walton (Auditor Level 3)

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2 **Project Description**

The aim of this project is to assess the proposed intersection upgrades at Prince Street / Menangle Street near the Picton town centre.

The upgrade of the Prince Street / Menangle Street intersection will include signalisation with Station Street and dedicated turning bays.

3 Audit Stage

A pre-construction strategic design stage audit was carried out through desktop review of plans (as detailed in **Section 8**) on 2 April 2020. An existing conditions stage audit and strategic design audit was previously carried out in May 2018 and June 2018 respectively and the audit team had undertaken a site visit and a previous detailed design audit in June 2019.

4 Study Area



The focus of the study is limited to the Prince Street / Menangle Street intersection as shown in Figure 4-1.

Figure 4-1 Areas of Audit

5 Audit Team

The audit team and client details are shown in Table 5-1.

Table 5-1 Audit Team & Client Deta	ils
Role	
Client	Wollondilly Shire Council
Client Email	Tim.sullivan@slrconsulting.com.au
Lead Auditor	Hayden Calvey (RSA-02-0754)
Team Members	Aaron Walton (RSA-02-0501)
Contact for enquiries	Hayden.calvey@cardno.com.au

6 Audit Program

The audit program details are shown in Table 6-1.

Table 6-1 Audit Program		
Activity	Date	
Site Visit	03/06/2019	Hayden Calvey, Aaron Walton
Draft Report issued	06/04/2020	Draft Report
Review/Closing Meeting	ТВС	Project Manager Comments
Final Report Issued	ТВС	Final Report

7 Exclusions

The following list identifies items excluded from the audit process:

- Crash data
- Parking relocation impacts

The following design details have not been provided, or audited:

- Utility plan
- Lighting plan
- Signs & Linemarking plan
- Contours
- Drainage
- Pavement plan
- Turning paths
- Retaining Wall plans

8 Reference Documents

DRAWING INDEX			
SHEET NUMBER DESCRIPTION			
GENERAL			
GE-0001	COVER SHEET 1 OF 1		
GE-0002	DRAWING INDEX 1 OF 1		
GE-0011	LOCATION PLAN 1 OF 1		
GE-0031	GENERAL NOTES 1 OF 1		
ROAD ALIGNMENT AND DETAIL			
RD-0031	TYPICAL CROSS SECTIONS 1 OF 1		
RD-0101	CONTROL PLAN 1 OF 3		
RD-0102	CONTROL PLAN 2 OF 3		
RD-0103	CONTROL PLAN 3 OF 3		
DETAIL PLAN			
RD-1001	GENERAL ARRANGEMENT 1 OF 3		
RD-1002	GENERAL ARRANGEMENT 2 OF 3		
RD-1003	GENERAL ARRANGEMENT 3 OF 3		
LONG SECTION			
RD-5001	LONGITUDINAL SECTION MC20 1 OF 3		
RD-5002	LONGITUDINAL SECTION MCA0, MCB0, AND MCC0 1 OF 3		
RD-5003	LONGITUDINAL SECTION MK10, MCA1, AND MT10 1 OF 3		
CROSS SECTION			
RC-7001	MC20 1 OF 9		
RC-7002	MC20 2 OF 9		
RC-7003	MC20 3 OF 9		
RC-7004	MC20 4 OF 9		
RC-7005	MC20 5 OF 9		
RC-7006	MC20 6 OF 9		
RC-7011	MCA0 7 OF 9		
RC-7021	MC80 8 OF 9		
RC-7031	MCC0 9 OF 9		

The following reference documentation are the focus of the audit.

9 Audit Risk Assessment Technique

For each of the safety issues identified, the level of risk with each has been determined. **Table 9-1**, **Table 9-2** and **Table 9-3** are extracted from Austroads and have been used in the assessment of risk for this audit.

Table 9-1	Incident Frequency	
	Frequency	Description
	Frequent	Once or more per week
	Probable	Once or more per month
	Occasional	Once or more per year
	Improbable	Less often than once every year

Table 9-2 Incident Severity

Severity	Description	Examples
Catastrophic	Likely multiple deaths	 > High-speed, multi-vehicle crash on freeway. > Car runs into crowded bus stop. > Bus and petrol tanker collide. > Collapse of bridge or tunnel.
Serious	Likely death or serious injury	 > High or medium-speed vehicle/vehicle collision. > High or medium-speed collision with a fixed roadside object. > Pedestrian or cyclist struck by a car
Minor	Likely minor injury	 > Some low-speed vehicle collisions. > Cyclist falls from bicycle at low speed. > Left-turn rear-end crash in a slip lane.
Limited	Likely trivial injury or property damage only	 > Some low-speed vehicle collisions. > Pedestrian walks into object (no head injury). > Car reverses into post.

Table 9-3 Resulting Level of Risk Matrix

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

Audit Findings 10

Audit Findings – Menangle Street / Prince Street Table 10-1

CAR Reference	Safety Hazard Findings	Risk Rating	
1.01	Typical Cross Section 2 shows a 10.1% small embankment to the existing surface. There are no details of drainage provision in this location.		Improbable
Drainage	There is a risk that water may pond in this location and be hazardous for pedestrians within the verge area,	<u>Severity</u>	Limited
RD-0031	resulting in slip / trip type falls when navigating the verge. This may result in personal injury for pedestrians.	Level of Risk	Low
	There is a risk that ponding water adjacent to the carriageway may enter the pavement layers resulting in pavement failure and destabilisation of through vehicles, in particular motorcyclists.		
1.02	Typical Cross Section 1 shows a 5.7% fall back to the Menangle Street kerb, adjacent to the existing footpath. This gradient adjacent to the footpath may create difficulties for pedestrians when walking along	<u>Frequency</u>	Improbable
Western Verge Gradient	the footpath and potentially passing opposing pedestrians. The cross fall may be unsuitable for pedestrians resulting in slip / trip type falls		Limited
RD-0031	resulting in slip / thp type fails.	Level of Risk	Low
1.03	The plans indicate a potential retaining wall on the north-west corner of Station Street and Menangle	Frequency	Improbable
Restricted Width and Access	Ith Street. The retaining wall appears to restrict access to the adjacent stairs and business. The retaining wall may also reduce the clear width for pedestrians in this location.		Minor
RD-1002	Couple with the placement of the signal posts and kerb ramps, the clear width may be inadequate for pedestrians and persons with a disability to traverse the footpath in this location. Persons aided by wheelchairs may be forced to use the roadway to access Station Street and similarly pedestrians may be required to use the roadway if the width does not permit passing of other pedestrians.	Level of Risk	Low

Utilising the roadway in this location may result in slip / trip type falls or conflict with opposing vehicular movements within Station Street resulting in vehicle to pedestrian crashes.



The proposed northern kerb in Station Street includes a unique 'kink' to meet the existing kerb.	Frequency	Occasional	Li
There is a risk that a vehicle may mount the kerb in this location resulting in pedestrian collisions.	<u>Severity</u>	Minor	
Additionally, there is a risk that parking may occur in this location resulting in reduced travel lane width and side swipe collisions with parked or adjacent turning vehicles.	Level of Risk	Medium	

1.04

Alignment

RD-1002

Station Street Kerb

Project Manager Response
Stormwater design has been finalised as part of the 20% detailed design. To be Addressed in the 80% design.
This area is proposed to be vegetated and is not intended for use by pedestrians.
Minimum footpath width and circulation requirements to be reviewed and incorporated as part of the 80% detailed design.
Linemarking to be provided to delineate shoulder. To be assessed in 80% detailed design.

CAR Reference	Safety Hazard Findings	Risk Rating		P
	"This risk is increased given the developing lane and angle of kerb line on approach"			
	CTU DE LE RETAINING WALL POSSIBLE RETAINING WALL EXTENTS AND TYPE TO BE CONFIRMED 0 0 0 0 0 0 0 0 0 0 0 0 0			
1.05	It is unclear if kerbside parking will be permitted on the western side of Menangle Street. There are no	<u>Frequency</u>	Occasional	T
Menangle Street Parking (Western	There is a risk that if parking is permitted it may reduce the effective road width and potentially result in	Severity	Minor	d
Side)	sideswipes with parked vehicles.	Level of Risk	Medium	P
RD-1003				
1.06 Turn Restrictions	I nere is a "No left turn" combined with "Vehicles under 9m excepted" applying to northbound vehicles on Menangle Street entering Prince Street. The signage is provided at the intersection, however vehicles on	Frequency	Uccasional	d J
on Menangle Street	approach would have already adopted the left lane (which is a dedicated left turn lane) prior to being advised of the turn restriction.	Severity	Minor	ır P
TCS Plan	Drivers unaware of the turn restriction who have already moved into the left lane may undertake abrupt lane change to continue travelling northbound. This may result in side-swipe or rear-end crash types	Level of Risk	Medium	tł
	Additionally, it is unclear why one driveway on the eastern side has a right turn restriction.			ŭ
1.07	The "No left turn" combined with "Vehicles under 9m excepted" appears to apply to Prince Street however	Frequency	Improbable	Т
Left Turn	due to the close proximity to Station Street, it is unclear if Station Street has the same restriction.	<u>Severity</u>	Minor	d P
Station Street	changes to avoid undertaking a prohibited turn. This may result in side-swipe or rear-end crash types.	Level of Risk	Low	n
TCS Plan				

The parking will be removed by these works. Signage to be provided as part of the 80% detailed design to show the signs restricting parking in this area.

The signage will be assessed in the 80% detailed design to provide advance signs to inform the incoming intersection.

Per RMS comments the no right hand turn into the driveways has been placed to deter the unsafe movement.

The signage will be assessed in the 80% detailed design to ensure the restrictions are directed to Prince St do not conflict with Station Street movements.



Project Manager Response

Painted island in addition to right only arrow have been provided to delineate a through movement is not warranted from the right hand lane.

Right only arrow have been provided to delineate a through movement is not warranted from the right-hand lane. Delineation of painted island has been provided to guide road users into correct lane.

The clearance to the overhead wiring will be assessed in the 80% detailed design.

CAR Reference	Safety Hazard Findings	Risk Rating		1
1.11 Menangle Street Southern Approach	It is unclear if the tie-in for the southern approach will match the existing horizontal geometry. There is a risk that the incorrect horizontal geometry tie-in may result in sharp wheel correction for drivers increasing the risk of off-road crash types.	<u>Frequency</u> <u>Severity</u>	Occasional Minor	(H T
Tie-In RD-0101	No alignment data has been provided to the audit team.	Level of Risk	Medium	
1.12 Menangle Street Southbound CH100 RD-0102	MC20 appears to have a 'kink' (or two straights) indicating a change in the horizontal road alignment with no radius or transition between the two. There is a risk that abrupt changes in horizontal road geometry may result in increased potential for sideswipe collisions or run-off road crash types.	<u>Frequency</u> <u>Severity</u> Level of Risk	Improbable Serious Medium	ł

Project Manager Response

Cross section for MC20 CH 0 includes details of how the proposed alignment ties into the existing road levels.

Horizontal alignment to be reviewed and addressed as part of the 80% detailed design.

CAR Reference	Safety Hazard Findings	Risk Rating		Pr
1.13 Station Street Lane Allocation RD-1002	There are no pavement markings denoting the lane allocation. There is a risk that vehicles may undertake dual right turn movements to head Southbound on Menangle Street, resulting in side-swipe crash types.	<u>Frequency</u> <u>Severity</u> Level of Risk	Improbable Limited Low	Th 01 to pla
1.14 Turn Alignment into Station Street RD-1002	The T1, 8m long line marking into Station Street is positioned within the northbound through lane and does not appear to start in the correct location to advise vehicles of the appropriate turning angle. There is a risk this could result in side-swipe crash types in Station Street.	<u>Frequency</u> <u>Severity</u>	Improbable Limited	Th the de St of

Audit findings from the June 2019 detailed design, considered to still be applicable to the current audit, are reiterated below.

Table 10-2 June 2019 Audit Findings **CAR Reference** Safety Hazard Findings Risk Rating 2.07 The location of the Prince Street and Station Street stop line, in conjunction with the property boundary Frequency Improbable locations and vegetation is likely to result in poor sight lines to the Menangle Street northbound and Inadequate sight southbound approach. Minor <u>Severity</u> lines There is a risk that drivers will not have sufficient sight distance to join the Menangle Street traffic during GA-1006 Level of Risk Low black outs. Additionally, vehicles are likely to have poor sight lines to Menangle Street traffic in order to avoid potential crashes (e.g. if a vehicle or cyclist runs a red light). 2.13 The swept path diagrams do not show lane arrangements, which makes it difficult to identify if vehicles Probable Frequency encroach into other lanes. Prince Street Swept Severity Minor Paths MS-1111 & MS 1112 Level of Risk High 80019070 | 28 April 2022 | Picton Town Centre - Pre-Construction Detailed Design Stage Road Safety Audit

he line marking has not come through in RD-102. Line marking as shown on the TCS plans be included on the signage and line marking ans as part of the 80% detailed design.

he T1 linemarking ties into BB linemarking into e centre of the intersection. This provides clear elineation to the right-hand turn lane into Prince t. This linemarking is reflective of the turn path f a 8.8m service vehicle turning into Prince St.

Project Manager Response
Following construction, vegetation to be cut back to improve sight lines if required.
Swept paths have been revised in MS-1001 showing the proposed linemarking. There is a clash with northbound and southbound traffic as shown in audit image.

CAR Reference	Safety Hazard Findings	Risk Rating		
	The left turn from Station Street appears to potentially conflict with vehicles travelling or stopped in the southbound approach on Menangle Street			
2.14	The footpath appears to narrow adjacent to the pram ramp located on the northern approach of Menangle Street and the steps to the local business	<u>Frequency</u>	Improbable	
GA-1006	Insufficient footpath width may restrict the ability for pedestrians, particularly those with impairments or	<u>Severity</u>	Minor	
	resulting in personal injury.	Level of Risk	Low	
	Steps PCW CH 20 0 Narrow width BA-1 C4 PCW CH 20 0 CH 20 0			
2.15	There are a number of locations where proposed light posts may restrict sight lines to signal lanterns.	Frequency	Improbable	
Sight Lines to Signal Lanterns	There is a risk that insufficient sight distance to lanterns may result in insufficient reaction time for motorists, potentially resulting in increases in rear-end crashes or running red lights.	Severity	Serious	
LT-1121 & TCS Plan		Level of Risk	Medium	

Project Manager Response
Noted as per audit finding 1.03. To be assessed in 80% detailed design.
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Light pole locations to be reviewed to provide
clear line of sight for signals in 80% Detailed
Design.



Project Manager	Response
Vegetation to be	maintained and cutback.

11 Responding to the Audit Report

A project manager is under no obligation to accept the findings outlined in this audit report. This report simply provides the opportunity for the project manager to review potential problems highlighted by the auditors.

A formal road safety audit report should be responded to in writing.

It should be noted that this audit will be recorded on the NSW Register of Road Safety Auditors and the project manager should expect email notification from the register to confirm the audit has been carried out.

12 Formal Statement

We, the undersigned, declare that we have reviewed the design drawings listed in this report and identified the safety and operational deficiencies above.

It should be noted that while every effort has been made to identify potential safety hazards, no guarantee could be made that every deficiency has been identified.

We recommend that points of concern be investigated and necessary corrective actions are undertaken.

Hayden Calvey Level 3 Road Safety Auditor Team Leader Aaron Walton Level 3 Road Safety Auditor Team Member