Prepared For:
The community of Coburg and Preston and all road users of the Bell Street Bridge

Date
18 October 2023

Safe System Assessment (Rapid)

Bell Street Bridge (Merri Creek), Coburg

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Our reference
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Version	Date	Issue	Prepared by	Checked by
F01	18.10.2023	Final	Katie Harker Harry Jorgensen	Ben Krastins

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1. The situation

1.1. Introduction

The Bell Street Bridge study area provides a vital east-west connection in Melbourne's inner northern suburbs. It moves over 47,000 vehicles every day including private vehicles, heavy vehicles, buses, pedestrians and cyclists.

The bridge poorly services pedestrians, with no protection to traffic and very narrow paths on both sides of the road.

In fact, between 2018 and 2022, there was 16 crashes recorded that required attendance by emergency services. Of those crashes, 3 of these involved a pedestrian, 2 resulting in serious injuries requiring hospitalisation.

1.2. The Merri Creek

The Merri Creek is a significantly important waterway due to it being an environmental, heritage and recreation corridor that connects a distance of approximately 60km from near Wallan in the north to the Yarra River at Dights Falls (Abbotsford) in the south.

Due to the Merri Creek traversing through a number of Melbourne's northern suburbs, it provides a key attraction for it's recreational and open space value.

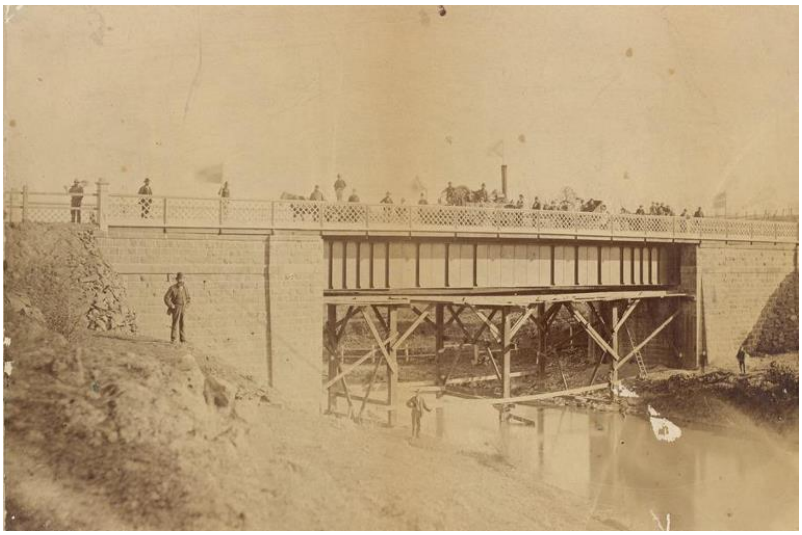
The Merri Creek has important cultural significance and has been an important place for time well before European colonisation, notably as a place of gathering for special events such as Tanderrum. The creek and it's banks contain culturally significant Indigenous artifacts and scarred trees.

Figure 1.1: Merri Creek near Bell Street Bridge in Coburg

1.3. Bell Street bridge in the early days

An early bridge was constructed across the Merri Creek on Bell Street in 1857 and was redeveloped in 1880 as a wrought iron lattice girder trusses bridge, which is unique in Victoria at the time of construction. The Bell Street bridge provided a vital connection between residential developments in Heidelberg and Pentridge.

Figure 1.2:Bell Street Bridge in the Early Days



Source: https://www.merri-bek.vic.gov.au/globalassets/areas/heritagelib-7504/heritage-list/coburg---bell-street-bridge.pdf

Throughout the twentieth century the bridge was upgraded on a number of occasions, the bridge was widened in 1954 and again further reinforced in 1990 to resemble how it exists today.

Figure 1.3: Bell Street Bridge Today

Source: https://www.merri-bek.vic.gov.au/globalassets/areas/heritagelib-7504/heritage-list/coburg---bell-street-bridge.pdf

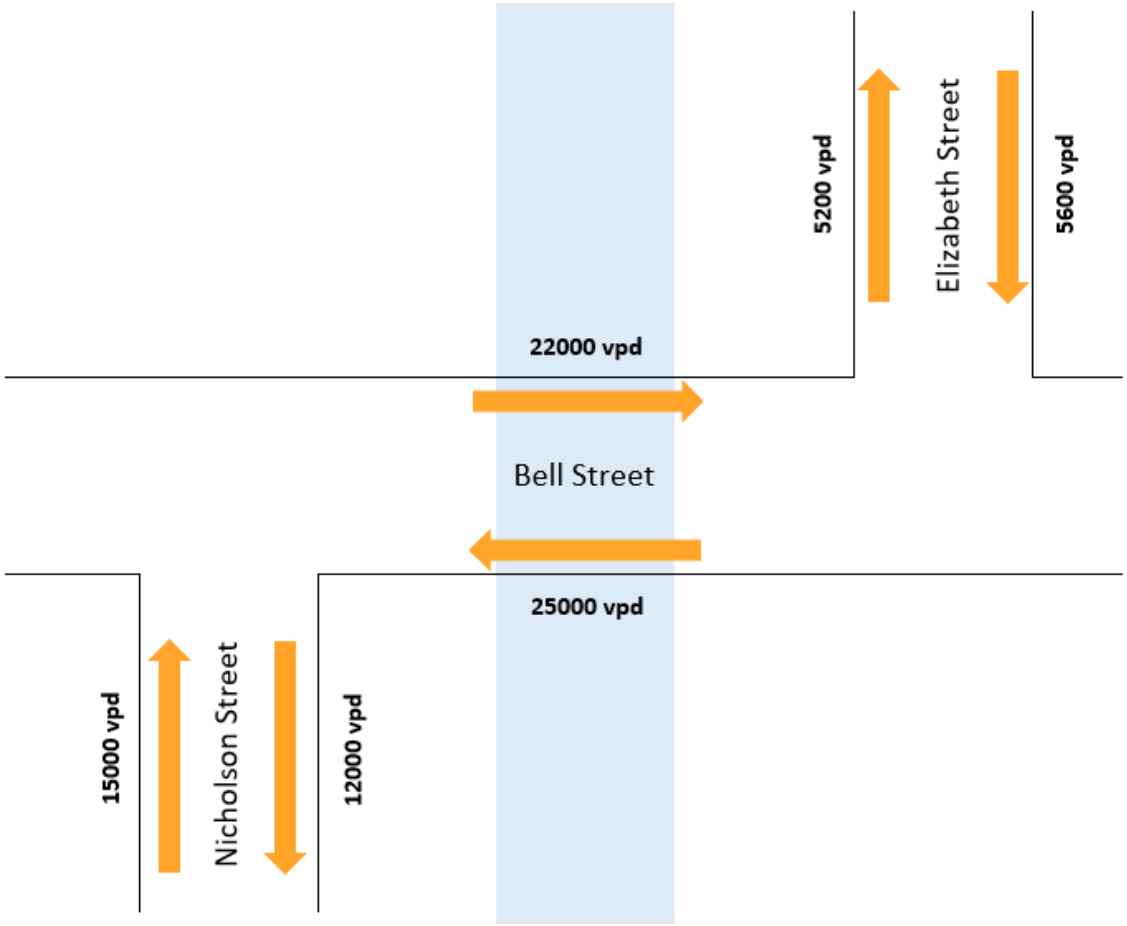
1.4. Bell Street, the movement corridor

Vehicle Movements

Bell Street carries in the order of 47,000 vpd, with 5% of all traffic being heavy vehicles[1]. Bell Street being a major east-west movement corridor facilitates in addition to private vehicles also serves buses and people walking and riding between Preston and Coburg.

Figure 1.4 shows the daily traffic volumes for Bell Street, Nicholson Street, and Elizabeth Street at the bridge intersection.

Figure 1.4: Daily Traffic Volumes



Key nearby destinations include Coburg High School, and Coburg Major Activity Centre on Sydney Road.

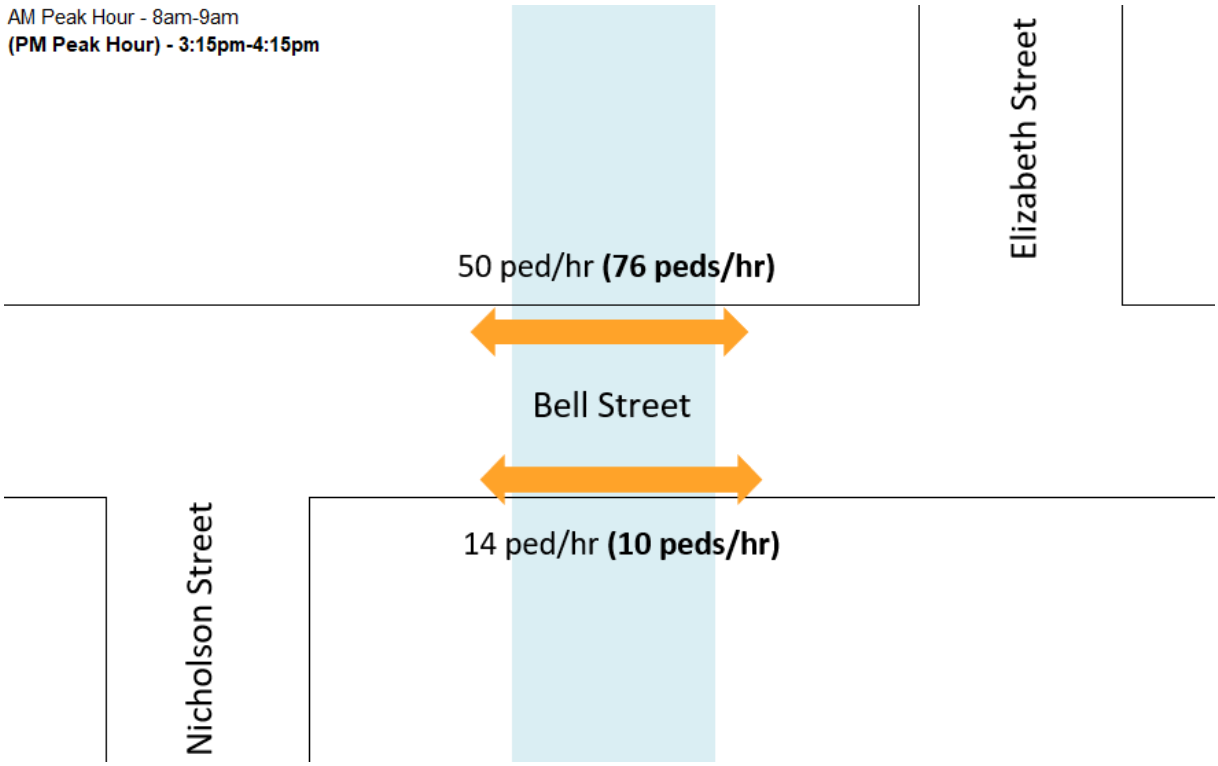
More broadly it connects the M80 ring road and Tullamarine Freeway in the west, to Preston, Bellfield and Heidelberg to the east.

[1] Both volumes and HV% sourced from Department of Transport & Planning open data

Pedestrian Movements

Pedestrian origin and destinations surveys[2] were undertaken between Monday 9 May 2022 and Friday 13 May 2022 between 6:00am – 9:00am and 3:00pm – 6:00pm. An average of 250 pedestrians crossed the Bell Street Bridge (both sides) across the week long survey period. An average across the weekdays of the peak hour pedestrian movements across the Bell Street is presented in Figure 1.5.

Figure 1.5: Average Peak Hour Pedestrian Movements Across Bell Street Bridge



As shown in the preceding figure, the majority of pedestrians who cross Bell Street Bridge use the northern side of the bridge, which is wider and can be accessed via pedestrian signals on both sides of the bridge.

[2] Provided by Merri-bek City Council

Crash history

A review of the Department of Transport and Planning crash history for the last 5 years of available data which is between 2018 and 2022 for the subject site was conducted to understand current safety operations of Bell Street bridge and adjacent intersections.

Table 1.1 details the crash history at the bridge and adjacent intersection, including severity and user type.

Table 1.1: Crash History for Last 5 Years of Available Data (2018-2022)

	Accident Severity			Person Severity			
Year	Serious Injury	Other Injury	Total Accidents	Seriously Injured	Other Injury	Not Injured	Total Person Involved
2018	2	-	2	3	1	3	7
2019	-	1	1	-	1	1	2
2020	1	3	4	1	6	7	14
2021	1	6	7	1	7	9	20
2022	1	1	2	1	1	1	3
Total	**5**	**11**	**16**	**5**	**16**	**21**	**46**

The data indicates that there have been 46 people involved in a total of 16 separate crashes in the last 5 years within the Bell Street bridge study area. Three of the accidents have involved pedestrians resulting in two 'serious injury' and one 'other injury' crash.

Two of these crashes have involved pedestrians crossing the road from the far side of the road and being struck by a driver travelling through an intersection, which both occurred at the intersection of Bell Street and Nicholson Street.

The first crash occurred in 2019 and involved the driver travelling north along Nicholson Street during at 9:47am in wet conditions and resulted in an 'other injury' for the pedestrian. The second crash occurred in 2020 and involved the driver travelling east along Bell Street and striking an elderly pedestrian approximately 30 metres west of the intersection at 2:16pm in dry conditions and resulted in a 'serious injury' for the pedestrian.

The other pedestrian crash occurred on Bell Street approximately 30 metres east of Elizabeth Street and resulted in a driver striking a 65 year old pedestrian who was 'playing, working lying, or standing on carriageway'. The accident occurred at 9:30pm on a weekday in 2018 and resulted in a 'Serious Injury' for the pedestrian.

1.5. Recent improvements

In 2022 the Department of Transport and Planning completed a number of safety improvements to Bell Street Bridge, which was funded by the Safe Travel in Local Streets Program.

The safety improvements which were introduced to Bell Street Bridge are as follows:

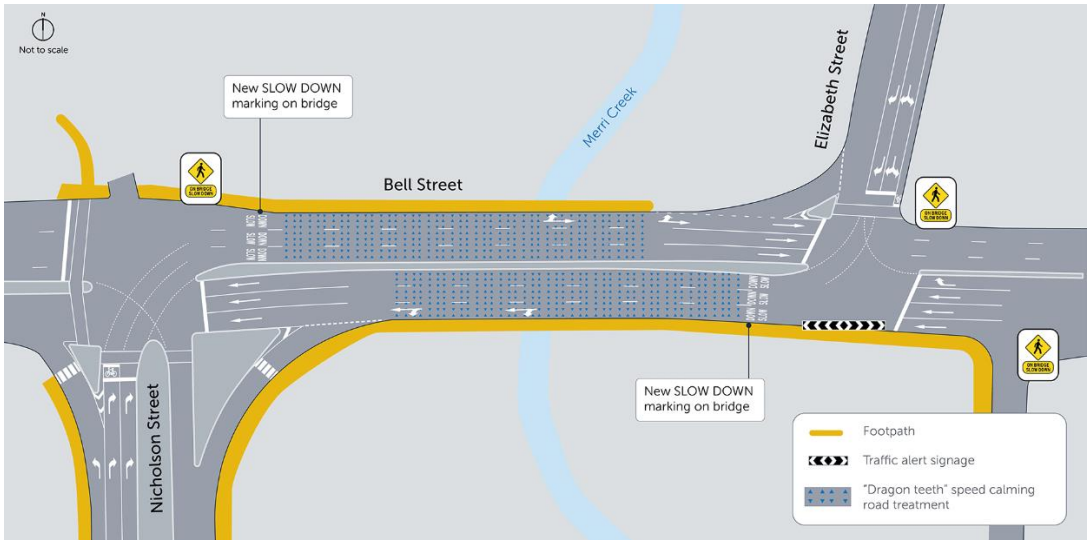
— 'SLOW DOWN' line marking on approach to bridge;

— Dragon teeth line marking to encourage slow speeds; and

— Pedestrian warning signs on the approach to Bell Street Bridge.

Figure 1.6 shows an excerpt of the recent road safety improvements the Department of Transport and Planning have made.

Figure 1.6: Excerpt of Recent Road Safety Improvements on Bell Street Bridge



Source: https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/bell-street-bridge-coburg-safety-improvement-works

Between 24 April and 5 May 2023, a post implementation community survey was open to the public to gauge the communities view on the success of the recent road safety improvements, 12 months after the improvements had been installed. Some of the key takeaways of the community survey are as follows:

— Over half of respondents feel that the current speed limit of 60km/h is inappropriate.

— Pedestrians and bike riders believe the line markings on the road are not enough to improve safety.

— Most people are aware of the signalised road crossings at Creek Pass Bridge or Harding Street Bridge, however they are unlikely to use them as they are perceived as too far away.

The community post-implementation surveys also identified some possible solutions to improve safety for pedestrians and cyclists such as reducing speed limits, widening footpaths, installing physical barriers and constructing a separate pedestrian / cyclist bridge.

Further information regarding the recent road safety improvements to Bell Street Bridge can be found on the VicRoads website at this link - https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/bell-street-bridge-coburg-safety-improvement-works

1.6. Scope and purpose of this assessment

The subsequent sections of this report have been prepared to be consistent with the VicRoads Safe System Assessment template, publicly available online, and AustRoads guidance on completing a Safe System Assessment.

Information used in the preparation of this report include a range of survey and open data sources, Austroads guides, site visits, anecdotal and recorded evidence of crashes and road safety hazards within the study area.

The report is being prepared to understand how the Bell Street bridge aligns with the 'Safe System' and what treatments could be implemented to improve safety for all users of the bridge.

2. Assessment Details

2.1. Type of Assessment

The Safe System Assessment (SSA) has been conducted to evaluate how conceptual option developed for the Bell Street bridge align with the Safe System principles.

A rapid SSA has been used in accordance with Austroads Safe System Assessment Framework guidelines as these options are high-level and conceptual only and are yet to proceed into functional or detailed design stages.

This report is based on, and generally follows, the Department of Transport and Planning Safe System Assessment (Rapid) report template available on the VicRoads website.

2.2. Assessment Team

Table 2.1 sets out the team members involved in the preparation of this assessment including their relevant qualifications or certification.

Table 2.1 Assessment Team

Name	Qualifications / Certification
Ben Krastins, Senior Associate: Transport	BEng(Civil)(Hons) RPEng(Civil) Qualified Safe System Assessor Senior Road Safety Auditor
Katie Harker, Senior Transport Engineer	BEng(Civil)(Hons) Qualified Safe System Assessor
Harry Jorgensen, Transport Planner	BDes(Planning)

2.3. Meetings and Site Inspections

To inform the preparation of this Safe System Assessment, a detailed site visit including walkthrough with community members was undertaken on 5 September 2023 between 8:30am and 10:00am.

3. Project Context and Description

3.1. Overview

The following Section provides detail relating the project objectives and project background, including the road function, speed environment, and road users.

3.2. Project Location

The Bell Street Bridge in Coburg, is approximately 7.7 kilometres north of the Melbourne CBD. Connecting Bell Street across the Merri Creek, the 6 lane bridge is a key arterial route running east-west throughout Melbourne's northern suburbs.

The Bridge is bounded by two signalised intersections:

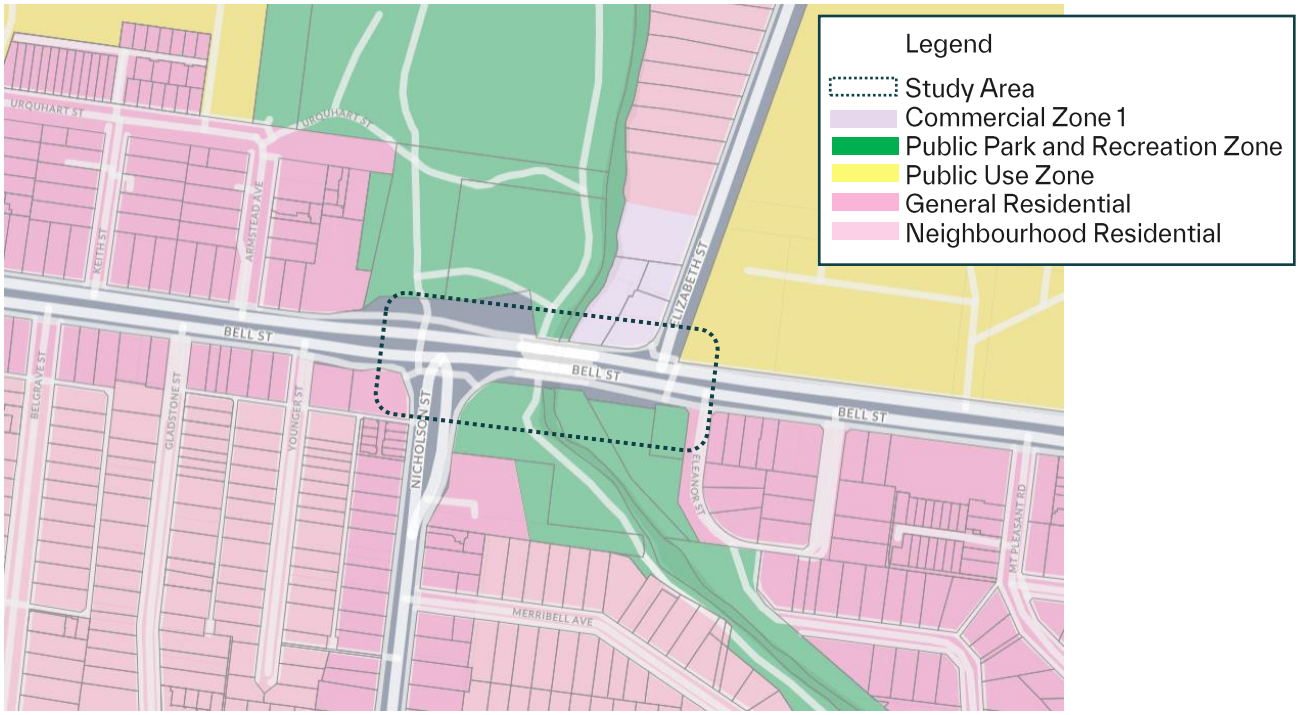
— Bell Street / Nicholson Street to the west, and

— Bell Street / Elizabeth Street to the east.

Land to the north and south of the Bridge consists of public open green space, with De Chene Reserve to the north, and Bowden Reserve to the south. Nearby land uses include residential dwellings, Coburg Pine Ridge Cemetery, commercial land uses along Bell Street and Coburg High School to the north west.

The Bell Street Bridge and the surrounding land uses are shown in Figure 3.1 below.

Figure 3.1 Bell Street Bridge Locality and Surrounding Land Uses



3.3. Project Context

The following Table 3.1 provides further project context as they relate to the Austroads AP-R509-16 prompts. Each prompt is provided with commentary as it related to the Bell Street Bridge.

Table 3.1 Project Context

Prompts	Comments
What is the reason for the **project**? Is there specific crash type risk? Is it addressing specific issues such as poor speed limit compliance, road access, congestion, future traffic growth, freight movement, amenity concerns from the community, maintenance/asset renewal, etc.	— Concerns have been raised by the community regarding the safety of pedestrians and road users. — There is an extensive crash history involving both vehicles and pedestrians at the bridge. — This includes a high proportion of non-injury crashes resulting in property damage, which are not recorded by DTP. — Current footpaths along the Bridge are narrow with no protection provided between vehicles. — Bell Street carries in the order of 47,000 vehicles per day.
What is the **function** of the road? Consider location, roadside land use, area type, speed limit, intersection type, presence of parking, public transport services and vehicle flows. What traffic features exist nearby (e.g. upstream and downstream)? What alternative routes exist?	— Bell Street is key arterial road within the suburbs of Coburg and Preston. Focusing primarily on the movement of vehicles in the east-west direction, Bell Street caters for Metro bus services and active transport movements. — Two signalised T-intersections are located on either end of the bridge. — Nearby main roads of Murray Road to the north and Moreland Road to the south provide alternative routes in an east-west direction. — Alternative pedestrian routes are located to approximately 480metres to the north and 400 metres to the south, which are not feasible, nor acceptable as detours.
What is the **speed** environment? What is the current speed limit? Has it changed recently? Is it similar to other roads of this type? How does it compare to Safe System speeds? What is the acceptability of lowering the speed limit at this location?	— Bell Street currently operates with a 60km/h speed limit, consistent with other similar arterial roads across Melbourne. — There are high volumes of pedestrians on unprotected paths next to traffic lanes, and 6 school campuses within a 1km radius. — The speed limit across bridge does not align with safe system speeds (30km/h) in its current configuration. — It is understood that DTP are currently investigating lower speed limits on Bell Street and in the vicinity of the bridge.

Prompts	Comments
What **road users** are present? Consider the presence of elderly pedestrians, school children and cyclists. Also note what facilities are available to vulnerable road users (e.g. signalised crossings, bicycle lanes, school speed limits, etc.)	— The Bell Street bridge services various road users including motorists, heavy vehicles (buses and trucks), pedestrians and cyclists. — There is a number of school aged children who use the bridge every day as there 6 schools within 1 kilometre of Bell Street bridge. School zone catchments encompass suburbs on either side of the Merri Creek, resulting in children being required to cross the bridge to travel to/from school and home. — Signalised crossings are provided on all approaches, with zebra crossings provided across slip lanes on the northern and southern approach turn lanes. — There are no bicycle facilities however cyclists were observed using the bridge (on-road) during site visits. It is not part of the Strategic Cycling Corridor network, which is unusual given the directness of the link and surrounding land uses in the wider area.
What is the **vehicle** composition? Consider the presence of heavy vehicles (and what type), motorcyclists and other vehicles using the roadway.	— Bell Street bridge carries in the order of 47,000 vehicles per day. — Approximately 5% of all vehicular traffic being Heavy Vehicles (including buses).

3.4. Existing Conditions

A detailed description of existing conditions is outlined in **Section 1.4** of this report.

Photos showing key elements of the bridge are shown in **Appendix A.**

3.5. Proposed Works

As this is an independent assessment of existing conditions, as opposed to project based assessment by a road authority, the approach included first undertaking the existing conditions assessment, and using the findings to establish a range of options.

A total of five (5) options were developed, as well as assessing the existing conditions ('do nothing').

The options developed included a range of intersection improvements at Nicholson Street and Elizabeth Street, including:

— Improved pedestrian crossings / on-road cycling facilities;

— Realignment of slip lane on South-West corner;

— Line marking improvements; and

— Raised safety platforms on Bell Street.

As a part of options 4 and 5 safety improvements include the provision of a separated, protected pathway, which will require the widening of the existing bridge, or construction of a new bridge.

The options tested, including common and unique features are outlined in Table 3.2 below.

Table 3.2: Options Assessed in the Bell Street Bridge Road Safety Assessment

Option	Description	Intersection Improvements	40km/h (school times)	40km/h (all times)	Protected Path (2 metres wide)	Protected Shared Path (3 metres wide)
Existing	Do nothing					
Option 1	Safety improvements	✓				
Option 2	Speed reduction during school times	✓	✓			
Option 3	Speed reduction at all times	✓		✓		
Option 4	Protected pedestrian path	✓		✓	✓	
Option 5	Protected shared path	✓		✓		✓

The range of potential road safety improvements which could be made to the Bell Street bridge intersection to improve safety for all users are spatially shown in Figure 3.2.

Figure 3.2: Proposed Road Safety Improvements to Bell Street Bridge

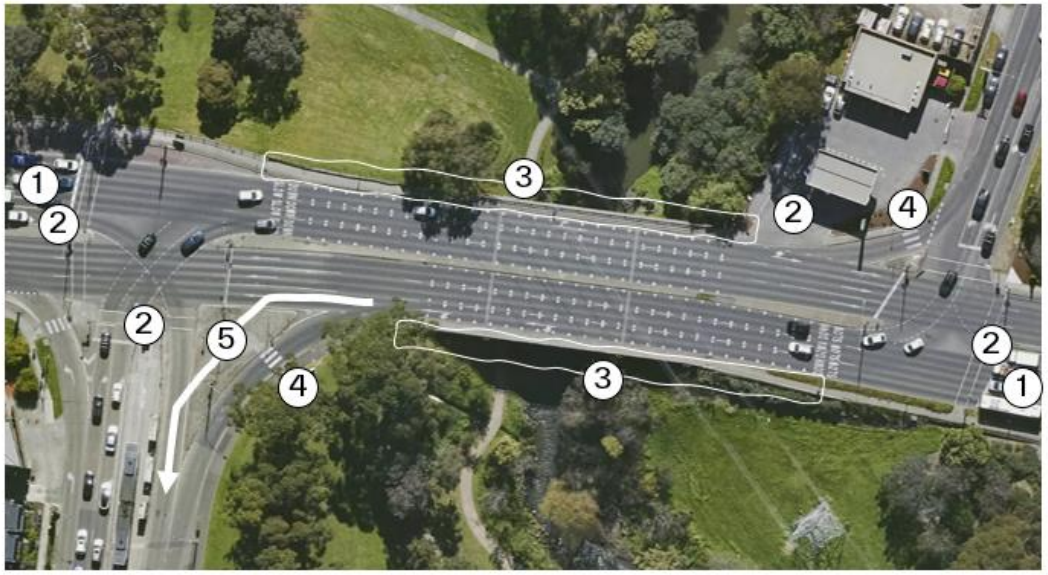
1: Raised Safety Platform

2: Improvements to Cyclist and Pedestrian Visibility

3: Protected and Widened Paths Over Bell Street Bridge

4: Raised Crossing on Slip Lane

5: Realignment of Slip Lane (to reduce speeds)



4. Assessment of Project Design Options

4.1. Assessment Summary

The Safe System Assessment Matrix scores for the existing conditions and the proposed design options are shown in Table 4.1.

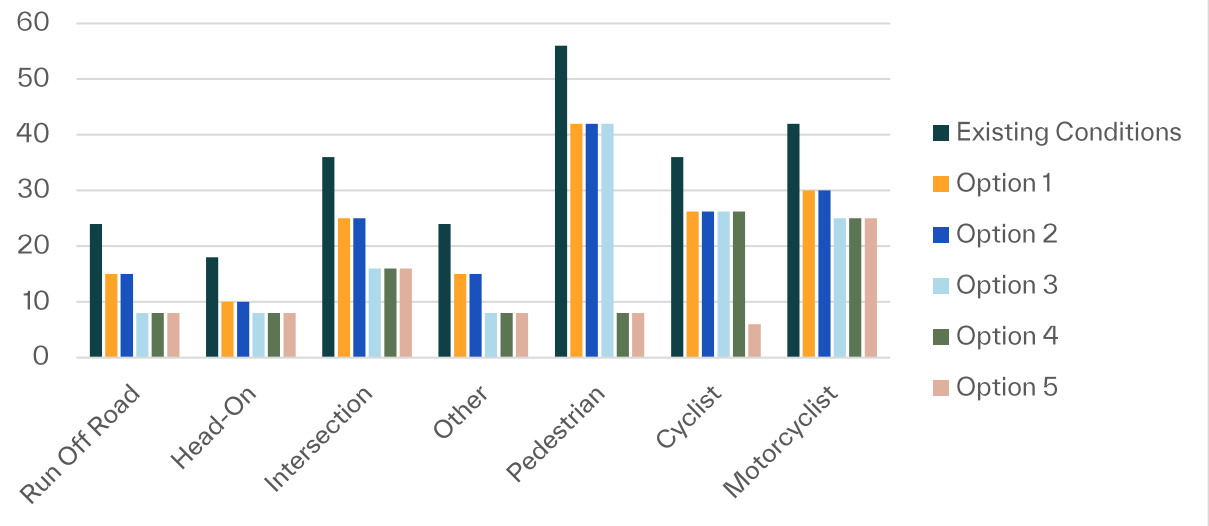
The scores for each **crash type** are shown in Figure 4.1.

The detailed assessments are presented in Appendix B of this report.

Table 4.1 SSA Matrix Scores for the Project

Option	Score
Existing conditions	236 / 448
Design Option 1	163 / 448
Design Option 2	163 / 448
Design Option 3	133 / 448
Design Option 4	99 / 448
Design Option 5	79 / 448

Figure 4.1 SSA Scores for Crash Types



4.2. Key Findings

The complete Safe System Assessment results are provided in **Appendix B, with key findings presented below:**

Existing Conditions

Under existing conditions and the 'do nothing' approach, alignment with Safe System principles is poor, in particular for pedestrians (56/64).

Key factors that resulted in this score included the high number of pedestrians using the bridge (**exposure**), the existing speeds of traffic (**severity**) and lack of separation or protection from errant vehicles in the instance of a vehicle losing control or being pushed off the road carriageway (**likelihood**).

It is further highlighted that the current pedestrian volumes could potentially be supressed due to the level of safety / comfort of using the bridge.

Option 1: Safety Improvements

By implementing a range of safety improvements to further reduce speeds to within safe system thresholds (**severity, likelihood),** the overall score reduces from 236 to 163 (or approx. 30%).

The change in scores is relatively consistent across all crash types.

In saying this, implementation of these safety improvements outlined in Option 1 will result in moderate improvements to safety but will not be highly consistent with Safe System principles.

Option 2 and 3: Speed Limit Reductions

Reductions to speed limits have been included given it is understood that this is being considered by DTP currently.

Under the Safe System Assessment framework, speed reductions for part of the day only are not considered to have any material change to the bridges alignment with Safe System principles **(Option 3).**

Speed reductions across all hours of the day (**Option 4**) will only be effective in improving alignment with Safe System principles at this location if accompanied by other traffic calming measures such as those outlined in **Option 1.**

Reduced speeds however will improve the road and bridge design with Safe System principles, including at intersection and for run-off road crash types **(likelihood, severity)**.

Option 4 and 5: Protected and Separated Paths

Implementation of protected and separated paths will result in significant improvements to pedestrian and cyclist safety across the bridge. Subject to an appropriate barrier design, this treatment would effectively eliminate the potential of a collision across the bridge (**likelihood, severity**).

Creating a shared path (**Option 5**) would result in an improved alignment with Safe System principles for cyclists as well, however design would need to consider how cyclists arrive on and depart the path back onto the road crossing given there is no other shared path infrastructure provided along Bell Street.

High speed cyclists could also pose a potential risk to pedestrians and path widths would need to consider off-sets to fencing and other barriers that pose risks to cyclists.

5. Treatments to Improve the Safe System Alignment

Table 5.1 and Table 5.2 list treatments that will improve the Safe System alignment of the project.

Primary treatments are those measures that have the potential to eliminate or come close to eliminating the risk of fatal and serious injury (FSI) crashes.

Supporting treatments are effective in reducing the risk of FSI crashes but not to the extent of a primary treatment (i.e. there is a residual moderate or significant FSI crash risk). Implementation of a primary treatment should be given priority over a supporting treatment that may be targeting a similar crash risk.

Note: as described in Section 3.5, the options presented in this report already consider a range of primary and supporting treatments to improve alignment with the Safe System. These improvements (outlined in Option 1), were applied consistently across all Options to better understand how reduction in speed limit, and improvements to pedestrian protection rate against each other and existing conditions.

As such, the following suggestions are applicable over-and-above Options 1-5.

Table 5.1: Primary Treatments

Treatments for consideration	Influence: E = Exposure L = Likelihood S = Severity	~~Project response~~
Reduced number of traffic lanes across bridge to reduce the overall throughput of vehicles on Bell Street. *(would need supporting alternative routes and unlikely given primary arterial road classification of Bell Street).*	E, L	*Not applicable, at preliminary stage only.*
Closing slip lanes on SW and NE corners.	E, L, S	
Fully separated shared path crossing bridge, and close path on existing Bell Street bridge *(already considered under Option 4,5).*	E, L	
Median barrier to prevent head-on collisions	L, S	

Table 5.2: Supporting Treatments

Treatments for consideration	Influence: E = Exposure L = Likelihood S = Severity	~~Project response~~
Refresh / update line marking (some faded, missing or non-standard line marking observed on site)	L	*Not applicable at this preliminary stage.*
Improvements to drainage (ponding visible during site visits along pedestrian crossings on road)	L	
Pedestrian fencing to prevent crossings at informal crossing locations (intersection)	L	
Interim speed limit reductions (while options 1-5 are investigated further)	L, S	
Electronic speed limit signs as part of long term solutions	L, S	
Red light / speed cameras	L, S	
On-road cycle lanes	L	
Improved street lighting (understood to have been knocked over by vehicle, so location should changed)	L	

6. Conclusions

The preceding Safe System Assessment has identified that under existing conditions, the Bell Street Bridge has poor alignment with the principles that underpin the Safe System.

The Bell Street bridge carries in the order of 47,000 vehicles per day, of which 5% are heavy vehicles. At the same time, there are in the order of 250 pedestrian across the peak periods. As such, under the Safe System approach, all crash types had a very high 'exposure'.

The bridge has a range of other complexities in its design, which overall contribute to a higher 'likelihood' of a crash occurring.

These include the gradient on approach to intersections, slight deviation on western approach, and signalised t-intersection on both approaches with dual right turn lanes.

From the existing conditions assessment, a range of 'options' were developed including improvements to safety and visibility of pedestrians / cyclists, speed environment changes, and protection and separation of pedestrians from vehicles.

Of all options assessed, Option 5 (fully protected and separated shared path across the bridge) had the best alignment with Safe System principles. However, the design of a shared path would potentially have a range of other impacts on pedestrian safety as well as project cost.

Option 4 (fully protected and separated pedestrian path across the bridge) also had a significant improvement on existing conditions and excellent alignment with Safe System principles.

Options 4 and 5 however do not address in full, the crash risk across within the broader area including at the signalised intersections. Further primary and supporting treatments have also been developed (shown in Section 5) to reduce exposure, severity and likelihood, which should be considered in further project development.

Appendix A : Site Photos

Southern footpath in south-east aspect facing west

Narrow footpath on southern side facing west

Damaged collision barrier on north-west aspect

School children crossing Elizabeth Street

Nicholson Street intersection facing east

Nicholson Street western slip lane (Bell Street left into Nicholson Street movement)

Bell Street southern side facing east

Bell Street northern side facing east

Appendix B Safe System Assessment Matrices

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Existing Conditions

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists	
Exposure Comments:	47,000 vpd	47,000 vpd	47,000 vpd	47,000 vpd	250 across a 6 hour period.	Unknown - For this purpose of this study, cyclist volimes are assumed to be beween 50 and 100 per day.	470	
Exposure Score: (#/4)	**4**	**4**	**4**	**4**	**4**	**3**	**4**	
Likelihood Comments:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	
	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	
	Multiple lanes of traffic (<3.5m width) with lane changing across bridge	No barrier within median	Signalised Intersections with 3 Left Turn Slip Lanes	Short distance between intersections and turning movements resulting in higher lane changing.	Clearance to traffic lanes less than 1.5 metres, approximately 1.1m at entry point to Bell St Bridge (SW corner).	No Cycling Facilities - Shared Vehicle Lane	Downhill approach from both east and west, loss of control	
	No shoulder provided		Proximitey of traffic signals may result in a see-through affect.	Proximitey of traffic signals may result in a see-through affect.	Minor change in direction / deflection on western approach to bridge, and downhill approaches increase risk of vehicle run off road into pedestrian area.	Downhill approach from both east and west, loss of control	No Street Lighting along Bridge	
	No street lighting along Bridge (existing lighting has been knocked over / removed)		Short distance between intersections and turning movements resulting in higher lane changing.	Proximitey of traffic signals encourages	No protection / barrier between pedestrians and vehicles.	No Street Lighting along Bridge		
	Minor change in direction / deflection on western approach to bridge.		Faded line marking	Lane Widths < 3.5m	High speed slip lane with Zebra crossing set back from Bell Street at SW corner of bridge.	No treatments to increase visibility of cyclists at intersections		
				Downhill approach from both east and west, increasing difficulty for emergency braking in poor conditions				
	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	`	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	
	Median provided	Median provided	Street Lighting at turning areas	Street Lighting at turning areas	Pedestrian priority crossings (zebra / POS)	Street Lighting at turning areas	Street Lighting at turning areas	
	Line Marking	Line Marking	All movements (except left turns) fully controlled	Hounds Teeth	Street Lighting at turning / crossing areas			
	Dragon Teeth	Dragon Teeth			Dragon Teeth			
Likelihood Score: (#/4)	**3**	**1.5**	**3**	**3**	**3.5**	**3**	**3**	
Severity Comments:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	
	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	Speed - 60km/h	
	Large fixed unsheilded hazards throughout the study area.	5% Heavy Vehicles	Impact angles are high - particularly for intersection slip lanes and right turning vehciles vs through movements	5% Heavy Vehicles	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds	Shared traffic lanes mean if a rider falls, they will slide into vehicles infront or behind, or nearby traffic lanes.	
	Fixed barrier >0.2 metres from edge of traffic lane with semi-mountable kerb.	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds		5% Heavy Vehicles	5% Heavy Vehicles	5% Heavy Vehicles	
	Downhill approach from both east and west, possible higher speeds							
	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	
	Median provided	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	
	Crash Barriers provided on north and south of bridge	Likely crash angle impact						
Severity Score: (#/4)	**2**	**3**	**3**	**2**	**4**	**4**	**3.5**	
Product (#/64)	**24**	**18**	**36**	**24**	**56**	**36**	**42**	
						TOTAL	**236**	**/448**

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 1

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	47,000 vpd	47,000 vpd	47,000 vpd	47,000 vpd	250 across a 6 hour period.	Unknown - For this purpose of this study, cyclist volimes are assumed to be beween 50 and 100 per day.	470
Exposure Score: (#/4)	**4**	**4**	**4**	**4**	**4**	**3**	**4**
Likelihood Comments:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Multiple lanes of traffic (<3.5m width) with lane changing across bridge	No barrier within median	Signalised Intersections with ~~3 Left Turn Slip Lanes~~	Short distance between intersections and turning movements resulting in higher lane changing.	Clearance to traffic lanes less than 1.5 metres, approximately 1.1m at entry point to Bell St Bridge (SW corner).	~~No Cycling Facilities~~ - Shared Vehicle Lane	Downhill approach from both east and west, loss of control
	No shoulder provided		Proximitey of traffic signals may result in a see-through affect.	Proximitey of traffic signals may result in a see-through affect.	Minor change in direction / deflection on western approach to bridge, and downhill approaches increase risk of vehicle run off road into pedestrian area.	Downhill approach from both east and west, loss of control	No Street Lighting along Bridge
	No street lighting along Bridge (existing lighting has been knocked over / removed)		Short distance between intersections and turning movements resulting in higher lane changing.	Proximitey of traffic signals encourages	No protection / barrier between pedestrians and vehicles.	No Street Lighting along Bridge	
	Minor change in direction / deflection on both approaches to bridge.		Faded line marking	Lane Widths < 3.5m	~~High speed slip lane with Zebra crossing set back from Bell Street at SW corner of bridge.~~	~~No treatments to increase visibility of cyclists at intersections~~	
				Downhill approach from both east and west, increasing difficulty for emergency braking in poor conditions			
	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	`	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:
	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge
	Median provided	Median provided	Street Lighting at turning areas	Street Lighting at turning areas	Pedestrian priority crossings (zebra / POS)	Street Lighting at turning areas	Street Lighting at turning areas
	Line Marking	Line Marking	All movements (except left turns) fully controlled	Hounds Teeth	Street Lighting at turning / crossing areas	Cyclist storage boxes and painted treatment will improve cyclist visability throuhg the area	
	Dragon Teeth	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection
					Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection		
Likelihood Score: (#/4)	**2.5**	**1.0**	**2.5**	**2.5**	**3.0**	**2.5**	**2.5**
Severity Comments:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Large fixed unsheilded hazards throughout the study area.	5% Heavy Vehicles	Impact angles are high - particularly for intersection slip lanes and right turning vehciles vs through movements	5% Heavy Vehicles	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds	Shared traffic lanes mean if a rider falls, they will slide into vehicles infront or behind, or nearby traffic lanes.
	Fixed barrier >0.2 metres from edge of traffic lane with semi-mountable kerb.	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds		5% Heavy Vehicles	5% Heavy Vehicles	5% Heavy Vehicles
	Downhill approach from both east and west, possible higher speeds						
	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:
	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge
	Median provided	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 1

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists	
	Crash Barriers provided on north and south of bridge	Likely crash angle impact	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	
Severity Score: (#/4)	**1.5**	**2.5**	**2.5**	**1.5**	**3.5**	**3.5**	**3.0**	
Product (#/64)	**15**	**10**	**25**	**15**	**42**	**26.25**	**30**	
						TOTAL	**163.25**	**/448**

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 2

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	47,000 vpd	47,000 vpd	47,000 vpd	47,000 vpd	250 across a 6 hour period.	Unknown - For this purpose of this study, cyclist volimes are assumed to be beween 50 and 100 per day.	470
Exposure Score: (#/4)	**4**	**4**	**4**	**4**	**4**	**3**	**4**
Likelihood Comments:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Multiple lanes of traffic (<3.5m width) with lane changing across bridge	No barrier within median	Signalised Intersections with ~~3 Left Turn Slip Lanes~~	Short distance between intersections and turning movements resulting in higher lane changing.	Clearance to traffic lanes less than 1.5 metres, approximately 1.1m at entry point to Bell St Bridge (SW corner).	~~No Cycling Facilities~~ - Shared Vehicle Lane	Downhill approach from both east and west, loss of control
	No shoulder provided		Proximitey of traffic signals may result in a see-through affect.	Proximitey of traffic signals may result in a see-through affect.	Minor change in direction / deflection on western approach to bridge, and downhill approaches increase risk of vehicle run off road into pedestrian area.	Downhill approach from both east and west, loss of control	No Street Lighting along Bridge
	No street lighting along Bridge (existing lighting has been knocked over / removed)		Short distance between intersections and turning movements resulting in higher lane changing.	Proximitey of traffic signals encourages	No protection / barrier between pedestrians and vehicles.	No Street Lighting along Bridge	
	Minor change in direction / deflection on both approaches to bridge.		Faded line marking	Lane Widths < 3.5m	~~High speed slip lane with Zebra crossing set back from Bell Street at SW corner of bridge.~~	~~No treatments to increase visibility of cyclists at intersections~~	
				Downhill approach from both east and west, increasing difficulty for emergency braking in poor conditions			
	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	`	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:
	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge
	Median provided	Median provided	Street Lighting at turning areas	Street Lighting at turning areas	Pedestrian priority crossings (zebra / POS)	Street Lighting at turning areas	Street Lighting at turning areas
	Line Marking	Line Marking	All movements (except left turns) fully controlled	Hounds Teeth	Street Lighting at turning / crossing areas	Cyclist storage boxes and painted treatment will improve cyclist visability throuhg the area	
	Dragon Teeth	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection
					Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection		
Likelihood Score: (#/4)	**2.5**	**1.0**	**2.5**	**2.5**	**3.0**	**2.5**	**2.5**
Severity Comments:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Large fixed unsheilded hazards throughout the study area.	5% Heavy Vehicles	Impact angles are high - particularly for intersection slip lanes and right turning vehciles vs through movements	5% Heavy Vehicles	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds	Shared traffic lanes mean if a rider falls, they will slide into vehicles infront or behind, or nearby traffic lanes.
	Fixed barrier >0.2 metres from edge of traffic lane with semi-mountable kerb.	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds		5% Heavy Vehicles	5% Heavy Vehicles	5% Heavy Vehicles
	Downhill approach from both east and west, possible higher speeds						
	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:
	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge
	Median provided	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 2

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists	
	Crash Barriers provided on north and south of bridge	Likely crash angle impact	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	
Severity Score: (#/4)	**1.5**	**2.5**	**2.5**	**1.5**	**3.5**	**3.5**	**3.0**	
Product (#/64)	**15**	**10**	**25**	**15**	**42**	**26.25**	**30**	
						TOTAL	**163.25**	**/448**

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 3

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	47,000 vpd	47,000 vpd	47,000 vpd	47,000 vpd	250 across a 6 hour period.	Unknown - For this purpose of this study, cyclist volimes are assumed to be beween 50 and 100 per day.	470
Exposure Score: (#/4)	4	4	4	4	4	3	4
	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Multiple lanes of traffic (<3.5m width) with lane changing across bridge	No barrier within median	Signalised Intersections with ~~3 Left Turn Slip Lanes~~	Short distance between intersections and turning movements resulting in higher lane changing.	Clearance to traffic lanes less than 1.5 metres, approximately 1.1m at entry point to Bell St Bridge (SW corner).	~~No Cycling Facilities~~ - Shared Vehicle Lane	Downhill approach from both east and west, loss of control
	No shoulder provided		Proximitey of traffic signals may result in a see-through affect.	Proximitey of traffic signals may result in a see-through affect.	Minor change in direction / deflection on western approach to bridge, and downhill approaches increase risk of vehicle run off road into pedestrian area.	Downhill approach from both east and west, loss of control	No Street Lighting along Bridge
Likelihood Comments:	No street lighting along Bridge (existing lighting has been knocked over / removed)		Short distance between intersections and turning movements resulting in higher lane changing.	Proximitey of traffic signals encourages	No protection / barrier between pedestrians and vehicles.	No Street Lighting along Bridge	
	Minor change in direction / deflection on both approaches to bridge.		Faded line marking	Lane Widths < 3.5m	~~High speed slip lane with Zebra crossing set back from Bell Street at SW corner of bridge.~~	~~No treatments to increase visibility of cyclists at intersections~~	
				Downhill approach from both east and west, increasing difficulty for emergency braking in poor conditions			
	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	`	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:
	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)
	Median provided	Median provided	Street Lighting at turning areas	Street Lighting at turning areas	Pedestrian priority crossings (zebra / POS)	Street Lighting at turning areas	Street Lighting at turning areas
	Line Marking	Line Marking	All movements (except left turns) fully controlled	Hounds Teeth	Street Lighting at turning / crossing areas	Cyclist storage boxes and painted treatment will improve cyclist visability throuhg the area	
	Dragon Teeth	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection
					Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection		
Likelihood Score: (#/4)	2.0	1.0	2.0	2.0	3.0	2.5	2.5
	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Large fixed unsheilded hazards throughout the study area.	5% Heavy Vehicles	Impact angles are high - particularly for intersection slip lanes and right turning vehciles vs through movements	5% Heavy Vehicles	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds	Shared traffic lanes mean if a rider falls, they will slide into vehicles infront or behind, or nearby traffic lanes.
	Fixed barrier >0.2 metres from edge of traffic lane with semi-mountable kerb.	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds		5% Heavy Vehicles	5% Heavy Vehicles	5% Heavy Vehicles
Severity Comments:	Downhill approach from both east and west, possible higher speeds						
	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:
	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 3

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists	
	Median provided	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	
	Crash Barriers provided on north and south of bridge	Likely crash angle impact	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	
Severity Score: (#/4)	**1.0**	**2.0**	**2.0**	**1.0**	**3.5**	**3.5**	**2.5**	
Product (#/64)	**8**	**8**	**16**	**8**	**42**	**26.25**	**25**	
						TOTAL	**133.25**	**/448**

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 4

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	47,000 vpd	47,000 vpd	47,000 vpd	47,000 vpd	250 across a 6 hour period.	Unknown - For this purpose of this study, cyclist volimes are assumed to be beween 50 and 100 per day.	470
Exposure Score: (#/4)	4	4	4	4	4	3	4
Likelihood Comments:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Multiple lanes of traffic (<3.5m width) with lane changing across bridge	No barrier within median	Signalised Intersections with ~~3 Left Turn Slip Lanes~~	Short distance between intersections and turning movements resulting in higher lane changing.	~~Clearance to traffic lanes less than 1.5 metres, approximately 1.1m at entry point to Bell St Bridge (SW corner).~~	~~No Cycling Facilities~~ - Shared Vehicle Lane	Downhill approach from both east and west, loss of control
	No shoulder provided		Proximitey of traffic signals may result in a see-through affect.	Proximitey of traffic signals may result in a see-through affect.	~~Minor change in direction / deflection on western approach to bridge, and downhill approaches increase risk of vehicle run off road into pedestrian area.~~	Downhill approach from both east and west, loss of control	No Street Lighting along Bridge
	No street lighting along Bridge (existing lighting has been knocked over / removed)		Short distance between intersections and turning movements resulting in higher lane changing.	Proximity of traffic signals encourages	No protection / barrier between pedestrians and vehicles at intersections	No Street Lighting along Bridge	
	Minor change in direction / deflection on both approaches to bridge.		Faded line marking	Lane Widths < 3.5m	~~High speed slip lane with Zebra crossing set back from Bell Street at SW corner of bridge.~~	~~No treatments to increase visibility of cyclists at intersections~~	
				Downhill approach from both east and west, increasing difficulty for emergency braking in poor conditions			
	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	`	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:
	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge
	Median provided	Median provided	Street Lighting at turning areas	Street Lighting at turning areas	Pedestrian priority crossings (zebra / POS)	Street Lighting at turning areas	Street Lighting at turning areas
	Line Marking	Line Marking	All movements (except left turns) fully controlled	Hounds Teeth	Street Lighting at turning / crossing areas	Cyclist storage boxes and painted treatment will improve cyclist visability throuhg the area	
	Dragon Teeth	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection
					Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection		
					Separate protected pedestrian path will remove the conflcit between pedestrians and vehicles along the bridge		
Likelihood Score: (#/4)	2.0	1.0	2.0	2.0	1.0	2.5	2.5
Severity Comments:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Large fixed unsheilded hazards throughout the study area.	5% Heavy Vehicles	Impact angles are high - particularly for intersection slip lanes and right turning vehciles vs through movements	5% Heavy Vehicles	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds	Shared traffic lanes mean if a rider falls, they will slide into vehicles infront or behind, or nearby traffic lanes.
	Fixed barrier >0.2 metres from edge of traffic lane with semi-mountable kerb.	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds		5% Heavy Vehicles	5% Heavy Vehicles	5% Heavy Vehicles
	Downhill approach from both east and west, possible higher speeds						
	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:
	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 4

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists	
	Median provided	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	
	Crash Barriers provided on north and south of bridge	Likely crash angle impact	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	
					Separate protected pedestrian path will remove the conflcit between pedestrians and vehicles along the bridge			
Severity Score: (#/4)	**1.0**	**2.0**	**2.0**	**1.0**	**2.0**	**3.5**	**2.5**	
Product (#/64)	**8**	**8**	**16**	**8**	**8**	**26.25**	**25**	
						TOTAL	**99.25**	**/448**

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 5

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	47,000 vpd	47,000 vpd	47,000 vpd	47,000 vpd	250 across a 6 hour period.	Unknown - For this purpose of this study, cyclist volimes are assumed to be beween 50 and 100 per day.	470
Exposure Score: (#/4)	4	4	4	4	4	3	4
Likelihood Comments:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:	Factors that **increase** the likelihood include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Multiple lanes of traffic (<3.5m width) with lane changing across bridge	No barrier within median	Signalised Intersections with ~~3 Left Turn Slip Lanes~~	Short distance between intersections and turning movements resulting in higher lane changing.	~~Clearance to traffic lanes less than 1.5 metres, approximately 1.1m at entry point to Bell St Bridge (SW corner).~~	~~No Cycling Facilities - Shared Vehicle Lane~~	Downhill approach from both east and west, loss of control
	No shoulder provided		Proximitey of traffic signals may result in a see-through affect.	Proximitey of traffic signals may result in a see-through affect.	~~Minor change in direction / deflection on western approach to bridge, and downhill approaches increase risk of vehicle run off road into pedestrian area.~~	Downhill approach from both east and west, loss of control	No Street Lighting along Bridge
	No street lighting along Bridge (existing lighting has been knocked over / removed)		Short distance between intersections and turning movements resulting in higher lane changing.	Proximitey of traffic signals encourages	No protection / barrier between pedestrians and vehicles at intersections	No Street Lighting along Bridge	
	Minor change in direction / deflection on both approaches to bridge.		Faded line marking	Lane Widths < 3.5m	~~High speed slip lane with Zebra crossing set back from Bell Street at SW corner of bridge.~~	~~No treatments to increase visibility of cyclists at intersections~~	
				Downhill approach from both east and west, increasing difficulty for emergency braking in poor conditions			
	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	`	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:	Factors that **decrease** the likelihood include:
	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)	Reducing the Speed to 40km/h at all and times and the introduction of raised safety platform on approach to the Bridge will reduce speeds to near safe Systems speeds (30km/h)
	Median provided	Median provided	Street Lighting at turning areas	Street Lighting at turning areas	Pedestrian priority crossings (zebra / POS)	Street Lighting at turning areas	Street Lighting at turning areas
	Line Marking	Line Marking	All movements (except left turns) fully controlled	Hounds Teeth	Street Lighting at turning / crossing areas	Cyclist storage boxes and painted treatment will improve cyclist visability throuhg the area	
	Dragon Teeth	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Dragon Teeth	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection
					Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Separate protected shared path will remove the conflcit between pedestrians and vehicles along the bridge	
					Separate protected pedestrian path will remove the conflcit between pedestrians and vehicles along the bridge		
Likelihood Score: (#/4)	2.0	1.0	2.0	2.0	1.0	1.0	2.5
	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:	Factors that **increase** the severity include:
	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~	~~Speed - 60km/h~~
	Large fixed unsheilded hazards throughout the study area.	5% Heavy Vehicles	Impact angles are high - particularly for intersection slip lanes and right turning vehciles vs through movements	5% Heavy Vehicles	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds	Shared traffic lanes mean if a rider falls, they will slide into vehicles infront or behind, or nearby traffic lanes.
	Fixed barrier >0.2 metres from edge of traffic lane with semi-mountable kerb.	Downhill approach from both east and west, possible higher speeds	Downhill approach from both east and west, possible higher speeds		5% Heavy Vehicles	5% Heavy Vehicles	5% Heavy Vehicles
	Downhill approach from both east and west, possible higher speeds						
	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:	Factors that **decrease** the severity include:

Project: Bell Street Bridge (Merri Creek), Coburg
Sheet: Option 5

No Data, assume 1% of AADT
1% Vehicle

Crash Type	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists	
Severity Comments:	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	Speed likely to be reduced due to raised safety platform on approach to the Bridge	
	Median provided	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	Impact speed likely to be low during periods due to siganlised intersections on either end of the study area.	
	Crash Barriers provided on north and south of bridge	Likely crash angle impact	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	Tighten up slip lanes and providing raised pedestrian crossing are likely to improve sightlines and reduce speed through intersection	
					Separate protected pedestrian path will remove the conflcit between pedestrians and vehicles along the bridge			
Severity Score: (#/4)	**1.0**	**2.0**	**2.0**	**1.0**	**2.0**	**2.0**	**2.5**	
Product (#/64)	**8**	**8**	**16**	**8**	**8**	**6**	**25**	
						TOTAL	**79**	**/448**