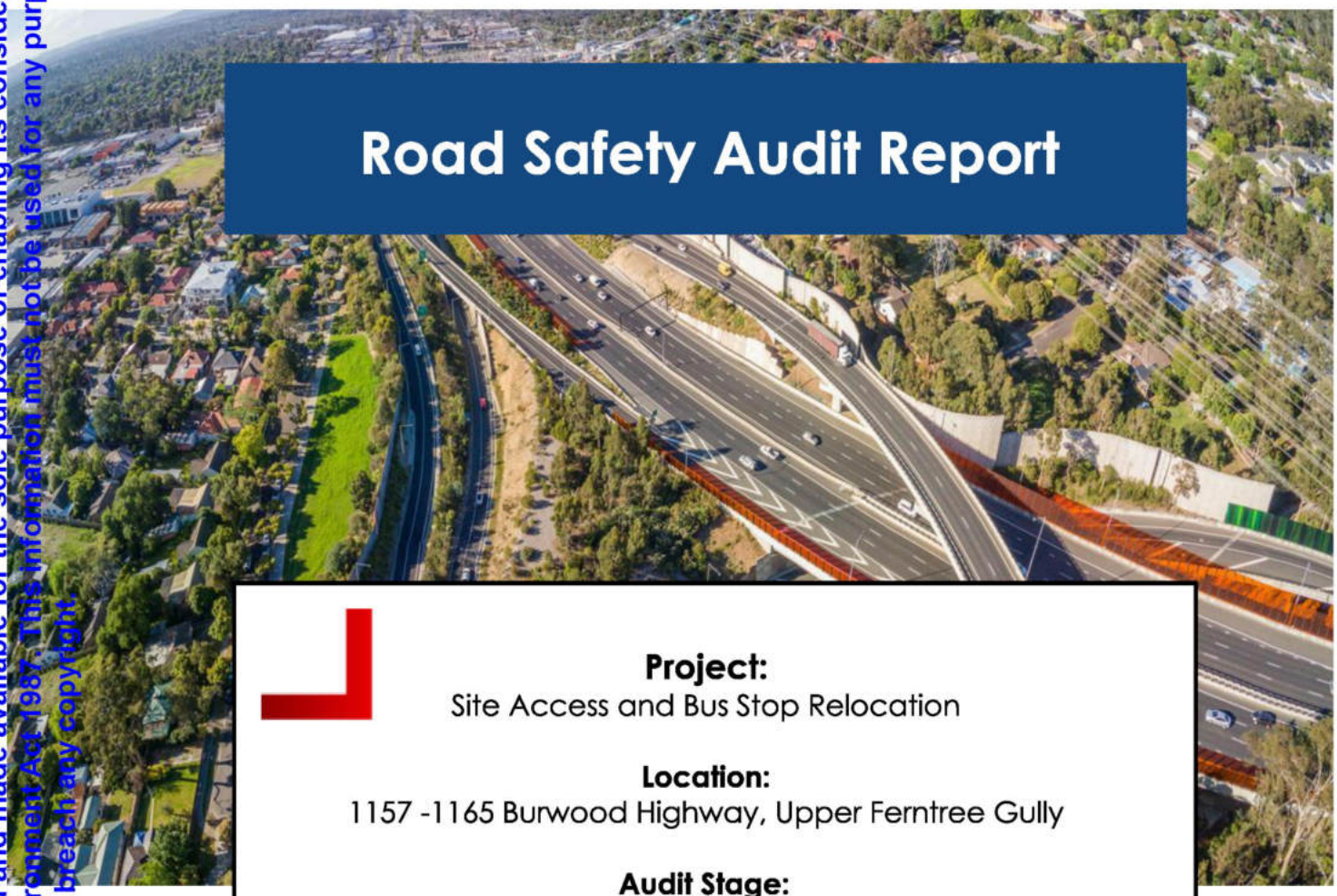
Road Safety Audit Report



Project:
Site Access and Bus Stop Relocation

Location:
1157 -1165 Burwood Highway, Upper Ferntree Gully

Audit Stage:
Functional Design Stage

Client:
[redacted]

Report Issue Date: 15 July 2024

RSA Reference: 16236

road safety audits

Road Safety Audit Report

Site Access and Bus Stop Relocation
1157 -1165 Burwood Highway, Upper Ferntree Gully
Functional Design Stage
Stantec

RSA Reference: 16236

Google Maps

Document Record

Revision	Delivered	Road Safety Auditors	Contact
A	15 July 2024	[redacted]	[redacted]

CONTENTS

PROJECT BACKGROUND

INTRODUCTION

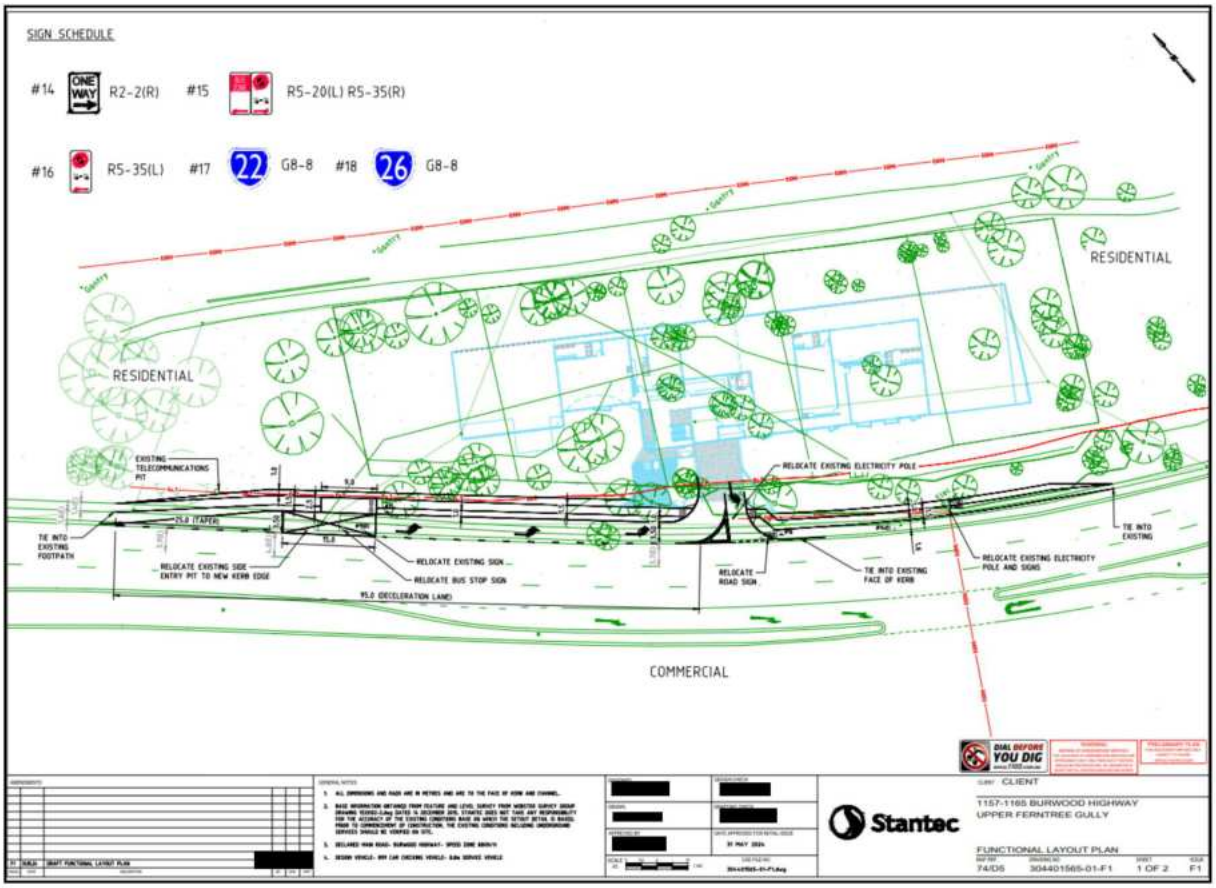
This is a functional design stage road safety audit of a proposed site access point including a left turn lane and bus stop relocation, at 1157 -1165 Burwood Highway, Upper Ferntree Gully.

The audit has been undertaken by RSA, commissioned by [redacted]

It has been conducted according to 'Austroads Guide to Road Safety, Part 6 Road Safety Audit 2022' guidelines.

PROJECT

The project involves creating a new access for a child care centre development on the northern side of Burwood Highway in Upper Ferntree Gully. The access will accommodate left-in / left-out movements only. The design features localised widening for a deceleration lane, pram ramps and connection to the existing footpath. The existing bus stop at the commencement of deceleration lane will be relocated to suit the widening.



300401565-01-F1

LOCATION AND ROAD CONDITIONS

The subject site is on the north side of the eastbound carriageway of Burwood Highway in Upper Ferntree Gully. At the subject site, Burwood Highway is a multi-lane divided arterial road. The posted speed limit is 80 km/h. A footpath connects the existing bus stop near the subject site to the west.

Burwood Highway eastbound - looking east (red arrow indicates approx. location of start of deceleration lane)

Burwood Highway eastbound - existing bus stop and footpath

Burwood Highway eastbound - existing verge

Burwood Highway eastbound - looking east at night

PROJECT-SPECIFIC AUDIT FOCUS

The audit has contemplated issues associated with the project, including:

- The relocated bus stop location and its interaction with the deceleration lane;
- Attributes of the channelised left-turn treatment;
- Pedestrian crossing facilities and connecting paths;
- Turn movements and potential conflict points;
- Sight distance;
- Lighting;
- Roadside hazards;
- Signs and line marking.

Commencement Meeting

Nil.

Constraints and Exclusions

- This audit may cover DDA and accessibility issues but is not a formal DDA audit.
- This audit may cover lighting issues but is not a formal lighting assessment to AS1158.

Conduct of the Site Inspection

A site visit was conducted during the day and night of 12/07/2024.

Documentation Provided for the Audit

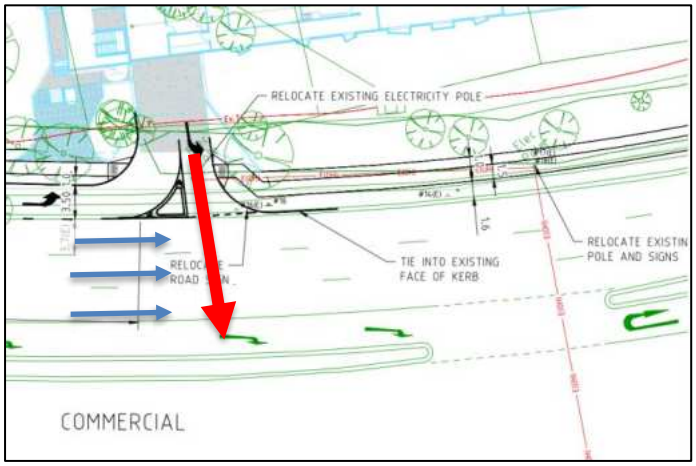
The following documents were provided by the client to facilitate the audit:

- Functional layout plan with swept path assessment (Stantec drawing no. 304401565-01-F1, dated 31/05/2024)

AUDIT FINDINGS AND RECOMMENDATIONS

1. Egress

There will be a left-in / left-out access along Burwood Highway eastbound. However, there is an existing channelised right turn (CHR) fronting the new access. Left turners from the subject site heading westbound may travel across multiple lanes over the eastbound carriageway of Burwood Highway and enter the CHR, increasing the risk of conflict with approaching traffic, including side-impact crashes.



Sheet 1 of layout plan

Burwood Highway eastbound – channelised right turn (red circle indicates approx. location of new access)

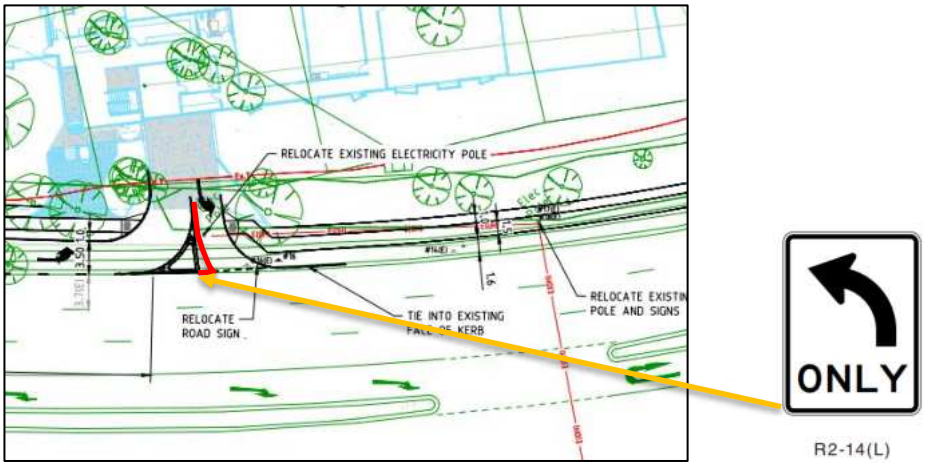
Risk Rating (Austroads GRS6)

Risk Rating: Rare (>7Y) + Serious = Medium (FSI)

Recommendation

The following options could assist with discouraging drivers from traversing multiple lanes on the eastbound carriageway of Burwood Highway:

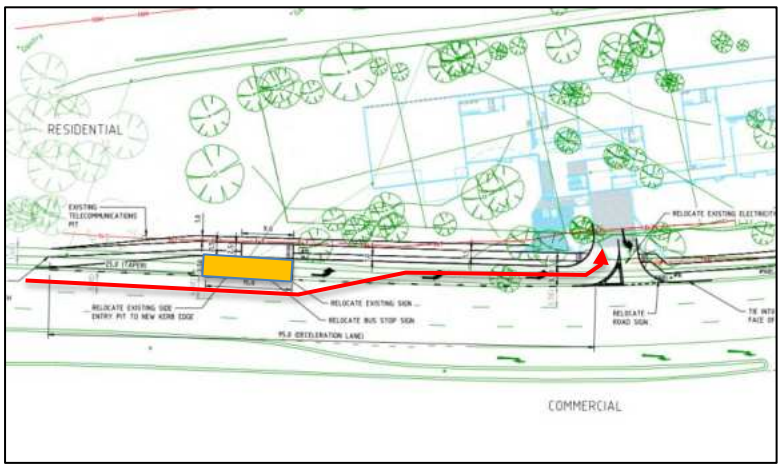
- Provide line marking at the exit at an angle to the eastbound carriageway.
- Display 'left turn only' sign R2-14 (L).



Sheet 1 of layout plan

2. Left-turn treatment

The relocated bus stop is at the commencement of the deceleration lane. If buses are stopped at the bus stop, left turners will need to enter the left turn lane after the bus stop. This effectively reduces the deceleration length (i.e. 95-25-15 = 55 m), which increases the potential for rear-end crashes as motorists will need to commence their deceleration in the through traffic lane.



Sheet 1 of layout plan

Risk Rating (Austroads GRS6)
Risk Rating: Rare (>7Y) + Moderate = Low

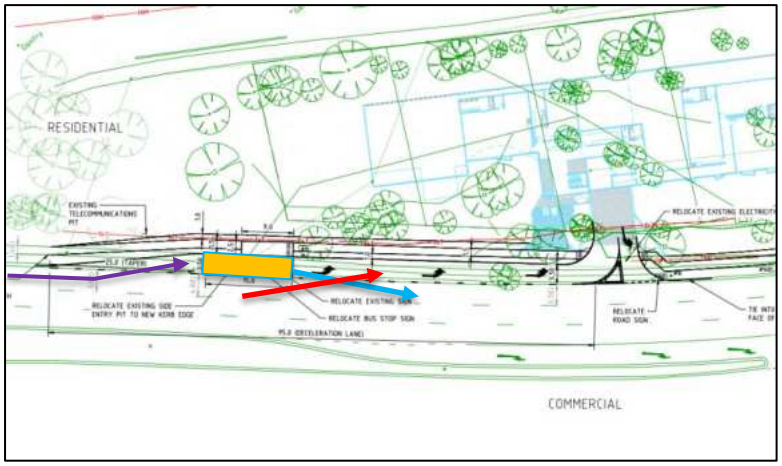
Recommendation

For project consideration.

3. Conflict

The bus stop is at the commencement of the deceleration lane. Bus drivers will have to decelerate on the approach side of the stop. However, drivers (left turners into the subject site) wishing to enter the deceleration lane may not expect a bus stopping at the commencement of the deceleration lane, increasing the potential of rear-end crashes.

Additionally, departing bus drivers must shift to the adjacent eastbound traffic lane from the bus stop, increasing the potential for side-swipe crashes between existing buses and left turning vehicles into the deceleration lane.



Sheet 1 of layout plan

Guide on risk: Relevant DTP guidelines (Supplement to AS 1742.12 section 4 'Bus stop bays') do not show specific layouts and are silent about having a bus stop at the commencement of a left turn lane. Furthermore, AGRD Part 3 Section 4.13 'Bus Stops' requires a general assessment of the layout on its merits. As such, the following risk rating is provided as a guide.

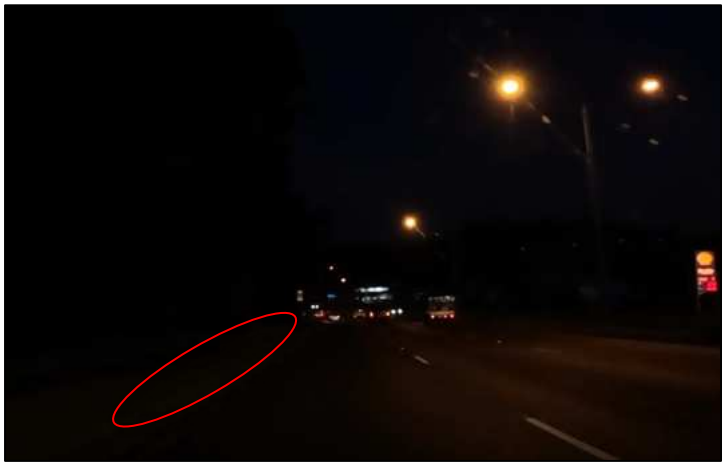
Risk Rating (Austroads GRS6)
Risk Rating = Unlikely (3-7Y) + Moderate = Medium

Recommendation

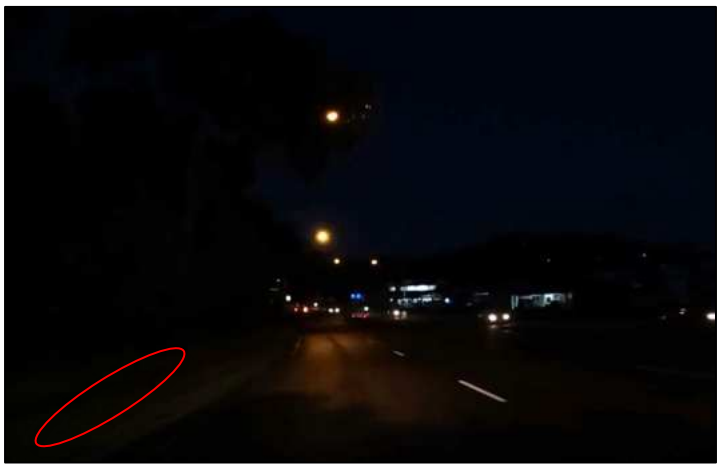
For note only.

4. Lighting

There is existing lighting along the median of Burwood Highway and on the verge on the departure side of the subject site. However, it appears the existing verge area adjacent the proposed deceleration lane and footpath connection are poorly illuminated. This may reduce road readability along this section.



Burwood Highway eastbound – approach side of subject site



Burwood Highway eastbound – departure side of subject site

Risk Rating (Austroads GRS6)
Risk Rating: Rare (>7Y) + Moderate = Low

Recommendation

Review lighting.

FINALISATION

CONCLUDING STATEMENT

- The audit has attempted to balance the safety needs of all road users within the site/design constraints. As per Austroads guidelines, the recommendations provided have attempted to be realistic, feasible, and commensurate with the risk posed.
- The audit attempts to raise all potential safety risks, however at times this is not possible due to a limited knowledge of the site and the design.
- Agreement to the issues and/or suggestions does not necessarily eliminate risk.
- The project team should incorporate audit findings into the broader design process and ask the audit team further questions where necessary.

Senior Road Safety Auditor/ Level III (NSW)
CPEng, NER, MIEAust, BE (Hons), BSc

BE (Civil), MMgt

RESPONDING TO THE ROAD SAFETY AUDIT

The audit findings should be considered with the knowledge and insight of the responding entity (client) and other stakeholders. The responding entity does not have to agree to the audit findings; however, a written response should be prepared to the audit findings. When responding to the audit, the responding entity is encouraged to focus on the 'audit finding', not the 'recommendations' as the auditors have limited knowledge of the project background and constraints.

RSA does not change the substance of the audit findings or sign-off the responses from the responding entity. However, the client is encouraged to provide the responses to RSA to check that each audit point has been understood.

ROAD SAFETY AUDIT BACKGROUND

ROAD SAFETY AUDIT: OVERVIEW

A road safety audit is an independent examination of a design or condition to evaluate potential safety issues for all road user types. It is conducted by a team of suitably qualified people, typically comprising at least one engineer, and can provide recommendations. It combines the experience of the individual team members with contemporary evidence-based knowledge on road crash types and countermeasures. It uses the principles of Austroads Guide to Road Safety Part 6: Road Safety Audit 2022 and DOT (VicRoads) / Austroads guidelines and standards as references where relevant. A road safety audit is not a checklist or a check of compliance to standards.

ROAD SAFETY AUDIT TEAM AND QUALITY ASSURANCE

The road safety audit was conducted by David Graham and Kimmy Wong. David Graham conducts road safety audits in various states of Australia and have extensive experience in all stages of road safety audits, leading or participating in several hundred audits and risk assessments every year.

RSA is accredited for the conduct of road safety audits under VicRoads' professional services register. David Graham is an accredited Senior Road Safety Auditor under VicRoads pre-qualified senior road safety audit scheme.

Road Safety Audits' quality assurance process encompasses three key areas:

- Staff: Utilising highly experienced road safety practitioners
- Staff: Customising the audit team for the project to inject the necessary skill-set.
- Processes: Utilise customised checklists designed for niche areas in traffic engineering and road design such as safety barriers, public transport hubs, CBD / inner-urban, and cyclists.
- Training: Regular in-house and external training.
- Review: Up to four-layer review: 1. On-site auditor evaluation; 2. Media and data review; 3. Specialist auditor input; and 4. Blinded reviews.

AUDIT TYPE

A functional design stage road safety audit examines the design for fundamental issues. This includes intersection layouts and types, horizontal and vertical alignments, access points, and all road user groups.

SCOPE: GENERAL

RSA focuses on high-level fundamental safety issues affecting road safety, based on likely road user behaviour and expectations.

Checking compliance to road design guidelines is incorporated within the audit but forms a secondary consideration. "A Road Safety Audit is not a check of compliance to standards. Rather than checking for compliance, a road safety audit is checking fitness for purpose: will the road or treatment work safely for its expected road users?" (AGRS RSA 2022).

The scope is generally limited to the *safety* effects of the proposed changes, and does not look beyond the limits of works to try to improve substandard conditions outside of the general scope of the works.

Where suggestions are provided, they are made from a safety perspective only, and are made in the absence of full project knowledge and design constraints. Road Safety Audits can provide a detailed risk assessment / issue evaluation report upon request.

Generally, a road safety audit only raises *issues* and does not discuss design elements if they are *not* safety issues. i.e. if a topic (such as 'drainage') is not mentioned, then it means that there are no issues of concern on that topic.

SCOPE: SAFE SYSTEM

Austroads guidelines adopt safe system principles within design and road safety audits. Safe system (roads) calls for a design to not allow serious injury and fatalities to occur for the expected road users and the typical crash types expected for that design type. This design-objective is considered within this road safety audit and is detailed in the Risk Ratings section. However, a road safety audit by definition is not a 'Safe System Assessment'.

REFERENCES

Relevant guidelines, standards, codes, road rules, and policy documents, including:

- Austroads Guide to Road Safety Part 6 – Road Safety Audit – 2022
- State-specific road safety audit guides where applicable (e.g. NSW *Guidelines for Road Safety Audit Practices*)
- Austroads Guide to Road Design Series (AGRD)
- Austroads Guide to Traffic Management Series (AGTM)
- Austroads Guide to Road Safety Series (AGRS)
- Miscellaneous Austroads Publications relating to road trauma, crash causality and statistics, traffic engineering treatments and Safe System
- AS 1742 Manual of Uniform Traffic Control Devices
- State road authority supplements to above documents
- State road authority technical publications including standard drawings, road design notes and other publications
- Other industry knowledge as disseminated through industry conferences, seminars, workshops via organisations including Austroads, ITE, ACRS, AITPM, TMAA and IRF

RISK RATINGS

Austroads Road Safety Audit Part 6 suggests that the organisation responding to the audit uses the following risk assessment method as a tool to give an indication of risk. Road Safety Audits will typically offer its own evaluation of risk for the responder to use as a guide.

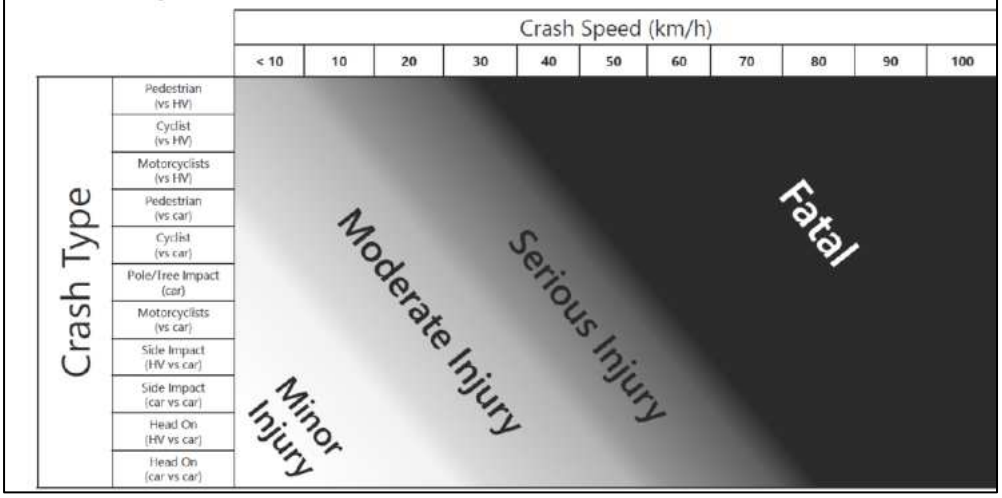
Figure 10.2: Austroads RSA risk matrix

Likelihood (includes exposure)		Severity*				
		Insignificant	Minor	Moderate	Serious	Fatal
		Property damage	Minor first aid	Major first aid and/or presents to hospital (not admitted)	Admitted to hospital	Death within 30 days of the crash
Almost Certain	One per quarter	Medium	High	High	Extreme (FSI)	Extreme (FSI)
Likely	Quarter to 1-year	Medium	Medium	High	Extreme (FSI)	Extreme (FSI)
Possible	1 to 3 Years	Low	Medium	High	High (FSI)	Extreme (FSI)
Unlikely	3 to 7 Years	Negligible	Low	Medium	High (FSI)	Extreme (FSI)
Rare	7 years+	Negligible	Negligible	Low	Medium (FSI)	High (FSI)

*see Severity Guidance Sheet

Safe System crash outcome threshold

Figure 10.3: The severity guidance sheet – to be used with the risk matrix (Figure 10.2)

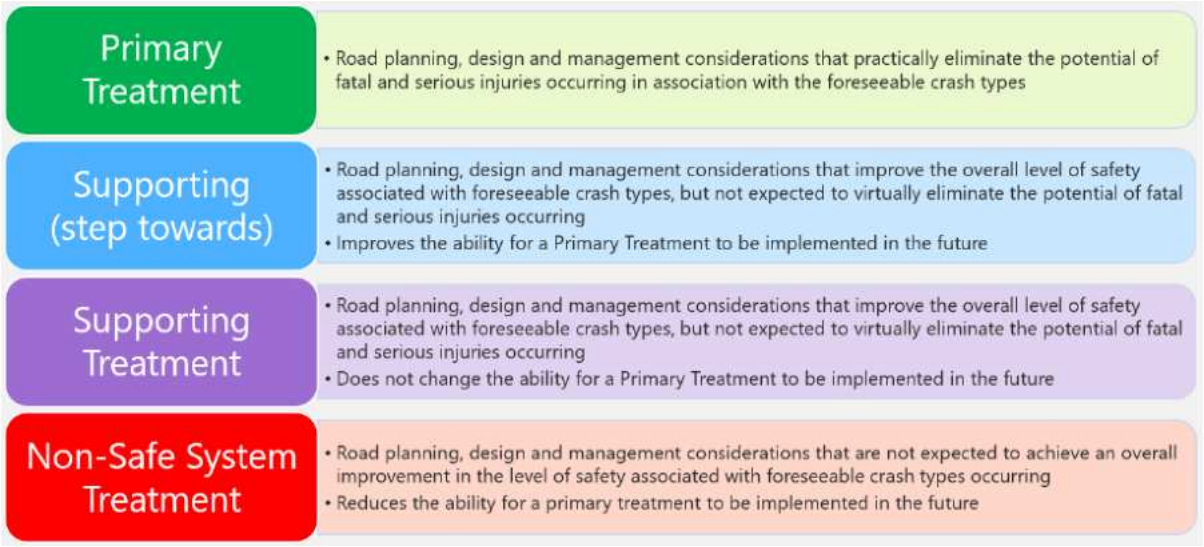


"The corresponding priorities for mitigation are categorised as:

- Negligible – no action required
- Low – should be corrected or the risk reduced if the treatment cost is low
- Medium – should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high
- High – should be corrected or the risk significantly reduced, even if the treatment cost is high
- Extreme – must be corrected regardless of cost.

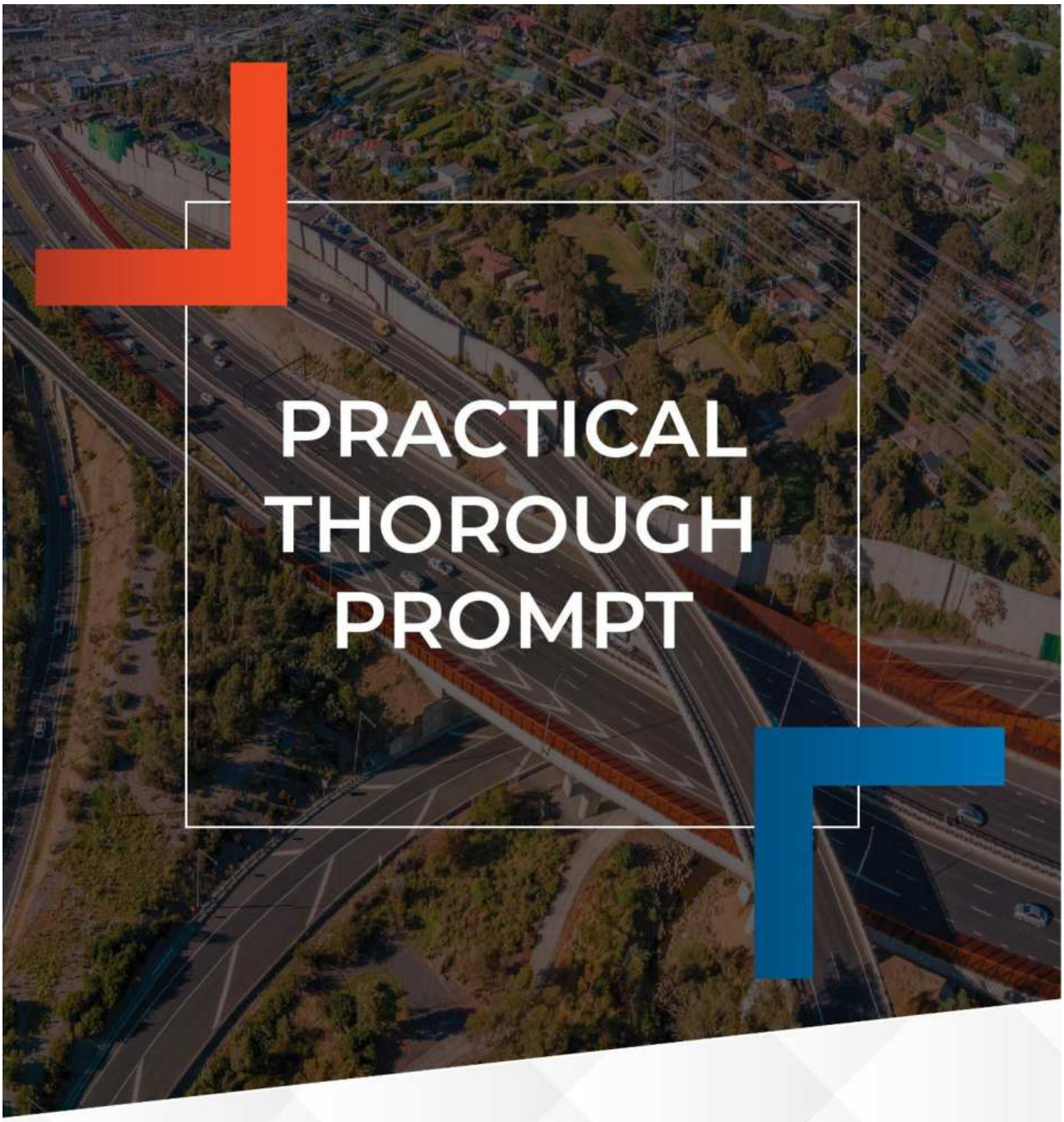
No definitive guidance can be given as to the respective monetary values of the terms 'low', 'moderate' or 'high' regarding treatment costs, but it is expected that consideration against the total project cost would be an important factor when categorising mitigation of each risk." (AGRS-RSA2022)

Furthermore, suggested recommendations are given a safe system treatment ranking as follows:



A risk cannot always be assigned to an issue when there is a highly indirect relationship between the issue 'leading to a crash'. However, the issue may still be *important* for the design, the project, general safety and amenity. Other common language used and its meaning are as follows:

- 'Urgent': Needs immediate attention / changes as per RSA suggestion or similar.
- 'Recommend' / 'Serious' / 'Important': Must be robustly reviewed. Most likely requires a change to avoid a high-risk road environment for one or more user groups.
- 'Should' / 'Suggest' / 'Significant': Based on the view of the RSA team the suggestion should be done, but it concedes that there could be reasons why inaction or alternative action is equally correct. Must be robustly reviewed by contractor and where relevant key traffic engineering project stakeholders.
- 'Review' / 'Consider': RSA is raising an observation but has no *strong* opinion on need for changes due to limitations in knowledge on the site / design /constraints.
- 'Minor': Typically, a low road-safety consequence / compliance issues (to guidelines or plans) / administrative controls. Unlikely to increase risk of crash.
- 'Note': Little or no road safety significance. Typically added to give a complete picture of the design, site, context, analysis, auditors understanding.



rsa road safety audits