

MILL PARK, BALLAN ROAD SAFETY AUDIT

PROPOSED MASTERPLAN

MILL PARK, BALLAN ROAD SAFETY AUDIT

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1 INTRODUCTION

SALT has been engaged by Moorabool Shire Council to undertake a Concept Design Stage Road Safety Audit (RSA) of the proposed vehicle and pedestrian access arrangements in association with the proposed Mill Park Masterplan.

The intent of the RSA is to identify any safety concerns with the proposal.

This assessment has been carried out in accordance with the *AustRoads Guide to Road Safety Part 6 & 6A: Road Safety Audit* (2019) guidelines.

Report findings are provided in Section 6.

2 ROAD SAFETY AUDIT PROCESS

A Road Safety Audit (RSA) is a formal, systematic assessment of a project's crash potential and safety performance. The RSA considers all road users and suggests measures to eliminate or reduce any road safety deficiencies.

The RSA is carried out by a suitably qualified, experienced and indepedent audit team.

An audit is not intended to check compliance with standards or guidelines – however, this can be done if it is relevant from a safety context. An audit will not identify design elements that are not safety issues.

3 SCOPE OF THE AUDIT

Moorabool Shire Council has prepared a draft Masterplan for the upgrade of Mill Park in Ballan – refer **Figure 1** (existing conditions) and **Figure 2** (proposed Masterplan).



Figure 1 Existing Conditions





Figure 2 Proposed Masterplan

The Masterplan would see an upgrade of the existing reserve including new recreational facilities, playground, walking paths and car parking. The existing public pool would be retained.

Vehicle access is proposed in the same location as the existing location.

The audit is to consider:

- The appropriateness of the external vehicle acess arrangements to Simpson Street; and
- The appropriateness of the external pedestrian access treatments (including two crossing points on Simpson Street and landscaping to discourage pedestrians crossing Simpson Street near the car park access point).

4 AUDIT CONSIDERATIONS

4.1 EXISTING CONDITIONS

Mill Park is currently occupied by a public pool, playground and grassed recreational areas. Vehicle access is via a connection to Blackwood Street between the Simpson Street / Simpson Street intersection and the bridge over Werribee River.

Blackwood Street and Simpson Street (west – not the unsealed section) are both collector roads under the care and management of Moorabool Shire Council. The carriageway width is approximately 8.4m. On-street parking is not permitted except within designated indented parking bays on the southern side.

The speed limit is 60km/h. However, our observations indicate that some drivers likely exceed this limit when coming down the hill on Blackwood Street from the east.

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Existing traffic volumes are unknown.

Site photographs are provided in Appendix 1.

4.2 THE AUDIT TEAM

This audit has been undertaken by a team of qualified and experienced road safety professionals, with accreditation to undertake Road Safety Audits in Victoria. No member of the audit team has previously been involved in the project, and hence full independence is maintained.

The team for this audit comprises of the following auditors:

Jarrod Wicks – Road Safety Audit Team Leader

Jarrod has over 15 years' experience in the field of traffic engineering encompassing traffic impact assessments for a range of small to large-scale land use development projects and subdivisions, parking and traffic studies for local government, LATM schemes, intersection design and capacity analysis, road safety audits, car park design, bicycle facility design, traffic and parking surveys, black spot scoping and preparation of traffic management plans for major construction projects.

Jarrod is a VicRoads-accredited Senior Road Safety Auditor and is the team leader for this audit.

Chris Sanstoupet – Road Safety Auditor

Chris has over 15 years' consulting experience as a traffic designer. He has worked on multiple large scale projects for state and local government as well as delivering projects for top tier developers and builders. His project experience is wide ranging including design for construction traffic management, aviation, bicycles, highways, public transport, parking, intersections, bicycles and pedestrians.

Chris is a VicRoads-accredited Road Safety Auditor.

4.3 SITE INSPECTION

A day time inspection of the site was carried out. Conditions at the time were clear and dry.

Refer attached site photos.

4.4 PREVIOUS AUDITS

No previous audits have been carried out to our knowledge.

4.5 CRASH HISTORY

A review of VicRoads' CrashStats database has been carried out in the vicinity of the subject site. CrashStats reports accidents that have been attended by the police and resulted in a level of injury classified as either 'Fatal', 'Serious' or 'Other'.

In the past 5 years of available data there has been one (1) reported casualty crash in the vicinity, occurring near the intersection of Simpson Street / Simpson Street – refer **Figure 3**. This accident involved a head on collision between two passenger vehicles, resulting in an 'other' level of injury.



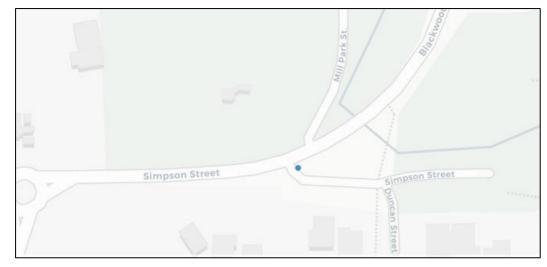


Figure 3 CrashStats Image

5 ROAD SAFETY AUDIT

5.1 SAFE SYSTEMS APPROACH

The Safe System approach to road safety focuses on creating a forgiving road system that acknowledges that people make mistakes and have limited ability to withstand crash forces without being killed or seriously injured. AustRoads details that all parts of the road and transport system - roads and roadsides, speeds, vehicles, and road use, all need to be improved and strengthened - so that if one part fails, other parts will still protect people involved in a crash.

The basic principles of the Safe System that should be followed when designing and managing roads are:

- Humans are fallible and will inevitably make mistakes when driving, riding or walking.
- Road trauma should not be accepted as inevitable no one should be killed or seriously injured on our roads.
- The road system must be forgiving so that the forces of collisions do not exceed the limits that the human body can tolerate.

Within the Road Safety Audit process, the Safe Systems approach focuses the audit on considering consider key crash types that may lead to fatal or serious injuries and kinetic energy generation and their management, Aincluding the introduction of critical speed thresholds (as identified in *Austroads Guide to Road Safety – Part 6: Managing Road Safety Audits* (2019) These crash types and speed thresholds include:

- head-on crashes (where one vehicle crosses onto the opposing side and impacts another vehicle, including head-on crashes at intersections) at speeds of 70km/h or greater;
- intersection crashes (including side-impacts involving vehicles from adjacent directions and turning vehicles) at speeds of 50km/h or greater;
- run-off-road crashes (where a vehicle leaves the carriageway without impacting another vehicle, including run-off-road crashes at intersections) at speeds of 40km/h or greater; and
- crashes involving vulnerable road users (including pedestrians, cyclists, motorcyclists, the elderly, children and people with special needs) at speeds of 30km/h or greater.

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MILL PARK, BALLAN ROAD SAFETY AUDIT ROAD SAFETY AUDIT

5.2 AUDIT PROCESS & FORMAT

This audit has been conducted in accordance with the procedure set out in *Austroads Guide to Road Safety* – *Part 6A: Implementing Road Safety Audits* (2019) and by applying Safe System principles.

The audit covers physical features of the project which may affect road user safety and it has sought to identify potential safety hazards with a particular focus on the reduction in fatal and serious injuries. These potential hazards have been identified in **Section 6**.

As outlined in *Austroads Guide to Road Safety – Part 6A: Implementing Road Safety Audits* (2019), in order to provide guidance regarding whether or not recommendations need to be resolved, the project manager should consider the:

- Likelihood that the identified problem will result in harm;
- Severity of that harm;
- Effectiveness of a remedy in reducing the harm;
- Designer's response to the audit; and
- Cost of remedying the problem (there may be several options for treatment).

In the preparation of this audit report, a ranking system has been used that considers crash severity, road user exposure (the number of road users that have the potential to be involved in a crash), and crash likelihood (the probability of a crash occurring) to rate the identified risks in consideration of Safe System principles.

Where an audit finding has the potential to result in a fatal or serious injury, or where findings have the potential to result in the following crash types above the related speed environment, an additional notation "**IMPORTANT**" has been used to provide emphasis on the relevant finding.

- Head on crashes (>70km/h)
- Right angle crashes (>50km/h)
- Run off road impact object crashes (>40km/h)
- Vulnerable road user crashes (>30km/h)

Where a finding has been deemed "**IMPORTANT**", the exposure and likelihood of crash occurrence will be considered and evaluated for the corresponding risk. Crash likelihood will be considered and evaluated for all risks identified by the audit.

The ranking system used within this audit has been based on the AustRoads guidelines, as detailed in **Table 1 – Table 4** that follow.



Table 1 How often the problem is likely to lead to a crash

Rating	Desription
Frequent	Once or more per week
Probable	Once of more per year (but less than once a week)
Occasional	Once every five or ten years
Improbable	Less often than once every 10 years

Table 2 What is the likely severity of the resulting crash type?

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

Table 3 The resulting level of risk

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

Table 4 Treatment approach

Risk	Suggested treatment approach
Intolerable	Must be corrected.
High	Should be corrected or the risk significantly reduced, even if the treatment costs is high.
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high.
Low	Should be corrected or the risk reduced, if the treatment cost is low.

In addition to these findings, the audit provides recommendations on suitable treatment option(s) that are designed to mitigate the specific risk identified by the audit. These recommendations have been considered against Safe System hierarchy of treatment outcomes, which distinguishes treatments that provide a high alignment with Safe Systems outcomes from those that assist in delivering general safety improvements. All identified recommendations have been categorised into the four Safe System categories listed in **Table 5**.

Table 5 Safe Systems Hierarchy of Primary and Supportive Treatment options (Source: AustRoads)
--

Primary Treatment	Road planning, design and management considerations that practically eliminate the potential of fatal and serious injuries occurring in association with the foreseeable crash types
Supporting (step towards)	Road planning, design and management considerations that improve the overall level of safety associated foreseeable crash types, but is not expected to virtually eliminate the potential of fatal and serious injuries occurring. Improves the ability for a Primary Treatment to be implemented in the future.
Supporting Treatment	Road planning, design and management considerations that improve the overall level of safety associated foreseeable crash types, but is not expected to virtually eliminate the potential of fatal and serious injuries occurring. Does not change the ability for a Primary Treatment to be implemented in the future.
Non-Safe System Treatment	Road planning, design and management considerations that are not expected to achieve an overall improvement in the level of safety associated foreseeable crash types. Reduces the ability for a Primary Treatment to be implemented in the future.



5.3 RESPONDING TO THE AUDIT

The audit findings and recommendations must be responded to by the project managers with a written response to each audit finding or recommendation. The response document must be signed by a representative of the project team. This response document, for example, may be a 'corrective action report' (CAR).

Each finding or recommendation in the road safety audit report can be responded to by either:

- Accepting the finding and recommendation in its entirety, and designing a solution to overcome or reduce the problem, in line with the recommendation or in another equally effective way; or
- Accepting the finding and recommendation in part only, where the local context and risk assessment is conducted by the Project Manager by considering:
 - outcomes from the audit team
 - the project sponsor and designer's assessment of the risk
 - severity of the harm and effectiveness of the suggested treatments (including improving on the recommendation)
 - cost and effectiveness of potential alternative treatments.
- Reject the finding and taking no action.

The Project Manager's response to each finding and recommendation, including details of alternative solutions, should be documented in a formal risk register or other appropriate control documentation. If a finding is accepted, but recommendation is rejected, this should be reflected in the response.

6 FINDINGS AND RECOMMENDATIONS

				Project M	anager
Audit Findings		Recommendation/s	Rating	Accept? Yes/No	Reasons/Comments
1.	 Sight distance to the east The key issue identified from the audit is the limited sight distance to the east due to trees and other vegetation – refer Photo 1 attached. This poses a significant risk of collisions between exiting vehicles and westbound traffic, particularly given that some drivers were observed to travel at excessive speed coming downhill along Blackwood Street around the bend. Sight distance requirements are specified in AustRoads Guide to Road Design Part 4A: Unsignalised & Signalised Intersections. The key criteria in this case is 'Safe Intersection Sight Distance' (SISD) – refer Figure 4. This aims to provide sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes), and to decelerate to a stop before reaching the collision point. Based on the existing speed limit of 60km/h, and applying a grade correction factor to account for the estimated downhill slope on Blackwood Street (6%), the minimum SISD requirement is 131m – refer Figure 5. Alternatively, if the speed limit was reduced to 50km/h, the SISD requirement reduces to 102m. 	 Primary Treatment 1. Trim/remove vegetation to ensure AustRoads SISD requirements are met based on 60km/h for Normal Design Domain (note: the Extended Design Domain requirements may also be considered). 2. Move the 'Give Way' line outwards to connect into the edge line on the bridge, which will slightly improve sight lines. Sight Sight Sigh	IMPORTANT Likelihood: Occasional Severity: Level of Risk: High Important Level of Risk: F P 0 Important F P 0 Important F P 0 1 Important F F F F Important F F F F Important F F F F F Important F F F F F F Important F F F F F F F Important F F F F F F F F		

			Project Ma	anager
Audit Findings	Recommendation/s	Rating	Accept? Yes/No	Reasons/Comments
Note. these are the 'Normal Design Domain' (NDD) requirements that are applicable under most normal circumstances and should be seen as the desirable standard.	If SISD requirements cannot be met due to retention of trees, we recommend that the intersection be relocated further west (although this will also require tree removal).			
However, Council could consider adoption of the AustRoads Extended Design Domain (EDD) requirements. These are essentially 'relaxed' standards that may be applied in constrained situations where NDD cannot reasonably be achieved, including existing brownfield areas.				
The EDD SISD requirements are as follows (including estimated grade corrector factor). Note that existing traffic volumes must be determined.				
Traffic volume <4000 vehicles per day (two-way)				
50km/h: 75m				
60km/h: 94m				
Traffic volume >4000 vehicles per day (two-way)				
50km/h: 82m				
60km/h: 102m				

			Project Ma	anager
Audit Findings	Recommendation/s	Rating	Accept? Yes/No	Reasons/Comments
2. Sight distance to the west Sight distance to the west is partly obscured by low hanging branches – refer Photo 4.	Primary Treatment Trim low hanging branches to ensure sight distance to the west is not obstructed.	IMPORTANT Likelihood: Improbable Severity: Level of Risk: Medium Improbable Improbable Severity: Level of Risk: Medium Improbable Improbable Improbable Severity: Improbable Improbable		
3. Vegetation (Item 11) Vegetation is proposed adjacent the car park access point with the intent of discouraging pedestrian movements. This has significant merit; however, it must be ensured that the vegetation is no higher than 900mm above road level to maintain Safe Intersection Sight Distance as well as to not obscure vision of pedestrians stepping onto the roadway. It must also be planted in a way to discourage pedestrians effectively.	 Primary Treatment Ensure roadside vegetation (Item 11) is no higher than 900mm above road level. Ensure that vegetation is suitably dense so as to discourage pedestrian movements through it. 	Likelihood: Improbable Severity: Serious Level of Risk: Medium LikeLihoot I F P 0 I I F P 0 I I C I I I M I I X X M I I X X		

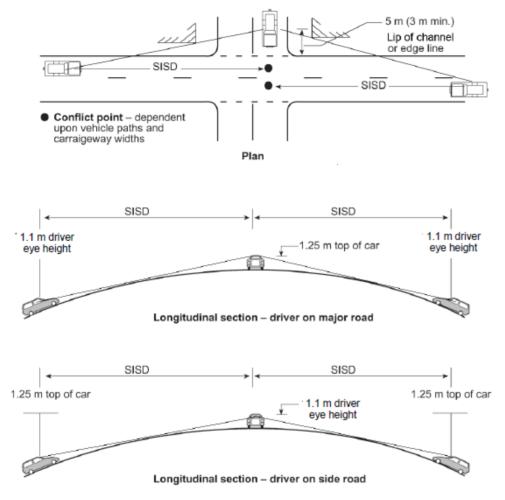
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Project Manager Reasons/Comments Yes/No 4. Pedestrian crossing point (eastern) Supporting Treatment IMPORTANT It is proposed to install a pedestrian crossing point Consider any or all of the following Likelihood: near the Simpson Street / Simpson Street intersection Occasional treatments: - refer Item 15 below: 1. Reduction of the speed limit to 50km/h. Severity: Serious 2. Installation of pedestrian warning signs. Level of Risk: High 3. Construction of a pedestrian refuge to LIKELIHOOD (11 provide a safer two stage crossing (will F Ρ 0 require the crossing point to be shifted SEVERITY ≤ Ω ∩ С slightly west and the adjacent indented Х parking bay to be removed, in order to maintain satisfactory vehicle access to the crossover of No. 43 Simpson Street). 1 This will connect with an existing footpath that provides access to the park from the east, south-east and north-east. The river prevents access from occurring elsewhere along Blackwood Street to the east, and so we envisage this crossing point will be relatively heavily used Noting the high speeds at which some drivers were observed to travel at when coming down the hill from the east, there is a heightened risk of collision between vehicles and pedestrians over what is a relatively wide crossing point (approx. 8.4m).

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		Rating	Project Manager		
Audit Findings	Recommendation/s		Accept? Yes/No	Reasons/Comments	
<text><text><image/><text><text></text></text></text></text>	Supporting TreatmentConsider any of the following treatments:1. Construct a pedestrian refuge within the existing roundabout splitter island, with connecting pram ramps; orImage: Construct a pedestrian refuge vithin the existing construct a pedestrian refuge island 	IMPORTANT Likelihood: Occasional Severity: Severity: Level of Risk: High Import Import Import Import </th <th></th> <th></th>			

Figure 3.2: Safe intersection sight distance (SISD)



Source: Based on Department of Main Roads (2006).

Figure 4 Safe Intersection Sight Distance (SISD)



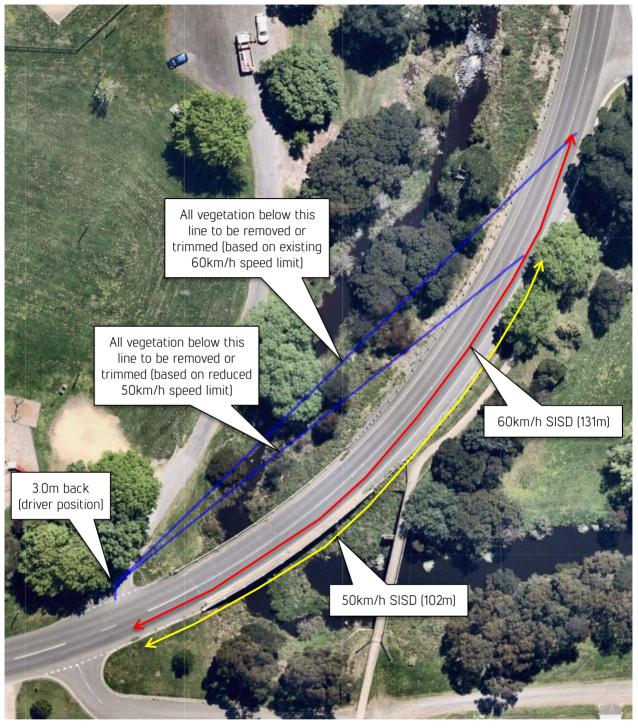


Figure 5 SISD to east from car park access point (Normal Design Domain)



7 CONCLUSION

This Road Safety Audit has been conducted in accordance with the audit process specified within Austroads Guide to Road Safety Part 6 & 6A: Road Safety Audits (2019).

The identified safety concerns have been noted in this report and the findings and recommendations are put forward for consideration by the project manager. Where recommended actions are not taken, this should be reported in writing providing reasons for that decision.

SIGNED:

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Jarrod Wicks – Associate Director 22 December 2020 SENIOR ROAD SAFETY AUDITOR

Chris Sanstoupet – Associate Design Manager 22 December 2020 ROAD SAFETY AUDITOR



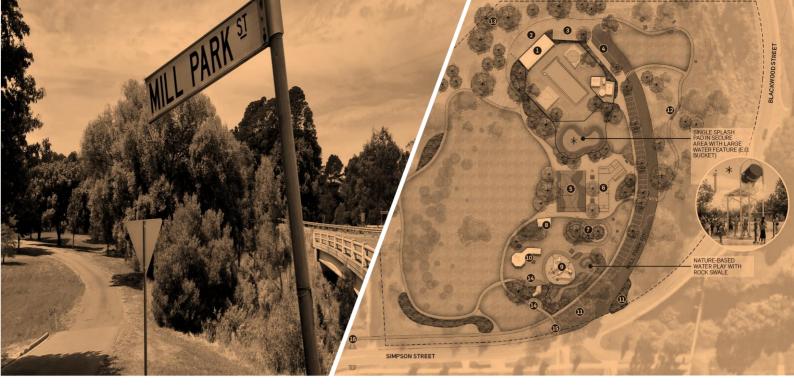
APPENDIX 1 SITE PHOTOGRAPHS











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