

Kent Road, Pascoe Vale

Road Safety Audit

Audit Stage: Concept Design





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Information Page

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List of Abbreviations

- AGRD Austroads Guide to Road Design
- RDN Road Design Note
- RSA Road Safety Audit



1. Introduction

Safe System Solutions Pty Ltd has been engaged by Moreland City Council to undertake a concept design stage Road Safety Audit (herein referred to as either RSA or audit) for the proposed changes to the separated bike lanes along Kent Road between Cumberland Road and Cornwall Road in Pascoe Vale.

The location of the RSA is shown in Figure 1.



Figure 1: Locality plan (source: OpenStreetMap)

1.1 Purpose of this report

The purpose of this report is to document the findings of the completed RSA and offer recommended mitigations to identified road safety risks and hazards.

1.2 Scope and limitations

This report has been prepared by Safe System Solutions Pty Ltd for the client and may only be used and relied on by the client for the purpose agreed between Safe System Solutions Pty Ltd and the client as set out in Section 1.1 of this report.



2. Guidance for RSA

RSA is a term used internationally to describe a recognised process which identifies road safety related risks and hazards. The primary objective of the RSA is to reduce road trauma at the RSA location. The Guide to Road Safety Part 6: Road Safety Audit (Austroads, 2022) is the primary guidance for undertaking RSAs in Australia and New Zealand.

An RSA is not a review or check of compliance with standards and/or guidelines for design projects or existing roads and it is possible that not every risk or hazard that affects road user safety has been identified.

Although the adoption of the audit recommendations will improve the level of safety of the audit location it will not, however, eliminate all the road user safety risks.

RSA is a formal process and responses to audit findings and recommendations should be documented by the client in writing. If recommendations are not accepted by the client then reasons should be included within the written response. A client is under no obligation to accept all the audit findings and recommendations and should consider these in conjunction with all other project considerations. It is not the role of the auditor to approve the client's response to an audit.

2.1 RSA within the Safe System

The RSA pre-dates the emergence of the Safe System approach. Within the Safe System, an RSA is relevant as it is recognised that full compliance with road standards alone may not result in a road system that eliminates fatal and serious injury road crashes.

The Guide to Road Safety Part 6: Road Safety Audit states:

Safe System principles must be given due consideration in all activities within the road safety management of a road network, including RSA.

In basic terms this is to be achieved during the RSA process by:

- Identifying and considering key crash types that result in fatal and serious injury
- Relating possible crash forces to tolerable levels, regardless of the likelihood, when identifying and assessing risks/hazards
- Consideration of audit findings and mitigation measures by their alignment with the Safe System e.g. in terms of operating speed, impact angles etc.

While RSAs are intended to identify risks and hazards associated with all crash types, increased focus is required to identify risks and hazards that may result in fatal and serious injury crashes. For this reason, sound knowledge in the Safe System is essential for all participants in the RSA process.

VicRoads Safe System Assessment Guidelines (2019) states that a Safe System assessment *must* be undertaken for any Victorian Government project greater than \$5M in value, is *desirable* for where the project value is greater than \$2M and *optional* for projects under \$2M. Where A Safe System Assessment is not undertaken, the project team should document how the project has considered Safe System alignment. Safe System assessments are most valuable when conducted during the early stages of a project.



2.2 The RSA process

The simplified process to undertake an RSA is shown by Figure 8.1 (Austroads, 2022), reproduced as Figure 2.



Figure 2: Simplified RSA process (source: Austroads, 2022)



3. Conducting the RSA

3.1 Selection of the RSA team

It is a requirement in Victoria that audits are undertaken in teams of two or more, with at least one Senior Road Safety Auditor. Each auditor must be accredited and registered on VicRoads Register of Road Safety Auditors (www.vrsa.com.au). Table 1 provides details of the RSA team.

Table 1: RSA team

| Name | Accreditation | Employer | | | | |
|-----------------|----------------------------|-------------------------------|--|--|--|--|
| Max McCardel | Senior Road Safety Auditor | Safe System Solutions Pty Ltd | | | | |
| Ken Murphy | Senior Project Manager | Safe System Solutions Pty Ltd | | | | |
| Catherine Deady | Senior Road Safety Auditor | Safe System Solutions Pty Ltd | | | | |

3.2 Existing conditions

At the subject site, Kent Road in Pascoe Vale, between Cumberland Road and Cornwall Road and is subject to the urban default speed limit (50km/h). The road is single lane which caters for traffic in both directions. An eastbound and westbound bike lane is provided, one on each side of the road. Parking is also allowed for on both north and south sides of the road.

Kerb side protected bicycle lanes were recently installed on both sides of Kent Road. Speed humps are present along with bicycle sharrow markings on the eastern approach to Cumberland Road roundabout and at Cornwall Road, Valerie Street intersection. According to the traffic survey conducted in December 2021, the daily traffic volume for Kent Road in the audit area is 2,074 vpd.

The surrounding area is predominantly residential with one church on the west end and a Medical Centre on the north-east corner of Joffre Road.



3.3 Undertaking the RSA

3.3.1 Meetings and site inspection

Table 2 lists site inspections completed for the audit.

Table 2: Site inspections

| Activity | Location | Date | Time |
|-----------------------|------------------------|-------------------|------|
| Day site inspection | Kent Road, Pascoe Vale | 01 September 2022 | 1030 |
| Night site inspection | Kent Road, Pascoe Vale | 01 September 2022 | 1915 |

Photos taken during the site inspection are included as Appendix A.

3.3.2 Risk assessment

Risk and hazards identified by the audit have been assigned a risk rating based on the **likelihood** and **severity** of the crash type associated with the risk or hazard.

The Austroads risk assessment matrix (Figure 10.2, Austroads, 2022) is reproduced as Figure 3.

| | | 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) | | | |
| | Almost Certain Likely Possible Unlikely Rare | Almost CertainOne per quarterLikelyQuarter to 1- yearPossible1 to 3 YearsUnlikely3 to 7 YearsRare7 years+ | Event Hamost CertainInsignificantAlmost CertainOne per quarter Quarter to 1- yearMediumLikelyQuarter to 1- yearMediumPossible1 to 3 YearsLowUnlikely3 to 7 YearsNegligibleRare7 years+Negligible | InsignificantMinorInsignificantMinorProperty damageMinor first aidAlmost CertainOne per quarterMediumIkelyQuarter to 1- yearMediumIkelyQuarter to 1- yearMediumPossible1 to 3 YearsLowUnlikely3 to 7 YearsNegligibleRare7 years+Negligible | SeverityInsignificantMinorModerateInsignificantMinor first aidModerateProperty damageMinor first aidMajor first aid and/or presents to hospital (not admitted)Almost CertainOne per quarterMediumHighLikelyQuarter to 1- yearMediumMediumPossible1 to 3 YearsLowMediumUnlikely3 to 7 YearsNegligibleLowRare7 years+NegligibleNegligibleLow | Herein Severity:InsignificantMinorModerateSeriousProperty damageMinor first aidMajor first aid and/or presents to hospital (not admitted)Admitted to hospitalAlmost CertainOne per quarterMediumHighHighAdmitted to hospitalLikelyQuarter to 1- yearMediumMediumHighExtreme (FSI)Possible1 to 3 YearsLowMediumHighHigh (FSI)Unlikely3 to 7 YearsNegligibleLowMediumHediumRare7 years+NegligibleNegligibleLowMediumMedium | | | |

*see Severity Guidance Sheet

Safe System crash outcome threshold

Figure 3: Risk assessment matrix (source: Austroads, 2022)



Corresponding to the assessed level of risk, Austroads provides the priorities for mitigation:

- 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

The risk matrix is intended to be used in conjunction with the severity guidance sheet (Figure 10.3, Austroads 2022), reproduced as Figure 4. The severity guidance sheet provides an indication of crash severity outcomes for a range of crash types and crash speeds. Professional engineering judgement is required to confirm the severity outcomes indicated by the guidance sheet, as research into Safe System tolerance speeds continues to evolve.



General indication only - professional judgement required

Figure 4: Severity guidance sheet (source: Austroads, 2022)



3.3.3 Making recommendations

Recommendations are provided for all identified risks and hazards. Recommendations are categorised into one of the Safe System treatment categories described in Table 3.

Table 3: Safe System treatment categories (source: Austroads, 2018)

| Treatment category | Description | | | | | | | |
|-----------------------------------|---|--|--|--|--|--|--|--|
| Primary | 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 with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injury occurring. Improves the ability for a Primary Treatment to be implemented in the future. | | | | | | | |
| Supporting | Road planning, design and management considerations that improve the overall level of safety associated with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injury occurring. Does not change the ability for a Primary Treatment to be implemented in the future. | | | | | | | |
| Non-Safe System Other Elements | Road planning, design and management considerations that are not expected to achieve an overall improvement in the level of safety associated with foreseeable crash types occurring. Reduces the ability for a primary treatment to be implemented in the future. | | | | | | | |



4. RSA findings and recommendations

A table containing audit findings and recommendations table is included as Appendix B.

5. Conclusion

This RSA has been conducted in accordance with the Guide to Road Safety Part 6: Road Safety Audit (Austroads, 2022).

The findings and recommendations of the RSA are provided for consideration and response by the client.

Auditors:

Malad

Max McCardel Senior Road Safety Auditor

26 September 2022

K Mumphy

Ken Murphy Senior Project Manager

26 September 2022

Catherine Deady Senior Road Safety Auditor

26 September 2022



Road Safety Audit

Appendix A: Site photos





Photo 1: Kent Rd, east end looking west



Photo 2: Looking east at Cole Reserve





Photo 3: Opposite Medical Centre



Photo 4: showing bike path as it heads west





Photo 5: Looking east from Valerie Street intersection



Photo 6: Cycle path in use





Photo 7: Western end of Kent Road at intersection with Cornwall Road, showing transition from bike lane to parklands



Photo 8: At intersection of Kent and Cornwall roads looking east





Photo 9: East end of Kent Road showing speed hump at Kitchener Street



Photo 10: Kent Road, Cumberland Road end looking toward roundabout





Photo 11: Pedestrian crossing zone at east end



Photo 12: At Cumberland Road end of Kent Road looking west





Photo 13: Entry to Kent Road from Cumberland Road roundabout



Photo 14: Kent Road looking west at night





Photo 15: At western end of Kent Road looking west at night



Road Safety Audit

Appendix B: RSA findings and recommendations



Audit findings and recommendations

| Audit Findings | | lisk Assessme | nt | Recommendations | | Responsible Officer | | |
|---|------|---------------|---|---|------------------|--|--|--|
| | | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | | |
| 1. During the site inspection multiple cars were found to be parked on the separators. This reduces the distance between the parking lane and the bicycle lane, and thus in turn increases the risk of passenger side doors swinging into the bicycle lane (i.e. the risk of dooring). The design proposes to install separators placed at the start and end of each parking bay and hatched linemarking in between to create a buffer zone between the bicycle lane and parking lane. The auditors are concerned that vehicles will park on the hatched where there is space to do so. Once again, increasing the risk of dooring. | Rare | Serious | Medium (FSI) Safe System energy exceeds tolerable levels | Consider installing separators at the start and end of each parking bay (S) Where the above is not possible due to the proximity of driveways / access points, consider installing flexible bollards on the hatched area to further deter vehicles from parking here. (S) The auditors note the Bike Lane Separator proposed (Orca Island 800) uses a barrier profile kerb. This decreases the likelihood of motorists mounting the separators to park (currently semi-mountable kerbs are provided). | Yes | A number of additional separators have been added into the current design, however there are few locations where additional separators have not been proposed for install since they restrict space for bin placement. Locations to be monitored and additional separators installed if parked cars regularly impede on buffer zone. | | |



| | 1 | Risk Assessme | nt | Recommendations | | Responsible Officer | |
|---|------------|---------------|--|---|------------------|---|--|
| Audit Findings | Likelihood | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| 2. The proposed ORCA Island separator has a barrier kerb profile. While this profile is recommended for the parking lane side, having the barrier kerb profile on the bike lane side is a less-forgiving kerb profile. Errant cyclists who ride into the kerb are likely to become destabilised and fall of their bike. | Rare | Moderate | Low Safe System energy within tolerable levels | <text><image/></text> | No | Barrier kerb profile will be pursued on both sides during trial as there is sufficient space for cyclist movement between face of kerb and proposed separator location. | |



| | | Risk Assessme | nt | Recommendations | | Responsible Officer | |
|----------------|------------|---------------|--|---|------------------|--|--|
| Audit Findings | Likelihood | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| <text></text> | Rare | Moderate | Low Safe System energy within tolerable levels | Consider defining specific locations for bin placement. This could include: Requesting residents to place bins in specific locations (S) Requesting residents ensure that bike lanes are clear of bins both prior to bin collection and in the days after (S) Liaising with waste management services to ensure bins are returned outside the bicycle lane. (S) | No | Will not implement specific locations for bins within hatched area. Will monitor how bin placement is undertaken and intervene as needed | |

| Audit Findings | | Risk Assessme | sk Assessment Recommendations | | Responsible Officer | |
|--|------|---------------|--|---|---------------------|---|
| | | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments |
| 4. The sight lines for motorists exiting from side streets have sight lines impacted by parked cars. It is likely that motorists exiting would creep towards the intersection and block the bicycle lane, increasing the risk of vehicle-cyclist collisions. Additionally, the impacted reduced sight lines increase the risk of intersection crash types. With the street street | Rare | Moderate | Low Safe System energy within tolerable levels | Consider removing parking bay(s) near intersections to open up sight lines. (S) The auditors note the Joffre Road and Kitchener Road intersections in particular were most affected by sight line restrictions. | Yes | Despite minimum distance of 10m either side of intersection, Council agrees to remove one parking bays on each side of intersection at Joffre Road. Will monitor Kitchener and make changes as needed. |

| | | Risk Assessment | | Recommendations | | Responsible Officer | |
|---|------------|-----------------|--|---|------------------|--|--|
| Audit Findings | Likelihood | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| 5. The design proposes to maintain on-street parking on Kent Street, adjacent the separated bike lanes. Parked vehicles will impact on sight lines between the through traffic lane and the bicycle lane. As such, there is a risk that vehicles pulling into driveways will not be able to see cyclists in the bicycle lane resulting in collisions with cyclists. | Rare | Moderate | Low Safe System energy within tolerable levels | Consider setting the edge of the parking bays further back from the edge of the driveway to improve sight lines. (S) Consider conducting sight line assessment to confirm there is enough distance for road users to see one another and stop prior to conflict. (S) | No | The implementation of 40km/h during trial reduces the risk of this type of collision substantially. Will remain as is and address as needed. | |

| | | | Risk Assessme | nt | Recommendations | | |
|----|----------------|------------|---------------|--|-------------------------------|--|--|
| | Audit Findings | Likelihood | Severity | Level of Risk | P – Primary S – Supporting | ST – Step Towards N – Non-Safe System | |
| 6. | <text></text> | Unlikely | Minor | Low Safe System energy within tolerable levels | Consider repainting the | speed humps (S) | |

| Responsible Officer | | | | | | | | | | | |
|---------------------|---|--|--|--|--|--|--|--|--|--|--|
| Accept Yes/No | Comments | | | | | | | | | | |
| Yes | Speed humps have been identified for repaining. Works to be completed. | | | | | | | | | | |

| | Risk Assessment | | | Recommendations | | Responsible Officer | |
|---|-----------------|----------|--|--|------------------|--|--|
| Audit Findings | | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| 7. On Kent Road at the Cornwall Road end on the southern side, adjacent to the church, there are no signs to confirm where parking ends approaching the intersection. Vehicles may park close to the intersection particularly on church days, causing vehicles to move over the painted median – increasing the risk of a crash with vehicles entering Kent Road from Cornwall Road. | Unlikely | Minor | Low Safe System energy within tolerable levels | The auditors note church car parking demand may be met by off-road parking facilities; thus this risk may negligible. Consider monitoring car parking at this location. If required, consider installing "No Standing" signage adjacent the last bay. (S) | Yes | Will monitor car parking at this location and implement signage as necessary to ensure that parked cars do not encroach within min. distance to intersecting road. | |

| | Risk Assessment | | nt | Recommendations | | Responsible Officer | |
|---|-----------------|----------|--|---|------------------|---|--|
| Audit Findings | Likelihood | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| 8. Vehicles exiting 142 Kent Road may take a more sweeping movement to head west on Kent Road due to the parked vehicles on the south side. This increases the risk of collisions with parked vehicles. | Unlikely | Minor | Low Safe System energy within tolerable levels | The auditors note this is also applicable to other driveways along the route. Consider monitoring car park egress movements. (S) | No | Will monitor risk, however note that the retention of on-street car parking at this location will present passive traffic calming for vehicles exiting such driveways. Parking spaces to remain. | |
| 9. On Kent Road at the Cumberland Road end, the centreline marking on the road and the parking areas do not align consistently. | N/A | N/A | To Note | Consider moving the "No Standing" sign to end of the centreline, removing 1 parking space (S) OR consider removing the centreline adjacent the parking bay (S) | Yes | Removal of existing line marking to align with No Standing sign. | |

Road Safety Audit Findings and recommendations table Appendix B | 8



| Audit Findings | | Risk Assessmer | nt | Recommendations | | Responsible Officer | |
|-------------------|-----|----------------|----------------|---|------------------|---|--|
| | | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| <image/> <image/> | N/A | N/A | To Note | Review the need for these "No Standing" zones and remove if redundant. (S) If these are required, investigate enforcing the zones. (S) | No | Not redundant. Installed as part of initial trial and continued as space for vehicles to yield to oncoming traffic. Additional yellow line marking to be implemented through these sections to further establish the parking restriction. | |

| Audit Findings | | Risk Assessmer | nt | Recommendations | | Responsible Officer | |
|--|-----|----------------|---------------|--|------------------|--|--|
| | | Severity | Level of Risk | P – Primary ST – Step Towards S – Supporting N – Non-Safe System | Accept Yes/No | Comments | |
| 11. On Kent Rd, midblock between Joffre Road and Kitchener Road in the northside bike lane, there is a painted hydrant marker which would be difficult for the fire department to sight in an emergency. | N/A | N/A | To Note | Consider placing fire hydrant reflective marker on the traffic lane and remove parking at this location so emergency access can be maintained at all times (S) | Yes | Plans have been updated to include new yellow hydrant marker line marking and blue RRPM within traffic lane for hydrant near to 130 Kent Road. | |

Road Safety Audit Findings and recommendations table Appendix B | 10