



Safe System Assessment (Rapid)

Name of Project

Version: [Click here](#) and enter a version number

Date: [Click here](#) to enter a date

Insert Project Name

Executive Summary

Provide a brief high level summary of the assessment, including the SSA Matrix scores and suggested treatments / design changes.

E.g. A Rapid Safe System Assessment has been conducted on xxxxxxxx project. Existing conditions and two design options were assessed. The SSA Matrix scores are shown in the table below.

Option	Score
Existing conditions	xx / 448
Design Option 1	xx / 448
Design Option 2	xx / 448

Summarise the conclusions of the assessment, highlighting the crash types that are the main contributors to the score. List the suggested treatments / design changes that should be considered to improve alignment with the Safe System approach.

Version History

Date	Version	Submitted By	Reviewed By	Approved By	RPEQ Signature	RPEQ No.

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1. Assessment Details

1.1. Type of Assessment

State that this is a Rapid SSA and the reasons for conducting a Rapid SSA rather than a Full SSA. Refer to VicRoads *Safe System Assessment Guidelines* (Section 1.6) for guidance on when to conduct a Rapid SSA.

1.2. Assessment Team

List the members of the SSA Team, their titles, department and organisation. Identify any members that are associated with the project and are therefore not independent.

1.3. Meetings and Site Inspections

List all meetings, site inspections and workshops held, with dates. Include the times of site inspections. Note: site inspections and workshops are optional for a Rapid SSA.

2. Project Context and Description

2.1. Existing Conditions & Project Background

Provide a brief description of the existing conditions. Include crash history for the past 5 years if relevant. Insert locality plan here or as an appendix if necessary. Use the table below to provide information about the project in the “Comments” column.

2.2. 5-year Crash/Accident History

Provide a summary of the crash history at the site in the last five years noting various crash modes and frequency. Note the source of the data and provide any mapped data in the appendices.

2.3. Proposed Works

Provide a summary of the proposed works. List the design options that are being assessed, identifying the differences. Provide a list of the design drawings that were assessed – include drawing & issue numbers.

Table 1: Project Context

Prompts	Comments
<p>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.</p>	
<p>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?</p>	
<p>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?</p>	
<p>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.)</p>	
<p>What is the vehicle composition? Consider the presence of heavy vehicles (and what type), motorcyclists and other vehicles using the roadway.</p>	

3. Assessment of Project Design Options

3.1. Assessment Summary

The Safe System Assessment Matrix scores for the existing conditions and the proposed design options are shown in Table 2. The scores for each crash type are shown in Figure 1. The detailed assessments are presented in Section 3.2.

Insert scores into Table 2 and edit Figure 1. If the project has been divided into two or more segments for the purposes of the assessment, provide details and the SSA scores for each segment. Provide a discussion of the results and conclusions. Compare the project options with existing conditions. In particular, highlight the crash types that present the highest risk and why. Identify the areas where there are opportunities to improve alignment with the Safe System.

Table 2: SSA Matrix Scores for the Project

Option	Score
Existing conditions	xx / 448
Design Option 1	xx / 448
Design Option 2	xx / 448

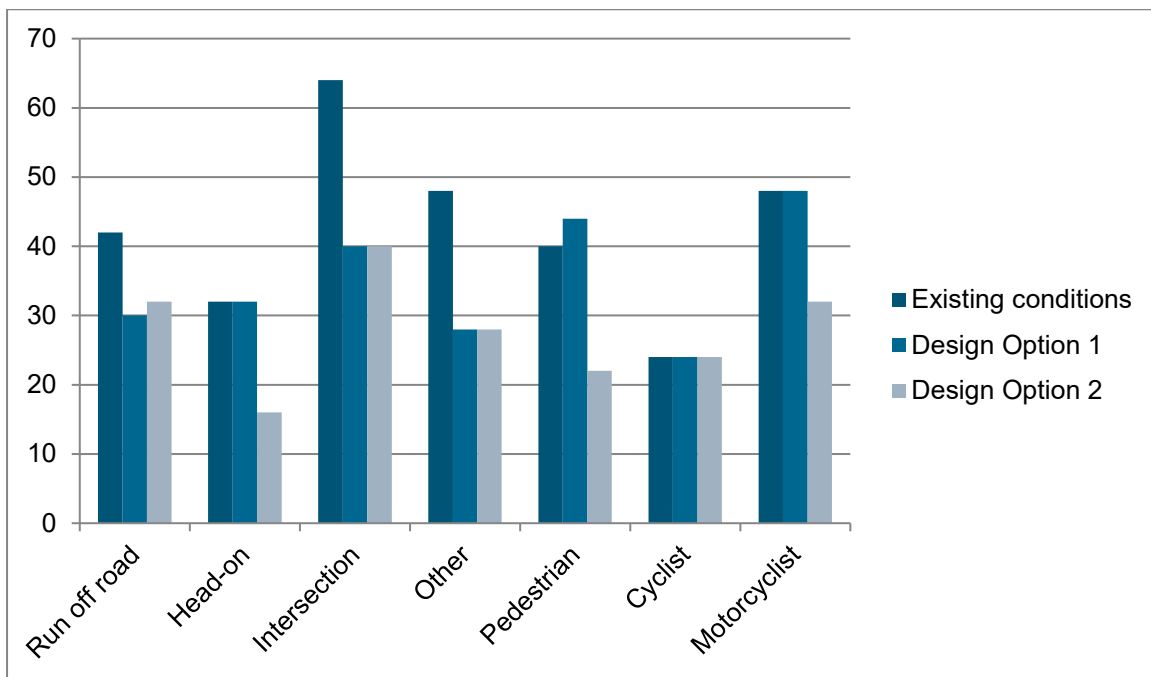


Figure 1: SSA Scores for Crash Types

3.2. Austroads AP-R509-16 Matrix

This Safe System Assessment has utilised the Safe System Matrix found in Table 4.4 in the Austroads Project AP-R509-16 Austroads Safe System Assessment Framework. The matrix serves the purpose of employing a risk assessment approach to evaluate various major crash types – those identified as the primary contributors to fatal and serious crash outcomes. These crash types are assessed based

on their exposure risk, the likelihood of occurrence, and the severity of the crashes. These three attributes are represented as rows in the matrix.

The columns of the Safe System Matrix display the main crash and road user types that significantly contribute to fatal and serious injuries. They are integrated into the matrix to focus thinking on the causes and solutions of crashes, and to ensure direct consideration of vulnerable road users. The matrix includes seven major crash types in its columns:

- Run-off-road (also known as 'loss of control' or 'off-path on curve/straight')
- Head-on (or 'vehicles from opposing directions')
- Intersection ('vehicles from adjacent directions')
- Other (encompassing same direction, manoeuvring, overtaking, on-path, and miscellaneous crashes)
- Pedestrian
- Cyclist
- Motorcyclist

To quantify alignment with Safe System principles, the matrix employs the scoring method described in Table 4.4 of the Austroads report AP-R509-16 Safe System Assessment Framework. This table, reproduced below as Table 3, outlines the scoring criteria.

Table 3: Safe System Matrix scoring method

Road user exposure	Crash likelihood	Crash severity
<p>0 = there is no exposure to a certain crash type. This might mean there is no side flow or intersecting roads, no cyclists, no pedestrians, or motorcyclists).</p>	<p>0 = there is only minimal chance that a given crash type can occur for an individual road user given the infrastructure in place. Only extreme behaviour or substantial vehicle failure could lead to a crash. This may mean, for example, that two traffic streams do not cross at grade, or that pedestrians do not cross the road.</p>	<p>0 = should a crash occur, there is only minimal chance that it will result in a fatality or serious injury to the relevant road user involved. This might mean that kinetic energies transferred during the crash are low enough not to cause a fatal or serious injury (FSI), or that excessive kinetic energies are effectively redirected/dissipated before being transferred to the road user.</p> <p>Users may refer to Safe System-critical impact speeds for different crash types, while considering impact angles, and types of roadside hazards/barriers present.</p>
<p>1 = volumes of vehicles that may be involved in a particular crash type are particularly low, and therefore exposure is low.</p> <p>For run-of-road, head-on, intersection and 'other' crash types, AADT is < 1 000 per day.</p> <p>For cyclist, pedestrian and motorcycle crash types, volumes are < 10 units per day.</p>	<p>1 = it is highly unlikely that a given crash type will occur.</p>	<p>1 = should a crash occur, it is highly unlikely that it will result in a fatality or serious injury to any road user involved. Kinetic energies must be fairly low during a crash, or the majority is effectively dissipated before reaching the road user.</p>
<p>2 = volumes of vehicles that may be involved in a particular crash type are moderate, and therefore exposure is moderate.</p> <p>For run-of-road, head-on, intersection and 'other' crash types, AADT is between 1 000 and 5 000 per day.</p> <p>For cyclist, pedestrian and motorcycle crash types, volumes are 10–50 units per day.</p>	<p>2 = it is unlikely that a given crash type will occur.</p>	<p>2 = should a crash occur, it is unlikely that it will result in a fatality or serious injury to any road user involved. Kinetic energies are moderate, and the majority of the time they are effectively dissipated before reaching the road user.</p>
<p>3 = volumes of vehicles that may be involved in a particular crash type are high, and therefore exposure is high.</p> <p>For run-of-road, head-on, intersection and 'other' crash types, AADT is between 5 000 and 10 000 per day.</p> <p>For cyclist, pedestrian and motorcycle crash types, volumes are 50–100 units per day.</p>	<p>3 = it is likely that a given crash type will occur.</p>	<p>3 = should a crash occur, it is likely that it will result in a fatality or serious injury to any road user involved. Kinetic energies are moderate, but are not effectively dissipated and therefore may or may not result in an FSI.</p>
<p>4 = volumes of vehicles that may be involved in a particular crash type are very high, or the road is very long, and therefore exposure is very high.</p> <p>For run-of-road, head-on, intersection and 'other' crash types, AADT is > 10 000 per day.</p> <p>For cyclist, pedestrian and motorcycle crash types, volumes are > 100 units per day.</p>	<p>4 = the likelihood of individual road user errors leading to a crash is high given the infrastructure in place (e.g. high approach speed to a sharp curve, priority movement control, filtering right turn across several opposing lanes, high speed).</p>	<p>4 = should a crash occur, it is highly likely that it will result in a fatality or serious injury to any road user involved. Kinetic energies are high enough to cause an FSI crash, and it is unlikely that the forces will be dissipated before reaching the road user.</p>

3.3. Safe System Assessment Matrices

Table 4: SSA Matrix – Insert option e.g. “Existing Conditions”, “Design Option 1” etc. Add and complete a table for each option. Refer to Austroads *Safe System Assessment Guidelines* for guidance on scoring.

LEGEND

Black text: Common factor between the ‘Existing Conditions’ and this option

Factor (strikethrough): factor that is removed or significantly diminished between the ‘Existing Conditions’ and this option.

Red text: New or significantly altered in this option compared to the ‘Existing Conditions’

	Run-off road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure Comments:	This volume is the same across all vehicle crash types				<i>If defined from data, this can be a number or quantified through land use/ other means</i>	<i>If defined from data, this can be a number or quantified through land use/ other means</i>	<i>If defined from data, this can be a number or quantified through land use/ other means – generally 1% of AADT for all vehicles.</i>
	For run-off road crash types, the combined AADT is in relation to SS triggers	For head-on crash types, the combined AADT is in relation to SS triggers	For intersection crash types, the combined AADT is in relation to SS triggers	For 'other' crash types, the combined AADT is in relation to SS triggers			
Exposure Score:	/4	/4	/4	/4	/4	/4	/4
Likelihood Comments:	Factors that increase the likelihood include: <ul style="list-style-type: none"> • Common factor example • Removed factor example • New or significantly altered factor example 	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 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: •	Factors that decrease the likelihood include: •
Likelihood Score:	/4	/4	/4	/4	/4	/4	/4
Severity Comments:	Side impacts with fixed objects at speeds greater than 30 km/h are likely to cause death or serious injury. Head-on impacts with fixed objects at speeds greater than 50km/h are likely to cause death or serious injury.	Impacts with an oncoming vehicle at speeds greater than 70 km/h are likely to cause death or serious injury.	Side-on impacts with a vehicle at speeds greater than 50 km/h are likely to cause death or serious injury.		Pedestrians struck at speeds above 30 km/h (the Safe System tolerance) are likely to be seriously injured or killed. Also, vehicle/pedestrian crashes at even lower speeds (especially involving heavy vehicles) can cause serious injury.	Cyclists struck at speeds above 30 km/h (the Safe System tolerance) are likely to be seriously injured or killed. Also, vehicle/cyclist crashes at even lower speeds (especially involving heavy vehicles) can cause serious injury.	Due to the vulnerability of motorcyclists, a crash between a motorcycle and a roadside hazard or parked car is likely to result in serious trauma unless speeds are very low.
	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: •
	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: •
Severity Score:	/4	/4	/4	/4	/4	/4	/4
Product (multiply scores above for crash type)	/64	/64	/64	/64	/64	/64	/64
	TOTAL						/448

4. Treatments to Improve Safe System Alignment

Table 4 and Table 5 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.

Provide additional information as required to support the suggested treatments. For example, how the treatments address the main risks identified in the SSA Matrices.

Table 5: Primary Treatments

Treatments for consideration	Project response

Table 6: Supporting Treatments

Treatments for consideration	Project response

5. Conclusions

Outline the conclusions of the assessment. For example, are the proposals an improvement on existing conditions, what are the main FSI crash risks, how well do each of the design options align with Safe System principles, which option is preferred and what changes could be made to the design / scope to further improve Safe System alignment.

Appendix A

Add appendices as required e.g. locality plan, site photos, crash data etc.