



Road Safety Audit

Intersection Southern Ports Highway & Southend Access Road, Southend

May 2019



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1 Introduction

This report presents the findings of a road safety audit carried out at the intersection of Southern Ports Highway and Southend Access Road in Southend.

The road safety audit was carried out following numerous complaints from RAA members. The intersection was one of the most frequently raised in the Limestone Coast region during RAA's Limestone Coast Regional Road Assessment survey conducted in February 2019.

The audit was conducted by an audit team comprising:

- Senior Road Safety Auditor – Charles Mountain; and
- Road Safety Auditor – Matthew Vertudaches.

This road safety audit report identifies safety issues present for vehicles turning into Southend Access Road from the north and south.

1.1 Purpose

This road safety audit is undertaken in accordance with best practice principles and a safe system framework to ensure that road safety is a primary consideration at all times.

A driver's expectations about the standard of the carriageway, road markings, delineation and a forgiving roadside environment are a major contributing factor in their ability to negotiate the road environment safely.

Traffic safety principles need to be considered in order to provide road users with the safest road environment possible. Such principles include:

- Creating safe carriageways that facilitate appropriate tracking of motor vehicles, specifically at locations where topographical or property boundary constraints require changes to alignment;
- Ensuring all road user types are considered, with appropriate facilities to ensure safe operation and travel for all road users;
- Roadside features and constraints – typically close proximity features and intersections which increase the likelihood of crashes;
- Managing crash severity risk through the implementation of safety design principles to ensure injury is minimised in the event of a crash;
- Ensuring that safety related design criteria such as appropriate sight distances, have been considered; and
- In the event of driver error, safe infrastructure can reduce the severity and probability of the crash occurring.

The findings, opinions, and recommendations in this report are based on an examination of the location, and may not cover every deficiency that is present on site. Notwithstanding, it is considered that adoption of the recommendations set forth in this report should improve the level of safety at the intersection of Southern Ports Highway and Southend Access Road.

1.2 Site Location

The site is located within the Wattle Range Council area and is shown below. Southern Ports Highway is under the care and control of the Department of Planning Transport and infrastructure (DPTI), and Southend Access Road under the care and control of Wattle Range Council.



Map detailing the location of the intersection



Satellite imagery of the intersection

2016 Census data indicates that Southend has a population of 263. Southend Port hosts one of the largest fleets of rock lobster fishing vessels on the Limestone Coast and has a large rock lobster fishing and processing industry¹. Two caravan parks are situated in Southend, as well as a variety of bed and breakfast or holiday rentals and a small general store/post office.

1.3 Audit Team

The audit team comprised:

- Charles Mountain

Charles is the Senior Manager of Road Safety at RAA. He has extensive experience in transport, traffic and road safety. Prior to joining RAA he had over 25 years' experience in local government managing a wide variety of traffic, access and parking issues. Charles has qualifications in engineering, business management and is a qualified road safety auditor.

- Matthew Vertudaches

Matthew is a Traffic Engineer at RAA and has been with the organisation for 3 years. He has undertaken five days of Road Safety Audit training and Treatment of Crash Location training at the Queensland University of Technology. Matthew has qualifications in civil engineering with experience in civil and traffic engineering, traffic investigations and local government.

¹ Wattle Range Council, 2016, *Southend Brochure*, accessed via <https://www.wattlerange.sa.gov.au/webdata/resources/files/WRC-Southend-2016-O-1.pdf>.

1.4 Audit Process Methodology

This road safety audit has been undertaken in accordance with the *Austroads Guide to Road Safety Part 6: Road Safety Audit*, and is aimed at ensuring that appropriate safety consideration is given, thus minimising the potential occurrence of crashes and reducing the severity of crashes that occur.

The site was inspected on foot and also by vehicle on 27/3/2019. A night audit was not undertaken by the auditors as ambient light conditions were deemed to have minimal impact on the safety concerns raised. The weather condition at the time of the inspection was cool and overcast with no rain. This site inspection forms the basis of the audit findings that are detailed in subsequent sections of this report.

Non-conformances and hazards have been identified using the Austroads guide and relevant guidelines and standards such as, *Austroads Guide to Road Design*, DPTI technical standards and guidelines and *AS 1742: Manual of uniform traffic control devices*.

Non-conformances or hazards identified in this report have been rated based on the probability and severity of possible crashes that could result from the identified issue. Possible actions have been suggested for the identified issues as a guide for consideration.

1.5 Responding to the Audit Report

Responsibility for road design always rests with the designer/project manager and not with a road safety auditor. A project manager or road authority is under no obligation to accept every recommendation set out in this report and it is not the auditor's role to agree with or approve of the road authorities audit response.

It is expected that this formal road safety audit report will be responded to in writing with reasoning given for rejections of any recommendations made in this report. Written confirmation outlining how or if recommendations are accepted may be useful and should be provided wherever possible.

To assist the road authority in responding, an area for a formal response is provided in **Appendix A** of this road safety audit report.

2 Safety Audit Findings

While it is important to ensure that a traffic control treatment and the road environment is designed to meet Australian Standards, there are times when, due to physical or financial constraints, this is not always possible. This report does not consider the potential cost of projects, and makes recommendations based solely upon safety needs.

The following section includes a review of crash data and describes each of the non-conformances or hazards identified during the audit. They are then summarised and ranked in section 2.4 based on the probability and severity of potential crashes that could result from the identified issue.

A sketch outlining the recommendations and suggested actions identified in this report is provided in **Appendix B**.

2.1 Crash History

The most recent five years of data available at the time this audit was undertaken was from 2013-2017. To provide further information, crashes since 2010 have also been reviewed.

5 year Crash History:

2016: Right angle crash resulting in minor injuries. Vehicle turning right from Southend Access Road failed to give way to vehicle continuing northwest on Southern Ports Highway. One person sustained minor injuries.

2017: Hit fixed object crash resulting in property damage only. Northbound driver hit a tree when making a left turn. D.U.I was the apparent error leading to the crash, with speed a contributing factor.

Other crashes:

2011: Right angle crash resulting in serious injuries. Vehicle turning right from Southend Access Road failed to give way to vehicle continuing north west on Southern Ports Highway. One person sustained serious injuries, and a further three sustained minor injuries.

2010: Hit fixed object crash resulting in property damage only. Northeast bound vehicle hit a tree at the intersection due to inattention.

2.2 Specific Findings

Item 1: Left turn from Southern Ports Highway to Southend Access Road

A left turn lane does not protect vehicles from trailing traffic when turning left from Southern Ports Highway with vehicles required to turn left from the through lane. The shoulder has been widened on the approach, which allows drivers to partially leave the through lane to make a left turn, however, this is of insufficient width to allow vehicles to fully leave the through lane.

Observations on site indicated that some drivers would utilise the wide shoulder to make a left turn whilst straddling the edge line and that other drivers would not cross the edge line to make a left turn. Trailing vehicles would often cross the solid dividing centre line to pass a left turning vehicle, placing them at risk of a head on collision with southeast bound traffic.

Another observed aspect of poor driver behaviour was an absence of safe following distances. With high volumes of slower vehicles (i.e. Caravans, tourists) travelling to Southend, tailgating was prevalent, giving less reaction time to the trailing driver should a vehicle slow down to make a left turn.



The widened shoulder sometimes utilised by vehicles turning left onto Southend Access Road

Construction of a sheltered left turn lane is recommended as the best option to address these issues, providing sufficient space for left turning vehicles to safely leave the main carriageway prior to turning.

Item 2: Poor lane designation on Southern Ports Highway (southeast bound)

A dedicated right turn lane does not shelter vehicles turning right from Southern Ports Highway onto Southend Access Road. There are two southeast bound lanes through the intersection, with one being a through lane and the other a shared right/through lane. Line marking directs southeast bound vehicles into the shared right/through lane, regardless of whether they are intending to turn right or continue southeast, increasing the risk of a rear end collision occurring in this lane.



Line marking directs all southeast bound traffic into the right-through lane.

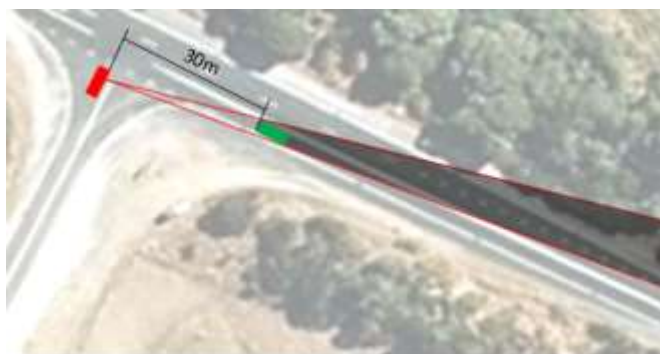
It is recommended that line marking on Southern Ports Highway be modified to create a dedicated right turn lane and dedicated through lane, with remaining road space to the southeast of the intersection converted to a painted traffic island. The painted island will provide clearance between northwest bound and southeast bound traffic streams to the southeast of the intersection. This additional clearance is particularly important when taking into account the poor driver behaviour observed and raised in item 1 and will provide extra protection when northwest bound vehicles cross the solid dividing line.

A sketch is provided in **Appendix B** outlining this and other recommendations.

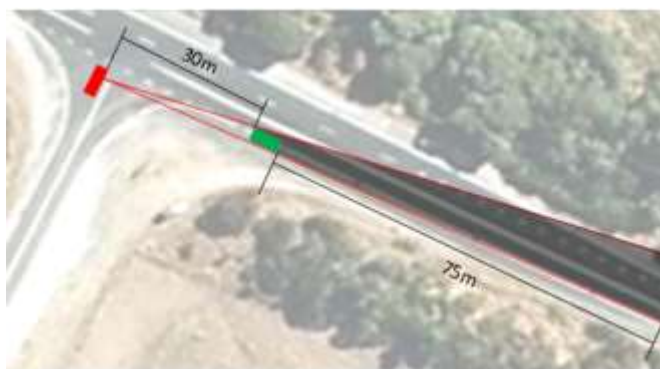
Item 3: Right turn from Southend Access Road

Crash data indicates that vehicles making right turn movements from Southend Access Road are responsible for the only casualty crash in the most recent five years of data (2013-2017) and another casualty crash in 2011. Both of these crashes were due to a driver of a vehicle turning right from Southend Access Road failing to give way to a northwest bound vehicle on Southern Ports Highway.

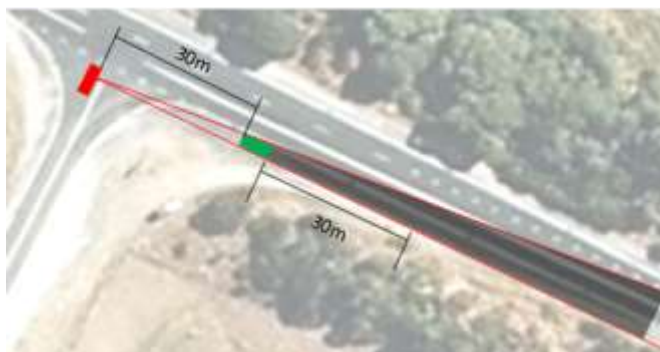
There are no obstructions to sight lines to the southeast from the holding position on Southend Access Road, and sight distance is substantial. It is possible for a vehicle turning left from Southern Ports Highway onto Southend Access Road to conceal the presence of through vehicles to a vehicle turning out of Southend Access Road as shown in the below diagrams.



A vehicle turning from the main carriageway has minimal impact on sight distance to the southeast



A vehicle straddling the edge line to turn left obscures the entire northwest bound lane behind the vehicle.



A vehicle turning left from the shoulder provides 30m of visibility behind the vehicle before completely obscuring the northwest bound lane.

It is of the auditor's opinion that installing a left turn lane as discussed in item 1 will provide greater awareness of the two northwest bound traffic movements through the intersection. It is reasonable to expect that all left turning vehicles will utilise the left turn lane, creating consistency with northwest bound movements through the intersection.

Current warning signage on the Southend Access Road approach to the intersection consists of duplicated W2-14 't-intersection beyond a curve' signs at 500m and 300m intervals prior to the intersection.

R1-2 'give way' signs are not currently installed at the intersection. To create additional awareness of the give way condition and to complement current W2-14 't-intersection beyond a curve' signs, it is recommended that duplicated R1-2 'give way' signs be installed. AS 1742.2 permits the use of give way signs in conjunction with t-intersection beyond a curve signs.

If this recommendation is adopted, stopping sight distance to the give way sign should be measured, and if this falls below 205m, installation of a W3-2 'give way sign ahead' sign should be considered as per AS1742.2 clause 2.9.3(b).

Item 4: Vegetation

Vegetation highlighted in the below images is at risk of restricting sight distance of;

- Vehicles turning right onto Southend Access Road to southeast bound vehicles; and
- Southeast bound vehicles to vehicles turning right from Southend Access Road.

At the time of assessment, sight distance was sufficient and no immediate action is required. This should be monitored on a regular basis with consideration being given to removing some vegetation on the inside of the curve to prevent future overgrowth.



Satellite image highlighting location of vegetation



Vegetation on the inside of the curve

2.3 Guide to Ranking System

The audit team has raised issues in respect of road safety that should be given due consideration. To assist and gauge the relevant importance of each of the safety issues documented in this report, the risk matrix in table 3 has been considered and a priority ranking system shown in table 4 has been adopted.

Table 1: Probability

Probability	Description
Highly Probable	It is likely that at least one crash of this type could occur within a five-year period.
Occasional	It is likely that less than one crash of this type could occur within a five-year period.
Improbable	Less than one crash of this type could occur within a 10-year period.

Table 2: Severity

Severity	Description
Major	The crash is likely to result in a fatality or serious injuries.
Moderate	The crash is likely to result in minor injuries or large scale of property damage.
Minor	The crash is likely to result in minor property damage or many near miss crash events.

Table 3: Safety Issue Ranking System

	Improbable	Occasional	Highly Probable
Minor	Low	Low	Medium
Moderate	Low	Medium	High
Major	Medium	High	High

Table 4: Safety Issue Ranking System

Safety Issue Ranking	Probability of a crash resulting in serious or fatal injury
Priority 'A' (High)	A major concern that should be addressed and requires changes to avoid serious safety problems.
Priority 'B' (Medium)	A significant safety concern that requires consideration of changes to improve safety.
Priority 'C' (Low)	A safety concern of lesser significance, but which should be addressed as it may improve overall safety.
Comment	A concern or an action that may be outside the scope of the RSA, but which may improve the overall design or be of wider significance. The responsibility for any action on comments may fall to the response road authority.

2.4 Summary of Recommendations

The road safety audit findings outlined in this report have been summarised in table 5 along with suggested actions and risk ranking.

Table 5: Audit Recommendations Summary

Item	Deficiency	Suggested Action	Ranking
1	Lack of sheltered left turn lane from Southern Ports Highway onto Southend Access Road.	Install sheltered left turn lane from Southern Ports Highway onto Southend Access Road.	B
2	Poor lane designation on Southern Ports Highway.	Modify line marking to direct southeast bound vehicles into the left lane and create a dedicated right turn lane from Southern Ports Highway onto Southend Access Road.	B
3	Lack of R1-2 'give way' signs on Southend Access Road.	Install R1-2 'give way' signs on Southend Access Road.	B
3a		(If above is adopted) Measure stopping sight distance to the give way sign, and if required, install W3-2 'give way sign ahead' sign.	Comment
4	Vegetation poses future risk to sight distance.	Monitor growth of vegetation in locations highlighted and consider its removal to ensure sight distance is not compromised in the future.	Comment

3 Audit Team Statement

The above safety audit findings and suggested actions are the opinion of the audit team, and are aimed at changes that may be implemented in order to improve safety. The issues raised in this report, together with recommendations, should be considered for implementation.

Senior Road Safety Auditor: Charles Mountain

Signed:



Date: 27/5/2019

Road Safety Auditor: Matthew Vertudaches

Signed:



Date: 27/5/2019

Appendix A: Decision Tracking Form

Road Safety Audit Report Recommendations

DECISION TRACKING FORM

Project Title: Intersection Southern Ports Highway & Southend Access Road, Southend.

Road Safety Audit Stage: Existing Road Safety Audit

Road Authority: Department of Planning Transport and Infrastructure, Wattle Range Council.

Designer: N/A

Road Safety Auditors: Charles Mountain, Matthew Vertudaches

Item No.	Recommendation	Risk Rating	Road Authority Response/Comments	Road Authority Decision
1	Install sheltered left turn lane from Southern Ports Highway onto Southend Access Road.	B		
2	Modify line marking to direct southeast bound vehicles into the left lane and create a dedicated right turn lane from Southern Ports Highway onto Southend Access Road.	B		
3	Install R1-2 'give way' signs on Southend Access Road.	B		
3a	(If above is adopted) Measure stopping sight distance to the give way sign, and if required, install W3-2 'give way sign ahead' sign.	Comment		
4	Monitor growth of vegetation in locations highlighted and consider its removal to ensure sight distance is not compromised in the future.	Comment		

Appendix B: Approximate location and sketch of audit findings and recommendations

