

# Tinsmith Corner

Road Safety Audit



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**RAA**

# Tinsmith Corner Road Safety Audit



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## Revision History

Rev	Date	Author	Approver	Comment
A	16/03/17	JF	CM	For Issue.

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## **1. Introduction**

### **1.1 Introduction**

RAA's Tourist Region Assessment (TRA) program aims to identify road issues, examine potential improvements and where possible, seek funding for infrastructure upgrade projects. As part of the 2016 TRA on Kangaroo Island, RAA undertook a joint Road Safety Audit with Kangaroo Island Council.

This audit has been requested due to number of concerns received by Kangaroo Island Council regarding road safety at the intersection of Playford Highway, Tinsmith Road and North Coast Road.

The intersection was modified in 2003 with the addition of a by-pass lane for west bound traffic on Playford Hwy (DPTI RN 4880). This road section contains a long broken back curve, and is beset with significant vegetation growth on the Tinsmith and North Coast Road approaches.

This report outlines the findings of the audit and provides broad recommendations for safety improvements at the intersection.

### **1.2 About the Road Safety Audit**

A road safety audit is a formal examination of an existing or proposed road or intersection, by an independent and qualified multidisciplinary team. The purpose of the audit is to identify risks and hazards that may result in a collision and provide broad recommendations that will reduce the probability and/or consequence of a collision occurring.

The audit is conducted in accordance with the *Austrroads Guide to Road Safety, Part 6: Road Safety Audit*, which defines a multi-stage review process for the audit, and incorporates the following stages:

- Feasibility / Concept Design
- Preliminary Design
- Detailed Design
- Construction (Road Works)
- Pre-Opening to Traffic
- Existing Road Audits

The Road Safety Audit undertaken at Tinsmith Corner is classed as an existing road audit.

### 1.3 Road Safety Audit Team

The road safety audit team comprised of the following members of staff:

#### Audit Team



**John Fernandez** is Kangaroo Island Council's Technical Program Manager and has 16 years' experience in Local Government, and conducts Road Safety Audits and traffic reports. He manages a variety of sealed and unsealed road, traffic, and general infrastructure issues associated with vehicular movement, to a range of Urban & Rural properties on Kangaroo Island.



**Richard Butler** is an Analyst within RAA's Road Safety section. He has been an analyst, for over 10 years. Richard joined the RAA in 2012 and is responsible for the analysis of crash, road quality and survey data. He also conducts and analyses travel time runs across metropolitan Adelaide and has undertaken a number of highway assessments across the state.



**Ian Bishop** is a Traffic Engineer at RAA. He is an accredited road safety auditor and is certified in the use of Vericom accelerometers for road operations. He has over 10 years' experience in Civil & Traffic Engineering including highways, intersection design and modelling, road safety mass action treatments and the design and implementation of local area traffic management.

#### Reviewer



**Charles Mountain** is the Senior Manager – 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. He has qualifications in engineering, business management and is a qualified road safety auditor.

## 1.4 Background

Tinsmith Corner is located three kilometres from Kingscote, connecting North Coast Road and Tinsmith Road to the Playford Highway. There are some standing geometric characteristics that present at this site, including:

- A 280 metre long broken back curve;
- Sight distance is limited to 150 metres within a 100 km/h zone;
- An additional intersection (Bullock Track) less than 40 metres from the intersection of Tinsmith Road and Playford Highway; and
- Presence of trees that restrict sight distance on the curve.



Figure 1 - Site

Prior to 2003, when an additional by-pass lane was added, there were regular occurrences of accidents or near miss incidents. The by-pass lane shown, while correcting the propensity for driver error, introduced some added issues:

- The extended super-elevation created by adding a by-pass lane on the inside of the curve, without significant engineering, made the road cross section steeper over a longer distance.
- The upgrade of the Bullock Track intersection some 40 metres to the east of the main crossing point has added another aspect to the site.

## **2. Site Investigation**

The Audit was undertaken on the 12th September 2016, in concert with staff from both RAA & Kangaroo Island Council, between 1:30 pm and 3:30 PM. Further photos were taken at a subsequent date when weather and ground conditions were improved.

## **3. Audit Findings**

### **3.1 3.1 Geometry**

- a) The super-elevation created by adding a by-pass lane on the inside of the curve placed vehicles lower than the other two lanes- adding to driver inability to see a reasonable distance when entering the Playford Highway from Tinsmith Road. This could increase the risk of crashes occurring. It is recommended that the lane width is increased to provide a basic right treatment (BAR). Raising the level of the junction should also be investigated.
- b) The intersection is located within an existing 100 km/h speed zone, this increases the crash risk given the poor sight distance. It is recommended that the Kingscote 80km/h speed limit is extended to include Tinsmith Corner.



**Figure 2 –Steep geometry over extended lane width created sight difficulty for entering traffic. (Note excavation depth into the opposite embankment)**

### **3.2 Sight distance**

- a) Sight distance was measured at 132 metres to the east and 205 metres to the west of the intersection and provides limited time for heavy vehicles to slow if a vehicle commences a turn. It is recommended that the speed limit is reduced along the Playford Highway at this section to allow additional reaction time commensurate with the sight distance.
- b) Vegetation restricts right distance to the east, increasing the risk of a crash. It is recommended that vegetation trimming and removal is undertaken in accordance with both DPTI and Kangaroo Island Council vegetation management plans.



**Figure 3 – Sight Distance- the vegetation indicated obstructs long range sight distance. On observation, drivers tend to hold further back from the Give Way line in order to optimise their view of oncoming traffic from Kingscote.**





Figure 4 - Holding further back from the Give Way line actually appears to reduce the line of sight to the west as seen from the photo above.



Figure 5 -The resultant embankment and relocation of signage associated with the works to increase the lane width on Playford Highway restricts sight distance to the east from Tinsmith Road.



**Figure 6 - Sight distance to the west on the Tinsmith Road approach.**

- c) The junction is unlit, which may reduce the general driver's awareness of the intersection after sunset and may increase the crash risk. It is recommended that lighting is considered for the intersection or that additional roadside markers and raised reflective pavement markers (RRPMs) are installed.

### **3.3 Signage**

- a) Advanced warning and give way signs are obstructed by vegetation on approach to the intersection. This increases the risk that motorists do not become aware of the intersection and may fail to give way, increasing the likelihood of a crash. It is recommended that vegetation trimming or removal is undertaken in accordance with both DPTI and Kangaroo Island Council vegetation management plans to make the signs conspicuous.
- b) The give way signs are located far to the left of the lane and may be less visible to motorists. It is recommended that the sign size is increased or signs are duplicated to make them more conspicuous.
- c) Junction is unlit at night which may not provide motorists with sufficient warning of its presence and increases the crash risk. It is recommended that lighting options are explored and additional roadside marker posts and raised reflective pavement markers are installed to increase night delineation.



Figure 7 - Signage and general vision on Tinsmith Rd approach.



Figure 8 - Tinsmith Road approach- Cross road sign obscured by vegetation from further back.

## 4. Summary & Recommendations

The road safety audit at Tinsmith Corner has identified a number of recommendations, a summary of which is provided in Table 1 below. Suggested priorities have also been included, where 1 is high priority and 3 is low priority. A further table is provided in Appendix A to enable the responsible authorities to respond to the audit.

Table 1 – Summary of Recommendations

Item No.	Risk / Hazard Description	Recommendation	Priority
<b>3.1 – Geometry</b>			
a	The superelevation of the curve restricts sight distance as a result of the embankment created.	<ul style="list-style-type: none"> <li>▪ Review site engineering</li> <li>▪ Increase lane width to provide Basic Right Turn (BAR)</li> <li>▪ Consider raising the junction.</li> </ul>	2
b	The site falls within the 100 km/h speed zone for the road	<ul style="list-style-type: none"> <li>▪ Review the speed zone and consider reducing the speed to 80km/h</li> </ul>	1
<b>3.2 - Sight Distance</b>			
a	Limited sight distance to lower than considered adequate for the intersection of roads precinct.	<ul style="list-style-type: none"> <li>▪ Conduct a full review to determine a more appropriate speed zone for the area.</li> </ul>	2
b	Vegetation obscures sight distance	<ul style="list-style-type: none"> <li>▪ Undertake vegetation trimming and clearance in accordance with both DPTI and Kangaroo Island Council vegetation management plans.</li> </ul>	1
c	The junction is unlit	<ul style="list-style-type: none"> <li>▪ Consider installing complying intersection and surrounds lighting to relevant standards. Install additional road side marker posts and raised reflective pavement markers (RRPMS).</li> </ul>	1

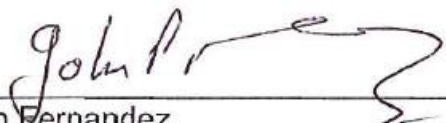
Item No.	Risk / Hazard Description	Recommendation	Priority
<b>3.3 - Signage</b>			
a	Approach signage obscured by vegetation	<ul style="list-style-type: none"> <li>Undertake clearance of vegetation in accordance with both DPTI and Kangaroo Island Council vegetation management plans.</li> </ul>	1
b	Signage of inadequate size on approach to the junction	<ul style="list-style-type: none"> <li>Increase sign size or consider duplication and monitor effects.</li> </ul>	2
c	The junction is unlit.	<ul style="list-style-type: none"> <li>Consider installing complying intersection and surrounds lighting to relevant standards. Install additional road side marker posts and raised reflective pavement markers (RRPMS).</li> </ul>	2


## 5. Concluding Statement

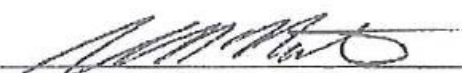
This road safety audit has been conducted by the audit team through an on-site inspection for the purposes of identifying infrastructure and/or environmental issues that may present safety risks for road users.

The identified issues have been noted in this report and the accompanying recommendations have been submitted for the consideration of the road authority.

  
\_\_\_\_\_  
16/03/17  
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Lead Auditor

  
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Senior Manager – Road Safety  
Reviewer

## Appendix A – Response to Road Safety Audit



Table A1 – Summary of Recommendations and Response to Audit

Item No.	Risk / Hazard Description	Recommendation	Priority	Audit Response
<b>3.1 – Geometry</b>				
a	The superelevation of the curve restricts sight distance as a result of the embankment created.	<ul style="list-style-type: none"> <li>Review site engineering</li> <li>Increase lane width to provide Basic Right Turn (BAR)</li> <li>Consider raising the junction.</li> </ul>	2	
b	The site falls within the 100 km/h speed zone for the road	<ul style="list-style-type: none"> <li>Review the speed zone and consider reducing the speed to 80km/h</li> </ul>	1	
<b>3.2 - Sight Distance</b>				
a	Limited sight distance to lower than considered adequate for the intersection of roads precinct.	<ul style="list-style-type: none"> <li>Conduct a full review to determine a more appropriate speed zone for the area.</li> </ul>	2	
b	Vegetation obscures sight distance	<ul style="list-style-type: none"> <li>Undertake vegetation trimming and clearance in accordance with both DPTI and Kangaroo Island Council vegetation management plans.</li> </ul>	1	
c	The junction is unlit	<ul style="list-style-type: none"> <li>Consider installing complying intersection and surrounds lighting to relevant standards. Install additional road side marker posts and raised reflective pavement markers (RRPMS).</li> </ul>	1	



Item No.	Risk / Hazard Description	Recommendation	Priority	Audit Response
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a	Approach signage obscured by vegetation	<ul style="list-style-type: none"> <li>Undertake clearance of vegetation in accordance with both DPTI and Kangaroo Island Council vegetation management plans.</li> </ul>	1	
b	Signage of inadequate size on approach to the junction	<ul style="list-style-type: none"> <li>Increase sign size or consider duplication and monitor effects.</li> </ul>	2	
c	The junction is unlit.	<ul style="list-style-type: none"> <li>Consider installing complying intersection and surrounds lighting to relevant standards. Install additional road side marker posts and raised reflective pavement markers (RRPMS).</li> </ul>	2	