A Review of Serious Casualty at Intersections in Tasmania
A Review of
Serious Casualty Crashes
at Intersections
in Tasmania

Traffic & Infrastructure Branch
Department of Infrastructure, Energy and Resources
January 2009
Contents

1. Introduction

2. Purpose

3. Understanding the Problem
   3.1 Crash data
   3.2 Speed limit
   3.3 Traffic control
   3.4 Crash type
   3.5 Distribution

4. How to address the Problem
   4.1 Identifying sites
   4.2 Assessing sites
   4.3 Types of improvements
   4.4 Prioritising sites

5. Progress in addressing the Problem
   5.1 Crash trends
   5.2 Discussion

6. Summary

Appendix A
Intersections with two or more serious casualty crashes

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written by:</td>
<td>Donald Howatson</td>
<td>12 Jan 2009</td>
</tr>
<tr>
<td>Reviewed by:</td>
<td>Simon Buxton</td>
<td>12 Jan 2009</td>
</tr>
</tbody>
</table>
1. Introduction

The ‘Tasmanian Road Safety Strategy 2007-2016’ sets out four key strategic directions for reducing road trauma. The second of these is to provide ‘best practice infrastructure’.

The Strategy also identifies intersection crashes as one of the three main types of crashes that result in a significant number of serious casualties in Tasmania.

There are now a number of Programs running in Tasmania that target funds at road safety improvements and the provision of best practice infrastructure. These include:

- Tasmanian Road Safety Strategy – Infrastructure Program;
- AusLink Black Spot Program;
- State Black Spot Program; and
- State Roads - Safer Roads Program.

Projects for inclusion in these Programs are identified, assessed and prioritised by the Traffic Safety Section of the Department of Infrastructure, Energy and Resources (DIER).
2. Purpose

The purpose of this Report is to:

- Improve our understanding of the incidence and circumstances of serious casualty crashes at intersections in Tasmania.

- Discuss treatment options for reducing the risk of these crashes and how to prioritise such treatments.

- Review the progress that has been achieved in reducing serious casualty crashes at intersections and the potential for further improvements.
3. Understanding the Problem

3.1 Crash data

Details of all crashes reported to Tasmania Police are recorded on a Traffic Accident Report form that is then electronically stored on the Crash Data Manager computer system which is maintained by DIER.

The Traffic Accident Report categorises the severity of the crash based on the most severe injury that was received by any person involved in the crash. Crashes where a person dies within 30 days of the crash are categorised as fatalities, and crashes where a person is admitted to hospital for at least 24 hours are categorised as serious injuries.

In this Report, the term ‘serious casualty’ is used to collectively describe fatalities and serious injuries. The numbers in this Report are based on counting each crash once — they do not allow for the fact that more than one person could be injured in the same crash.

During the five-year period (2004-2008) there were 1,569 serious casualty crashes in Tasmania, comprising 221 fatal crashes and 1,348 serious injury crashes. 238 of these serious casualty crashes occurred at intersections.

15% of serious casualty crashes occur at intersections. Intersections are inherently dangerous because they are places where drivers have to pick gaps in opposing traffic and cross the path of other vehicles.

![Diagram showing 15% of crashes occur at intersections and 85% occur on links.](image)

**Figure 3.1 – Serious casualty crashes (2004-2008), Location of crashes**
3.2 Speed limit

Two-thirds of serious casualty crashes at intersections occur in urban areas where the speed limit is 70 km/h or lower.

It might be expected that a greater proportion of the crashes would be in rural areas, where vehicles are travelling faster and the consequences of a collision are likely to be more severe. However, the traffic volumes through intersections in rural areas are so much lower that the number of serious casualty crashes is only half that of urban areas.

![Pie chart showing percentage of crashes at different speed limits](image)

**Figure 3.2 – Serious casualty crashes at intersections (2004-2008), Speed limit**

3.3 Traffic control

Almost three-quarters of serious casualty crashes at intersections occurred at sites controlled by ‘Give Way’ or ‘Stop’ signs, or where the T-junction rule applies.

Traffic signalised intersections accounted for more than one-fifth of the crashes. Most of the busiest intersections in Tasmania are controlled by traffic signals and the number of crashes reflects the high traffic volumes through these sites.

Crashes at all traffic signal sites were analysed in detail in 2006 and the layout of eight sites was upgraded to improve safety. It is intended to conduct another review of crashes at traffic signals during the next twelve months.
3.4 Crash type

Around half of the serious casualty crashes at intersections involve right angle collisions. About one-sixth of the crashes involved pedestrians - most of these occurred at sites controlled by traffic signals. Another one-sixth of the crashes involved loss-of-control by drivers trying to travel through intersections too quickly – this accounted for nearly all of the crashes reported at roundabouts.
3.5 Distribution

The 238 serious casualty crashes at intersections are very dispersed – 205 locations only had a single serious casualty incident in the last five years.

![Pie chart showing the distribution of serious casualty crashes at intersections in TAS (2004-2008). The largest category is intersections with one serious casualty (93%), followed by 7% with two serious casualties and 0% with three serious casualties.]

There are only 16 intersections in Tasmania that have had more than one serious casualty crash during this period.

These locations are listed in Appendix A.

Two of the intersections had substantial safety improvements implemented in 2006 and there have been no serious casualty crashes since. Three locations have improvements funded and programmed for the near future, and a further location is nominated for funding next financial year.
4. How to address the problem

4.1 Identifying sites

In order to improve safety at an intersection there needs to be a pattern in the type of crashes occurring, so that a relevant countermeasure can be identified. If the site’s crash history involves lots of different types of crashes it is much less likely to be treatable.

The incidence of serious casualty crashes is so low that it is not statistically significant for the purposes of identifying and prioritising safety works. Established best practice is to select locations based on all casualty crashes (fatal, serious injury, minor injury and first aid) while focusing on the types of crashes that are most likely to result in serious casualty. This is the methodology prescribed for setting the AusLink Black Spot Program and it has proven to be extremely successful at delivering road trauma reduction.

4.2 Assessing sites

Once the intersections with the greatest number of casualty crashes have been identified, the assessment process essentially involves:

- analysing the crash data for the intersection in detail to establish whether there is some sort of pattern; and
- selecting the road safety treatment that best addresses the types of crashes that are occurring.

4.3 Types of improvements

Almost half of serious casualty crashes at intersections involve angle collisions.

The construction of a roundabout at an intersection can be expected to reduce the incidence of angle collisions by 80%. Roundabouts are the safest form of intersection – they simplify the driving task so that drivers only have to give way to one direction of traffic. Furthermore, because drivers need to slow down to negotiate through the roundabout any crashes that do occur tend to be of low severity.
Roundabouts are not always an appropriate form of intersection treatment. Rural highways and urban arterials need to provide for the efficient flow of traffic and it would be inappropriate to install a roundabout at every side road junction. There are other treatments available for locations that are not well suited for roundabouts.

Some intersections have angle crashes caused by drivers on the side roads not realising that they need to give way.

Photo 4.2 – A driver on the side road might overlook the signs and proceed without giving way

In this situation, the installation of traffic islands, signs and markings improve the conspicuity of the intersection and can reduce angle collisions by 25%.

Photo 4.3 – Signs and markings to enhance conspicuity of intersection
Other intersections can have crashes associated with the poor sight distance available for side road drivers trying to select a gap in the traffic stream.

![Limited sight distance for driver on side road.](image)

The installation of kerb extensions and parking restrictions allow drivers on the side road to see further and can reduce angle collisions by 25%.

![Kerb extensions](image)

### 4.4 Prioritising sites

Treatments are prioritised based on value-for-money – that is, the benefits of the scheme in terms of the crash cost savings over the next twenty years, are compared to the cost of constructing the treatment.

Experience indicates that urban treatments tend to be more cost-effective than rural treatments because there tends to be a greater concentration of casualty crashes and the cost of the treatment is substantially lower.
5. Progress in addressing the Problem

5.1 Crash trends

The ‘Tasmanian Road Safety Strategy 2007-2016’ reports that during the period 1996 to 2005 intersection crashes represented 20% of all serious casualties.

During the period 2004 to 2008, the proportion of serious casualty crashes at intersections had dropped to 15%.

The annual number of fatal and serious injury crashes at intersections has been trending downwards during the last five years.

![Bar chart showing the annual trend of serious casualty crashes at intersections (2002-2008)](chart)

**Figure 5.1** – Serious casualty crashes at intersections (2002-2008), Annual trend

5.2 Discussion

The effectiveness of intersection improvements was examined in the ‘Evaluation of the AusLink Black Spot Program in Tasmania – January 2007’. The Evaluation looked at the annual number of crashes at specific intersections before and after treatments were implemented, and it was found that substantial crash reductions were being delivered.

The significant downward trend in the annual number of serious casualty crashes at intersections reflects the substantial funding that has been made available for safety improvements and the disciplined methodology being used to allocate it. The AusLink Black Spot Program and the 2006 State Election Commitments, particularly the State Black Spot Program, have funded safety improvements at numerous intersections.

As the worst sites are treated, the remaining intersection crashes become more dispersed. Consequently, the cost-effectiveness of implementing intersection treatments tends to diminish over time. Nevertheless, a number of economically beneficial intersection upgrades have been identified for the 2009/10 Programs.
6. Summary

Detailed analysis of serious casualty crashes at intersections highlighted that:
- two-thirds occur in urban areas;
- almost half involve right angle collisions; and
- serious casualty crashes at intersections are very dispersed.

In order to improve safety at an intersection there needs to be a pattern in the type of crashes occurring, so that a relevant treatment can be identified.

Over the last few years there has been a significant reduction in the number of serious casualty crashes at intersections. This reduction in road trauma is the direct return on the investment that has been made in safety improvements and it vindicates the methodology that is being used to prioritise sites for treatment.

While it is acknowledged that the cost-effectiveness of intersection treatments will tend to diminish over time, there are still a number of locations where the cost of constructing improvements would be more than outweighed by the crash cost savings. A number of intersection upgrades have been identified for the 2009/10 Programs.
Appendix A

Intersections with two or more serious casualty crashes (2004-2008)
## Intersections with two or more serious casualty crashes

<table>
<thead>
<tr>
<th>Location Description</th>
<th>Speed Limit</th>
<th>Control</th>
<th>Serious Casualty</th>
<th>Other Casualty</th>
<th>Property Damage</th>
<th>Total</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intersection of Albert Road and Main Road, Moorah, Glenorchy</td>
<td>50</td>
<td>Signals</td>
<td>3</td>
<td>1</td>
<td>11</td>
<td>15</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Brooker Highway and Goodwood Road, Goodwood, Glenorchy</td>
<td>80</td>
<td>Signals</td>
<td>2</td>
<td>8</td>
<td>28</td>
<td>38</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Illawarra Road and Tannery Road, Longford, Northern Midlands</td>
<td>80</td>
<td>Give Way</td>
<td>2</td>
<td>8</td>
<td>11</td>
<td>21</td>
<td>2009/10 Roundabout programmed</td>
</tr>
<tr>
<td>Intersection of Elizabeth Street and Macquarie Street, Hobart, Hobart</td>
<td>60</td>
<td>Signals</td>
<td>2</td>
<td>6</td>
<td>13</td>
<td>21</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of East Derwent Highway and Gage Road, Gagebrook, Brighton</td>
<td>80</td>
<td>Give Way</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>12</td>
<td>2009/10 Roundabout programmed</td>
</tr>
<tr>
<td>Intersection of Brooker Highway and Howard Road, Glenorchy, Glenorchy</td>
<td>80</td>
<td>Roundabout</td>
<td>2</td>
<td>5</td>
<td>39</td>
<td>46</td>
<td>Signals proposed for 2009/10</td>
</tr>
<tr>
<td>Intersection of Elizabeth Street and Elphinstone Road and Federal Street, North Hobart, Hobart</td>
<td>50</td>
<td>Signals</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>16</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Brisbane Street and Brooker Avenue, Hobart, Hobart</td>
<td>70</td>
<td>Give Way</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>15</td>
<td>2006 right turn banned</td>
</tr>
<tr>
<td>Intersection of Huon Highway and Southern Outlet, Kingston, Kingborough</td>
<td>60</td>
<td>Give Way</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>2006 Roundabout installed</td>
</tr>
<tr>
<td>Intersection of Huon Highway and Sandfly Road, Sandfly, Kingborough</td>
<td>100</td>
<td>Give Way</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Elizabeth Street and Warwick Street, Hobart, Hobart</td>
<td>60</td>
<td>Signals</td>
<td>2</td>
<td>1</td>
<td>16</td>
<td>19</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Davey Street and Salamanca Place, Hobart, Hobart</td>
<td>60</td>
<td>Give Way</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Inglin Street and York Street, Wynyard, Waratah/Wynyard</td>
<td>60</td>
<td>Give Way</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>2008/09 AusLink Black Spot project</td>
</tr>
<tr>
<td>Intersection of Bridge Road and Midland Highway, Ross, Northern Midlands</td>
<td>110</td>
<td>Give Way</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Don Road and Steele Street, Devonport, Devonport</td>
<td>60</td>
<td>Give Way</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>x</td>
</tr>
<tr>
<td>Intersection of Nook Road and Sheffield Road, Aegis Hills, Kentish</td>
<td>100</td>
<td>Give Way</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>x</td>
</tr>
</tbody>
</table>