A Review of Serious Casualty Pedestrian Crashes

February 2012

Department *of* Infrastructure, Energy *and* Resources

Tasmania
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A Review of

Serious Casualty Pedestrian Crashes

in Tasmania

Traffic & Infrastructure Branch
Department of Infrastructure, Energy and Resources
February 2012

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1. Introduction

This Report examines serious casualty crashes involving pedestrians in Tasmania.

The purpose of the Report is to:

- Improve our understanding of the incidence and circumstances of serious casualty crashes involving pedestrians in Tasmania.
- Discuss engineering works that can reduce the risk of pedestrian crashes.
- Review the progress that has been achieved in reducing pedestrian crashes and identify possible future initiatives.

2. Understanding pedestrian crashes

2.1 Crash data

Details of all crashes reported to Tasmania Police are recorded on Traffic Accident Report forms that are 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.

2.2 Scale of the problem

During the five-year period (2007-2011) there were 1,371 serious casualty crashes in Tasmania, comprising 182 fatal crashes and 1,189 serious injury crashes. Of these serious casualty crashes 148 (11%) involved pedestrians.

4.0% of all crashes reported to the Tasmania Police involve serious injury or death. Crashes involving pedestrians tend to be of higher severity – 15.4% of pedestrian crashes result in serious injury or death. This is why pedestrians are often referred to as 'vulnerable' road users.

2.3 Age of pedestrian

Teenagers are involved in more pedestrian crashes than other age groups.

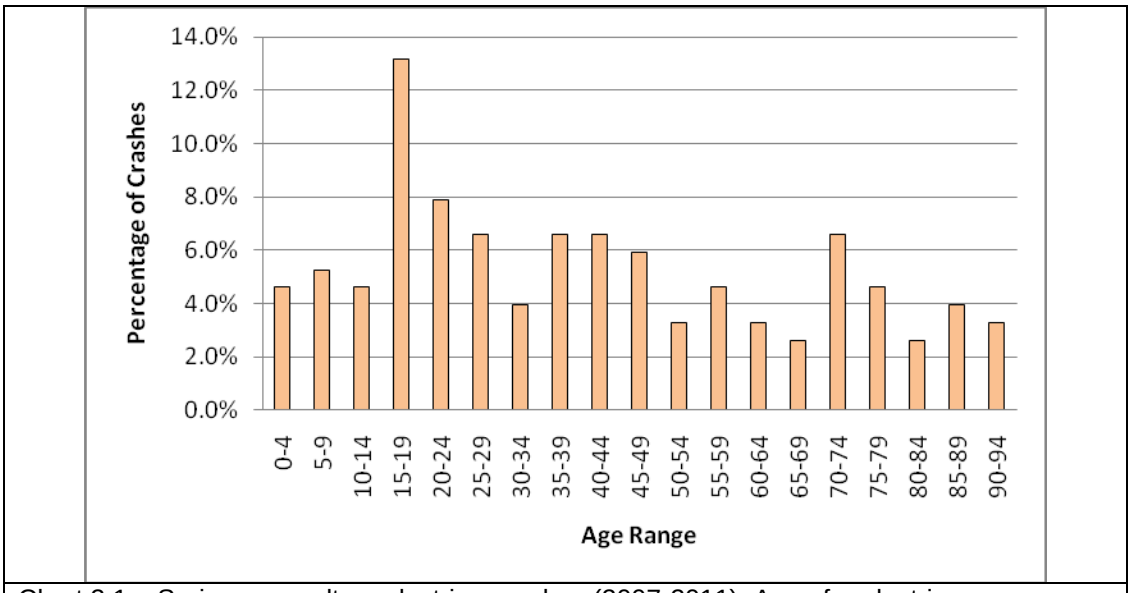


Chart 2.1 – Serious casualty pedestrian crashes (2007-2011), Age of pedestrian

2.4 Month of year

Pedestrian crashes are slightly more prevalent during the winter months.

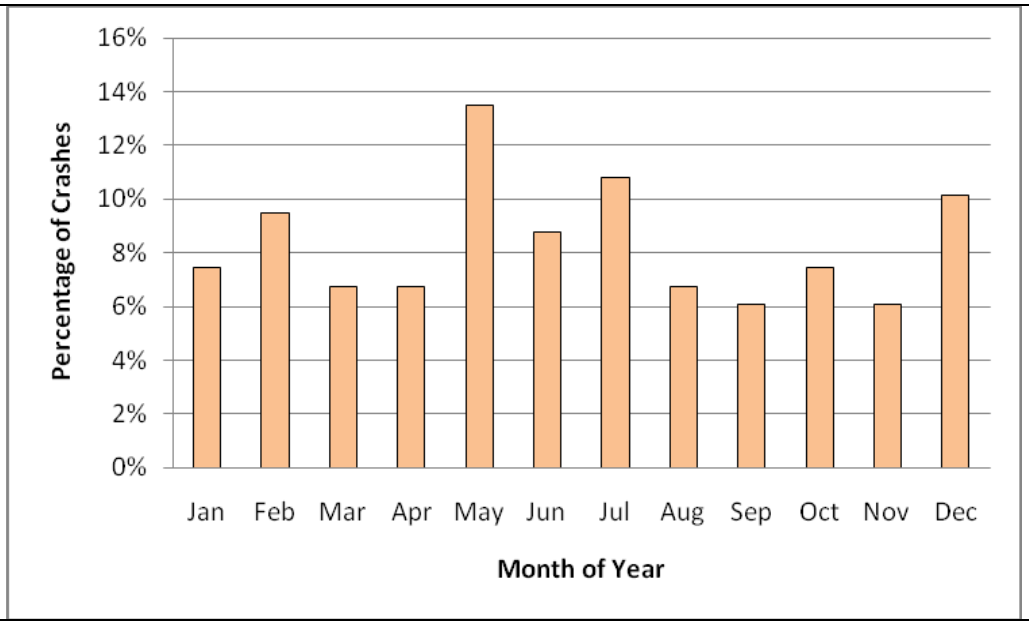


Chart 2.2 – Serious casualty pedestrian crashes (2007-2011), Month of year

2.5 Day of week

The greatest numbers of pedestrian crashes occur on Fridays and Saturdays.

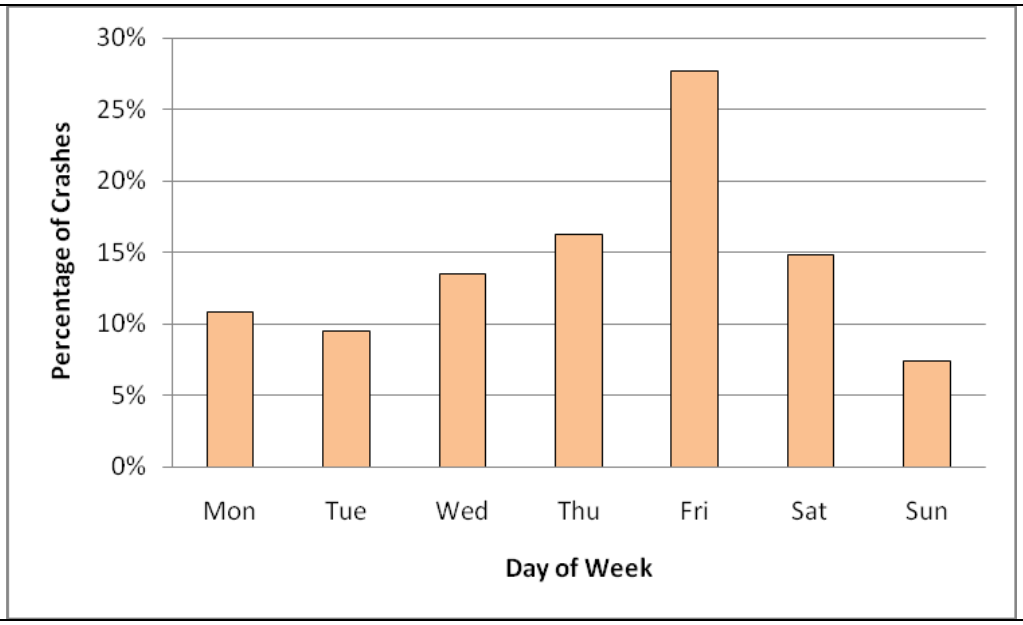


Chart 2.3 – Serious casualty pedestrian crashes (2007-2011), Day of week

Alcohol-affected pedestrians were involved in a significant proportion of the crashes at the weekend.

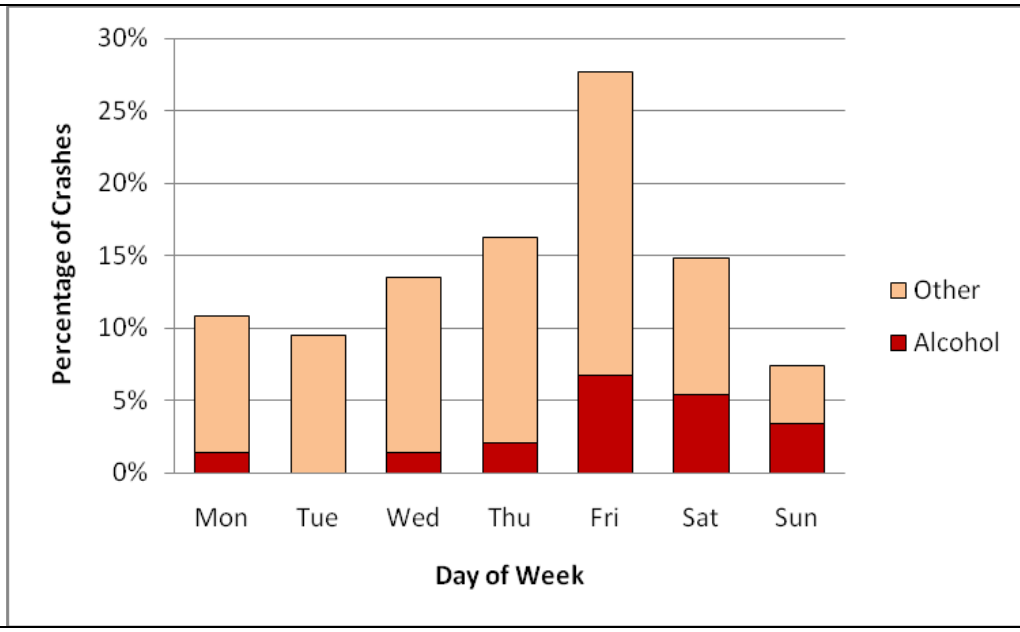


Chart 2.4 – Serious casualty pedestrian crashes (2007-2011), Alcohol identified as a cause of the crash, Day of week

2.6 Time of day

25% of serious casualty pedestrian crashes occur between 1500 and 1700 hrs. There are also a significant number of pedestrian crashes between 2100 and 0300 hrs.

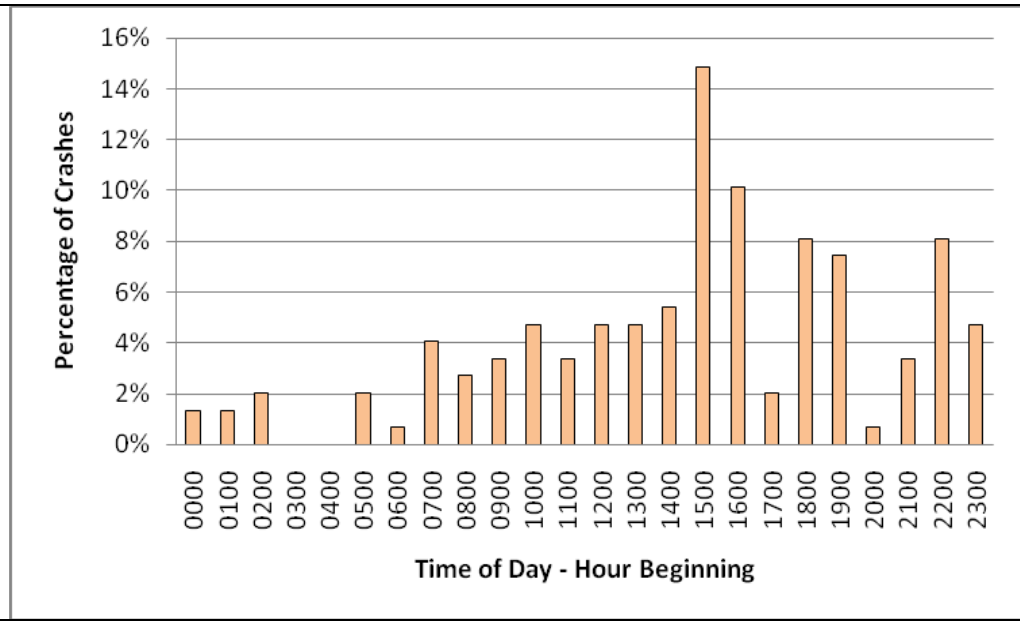


Chart 2.5 – Serious casualty pedestrian crashes (2007-2011), Time of day

Alcohol was specifically identified as a contributory factor in many of the crashes that occur in the evening and early morning. The circumstances of other night-time crashes suggest that they may have been associated with alcohol consumption.

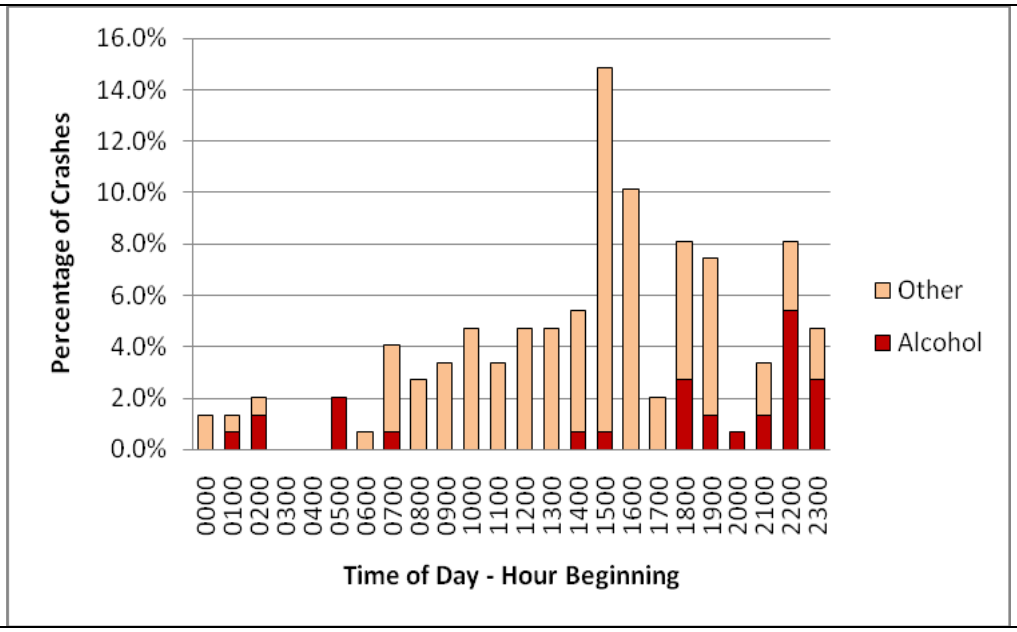
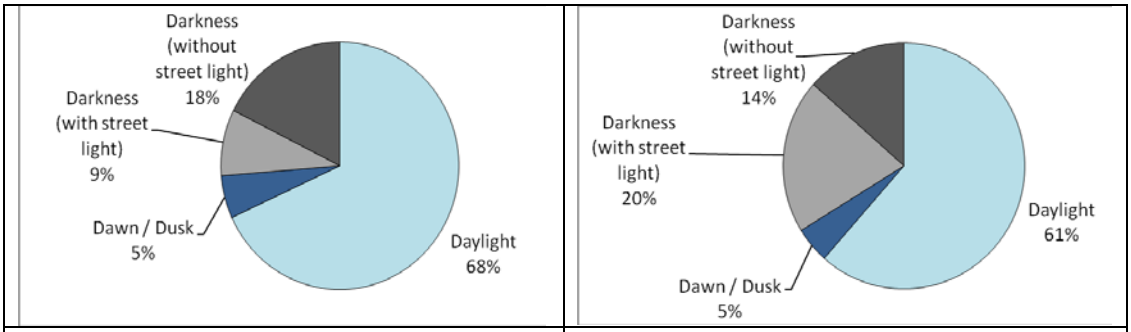


Chart 2.6 – Serious casualty pedestrian crashes (2007-2011), Alcohol identified as a cause of the crash, Time of day

2.7 Light condition

The following two pie charts compare the light conditions for all serious casualty crashes, with light conditions for serious casualty pedestrian crashes.



All serious casualty crashes | Serious casualty pedestrian crashes

Chart 2.8 – Serious casualty crashes (2007-2011), Light condition

The proportion of pedestrian crashes that occur during the hours of darkness is modestly higher than the overall average.

A greater proportion of the pedestrian crashes occurred at locations where street lighting was provided. This reflects that pedestrian crashes mostly occur in urban areas (that typically have street lighting) rather than rural areas (that typically don't have street lighting).

2.8 Speed limit

14% of serious casualty pedestrian crashes occur at off-road locations, including car parks and driveways, where the speed limit is recorded as less than 40 km/h.

Most pedestrian activity occurs in urban areas, and roads with a 50 or 60 km/h speed limit account for over half of all serious pedestrian crashes.

Rural roads (those with a speed limit of 80 km/h or greater) account for 18% of serious pedestrian crashes. The amount of pedestrian activity on rural roads is low but any incidents that do occur tend to be of high severity.

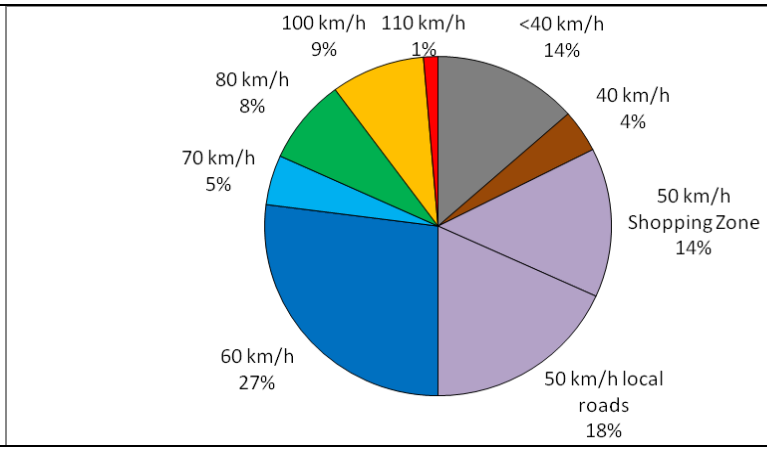


Chart 2.9 – Serious casualty pedestrian crashes (2007-2011), Speed limit

2.9 Traffic control

Almost two-thirds of crashes occur at mid-block type locations where the vehicle had priority but the pedestrian walked or ran in front of it.

15% of serious casualty pedestrian crashes occur at traffic signals. This reflects the large amount of pedestrian activity that is concentrated at these installations. About half of the crashes were caused by pedestrians ignoring the steady 'Don't Walk' signal and the other half were caused by drivers failing to give way to pedestrians when turning at traffic signals.

There were no serious casualty pedestrian crashes reported at roundabouts.

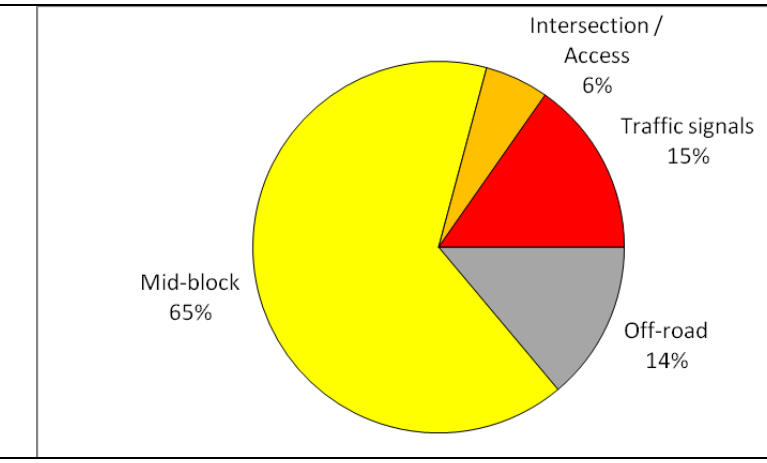


Chart 2.10 – Serious casualty pedestrian crashes (2007-2011), Traffic control

2.10 Type of crash

Details of all crashes reported to Tasmania Police are recorded on Traffic Accident Report forms. The Report includes a description of the crash, and this information is used to categorise the type of crash.

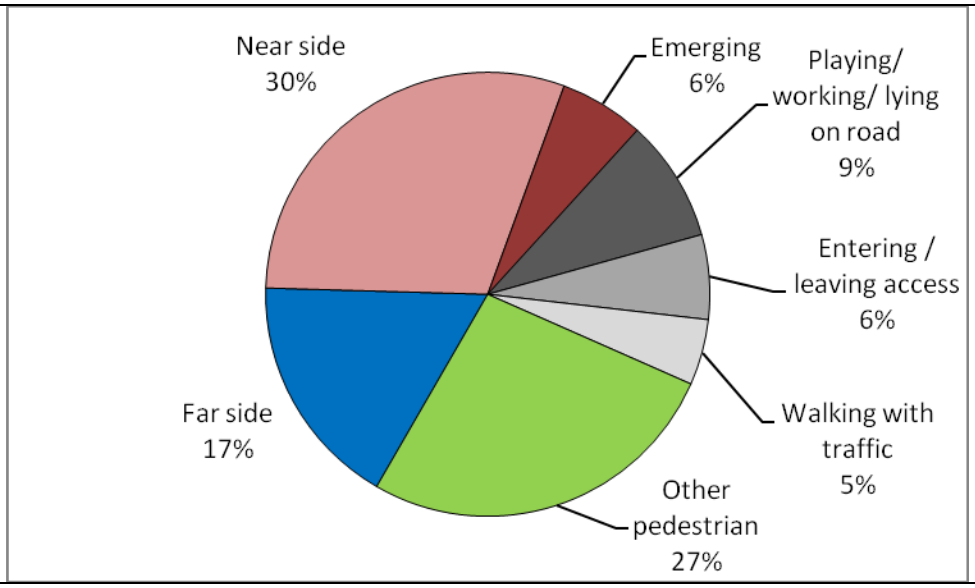


Chart 2.11 – Serious casualty pedestrian crashes (2007-2011), Type of crash

Slightly more than half of serious casualty pedestrian crashes occurred when the pedestrian was attempting to cross the road:

- 'Emerging' crashes involve a pedestrian emerging from behind a parked vehicle on the left-hand-side of the road;
- 'Near side' crashes involve a pedestrian attempting to cross the road from the left-hand-side of the motorist; and
- 'Far side' crashes involve a pedestrian attempting to cross the road from the right-hand-side of the motorist.

The lower incidence of crashes involving pedestrians crossing from the right-hand-side of the road (as viewed by the motorist) is related to the greater sight distance that is available between the motorist and the pedestrian in this type of situation.

27% of serious casualty pedestrian crashes were categorised as 'other'. This reflects the difficulty of categorising the irregular circumstances surrounding a lot of pedestrian crashes, particularly those that occur in off-road locations.

2.11 Clusters of crashes

The Crash Data Manager computer system was used to identify locations where there were clusters of casualty crashes (fatal, serious injury, minor injury and first aid) involving pedestrians. The analysis found 23 locations which had three or more casualty pedestrian crashes during the five-year period (2007-2011). These locations are listed in Appendix A.

Most of the clusters are located in the central business districts and busy shopping zones. Many of the crashes at these locations happen at traffic signals. Generally, these signals have already been provided with facilities, such as kerb extensions, to make them as safe as possible for pedestrians. The crashes mainly involve vehicles failing to give way when turning, pedestrians walking out against the steady 'Don't Walk' signal, and drivers going through red lights.

It should be noted that, although most of the clusters occur at or near traffic signals, only 15% of all serious casualty pedestrian crashes occur at signals. 66% of serious pedestrian crashes occur in mid-block locations, but these are generally dispersed.

There are no clusters of pedestrian crashes in the vicinity of schools or colleges.

3. Engineering treatments to assist pedestrians

This section provides an overview of the types of treatments that can be installed to improve pedestrian safety. Detailed technical guidance is contained in the Austroads Guide to Traffic Management and Australian Standard AS1742.10, Manual of uniform traffic control devices, Part 10: Pedestrian control and protection.

3.1 Footpaths

The fundamental type of pedestrian facility is the provision of a footpath so that pedestrians do not have to walk on the road.

3.2 Pedestrian refuges and median treatments

A pedestrian refuge is a traffic island in the middle of the road that allows pedestrian to cross the road in two stages. This is particularly useful on busy roads where there are not many gaps in the traffic. Kerb extensions can be provided in association with the pedestrian refuge to reduce the crossing distance and to improve visibility between the pedestrian and the motorist.

Traffic islands can also be installed in the mouth of side street junctions.

Photo 3.1 – A pedestrian refuge

A median treatment comprises a series of traffic islands along the middle of the road. Median treatments are appropriate where pedestrian crossing movements are dispersed along a length of road.

Photo 3.2 – A median treatment

3.3 Zebra crossings

Zebra crossings give pedestrians priority over vehicles and require the motorist to observe the pedestrian and then stop to let them cross.

Tasmanian experience indicates that this arrangement does not operate with consistent reliability. Pedestrians report near misses caused by vehicles not stopping, and nose-to-tail collisions occur on the approaches when vehicles stop unexpectedly. The sense of safety that a pedestrian may feel when using a zebra crossing will quickly prove to be illusory if the vehicle fails to stop. Furthermore, any collision between a pedestrian and a vehicle will invariably result in the pedestrian being injured – regardless of who was legally at fault.

Experience has shown that other types of pedestrian facility, such as pedestrian refuges, where the pedestrian takes responsibility for identifying a gap in the traffic to cross the road operate more safely. Accordingly, most mid-block zebra crossings in Tasmania have now been removed or replaced with other types of facilities.

3.4 Traffic signals

Pedestrian operated signals can be installed at locations where traffic volumes along the road and the number of pedestrians crossing are both high. Pedestrian signals are not effective when pedestrian crossing movements are dispersed along a length of road – experience has shown that pedestrians will not deviate far from the shortest route to their destination.

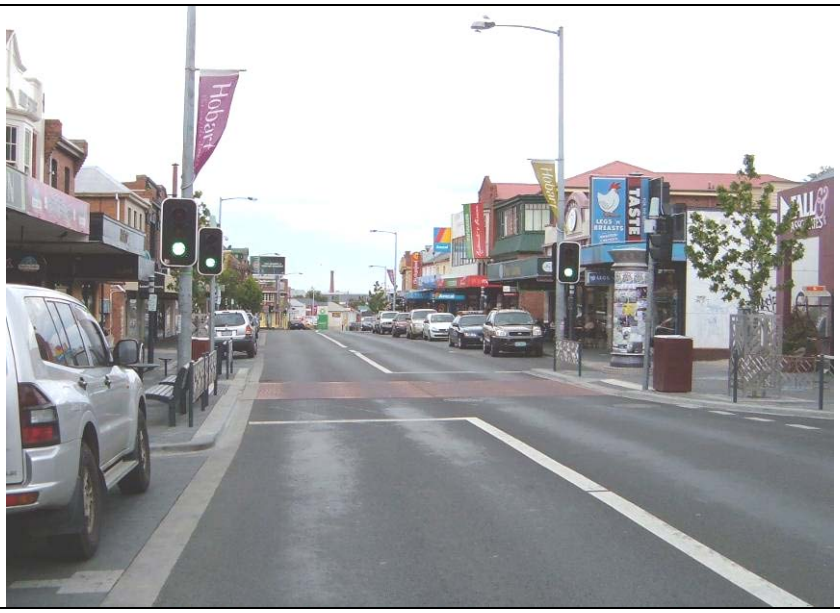


Photo 3.3 – Pedestrian operated signals

Intersections controlled by traffic signals normally include facilities for pedestrians. Traffic turning left or right at the intersection is required to give way to pedestrians. Kerb extensions can be provided to reduce the crossing distance for pedestrians and, where there is more than one lane of turning traffic, pedestrians can be given an 'early start' that allows them to start crossing before any traffic starts to move.

Photo 3.4 – Signal controlled intersection with provision for pedestrians

3.5 Underpasses and overpasses

Underpasses and overpasses theoretically provide the highest degree of pedestrian safety by separating pedestrians and vehicles. However, they are extremely expensive to install and maintain, and their long ramps or stairs discourage some people from using them.

Furthermore, experience has shown that pedestrians will not deviate far from the shortest route to their destination. Underpasses and overpasses are generally only provided to help people cross highways.

Photo 3.5 – An overpass

3.6 Vehicle speeds

Lower vehicle speeds improve pedestrian safety – they make it easier for pedestrians to identify gaps in the traffic to safely cross the road, and they reduce the likely severity of any collisions that do occur.

However, simply reducing the posted speed limit is not guaranteed to have a substantial effect on operating speeds. In order to attract compliance, the speed limit needs to reflect the road environment. Operating speeds can be reduced by narrowing the traffic lanes or installing traffic calming.

Photo 3.6 – Traffic management to reduce operating speeds

Part-time 40 km/h school zones operate in the vicinity of schools and cover the periods of high pedestrian activity at the beginning and end of the school day. The Tasmanian Road Safety Strategy – Infrastructure Program is funding the replacement of the old conventional style school zone signs with new electronic signs. The new signs have more impact because they only come on when the lower limit applies. They are expected to improve awareness and compliance with the lower limit.

Photo 3.7 – An electronic 40 km/h school zone sign

4. Addressing pedestrian crashes

4.1 Crash Trends

The annual number of fatal and serious pedestrian crashes has substantially reduced during the last decade, with the number of crashes in recent years being some 40% lower than the number recorded ten years ago.

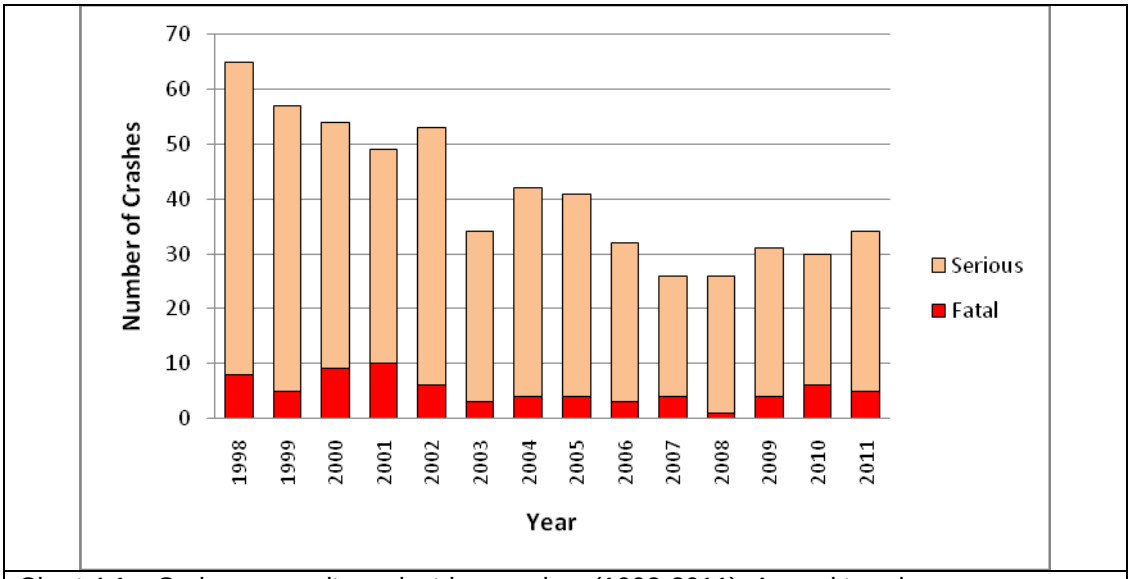


Chart 4.1 – Serious casualty pedestrian crashes (1998-2011), Annual trend

On 1 May 2002, the Tasmanian Government reduced the general urban speed limit from 60 to 50 km/h. Urban arterial roads carrying substantial volumes of through traffic retained a 60 km/h speed limit, but shopping zones (including city centres) and local streets were reduced to 50 km/h. This reduction in the speed limit corresponds with a step down in the annual number of serious casualty pedestrian crashes.

4.2 Current situation

Pedestrians are vulnerable road users and Tasmanian road authorities have been proactively installing treatments to improve pedestrian safety for many years. The city centres and busy shopping zones have been provided with signal controlled intersections and mid-block pedestrian operated signals. Many neighbourhood shopping zones and urban arterials have been provided with pedestrian refuges and median treatments.

The Crash Data Manager computer system is used to monitor the network and identify any intersections or sections of road with an over-representation of pedestrian crashes. Traffic accident reports are analysed in detail and treatments developed that will address any specific problems. Pedestrian safety improvements can be funded by the road owner or nominated for the Australian Government's Black Spot Program.

Schemes to improve pedestrian safety are also being encouraged through the 'Safer Travel Speeds in Urban Spaces' program. As part of the Tasmanian Road Safety Strategy, Councils are invited to nominate relevant traffic management proposals to receive a 50/50 funding contribution from the Tasmanian Government.

4.3 Possible future initiatives

Given the marked improvement in pedestrian safety that was achieved by reducing the speed limit from 60 to 50 km/h in city centres, shopping zones and local streets, it has been suggested that pedestrian safety could be further improved by reducing the speed limit on

urban arterials to 50 km/h. However, community reaction and compliance to lower speed limits would need to be carefully considered.

The speed limit on the arterial roads around central Hobart was reduced from 60 to 50 km/h in August 2011. These include the roads with the highest concentrations of vulnerable road users – pedestrians, cyclists and motorcyclists.

The greatest concentration of pedestrian casualty crashes (fatal, serious injury, minor injury and first aid) occurred in and around the city centres and busy shopping zones. These locations already have a high standard of facilities for pedestrians with traffic signals provided at regular intervals. However, pedestrian safety could be improved by the application of lower speed limits during the periods of high pedestrian activity. This could be achieved using the same type of electronic signs that are being installed for school zones.

The effectiveness of lower speed limits during periods of high pedestrian activity is going to be trialled by providing a part-time 40 km/h speed limit along Main Road through Moonah shopping zone. This scheme is scheduled for implementation in early 2012.

The effectiveness of the above initiatives will be assessed by comparing crash data for the periods before and after the speed limit reduction.

5. Summary

5.1 Understanding pedestrian crashes

Crashes involving pedestrians account for 11% of all serious casualty crashes in Tasmania. Pedestrians are often referred to as 'vulnerable' road users because, if they are involved in a crash, they are more likely to be injured than other road users.

Teenagers are involved in more pedestrian crashes than other age groups.

25% of serious casualty pedestrian crashes occur between 1500 and 1700 hrs.

Alcohol was prevalent as a cause of many of the serious casualty pedestrian crashes at the weekend and mainly occurred between 2100 and 0300 hrs the following morning.

Most pedestrian activity occurs in urban areas and roads with a 50 or 60 km/h speed limit account for most serious casualty pedestrian crashes. Almost two thirds of pedestrian crashes occur at mid-block type locations where the vehicle had priority but the pedestrian walked or ran in front of it.

5.2 Engineering treatments to assist pedestrians

There are a range of engineering treatments available that can improve pedestrian safety and Tasmanian road authorities have been proactively installing such treatments for many years. We are now approaching the situation where the great majority of roads that have significant pedestrian crossing activity have already been provided with pedestrian facilities. Nevertheless, pedestrian crashes are monitored and schemes are developed to address any problem locations.

5.3 Addressing pedestrian crashes

The annual number of fatal and serious pedestrian crashes has substantially reduced during the last decade. The reduction of the general urban speed limit from 60 to 50 km/h on 1 May 2002 resulted in a reduction in the annual number of serious casualty pedestrian crashes.

Reducing the speed limit from 60 to 50 km/h on urban arterials would further improve pedestrian safety but community reaction and compliance with the lower limit would need to be carefully considered.

The application of lower speed limits in city centres and busy shopping zones during the periods of high pedestrian activity would also improve pedestrian safety, and could be achieved with the new type of electronic signs that are being used in school zones.

Appendix A - Locations with clusters of pedestrian crashes

Ref	Street	Section (length)	Town / Suburb	Pedestrian casualty crashes	At signals	Not at signals	Comment
1	Macquarie Street	Harrington Street - Argyle Street (600m)	Hobart	19	15	4	speed limit was reduced from 60 to 50 km/h in August 2011
2	Liverpool Street	Argyle Street - Watchorn Street (500m)	Hobart	10	5	5	possible 40 km/h shopping zone
3	Harrington Street	Collins Street - Liverpool Street (200m)	Hobart	9	6	3	possible 40 km/h shopping zone
4	Davey Street	Murray Street - Salamanca Place (150m)	Hobart	8	5	3	speed limit was reduced from 60 to 50 km/h in August 2011
5	Main Road	through Moonah shopping zone (400m)	Moonah	7	4	3	electronic 40 km/h shopping zone scheduled for early 2012
6	Murray Street	Melville Street - Liverpool Street (250m)	Hobart	6	2	4	50 km/h speed limit extended in August 2011
7	Brisbane Street	Bathurst Street - Wellington Street (200m)	Launceston	6	3	3	existing traffic signals
8	George Street	York Street	Launceston	6	6	0	existing traffic signals - extended 'early start' scheduled
9	Sandy Bay Road	through Sandy Bay shopping zone (300m)	Sandy Bay	6	1	5	possible 40 km/h shopping zone
10	Wiseman Street	Mylan Crescent - Agar Court (400m)	Burnie	5	0	5	proposal to reduce speed limit from 60 to 50 km/h
11	William Street	Best St - Oldaker St, through shopping zone (150m)	Devonport	4	0	4	possible electronic 40 km/h shopping zone
12	St John Street	Vincent Street - The Mall (200m)	Launceston	4	1	3	possible 40 km/h shopping zone
13	Wilson Street	Ladbrooke Street	Burnie	3	3	0	existing traffic signals
14	Main Road	past Windsor Street, near take-away shops (50m)	Glenorchy	3	0	3	existing pedestrian refuge
15	Argyle Street	Brisbane Street	Hobart	3	3	0	existing traffic signals - kerb extensions funded by 2011/12 Black Spot Program
16	Campbell Street	Bathurst Street	Hobart	3	3	0	existing traffic signals
17	Campbell Street	Collins Street	Hobart	3	3	0	existing traffic signals
18	Harrington Street	Bathurst Street	Hobart	3	3	0	existing traffic signals
19	Macquarie Street	Barrack Street	Hobart	3	3	0	existing traffic signals
20	Main Street	through Huonville shopping centre (300m)	Huonville	3	0	3	existing roundabout and median treatment
21	Paterson Street	St John Street	Launceston	3	3	0	existing traffic signals
22	Sandy Bay Road	past Lambert Avenue, near Casino (150m)	Sandy Bay	3	0	3	recent median treatment funded by 2010/11 Black Spot Program
23	Reibey Street	King Edward Street	Ulverstone	3	3	0	existing traffic signals

TRAFFIC & INFRASTRUCTURE

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