NSW GOVERNMENT Transport for NSW

Centre for Road Safety

TOWARDS ZERO

Pedestrian trauma trends

Report

March 2017 | Version: 1

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Contents

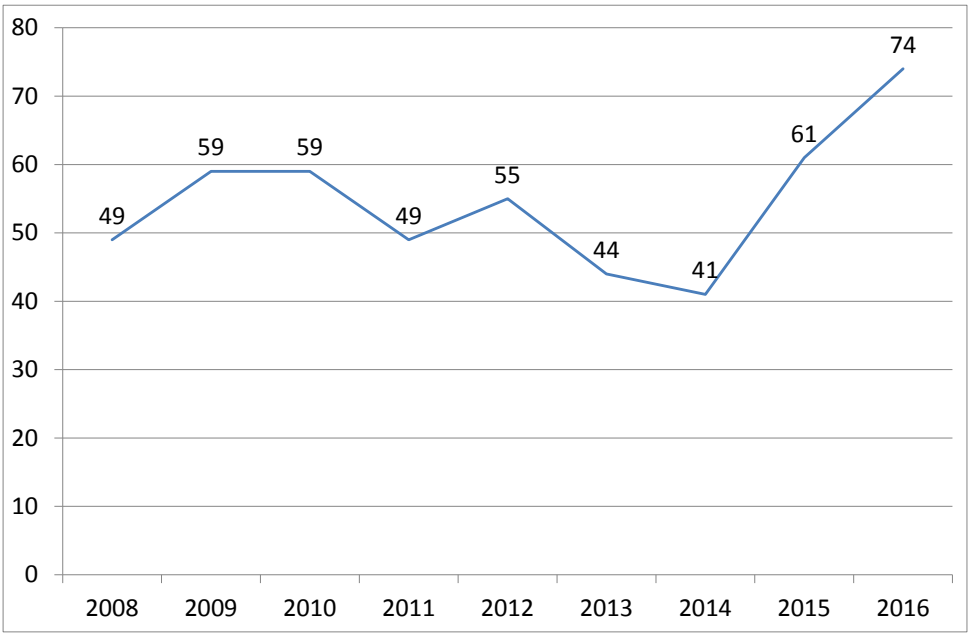
1 Pedestrian fatalities and serious injuries since 2008

The following overview of pedestrian trauma in NSW is limited to the most recent available data. For fatalities, this covers the calendar years 2008 to 2016. For serious injuries, data up to 30 June 2016 are used, therefore the analyse of serious injuries is undertaken in terms of financial years. For both fatalities and serious injuries, the 2016 data are preliminary and subject to change.

1.1 Fatalities

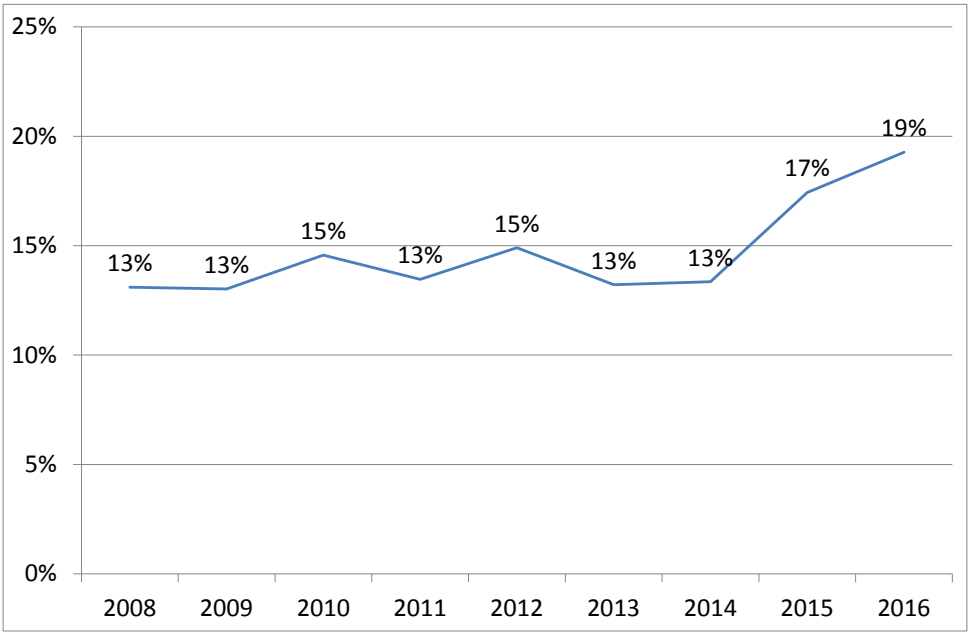
1.1.1 Pedestrian fatalities each year 2008 to 2016

The total number of pedestrian fatalities was 167 for 2008-10 and 176 for 2014-16 (increase of 5 per cent). The chart below shows that individual annual fatality numbers differ considerably across these periods. Pedestrian fatalities were at a record low in 2014, but increased in 2015 and 2016. The 2016 total of 74 fatalities was the highest since 2005, when there were 96 pedestrian fatalities.



1.1.2 Pedestrian fatalities as a proportion of all fatalities each year 2008 to 2016

Pedestrian fatalities represented 16 per cent of all fatalities in the five years (2012 to 2016). After steadily averaging 14 per cent of total fatalities from 2008 to 2014, the proportion of fatalities increased in 2015 (17 per cent) and again in 2016 (19 per cent).

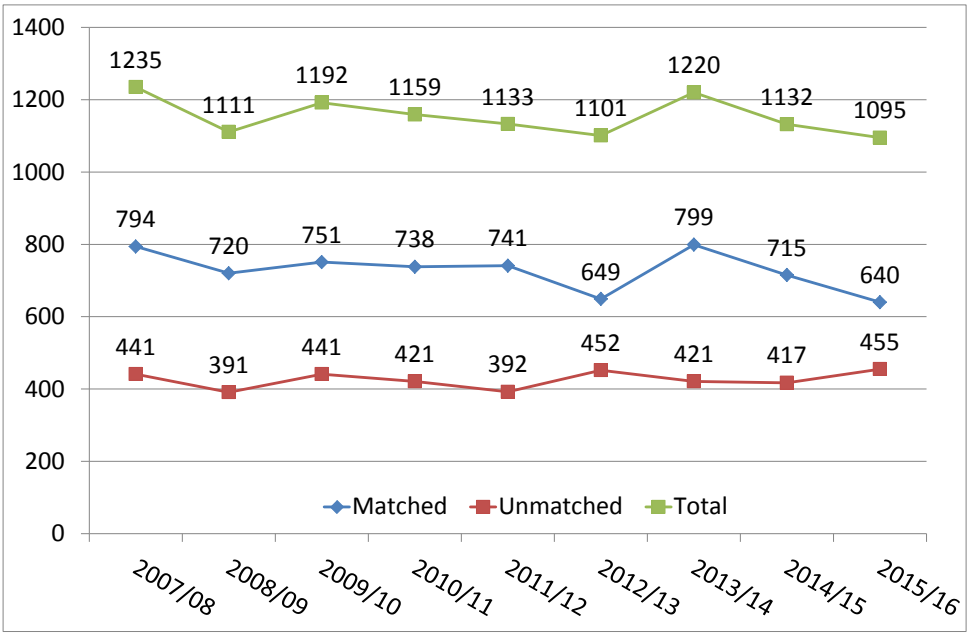


1.2 Serious injuries

1.2.1 Pedestrian serious injuries each financial year 2007/08 to 2015/16

Unlike pedestrian fatalities, pedestrian serious injuries have not increased in recent years. For the calendar years, 2008-10, there were 3,490 serious injuries. For the three years ended 30 June 2016, there were 3,447 serious injuries, 1 per cent less than 2008-10.

In the below chart, serious injuries are divided into those that are matched to police crash reports and those that are unmatched. Serious injuries are identified via hospital records. The extent to which these can be matched to a police crash report varies considerably among road user groups. Of pedestrian hospitalisations, 63 per cent were matched and 37 per cent remain unmatched.



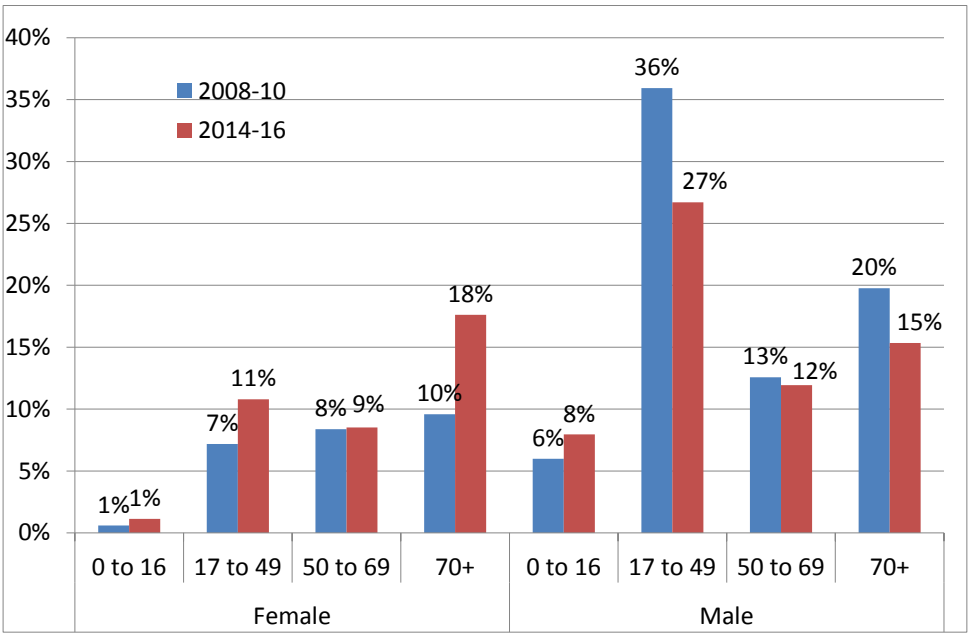
1.2.2 Road user group matched or unmatched to a police crash report, 2007/08 to 2015/16

Hospitalisations				
Road user group	Matched	Unmatched	Total	% Unmatched
Pedestrian	6,547	3,831	10,378	37%
Driver	29,895	6,032	35,927	17%
Passenger	8,431	6,472	14,903	43%
Motorcyclist	10,500	12,855	23,355	55%
Pedal Cyclist	2,933	13,573	16,506	82%
Other road user	7	6,059	6,066	100%
Total	**58,313**	**48,822**	**107,135**	**46%**

1.3 Age and gender

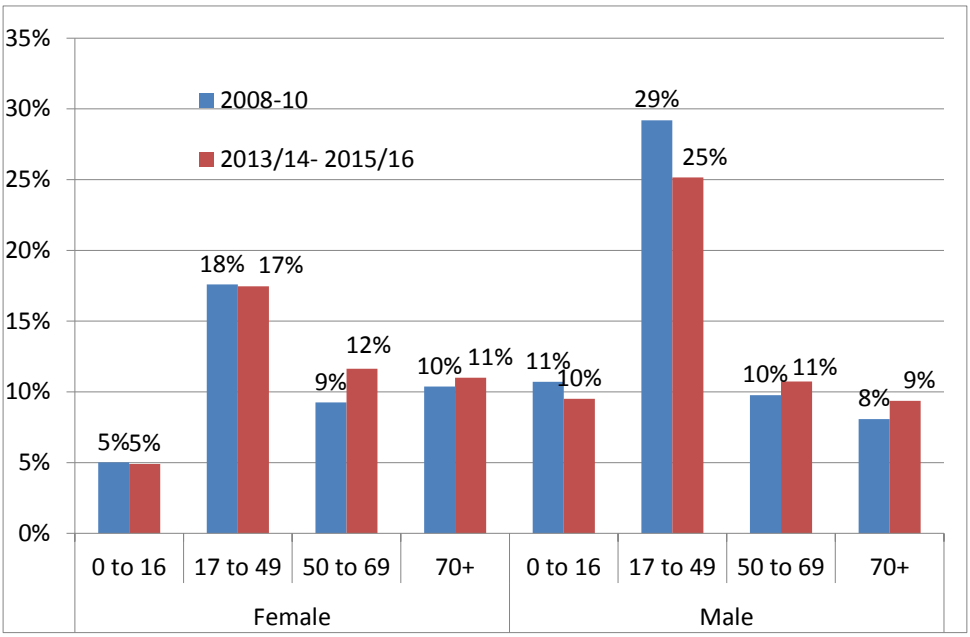
1.3.1 Distribution of pedestrian fatalities by age and gender, comparing 2008-10 with 2014-16

Males make up the majority of pedestrian fatalities. The proportion of fatalities that were female increased in 2014-16 compared to 2008-2010. The proportion of females was 26 per cent over 2008-10, and 38 per cent over 2014-16. The largest proportional increase was in females aged 70 or older, with the annual average of 5.3 in 2008-10 increasing to 10.3 in 2014-16. The largest proportional decrease was in males aged 17 to 49 years, with the annual average of 20.0 in 2008-10 decreasing to 15.7 in 2014-16.



1.3.2 Distribution of pedestrian serious injuries by age and gender, comparing 2008-10 with 2014-16

Males also make up the majority of pedestrian serious injuries, however the proportion of pedestrian serious injuries that were female increased slightly, from 42 per cent in 2008-2010, to 45 per cent during 2013/14-2015/16.



2 Factors in pedestrian trauma: alcohol, time of day and seasons

2.1 Alcohol

2.1.1 Blood alcohol concentration of pedestrian fatalities 2012 to 2016

The blood alcohol concentration (BAC) is known for most pedestrian fatalities, with only 10 per cent unknown. Most of the cases where BAC was unknown are where the pedestrian was younger than 17 or older than 69.

Of pedestrian fatalities aged 17 to 49 in 2012 to 2016, 39 per cent had a BAC of 0.05 or higher.

	Blood alcohol concentration range					
Age group	**<.05**	**≥0.05 & < 0.15**	**≥0.15**	**Unknown**	**Total**	**% ≥0.05**
0 to 16	17	1	0	8	26	4%
17 to 49	57	6	33	4	100	39%
50 to 69	38	1	11	4	54	22%
70+	81	3	0	11	95	3%
Total	**193**	**11**	**44**	**27**	**275**	**20%**

2.1.2 Proportion of pedestrian fatalities by BAC, comparing 2008-10 with 2014-16

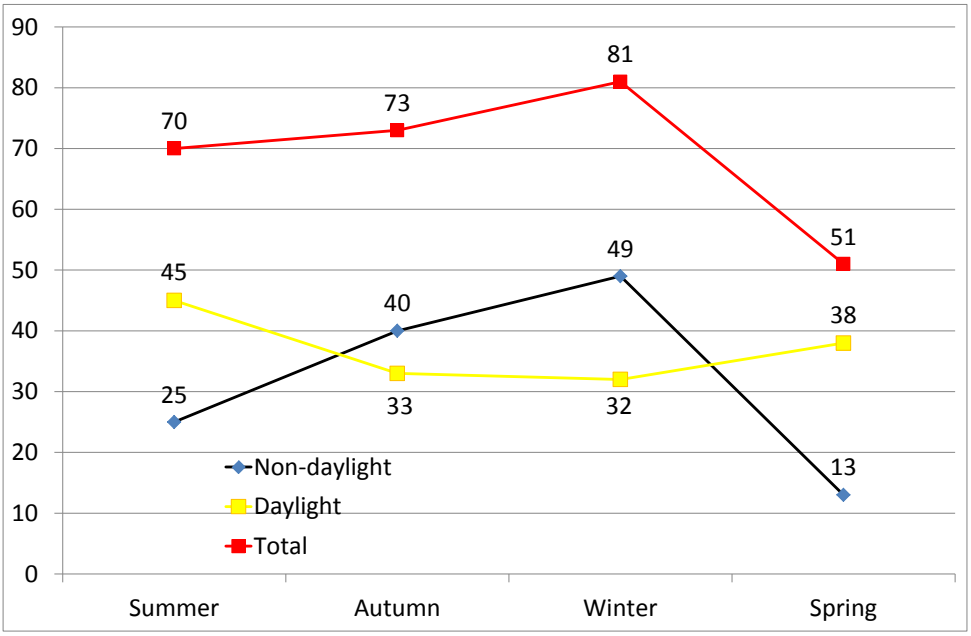
The proportion of pedestrian fatalities with BAC of 0.05 or higher was less in 2014-16 than in 2008-10. For those aged 17 to 49, the proportion with a BAC of 0.05 or higher was 54 per cent in 2009-10 and 39 per cent in 2014-16.

For serious injuries, BAC information is available only if the hospitalisation has been matched to a police report. Even then, BAC was unknown for most matched serious injuries; 61 per cent of matched serious injuries had unknown BAC for the five years ended 30 June 2016.

2.2 Seasons

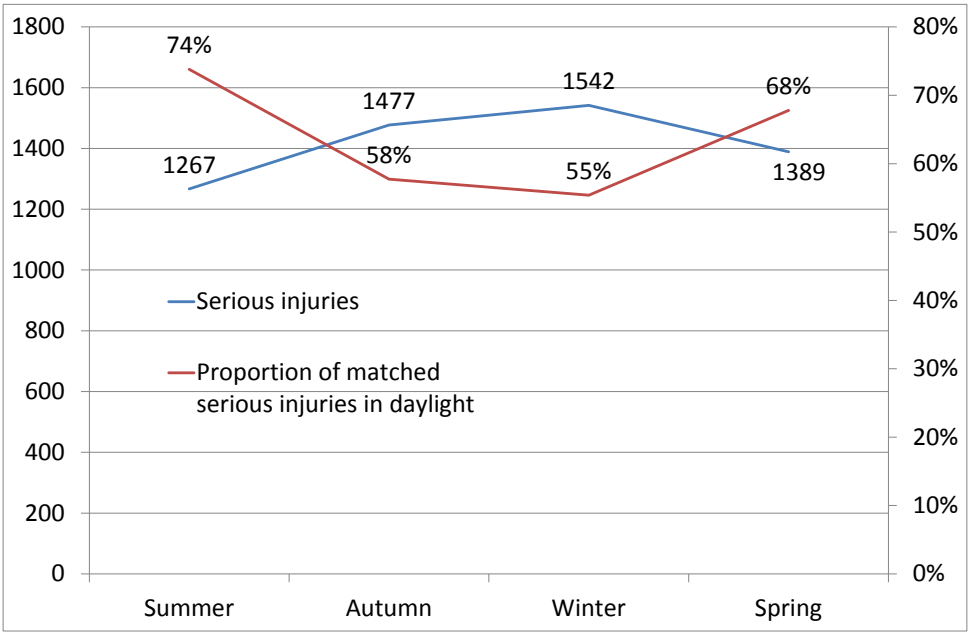
2.2.1 Pedestrian fatalities in different seasons, 2012 to 2016

In the below chart, non-daylight includes darkness, dawn and dusk. There are more pedestrian fatalities in winter.



2.2.2 Pedestrian serious injuries in different seasons, five years ended 30 June 2016

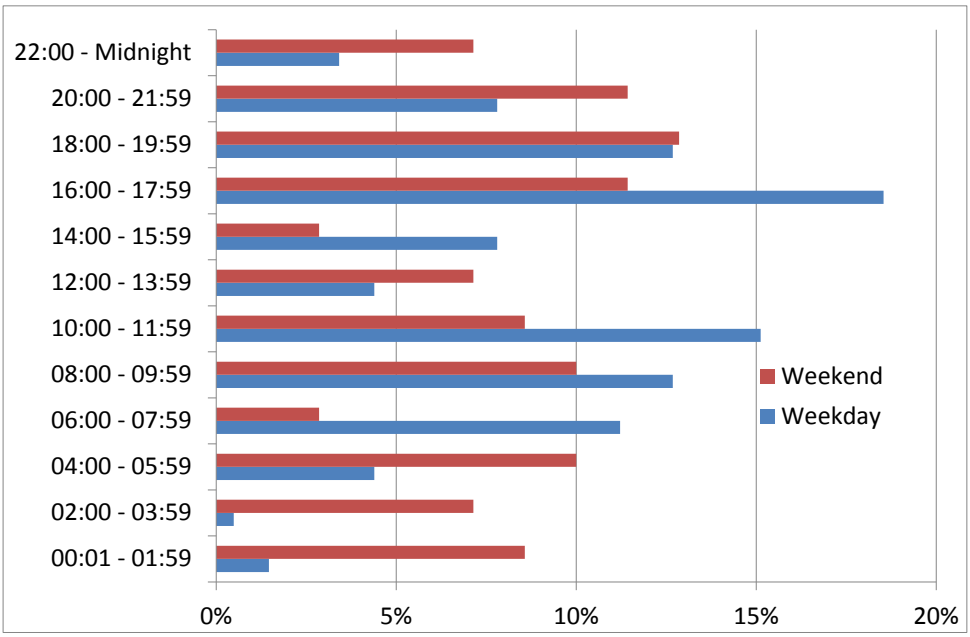
Unless the hospitalisation is matched, it is not known whether it was daylight at the time of the crash, and so the below chart shows the proportion of matched serious injuries that happened in daylight in each season.



2.3 Day of week, hour of day

2.3.1 Proportions of weekday fatalities and proportions of weekend fatalities, by two-hour daily intervals, 2012 to 2016

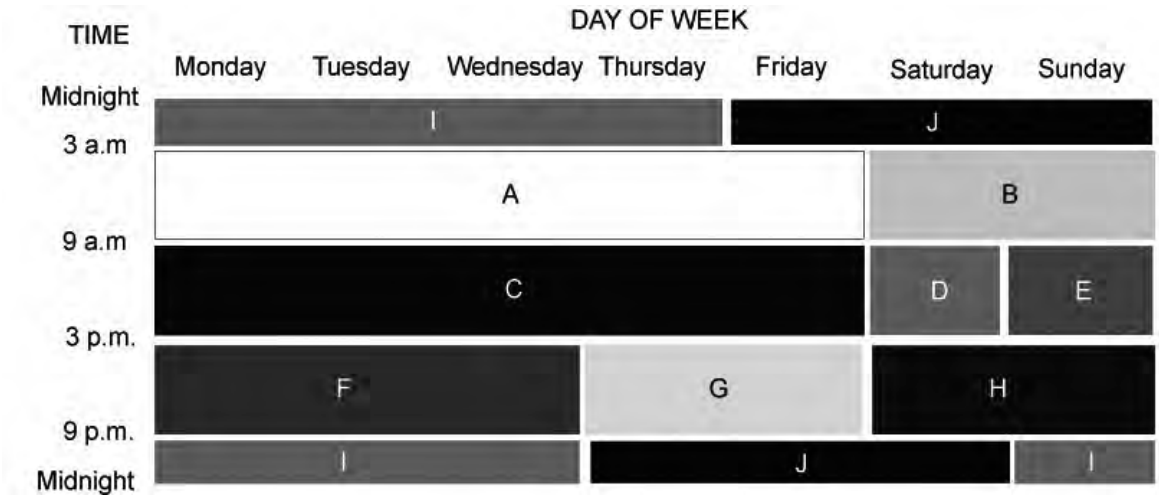
In the five years, 2012 to 2016, there were 205 fatalities on weekdays and 70 on weekends. Per day, therefore, there were 17 per cent more fatalities on a weekday than on a weekend day.



On weekdays, the fatalities tend to happen during the day, with a morning peak and stronger afternoon peak. On weekends, a much larger proportion of fatalities occur in hours of darkness. This could reflect the times when alcohol (or other drugs) could be a factor.

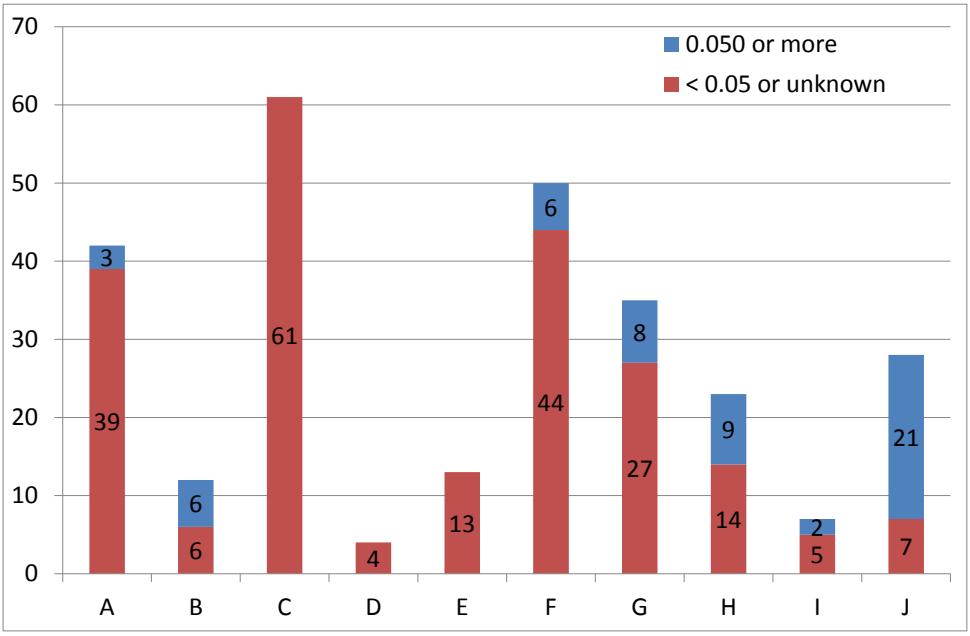
2.3.2 McLean time periods

McLean time periods were devised to capture times of the week when drink driving was likely, but the times appear to be useful for analysis of pedestrian trauma as well.



2.3.3 Pedestrian fatalities by McLean time periods and the pedestrian's BAC, 2012 to 2016

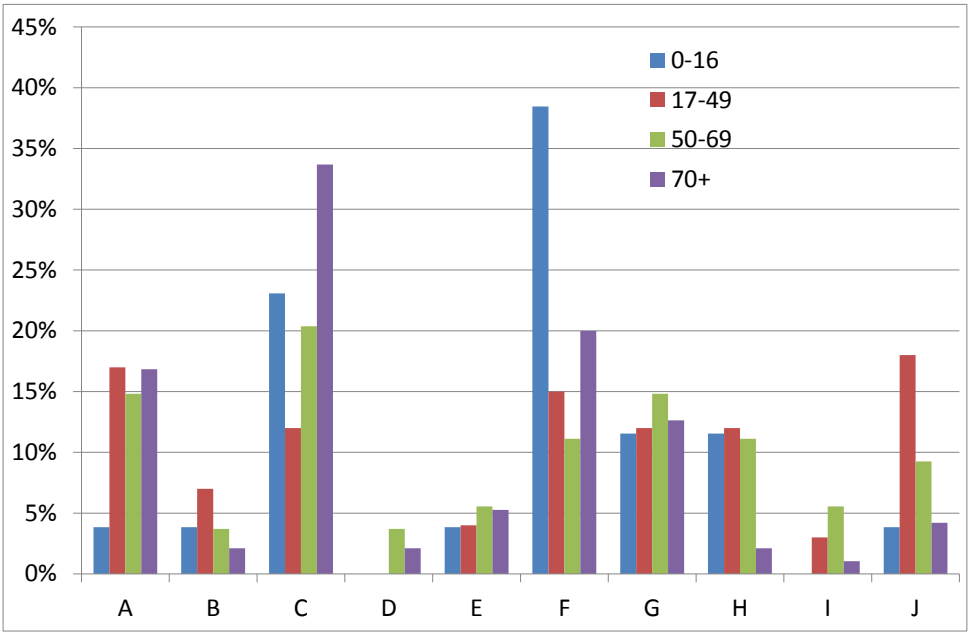
Of the 56 fatalities with a BAC of 0.05 or higher, 21 occurred in period J (Thursday to Saturday, 9 pm to 3 am).



Note: Although pedestrian fatalities with a BAC of 0.05 or higher tend to happen at similar times to drink driving crashes, it is rare for a pedestrian fatality to involve a drink driver. Of the 275 pedestrian fatalities 2012 to 2016, seven (2.5 per cent) involved a driver with an illegal BAC.

2.3.4 Distributions for four age groups of fatalities over McLean times, 2012 to 2016

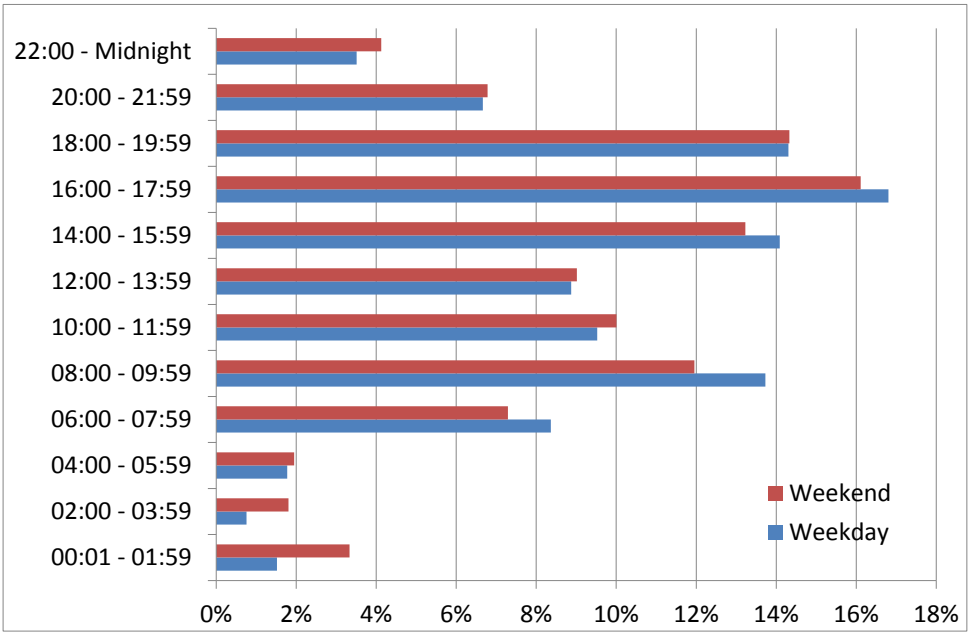
Because of different exposure patterns and the different distributions of alcohol over age groups it would be expected that there would be different distributions of fatalities by McLean times, depending on age groups. This is born out in the chart below.



2.3.5 Proportions of weekday matched serious injuries and proportions of weekend matched serious injuries, by two-hour daily intervals, five years ended 30 June 2016

For matched serious injuries, the distribution over two hour intervals for weekdays is similar to the distribution for weekend days. There is a slightly greater percentage on late night times for weekends compared to weekdays.

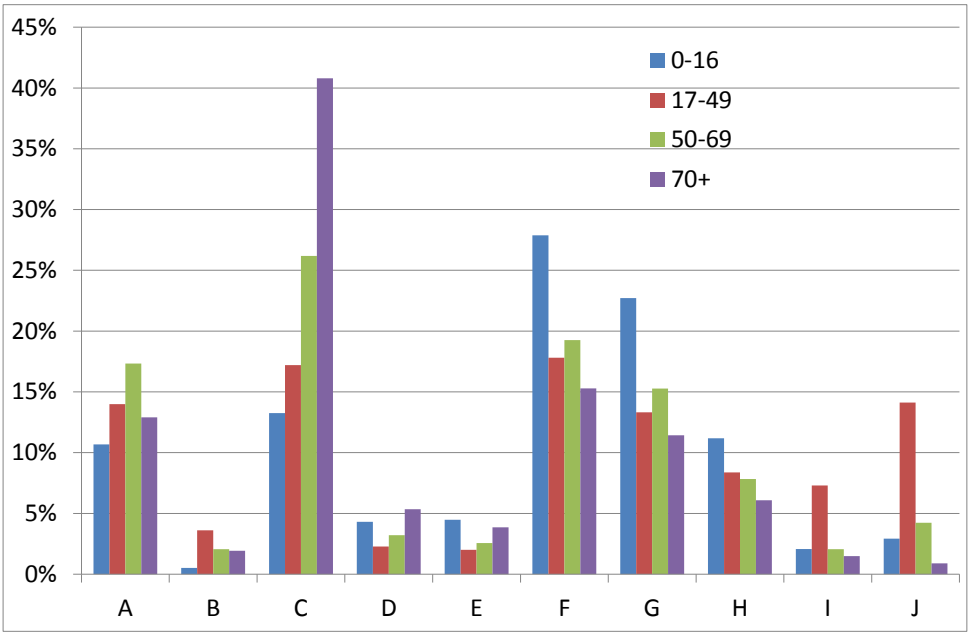
For the McLean time periods, there is insufficient BAC information to complete a breakdown by BAC.



2.3.6 Distributions for four age groups, of matched serious injuries over McLean times, five years ended 30 June 2016

Alcohol was an important factor for 17 to 49 year old fatalities. Periods I and J are substantial parts of the time distribution of 17 to 49 year old matched serious injuries, which suggests that alcohol may also be an important factor for serious injuries in this age group.

School travel times are defined as 07:30-09:30 and 14:30-17:00 on a weekday, outside school holidays. Of the 17 fatalities aged 5 to 16 years for 2012 - 2016, nine occurred during these times. Of the 471 matched serious injuries aged 5 to 16 for the five years ended 30 June 2016, 215 (46 per cent) occurred during school travel time.



3 Key traffic unit: heavier vehicles and fatalities

The “key” traffic unit is generally the vehicle whose movements are considered to have played the major role in the crash. It does not necessarily translate into fault or blame for the vehicle driver or rider. In pedestrian crashes, there is particularly no known ‘fault’, because if there is only one vehicle it is coded as the key traffic unit.

3.1 Key traffic unit in pedestrian fatalities 2012-16, and pedestrian matched serious injuries five years ended 30 June 2016

	Fatalities		Matched serious injuries	
Key traffic unit	**Number**	**%**	**Number**	**%**
Car (sedan/hatch)	115	42%	1,927	54%
4 wheel drive	37	13%	383	11%
Passenger van	11	4%	61	2%
Station wagon	8	3%	200	6%
Utility	7	3%	60	2%
Panel van	0	0%	2	0%
Car/car derivative	178	65%	2,633	74%
Light truck	44	16%	376	11%
Heavy truck	32	12%	60	2%
Bus	13	5%	88	2%
Motorcycle	2	1%	79	2%
Pedal cycle	0	0%	52	1%
Other	0	0%	6	0%
Unknown motor vehicle	6	2%	239	7%
Unknown	0	0%	5	0%
Total	**275**	**100%**	**3,538**	**100%**

In the above table, a car/car derivative includes sedan, station wagon, utility (based on car design), panel van (based on car design), coupe, hatchback, sports car, passenger van and four-wheel drive passenger vehicle.

Trucks (including light trucks) and buses are a higher proportion of fatalities (32 per cent) than of matched serious injuries (15 per cent).

4 Location factors and speed limits

4.1 Urbanisation and road classification

Most pedestrian trauma occurs in metropolitan areas. In the five years ended 30 June 2016:

- 67 per cent of pedestrian fatalities occurred in metropolitan areas.
- 84 per cent of pedestrian matched serious injuries occurred in metropolitan areas.

The distribution of casualties by road classification differs by injury severity and urbanisation.

4.1.1 Pedestrian fatalities 2012-16, by road classification and urbanisation

	Metropolitan		Country		Total	
	Number	%	Number	%	Number	%
Freeway/motorway	10	5%	0	0%	10	4%
State highway	67	36%	20	23%	87	32%
Other classified road	23	12%	33	38%	56	20%
Unclassified road	87	47%	35	40%	122	44%
Total	**187**	**100%**	**88**	**100%**	**275**	**100%**

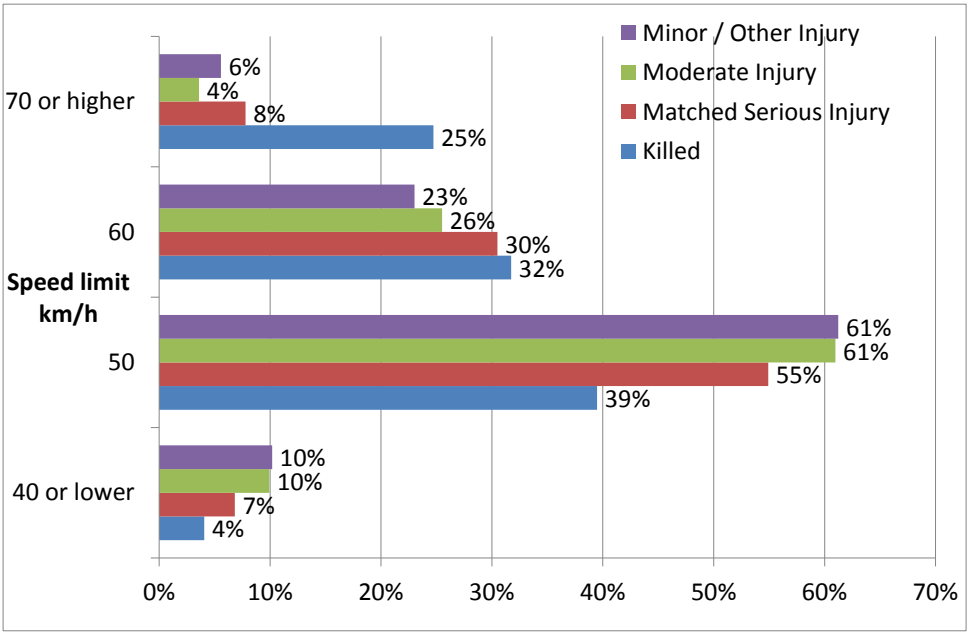
4.1.2 Pedestrian matched serious injuries five years ended 30 June 2016, by road classification and urbanisation

	Metropolitan		Country		Total	
	Number	%	Number	%	Number	%
Freeway/motorway	7	0%	1	0%	8	0%
State highway	269	9%	88	15%	357	10%
Other classified road	965	33%	138	24%	1,103	31%
Unclassified road	1,720	58%	350	61%	2,070	59%
Total	**2,961**	**100%**	**577**	**100%**	**3,538**	**100%**

4.2 Speed limit

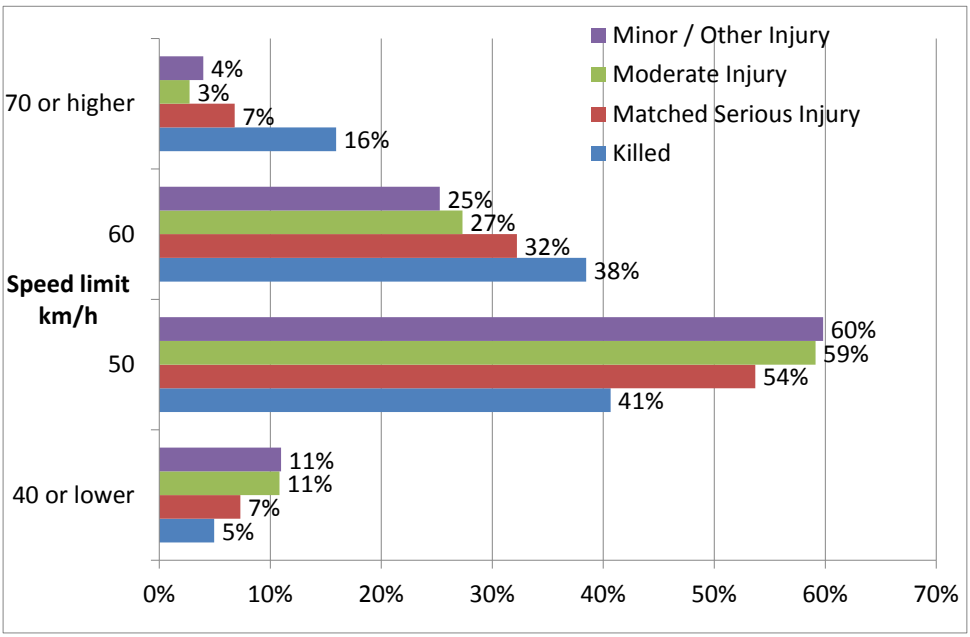
4.2.1 Distributions for each injury severity by speed limits, five years ended 30 June 2016

Each injury severity has a different distribution by speed limits. The more severe categories are skewed towards the higher speed limits, with 25 per cent of fatalities occurring where the speed limit was 70 km/h or higher.



The distributions by speed limit on metropolitan roads are different from those on country roads.

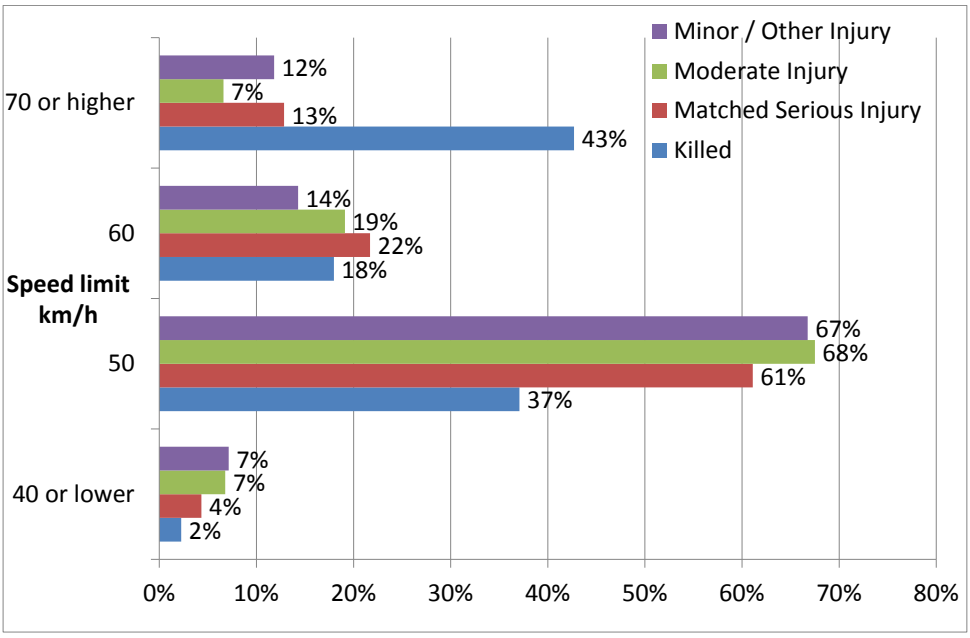
4.2.2 Distributions for each injury severity, by speed limits, metropolitan roads, five years ended 30 June 2016



4.2.3 Distributions, for each injury severity by speed limits, country roads, five years ended 30 June 2016

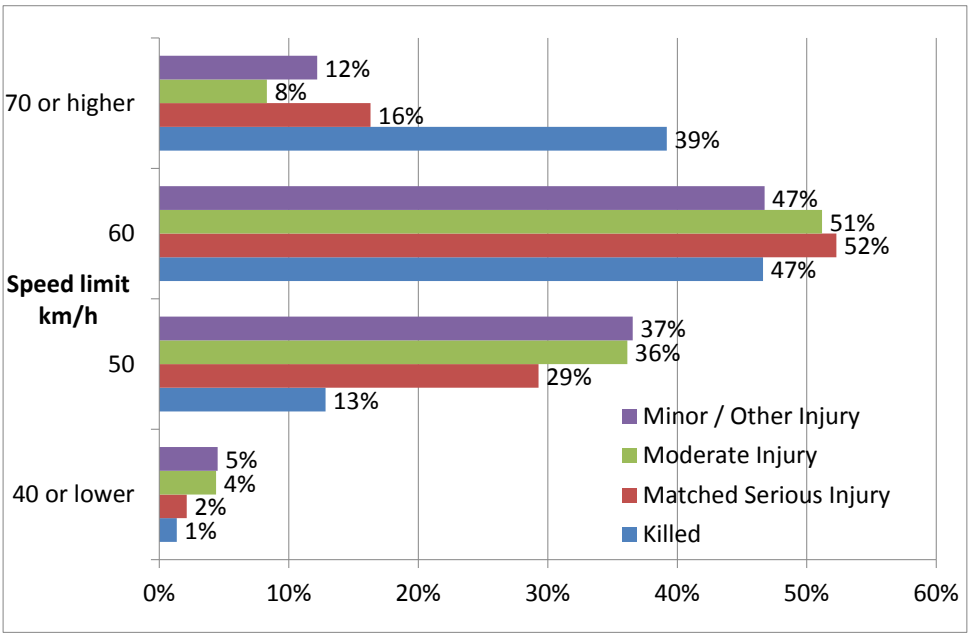
Although most pedestrian casualties occurred in 50 km/h zones, a substantial proportion of serious casualties occurred in higher speed zones:

- 25 per cent of fatalities occurred where the speed limit was 70 km/h or higher
- 38 per cent of matched serious injuries occurred where the speed limit was 60 km/h or higher.

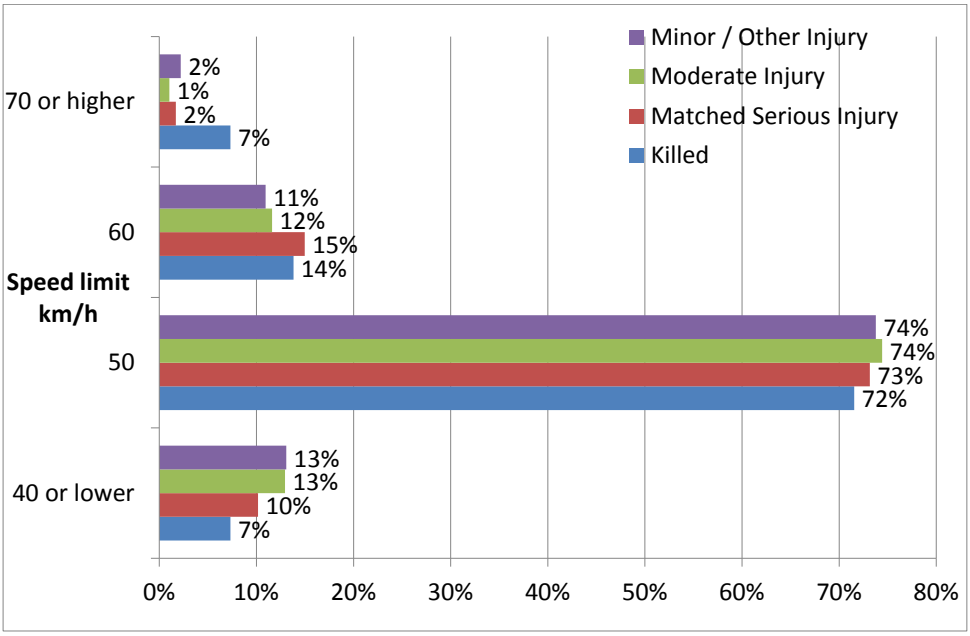


It is well established that higher speeds result in more severe injuries. Roads usually differ in speed limit because there are differences between the characteristics of roads. These other differences, as well as speed, may also contribute to severity of pedestrian injury. Some differences could be captured in road classification, and so the following two charts consider the relationship between severity and speed limit separately for classified and unclassified roads.

4.2.4 Distributions for each injury severity by speed limits, unclassified roads, five years ended 30 June 2016

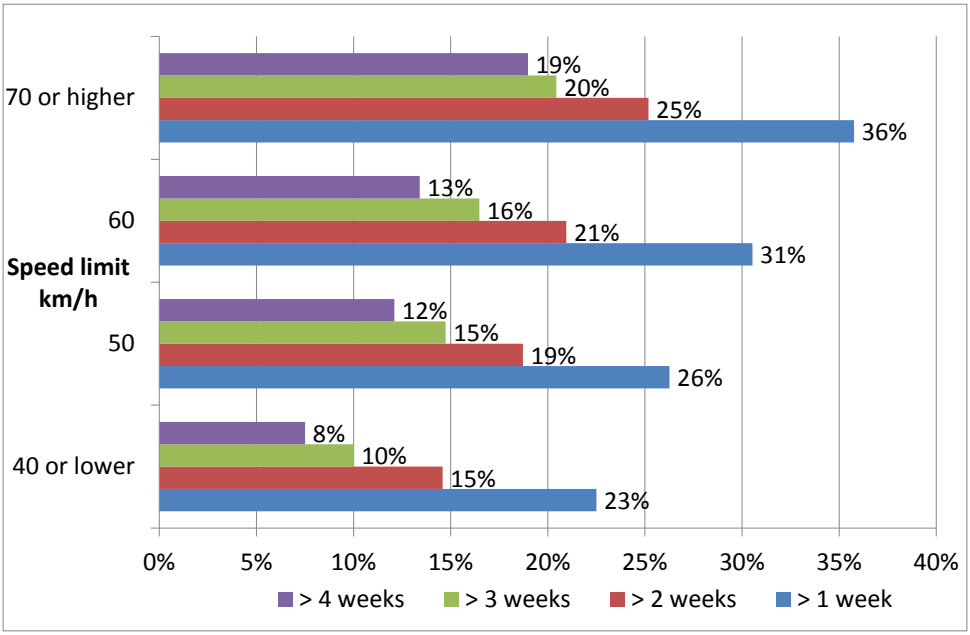


4.2.5 Distributions for each injury severity by speed limits, unclassified roads, five years ended 30 June 2016



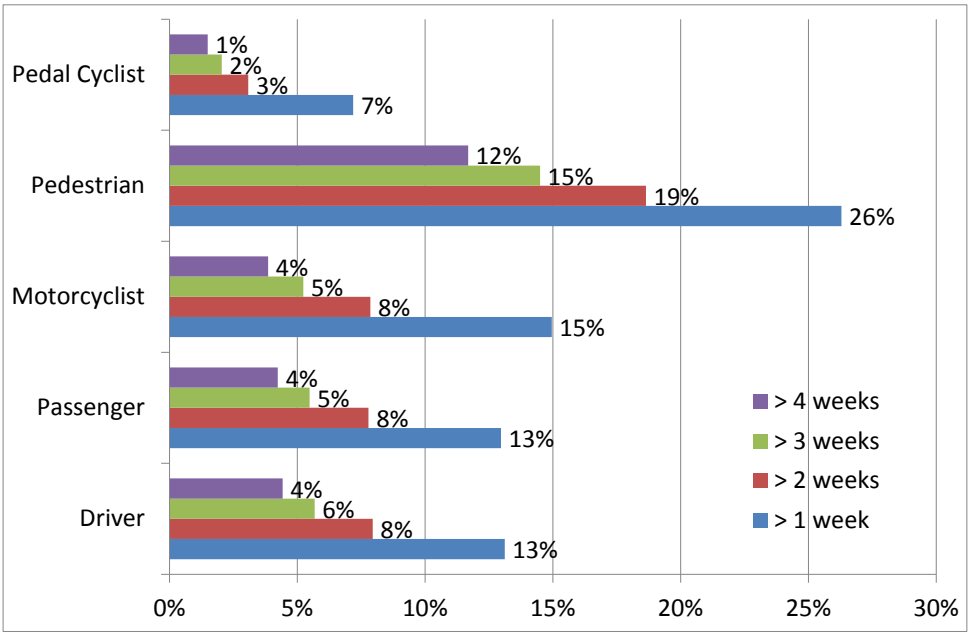
4.2.6 Proportion of pedestrian matched serious injuries with hospital admission, by speed limit for five financial years, 2011/12 to 2015/16

Pedestrians who are admitted to hospital because of injury are likely to stay longer if the speed limit is higher.



4.2.7 Proportion of serious injuries in each road user group with hospital admission for five financial years, 2011/12 to 2015/16

Serious injuries to pedestrians entail a longer hospital stay, on average, than serious injuries to other road users. Of pedestrians seriously injured, 26 per cent stayed in hospital longer than a week. (The periods of stay are added together if the person moves from one hospital to another.)



The body region injured per the principal diagnosis is identified in the data. In the case of multiple specified injuries, the condition which presents the most serious threat to life would be selected as the principal diagnosis in the hospital data. That is, each injured person has one body region for the principal diagnosis, but can have injuries in other body regions as well.

The most common principal injury type for pedestrians was head injury. Of the 5,673 pedestrian serious injuries for whom the principal injury was known, 1,626 (29 per cent) were head injuries. Of the 1,786 pedestrian serious injuries that met a high threat to life criterion based on the worst injury, 774 (43 per cent) were head injuries.

4.3 Intersections and traffic controls

Of the 275 pedestrian fatalities for 2012 to 2016, 87 (32 per cent) occurred at intersections. Only three of these were at a roundabout.

Of the 87 intersection fatalities, 25 were at intersections where signals were operating. For 21 of these 25, there was a pedestrian crossing. Therefore, for 21 of 275 fatalities (8 per cent), there were traffic signals and a pedestrian crossing at an intersection.

Of the 3,538 pedestrian matched serious injuries for the five years ended 30 June 2016, 1,762 (50 per cent) occurred at intersections. Of the 1,762 intersection matched serious injuries, 91 were at roundabouts.

Of the 1,762 intersection fatalities, 851 were at intersections where signals were operating. For 404 of these 851, there was a pedestrian crossing. Therefore, for 404 of 3,538 matched serious injuries (11 per cent), there were traffic signals and a pedestrian crossing at an intersection.

There were 47 non-intersection matched serious injuries where there were traffic signals and a pedestrian crossing.