Heavy Truck Crash Data Analysis

International Truck, Trailer and Equipment Conference

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NSW Centre for Road Safety

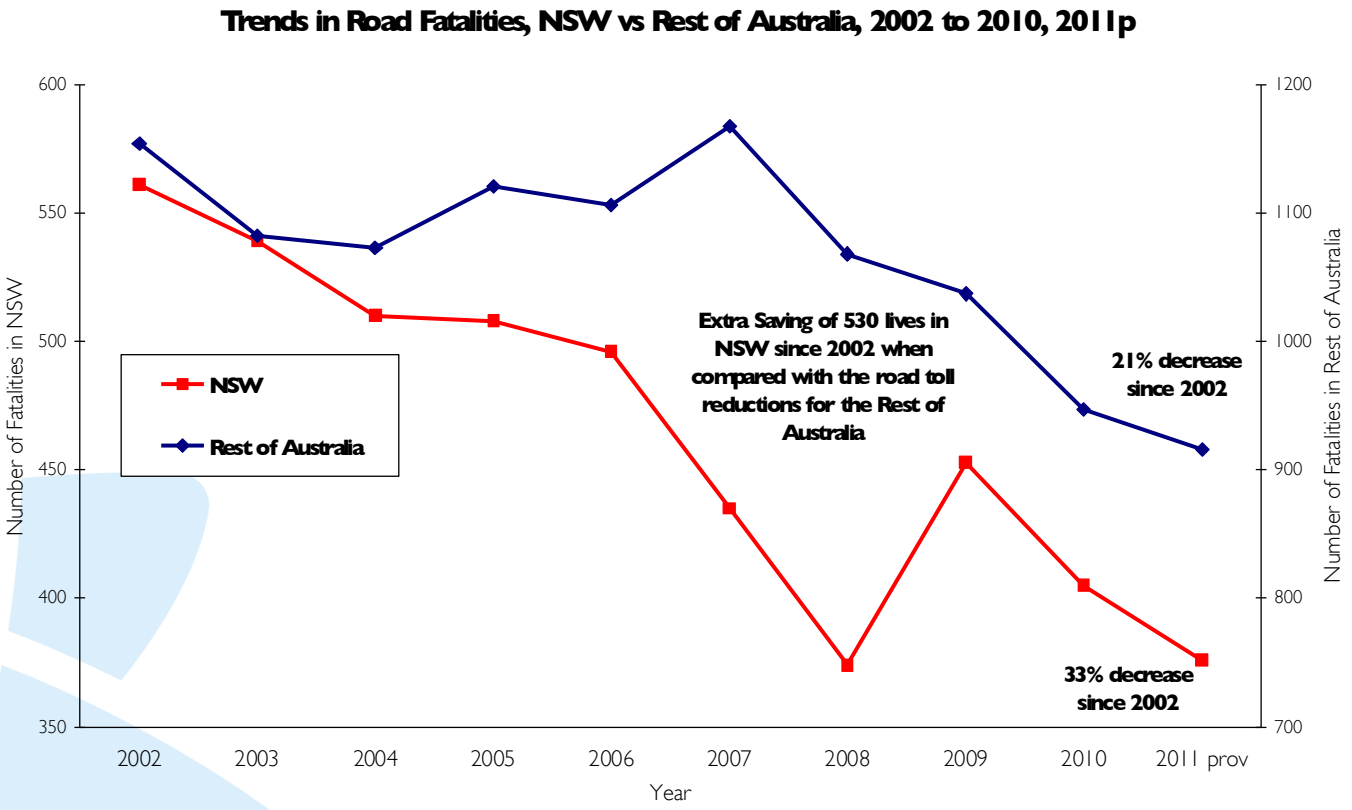
Purpose of Presentation

1. Heavy Truck Fatal Crash Trends in NSW and Australia
2. Features of Preliminary Fatal Crashes in 2011

- *Definition*
  - *Heavy Truck refers to vehicles such as articulated trucks, articulated tankers, B doubles, road trains and large rigid lorries with tare weight over 4.5 tonnes. Note that this definition excludes buses.*

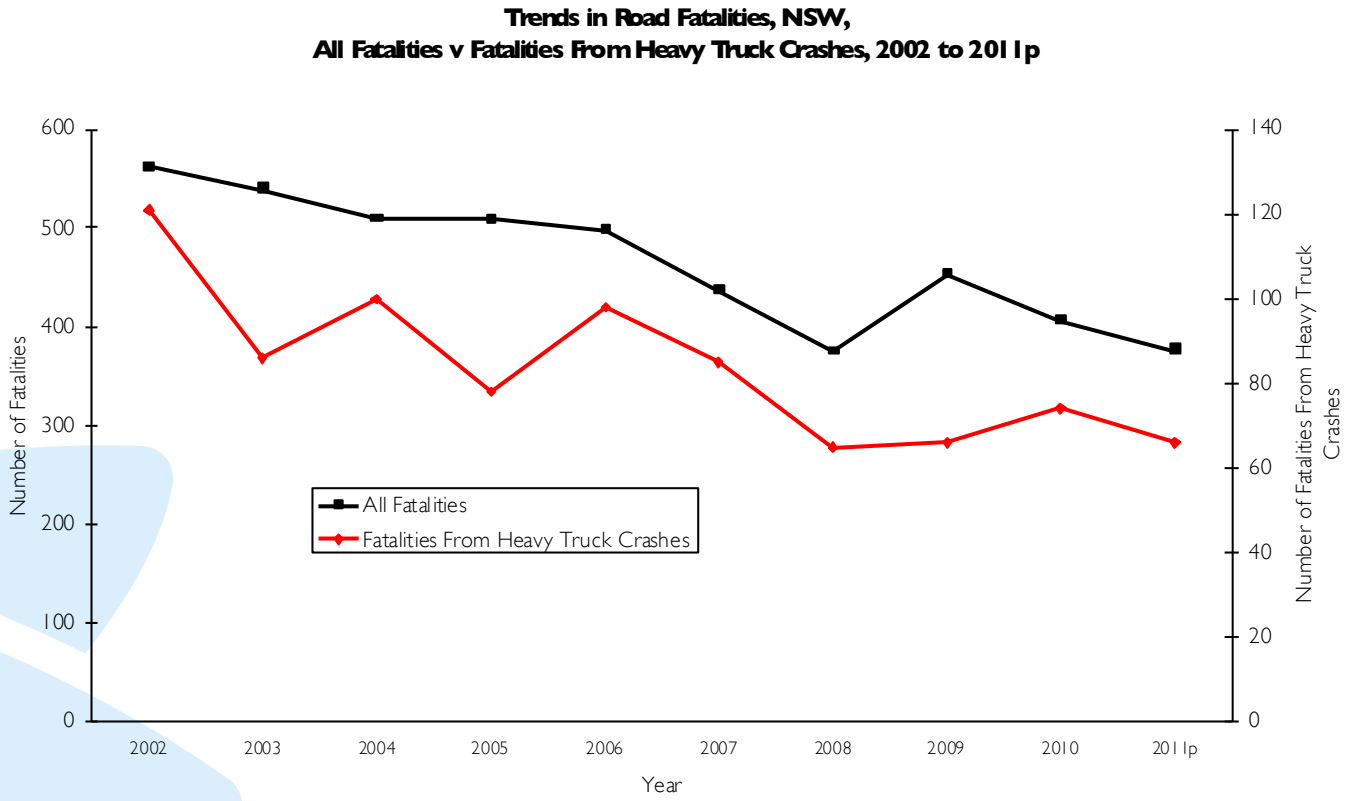
NSW v Rest of Australia 2002 to 2011

- NSW experienced impressive reductions in road fatalities between 2002 and 2011, whilst the Rest of Australia has decreased to a lesser extent over that period
- NSW saved an extra 530 lives compared with the road toll reductions for the rest of Australia over this nine year period



NSW Road Toll Trends – Heavy Trucks 2002 to 2011p

- Trends for heavy truck crash fatalities since 2002 have been generally a little better than the overall road toll performance
- But the road toll decreased in 2010 by 11%, whilst heavy truck crash fatalities increased by 12%
- In 2011, the reduction in heavy truck fatalities (down by 11%) was slightly larger than the reduction in overall fatalities (down by 7%)



Heavy Truck Crash Involvements

- Heavy trucks are often involved in serious road trauma in NSW, in part because when a heavy truck is involved in a crash their vehicle mass elevates the crash forces involved and hence increases the severity of the crash.

- In 2011 heavy trucks
  - Represented only 2.2 % of registered motor vehicles in NSW (RMS June 2011)
  - Accounted for 7% of all motor vehicle travel in NSW *(ABS SMVU 2010)*
  - Crashes involving heavy trucks accounted for 17% of all fatalities on NSW roads in 2008, 15% in 2009, 18% in 2010 and 18% in 2011

Heavy Truck Fatalities v All Fatalities in NSW

Trends for Fatalities and Fatal Crashes in NSW, 2002 to 2011p

	All Crashes		Heavy Truck Crashes			Heavy Truck as % of Total	
Year	Fatalities	Fatal Crashes	Fatalities	Fatal Crashes	Killed / Fatal Crashes	Fatalities	Fatal Crashes
2002	561	501	121	109	1.11	22%	22%
2003	539	483	86	69	1.25	16%	14%
2004	510	458	100	86	1.16	20%	19%
2005	508	459	78	70	1.11	15%	15%
2006	496	449	98	80	1.23	20%	18%
2007	435	405	85	78	1.09	20%	19%
2008	374	353	65	59	1.10	17%	17%
2009	453	408	66	51	1.29	15%	13%
2010	405	365	74	60	1.23	18%	16%
2011p	376	348	66	60	1.10	18%	17%

Note : 2011 provisional figures

- After a poor result in 2010 compared with previous years, the 2011p result represents a 11% decrease in heavy truck fatalities compared with calendar year 2010
- Heavy truck fatalities continue to account for around 18% of total fatalities

Recent Trends for Heavy Truck Fatalities in NSW

Fatalities From Heavy Truck Crashes, NSW, Year x Month, 2002 to 2012p

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2002	6	7	9	10	13	14	8	8	14	8	14	10	121
2003	3	5	8	5	9	7	6	9	4	13	10	7	86
2004	4	14	11	9	2	10	2	12	8	9	12	7	100
2005	7	3	6	8	7	10	2	6	6	6	7	10	78
2006	**18**	7	7	10	3	10	4	6	3	11	12	7	98
2007	3	6	9	5	3	10	8	6	3	8	9	**15**	85
2008	8	3	5	1	4	8	6	7	6	8	4	5	65
2009	2	5	4	7	5	5	5	7	7	4	5	10	66
2010	12	6	9	6	6	7	4	2	9	7	3	3	74
2011p	2	4	7	4	4	4	6	**14**	4	6	5	6	66
2012p	9	5											

- *Note: 2011 and 2012 data preliminary*
- Since November 2010 monthly fatality totals have been relatively low (averaging around five fatalities per month)
- But in August 2011 (up to midnight 31 August) there were 14 fatalities recorded for the month, the highest monthly total since December 2007

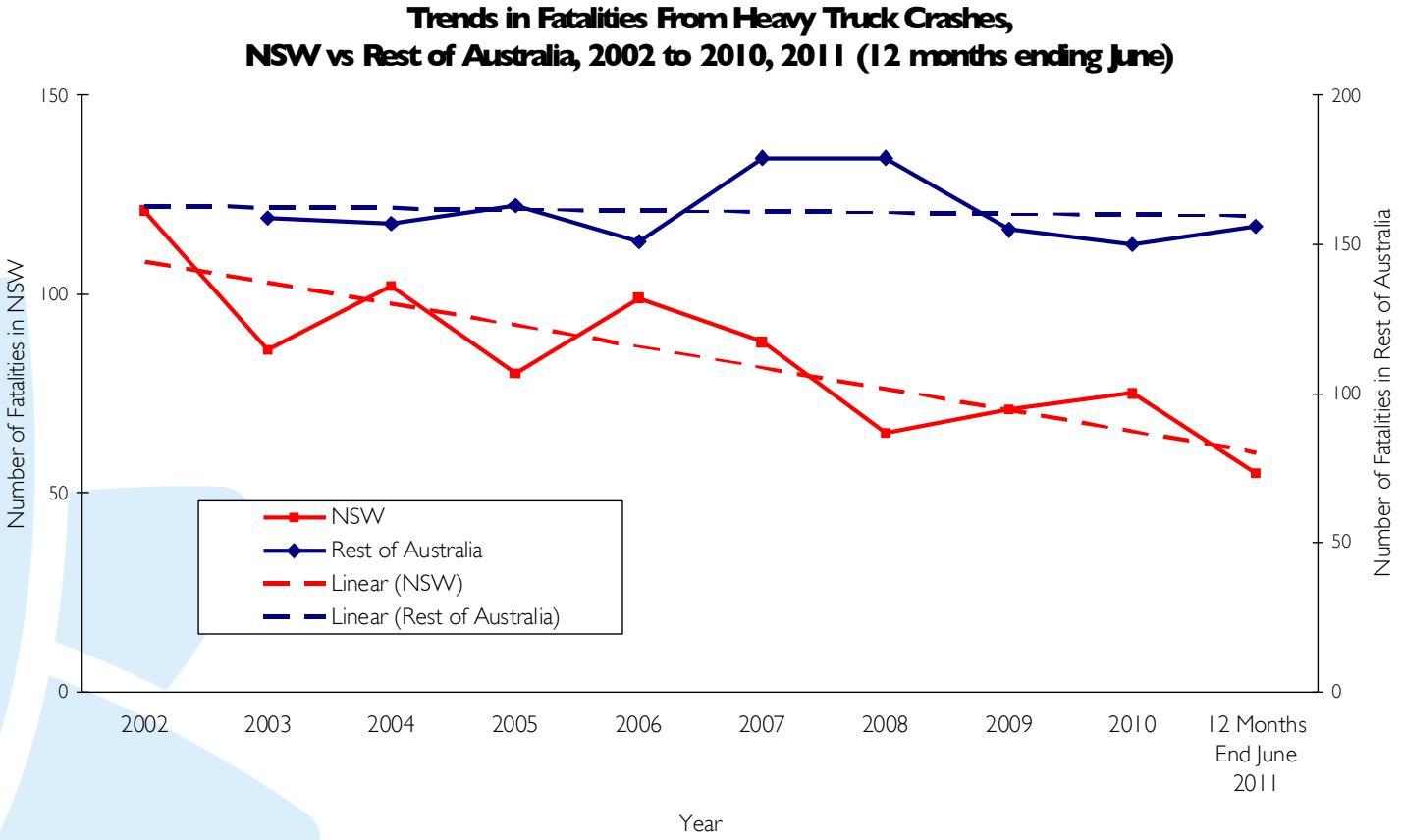
2011 Progress
Fatalities From Heavy Truck Crashes

Analysis of the preliminary 2011 data showed

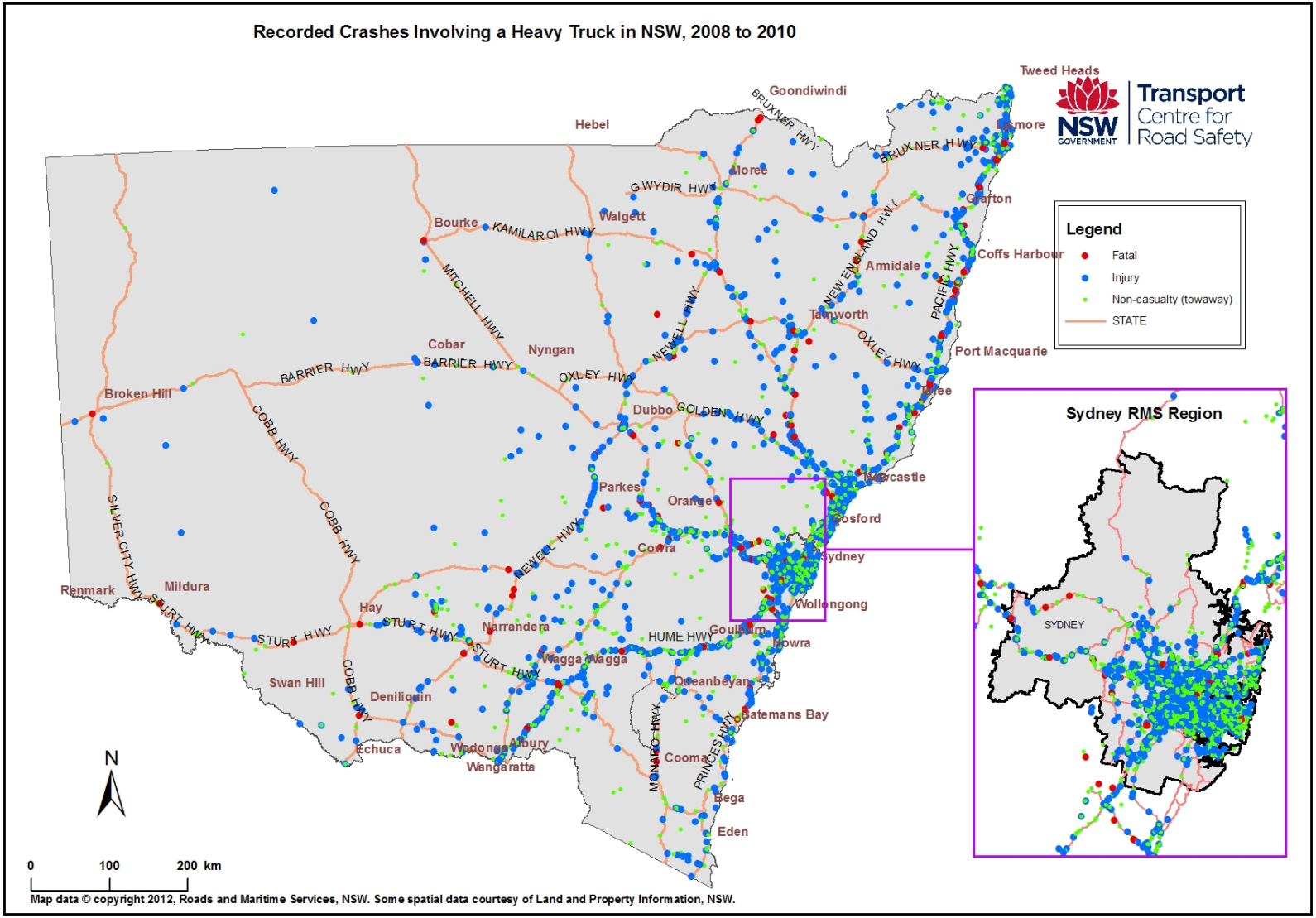
- Decreases for
  - Passenger fatalities from other vehicles (from 20 in 2010 to 10 in 2011)
  - Fatalities on country rural roads (from 44 to 35)
  - Vehicle into Object fatal crashes (from 12 to 4)
  - Off Path on Curve fatal crashes (from 10 to 4)
- But Increases for
  - Driver fatalities from other vehicles (from 26 to 34)
  - Head On (not overtaking) fatal crashes (from 20 to 28)
  - Fatigue related fatal crashes (from 10 to 17, as a result of an increased involvement of fatigue amongst other vehicle drivers)

Fatalities From Heavy Truck Crashes in Australia

- Latest National figures (BITRE published data) for the 12 months ending June 2011 show a decrease for NSW compared with 2010 but a small increase for the rest of Australia
- However, over the period 2002 to 2010 there is a decreasing trend for NSW whilst a relatively steady trend for rest of Australia



Location of Heavy Truck Crashes



State Highways / Motorways

•The Pacific and Hume Highways are the major routes with the highest numbers of heavy truck fatal crashes and heavy truck crashes – not surprising given they are the major freight corridors for NSW

Heavy Truck Crashes on State Highways/Motorways, 2008 to 2010

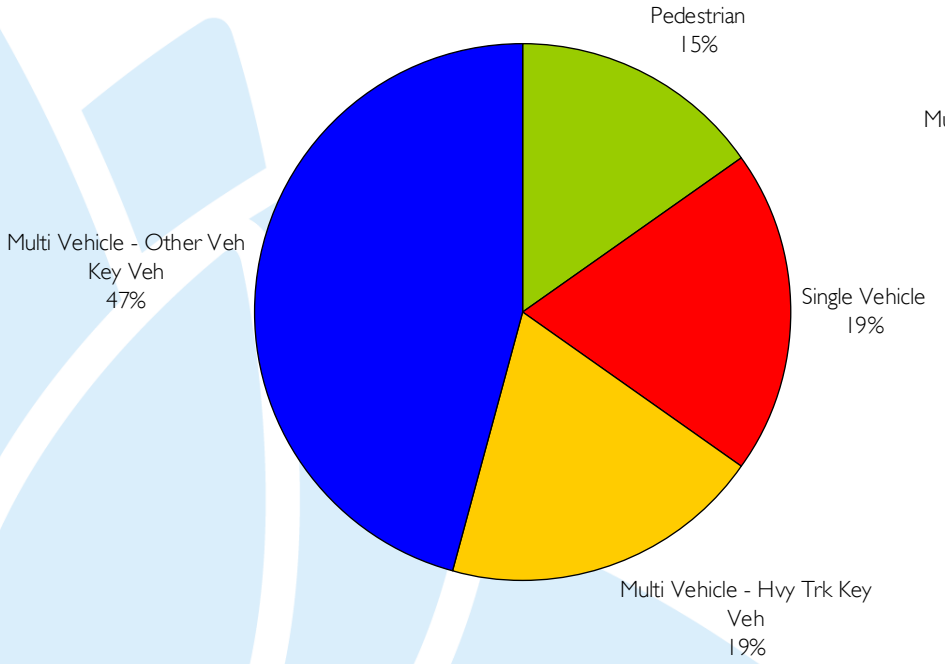
Top 10 By Number of Fatal Crashes

Rank	State Highway / Motorway	Fatal	All Recorded
1	Pacific	34	535
2	Hume	14	396
3	Newell	11	118
4	New England	10	133
5	Great Western	8	270
6	Sturt	7	56
7	F3	4	170
8	Mitchell	4	47
9	Princes	3	194
10	Mid Western	3	19

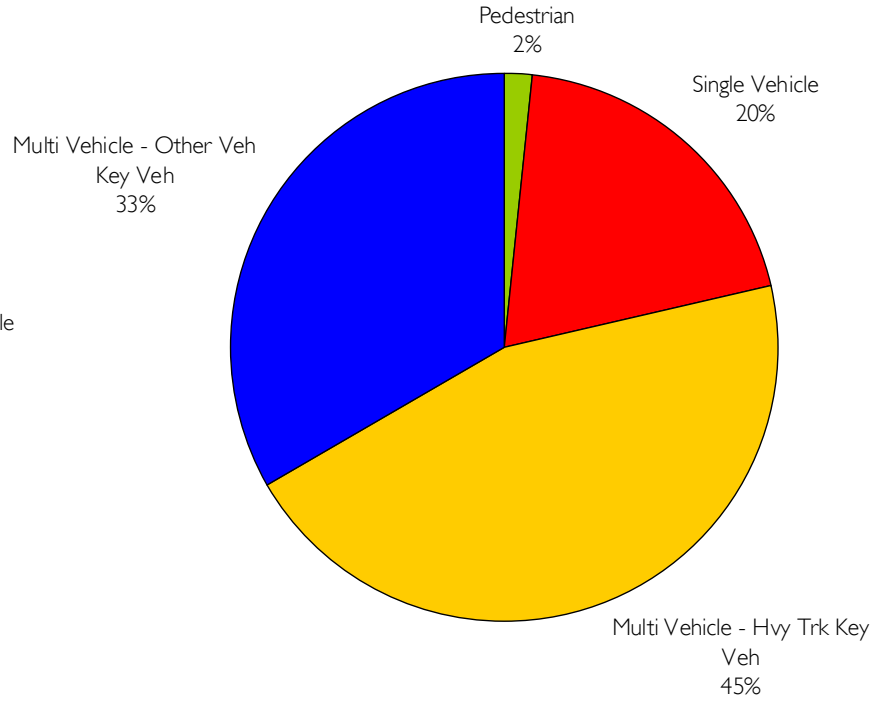
Heavy Truck Crashes
First Impact Crash Type

- The majority of heavy truck crashes involve multiple vehicles (78%), where key vehicle status (fault) is skewed towards the heavy truck (45% v 33%)
- The majority of heavy truck fatal crashes also involve multiple vehicles (66%), but key vehicle status (fault) is skewed towards the other vehicle (47% v 19%)

Heavy Truck Fatal Crashes, 2008 to 2010,
First Impact Crash Type x Key Vehicle Status



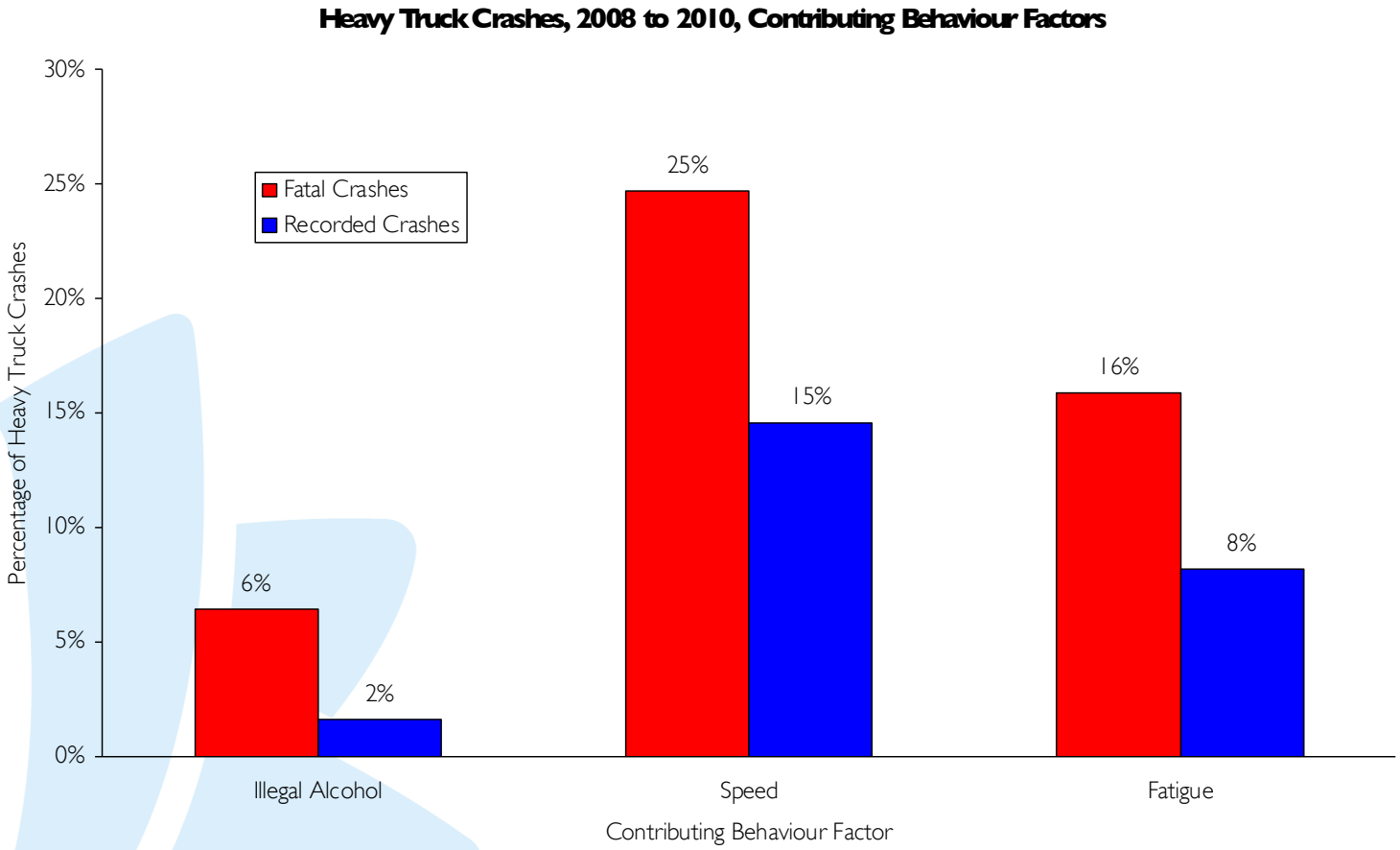
Heavy Truck Recorded Crashes, 2008 to 2010,
First Impact Crash Type x Key Vehicle Status



Contributing Behaviour Factors

•Compared with all heavy truck crashes, speed, fatigue and illegal alcohol are over-represented in heavy truck fatal crashes

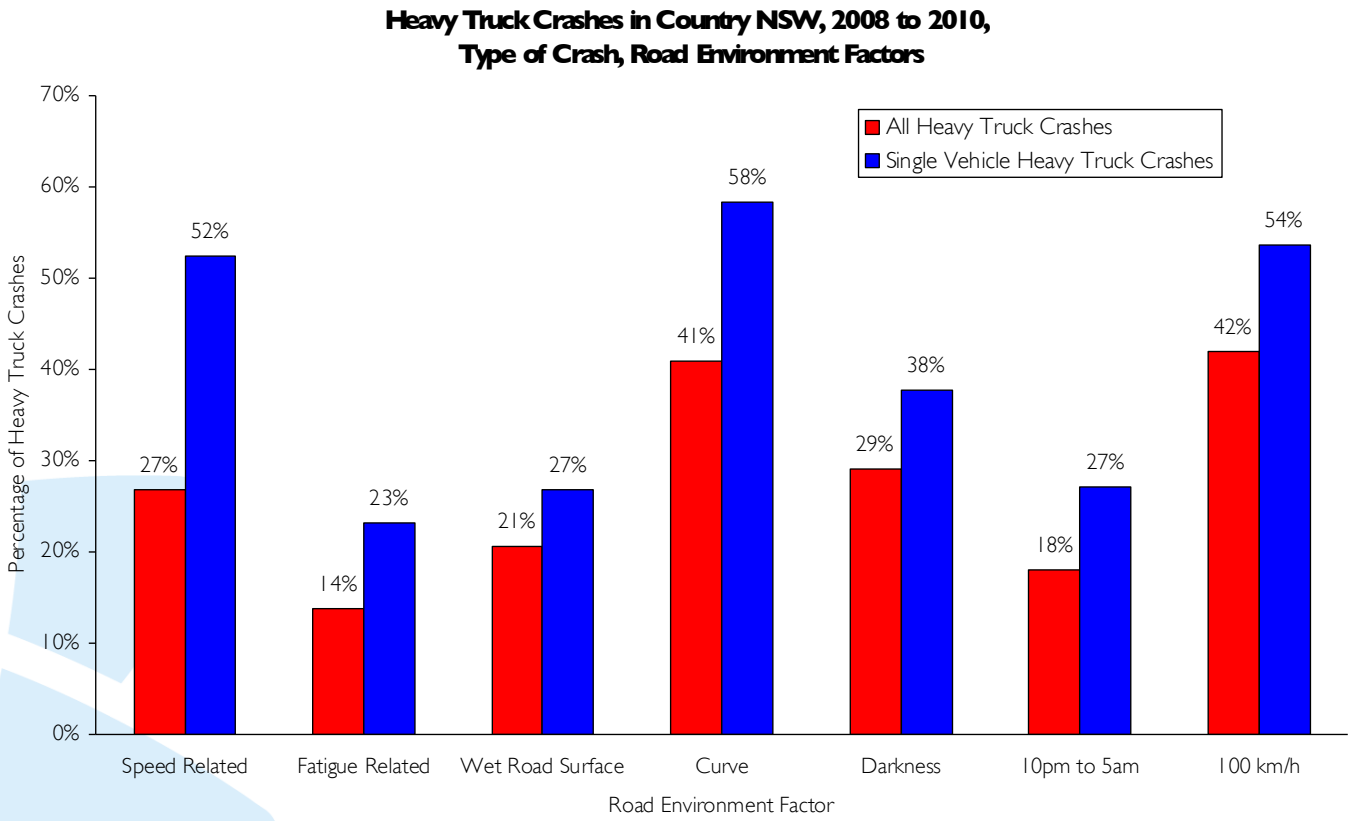
(Note – factor present for any driver / rider involved in the crash – not necessarily applicable to the heavy truck driver involved in the crash)



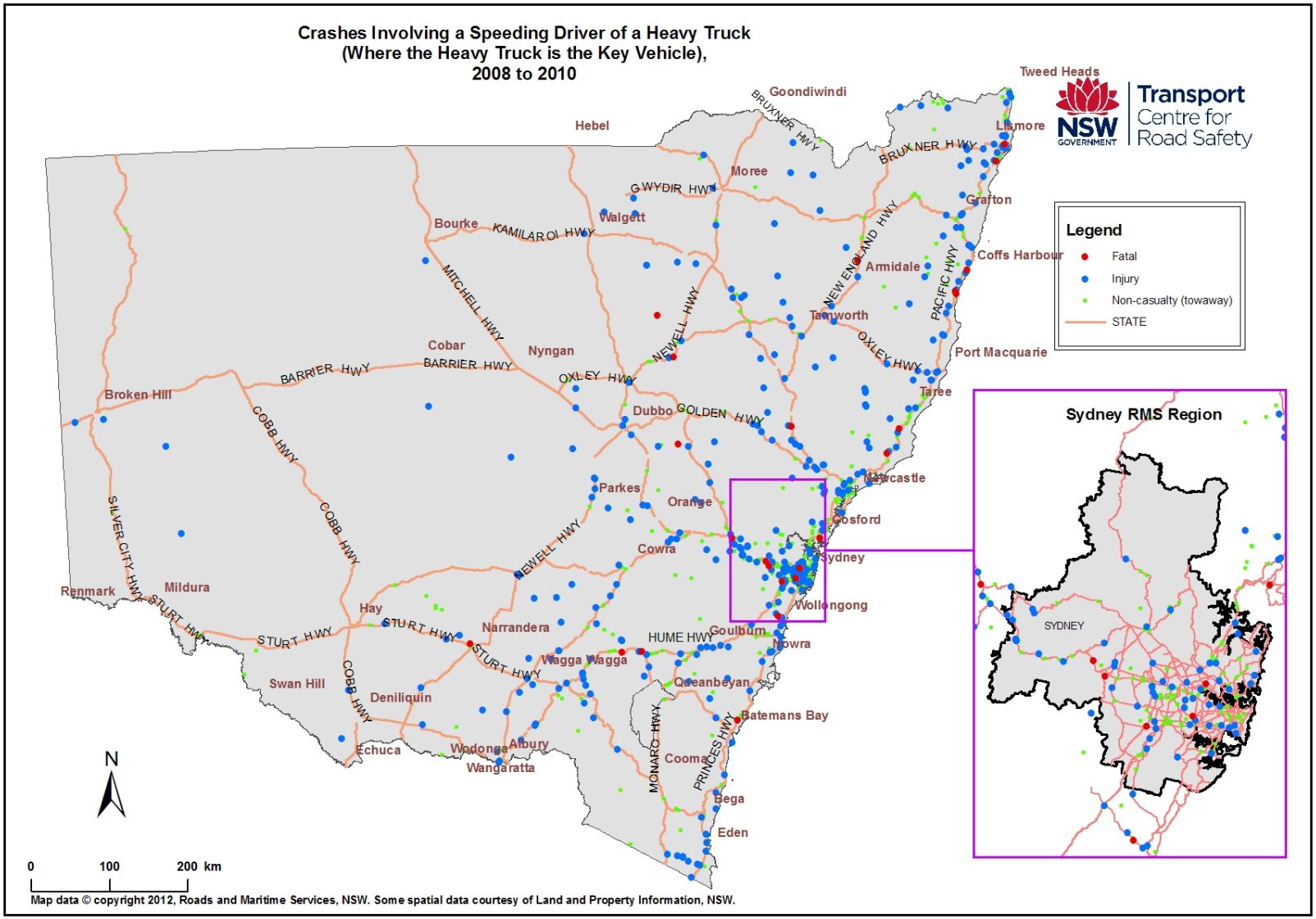
Road Environment Factors on Country Roads

- Compared with heavy truck crashes in the metropolitan areas, speed, fatigue, wet roads, curves, darkness, late night to early mornings and 100 km/h speed zones are overrepresented in heavy truck crashes in country NSW

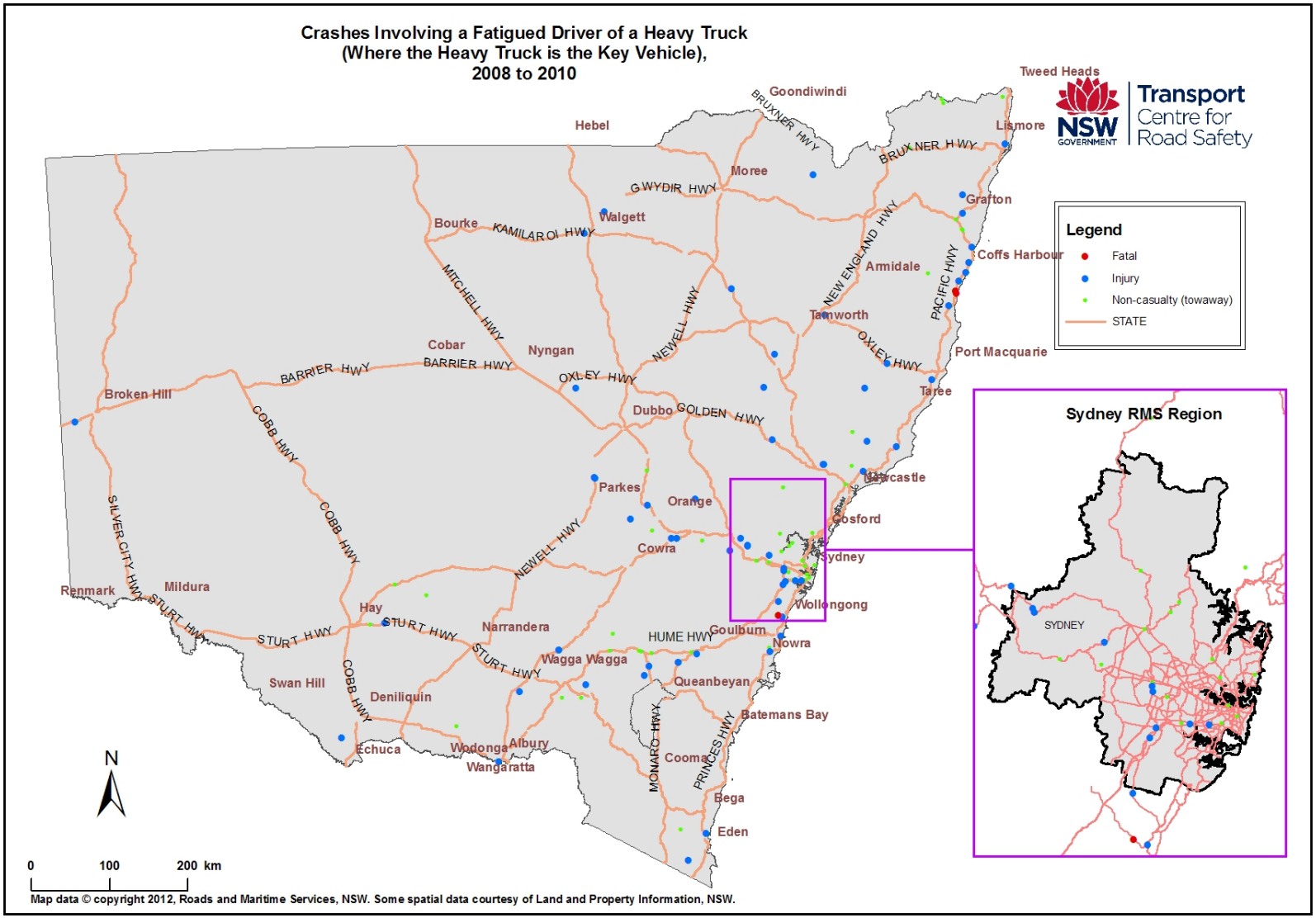
- All of these road environment factors have an even higher representation in single vehicle heavy truck crashes on country roads



Location of Speeding Heavy Truck Driver Crashes

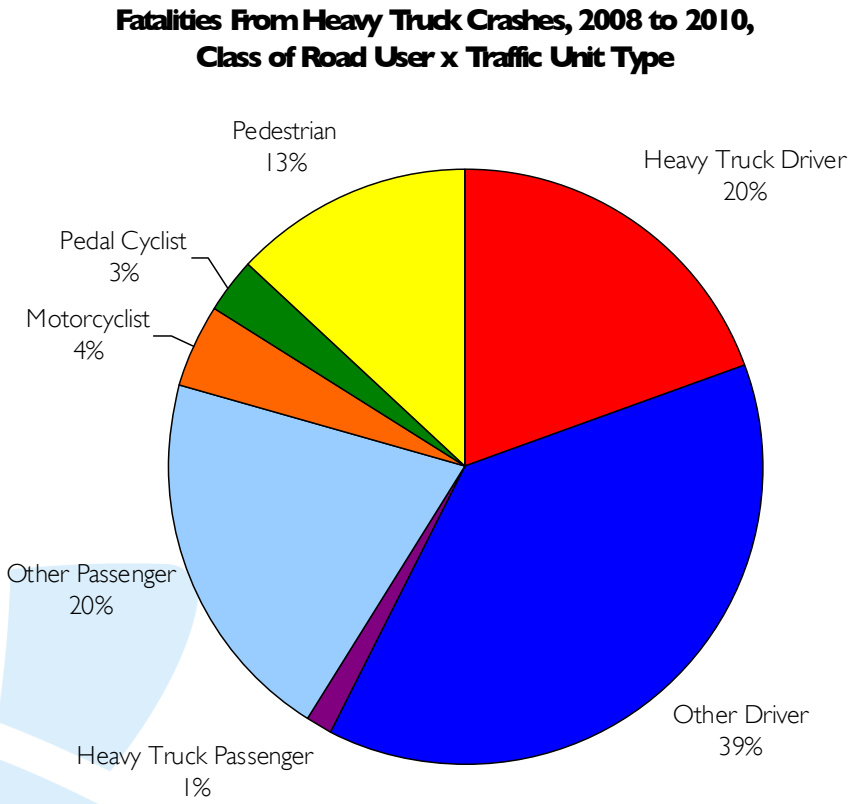


Location of Fatigue Heavy Truck Driver Crashes



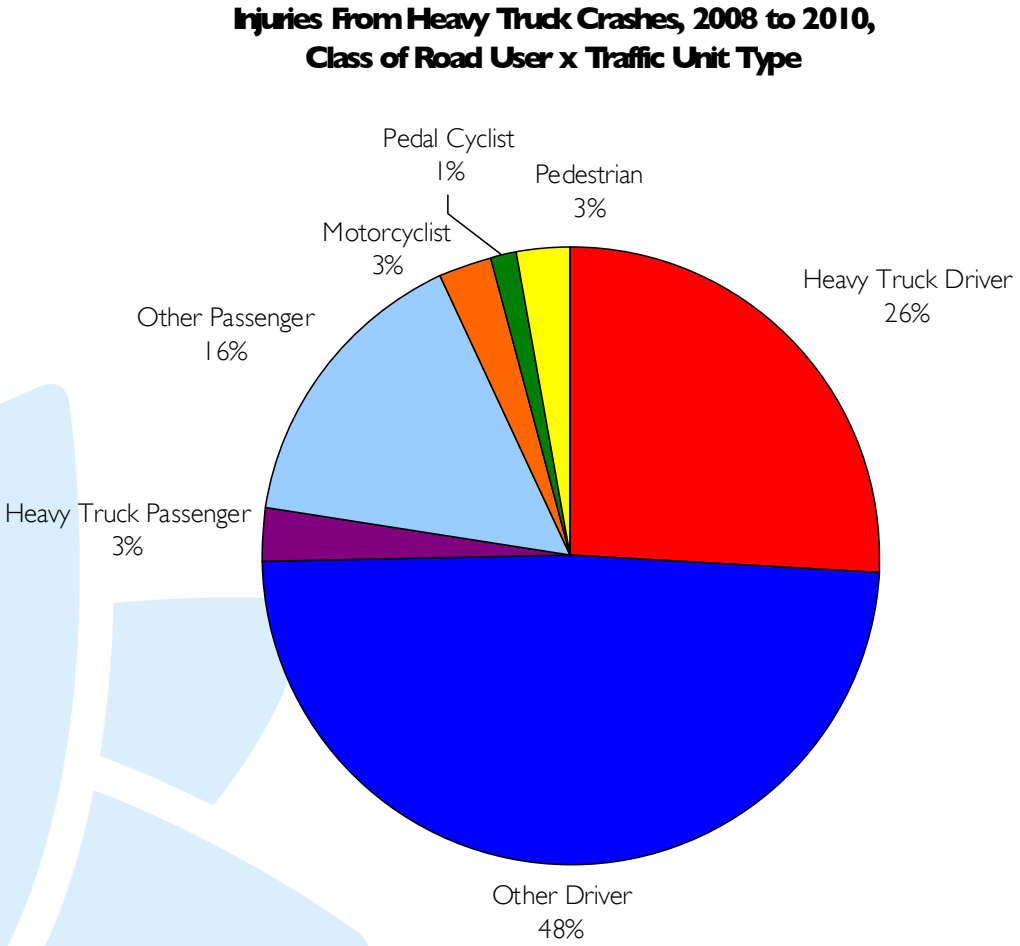
Fatalities From Heavy Truck Crashes

- The majority of fatalities from heavy truck crashes are occupants of other vehicles
- Pedestrians also account for nearly one in eight fatalities



Injuries From Heavy Truck Crashes

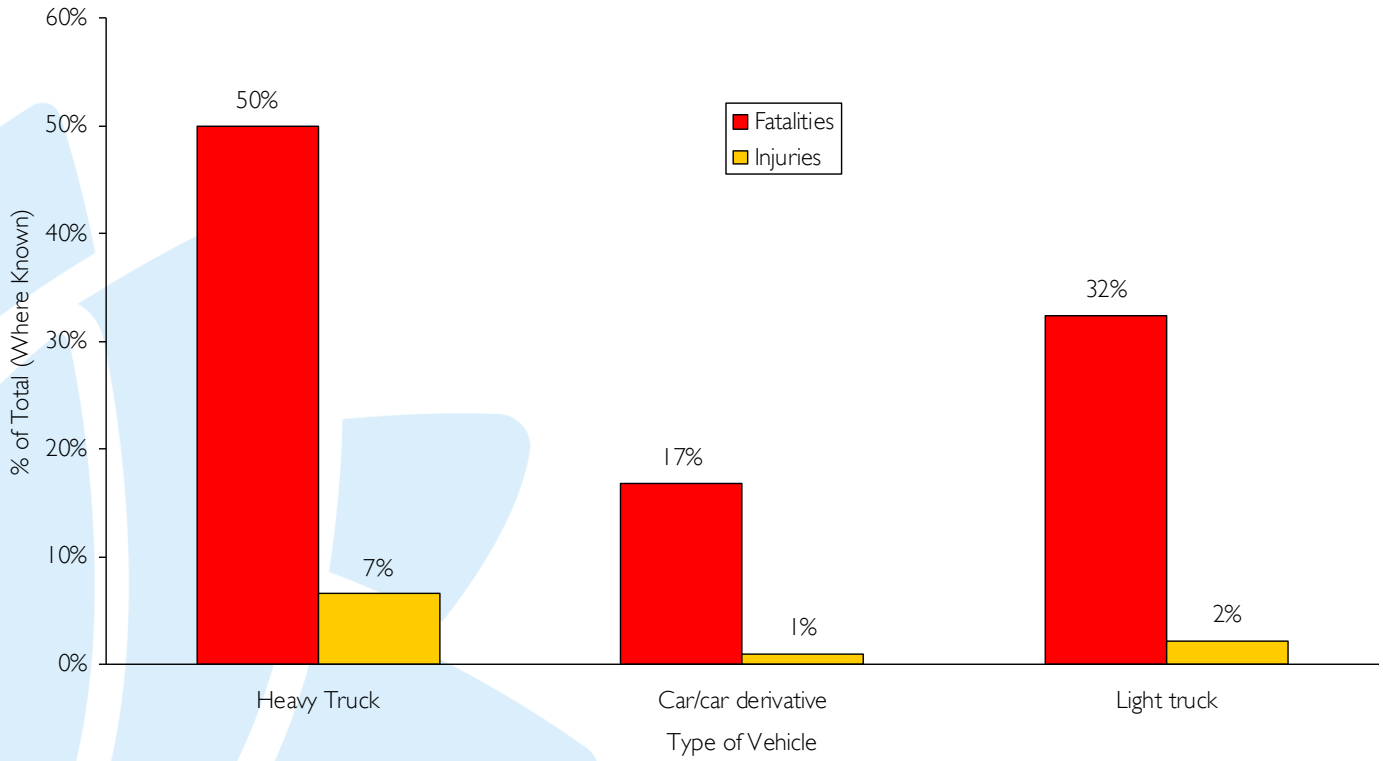
- Similarly the majority of injuries from heavy truck crashes are occupants of other vehicles
- Heavy truck occupants now account for more than one quarter of all injuries



Driver Casualties
Restraint Non Usage

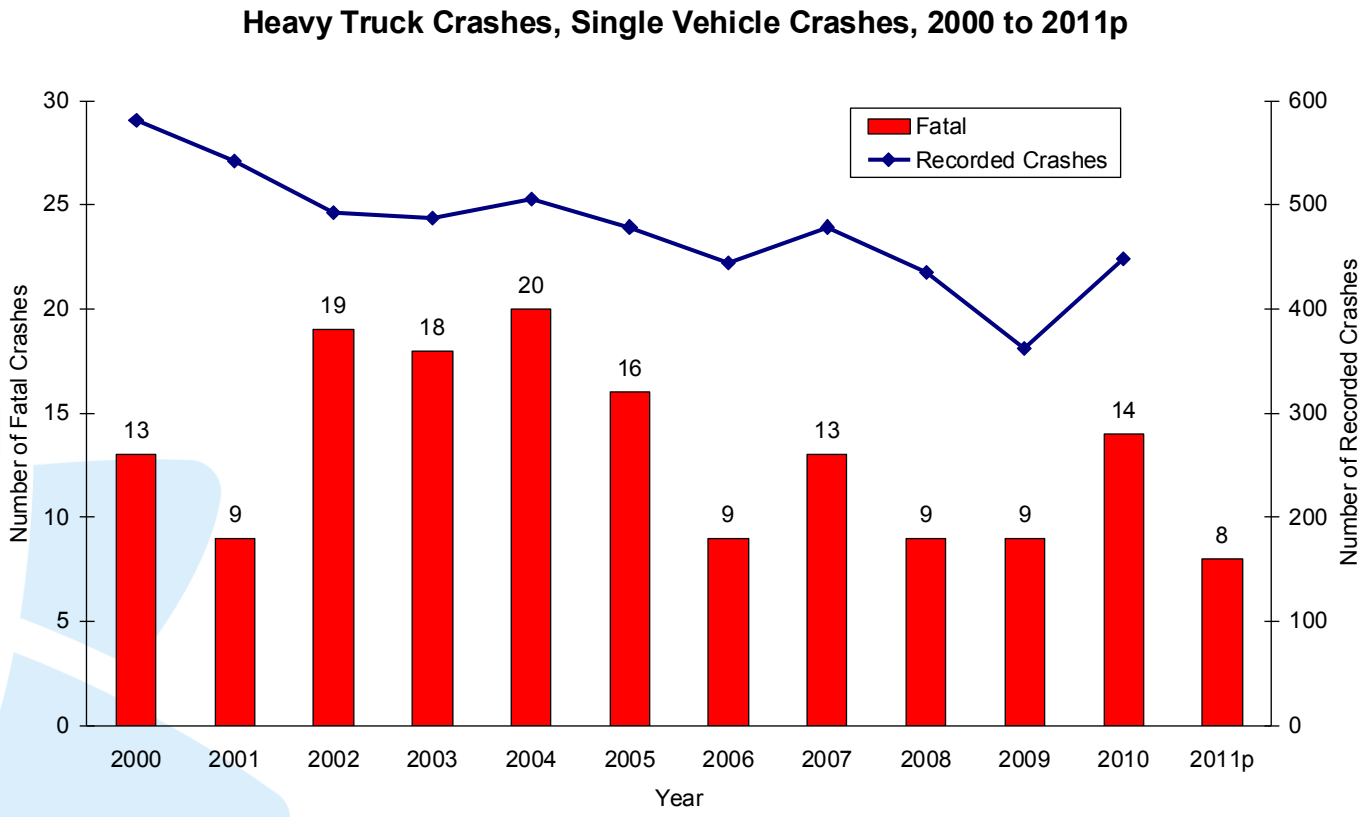
- Almost half of heavy truck drivers killed and one in fourteen injured are not wearing an available restraint
- Heavy truck driver casualties have much higher levels of non usage compared with car drivers and light truck drivers

Percentage of Driver Casualties Not Wearing An Available Restraint, 2008 to 2010, Degree of Casualty, Type of Vehicle



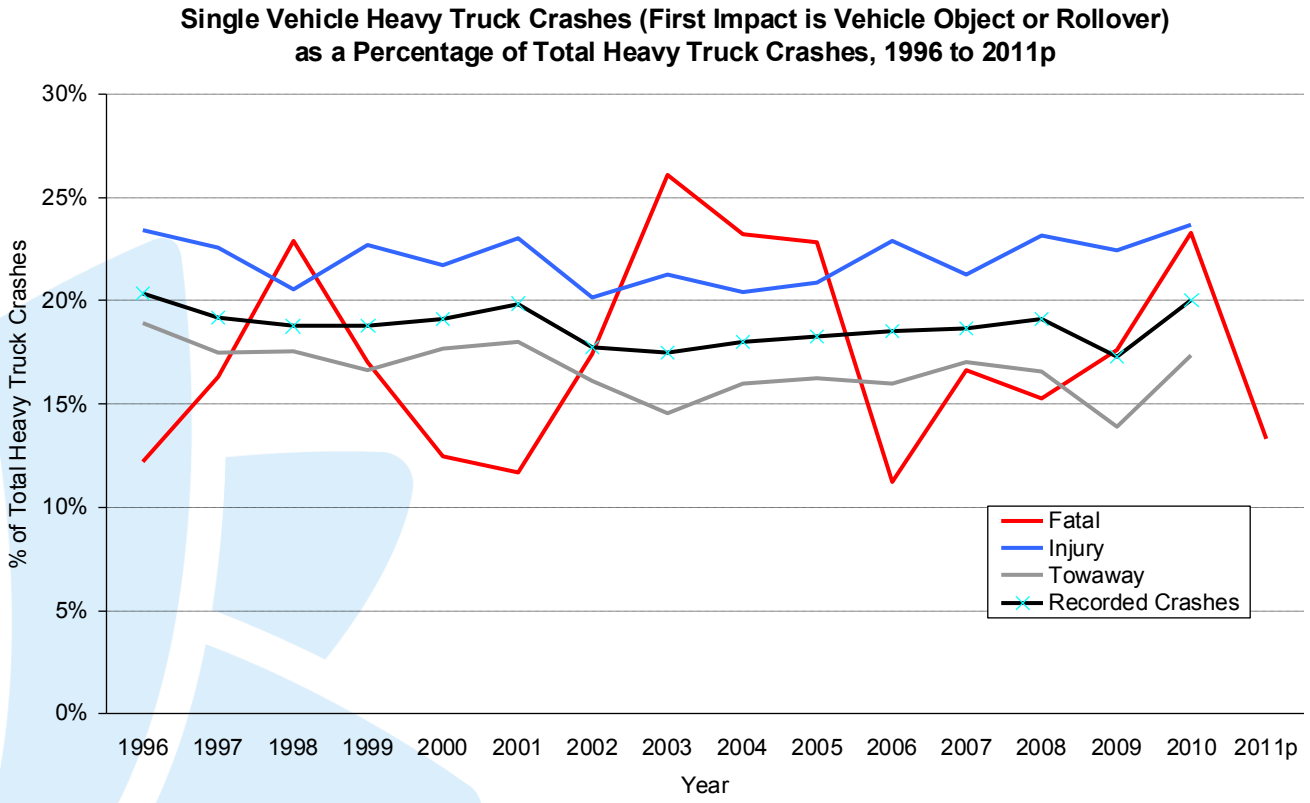
Heavy Truck Single Vehicle Crashes Trends Since 2000

- Heavy truck single vehicle crashes (where first impact is vehicle – object or vehicle rollover) have been declining since 2000
- Similarly fatal single vehicle crashes have decreased since averaging 18 per annum for 2002 to 2005
- However, increases recorded for fatal and recorded crashes in 2010



Heavy Truck Crash Trends Since 1996
Prevalence of Single Vehicle Crashes

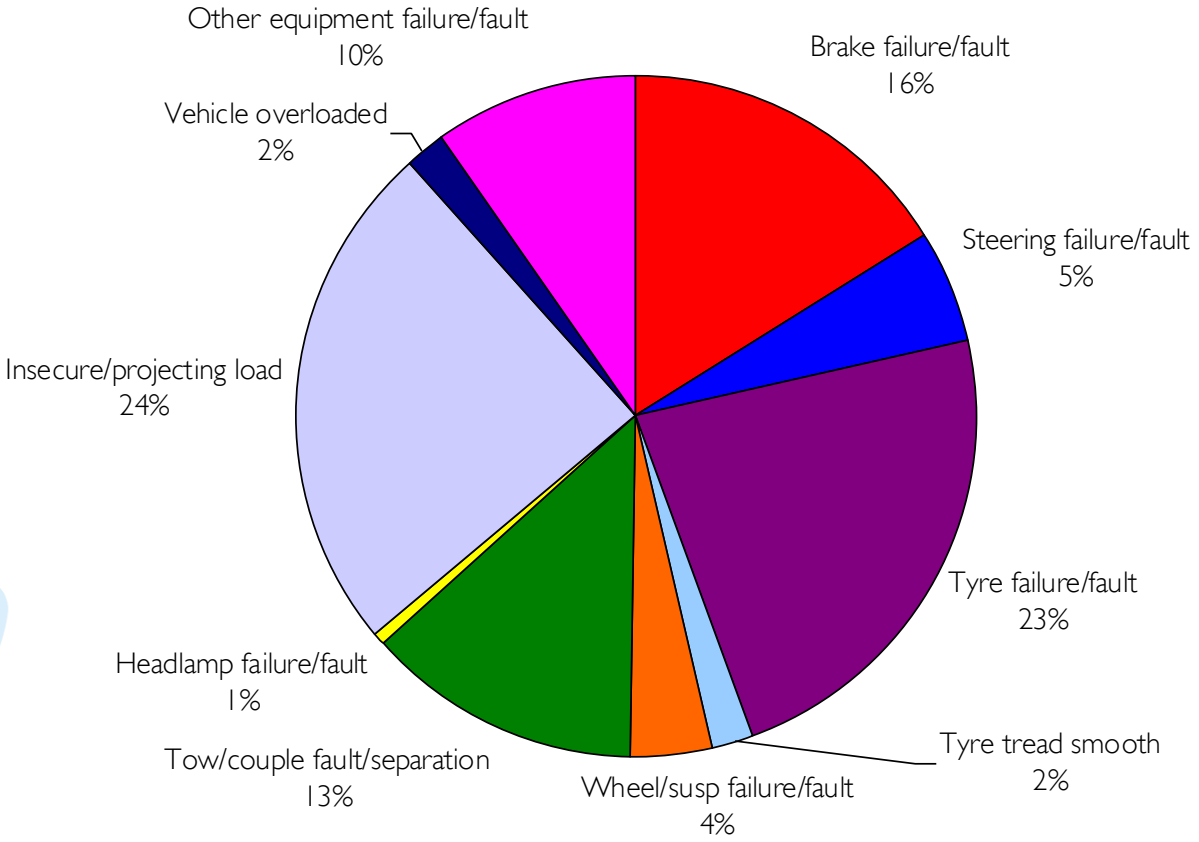
- Since 1996, just under 20 per cent of heavy truck crashes are single vehicle crashes, with a slightly higher percentage for injury crashes
- These percentages have remained relatively steady since 1996 but injury crashes are slightly higher since 2002-2004
- Over the past five years there have been around 430 single vehicle heavy truck crashes per annum, of these between 9 and 14 are fatal crashes



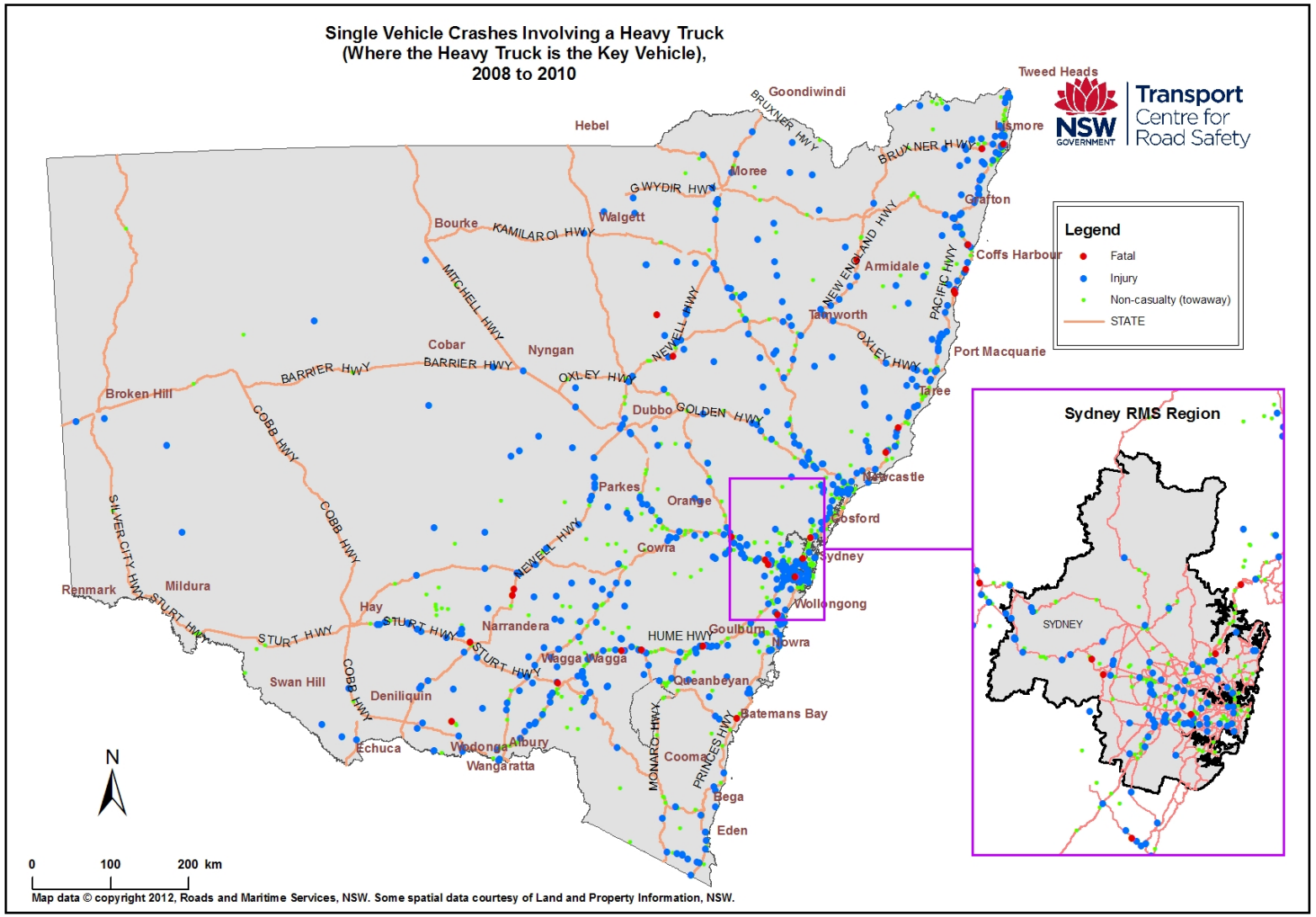
Equipment Factors for Heavy Trucks Involved in Single Vehicle Crashes

- One in sevem (14%) of heavy trucks involved in single vehicle heavy truck crashes had equipment failure recorded for that heavy truck
- The most common equipment failures recorded were brake and tyre failure or insecure load

Heavy Trucks in Single Vehicle Crashes with Equipment Failure, 2008 to 2010p, Type of Vehicle Equipment Failure

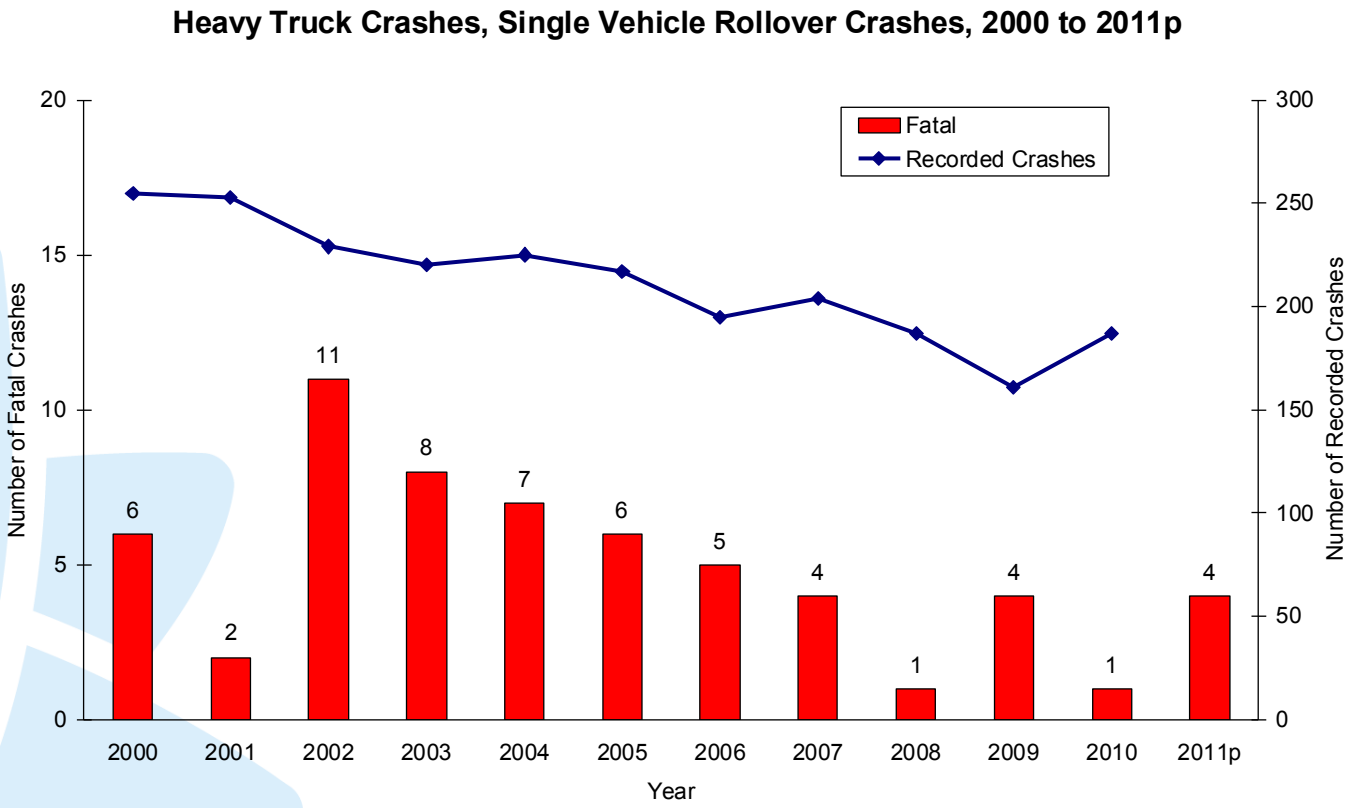


Location of Heavy Truck Single Vehicle Crashes



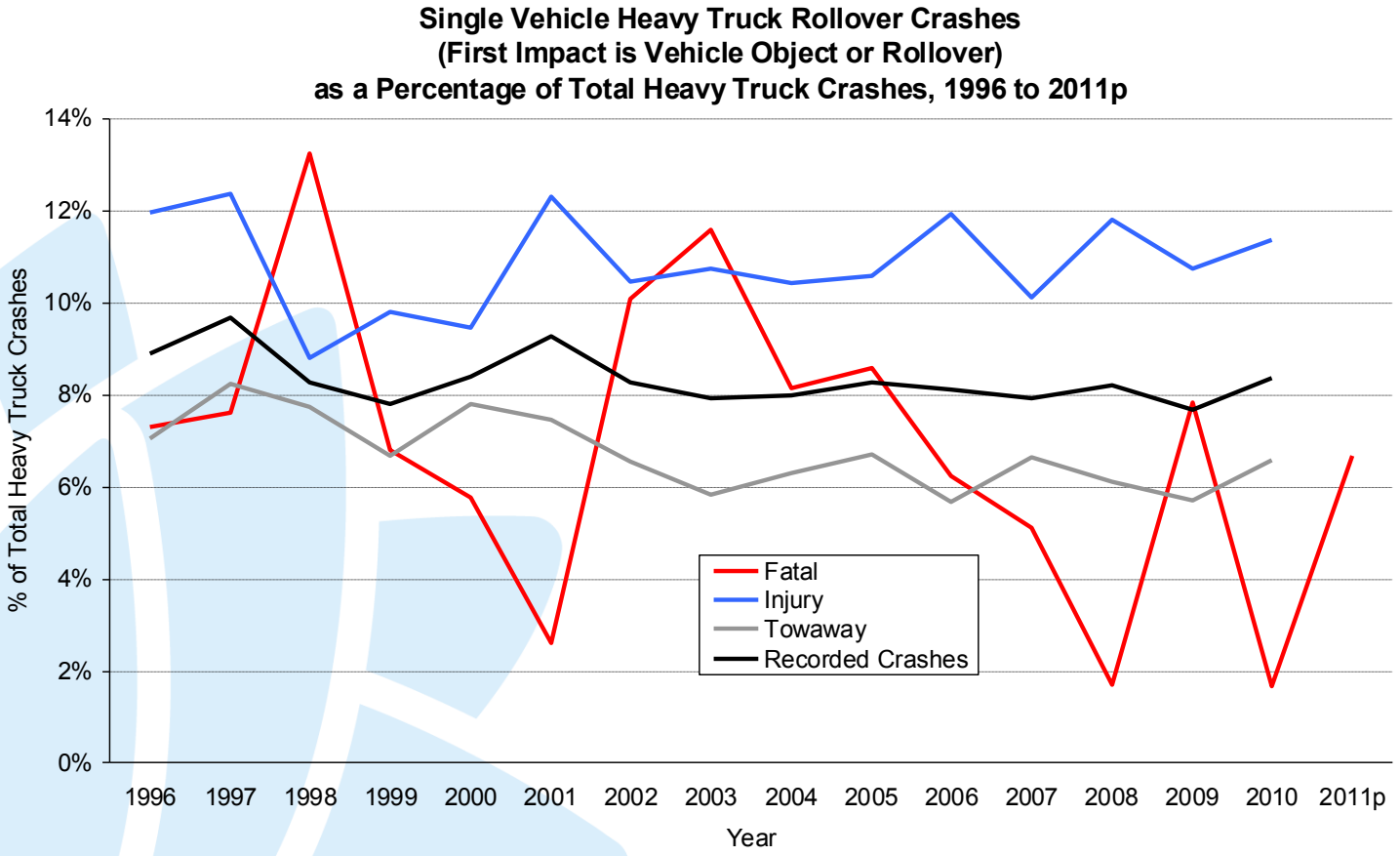
Heavy Truck Single Vehicle Rollover Crashes Trends Since 2000

- Heavy truck single vehicle rollover crashes have been generally been declining since 2000
- Similarly fatal single vehicle rollover crashes have decreased since a peak of 11 in 2002
- However, increase occurred for recorded crashes in 2010

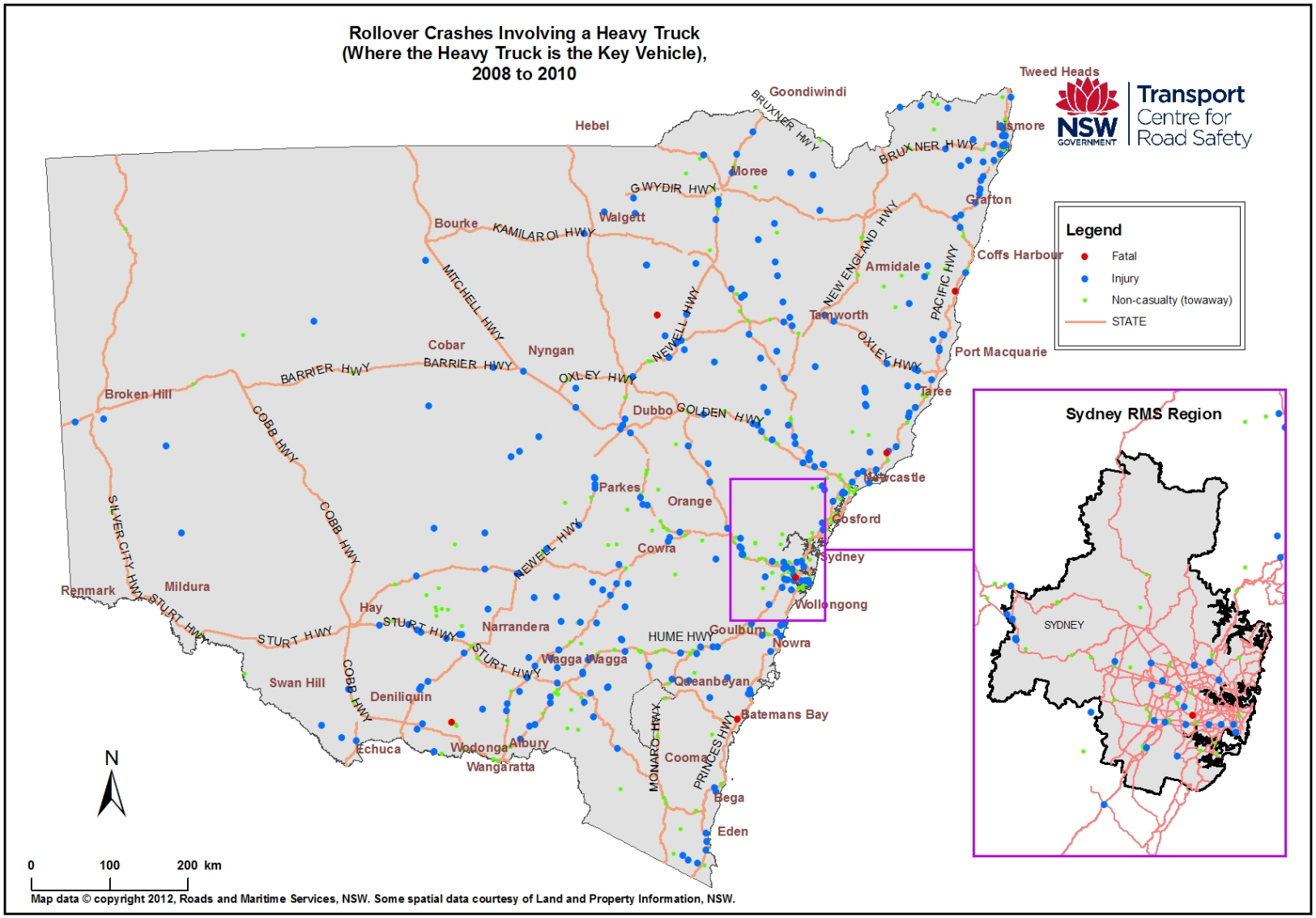


Heavy Truck Crash Trends Since 1996
Prevalence of Single Vehicle Rollover Crashes

- Since 1996, around 8 per cent of heavy truck crashes are single vehicle rollover crashes, with a slightly higher percentage for injury crashes
- Over the past five years there have been around 190 single vehicle heavy truck rollover crashes per annum



Location of Heavy Truck Single Vehicle Rollover Crashes



Distinctive Features of Heavy Truck Single Vehicle Rollover Crashes

•Compared with all heavy truck crashes for 2008 to 2010, heavy truck single vehicle rollover crashes are more likely to involve :

- Non intersection locations (79 per cent v 63 per cent)
- State highways (45 per cent v 34 per cent)
- Speed Related (61 per cent v 15 per cent)
- Fatigue Related (21 per cent v 8 per cent)
- Darkness (31 per cent v 19 per cent)
- Injury Crash (55 per cent v 39 per cent)
- 100 km/h speed zones (50 per cent v 18 per cent)
- Country areas (88 per cent v 39 per cent)
- Involve an articulated truck (71 per cent of all heavy trucks involved v 49 per cent)

Mareket Saturation

Interesting study in the US has shown long lead times for market saturation

ABS brakes

- Introduced in 1985
- Standard in 99% of new vehicles in 2010
- It will take till 2015 to reach 95% of the vehicle fleet.

Front air bags

- Introduced mid 1980's
- Mandatory in 1999
- It will take till 2016 for dual front air bags to be found in 95% of vehicles

Market saturation

Curtain air bags

- Introduced in 1998
- In 2005, they were standard in 33% of vehicles and optional on 29%
- It is expected that 95% of vehicles on the road will have these airbags by 2028.

Electronic Stability Control

- Introduced in 1995
- Mandated as standard equipment in 2012 – ESC has rapidly penetrated the market
- ESC will be in 95% of vehicles by 2029

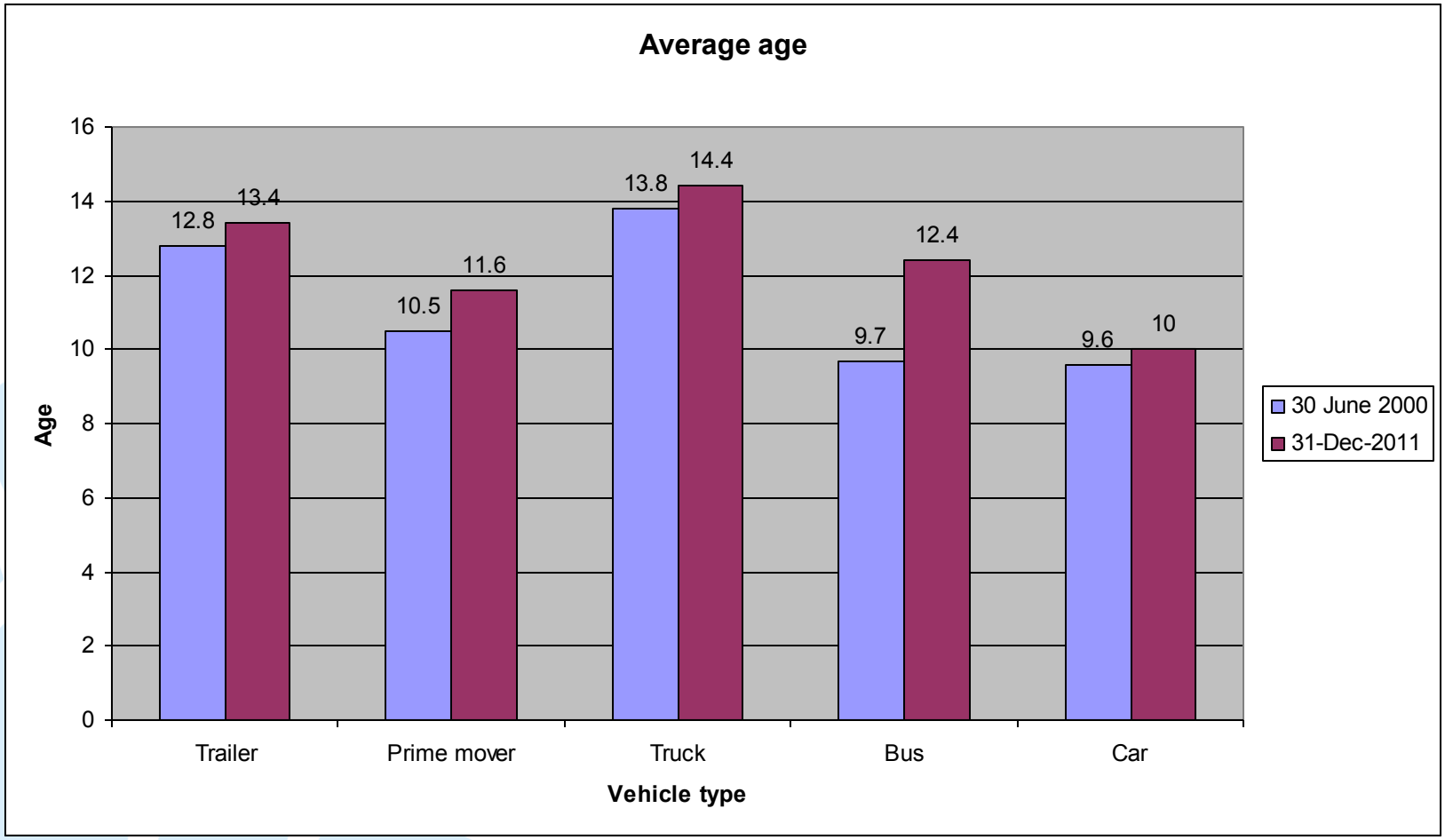
Forward Collision warning

- First appeared in 2000
- In 2010 was only standard on 1%
- It is expected that 95% of the vehicle fleet will have FC in 2049

Vehicle Age

Even though Vehicle manufactures are implementing technology quickly in their vehicles, it still takes time for the safety features to reach the majority of vehicles on the road, especially with owners holding on to their vehicles longer.

Average Age


Average age
16
14
12
10
8
6
4
2
0
Age
12.8
13.4
10.5
11.6
13.8
14.4
9.7
12.4
9.6
10
Trailer
Prime mover
Truck
Bus
Car
Vehicle type
30 June 2000
31-Dec-2011

Thank You