Australian Government
Department of Infrastructure and Regional Development
Bureau of Infrastructure, Transport and Regional Economics

Light commercial vehicle safety

At a glance

- This information sheet analyses fatal crashes and fatalities involving light commercial vehicles.
- Light commercial vehicles are motor vehicles constructed to carry goods or specialised equipment that are less than or equal to 3.5 tonnes gross vehicle mass. They include utility vehicles, panel vans, cab chassis vehicles and goods vans.
- Light commercial vehicles account for more than 1 in 6 registered vehicles and almost 1 in 5 of total vehicle kilometres travelled (VKT).
- In 2015 crashes involving light commercial vehicles accounted for 262 road deaths (21 per cent of road deaths), down 3.7 per cent on 2014.
- Deaths in crashes involving light commercial vehicles were down 5.0 per cent on the National Road Safety Strategy base period 2008–2010, less than light passenger vehicle involved crashes (16.4 per cent).
- This is partly due to greater exposure. Light commercial VKT increased at almost five times the rate for light passenger vehicles between 2008 and 2015. Adjusting for VKT, light commercial vehicle fatal crash rates are still 17 per cent higher per billion VKT than for light passenger vehicles.
- Light commercial vehicle involved fatal crashes differ from light passenger vehicle fatal crashes:
    - 90 per cent of drivers were male (65 per cent for light passenger vehicle drivers).
    - Over 60 per cent were in non-urban areas (50 per cent for light passenger vehicle crashes).
    - 55 per cent of crashes involve multiple vehicles (40 per cent for light passenger vehicles).
    - they are more likely to be head on or same direction, and less likely to be off path crashes.
- In terms of risk to occupants of vehicles involved in fatal crashes:
    - Light commercial vehicle occupant fatality rates are 30 per cent lower than light passenger vehicle occupants, however, on average there are 19 per cent more occupants in light passenger vehicles than light commercial vehicles.
    - When both a light commercial vehicle and light passenger vehicle are involved, occupant fatalities are 4 times more likely to be a light passenger vehicle occupant.
    - Fatality rates for light passenger vehicle drivers have declined significantly since 2008; while light commercial vehicle driver fatality rates also declined the trend is less clear.
- Most light vehicle safety Australian Design Rules apply to light commercial vehicles, the exception is offset frontal impact occupant protection.
- Where new Australian Design Rules apply to light commercial vehicles, the application dates to new vehicles are delayed compared to light passenger vehicles.

Vehicle definitions

Light commercial vehicles are motor vehicles constructed for the carriage of goods or specialised equipment which are less than or equal to 3.5 tonnes gross vehicle mass (GVM). These include utility vehicles, panel vans, cab chassis, and goods carrying vans with a GVM of less than 3.5 tonnes.

The Australian Design Rules (ADRs) define light commercial vehicles as Category NA vehicles: light goods vehicle with a GVM not exceeding 3.5 tonnes (for example, the Toyota Hilux or Ford Ranger).

Light passenger vehicles are motor vehicles constructed for the carriage of persons and contain less than 10 seats, excluding motorcycles (two and three wheeled vehicles) and buses (10 or more seats).

The ADRs define three light passenger vehicle categories:

Category MA: A passenger vehicle, not being an off-road passenger vehicle or a forward-control passenger vehicle, having up to 9 seating positions, including that of the driver (for example, a two wheel drive Mazda CX-9 or a Toyota Camry).

Category MB: A passenger vehicle, not being an off-road passenger vehicle, having up to 9 seating positions including that of the driver, and in which the centre of the steering wheel is in the forward quarter of the vehicle's 'Total Length.' There are no currently certified MB vehicles. The first generation Toyota Tarago was an example of a category MB vehicle.

Category MC: A passenger vehicle having up to 9 seating positions, including that of the driver, that is designed with special features for off-road operation (for example, a four wheel drive Mazda CX-9 or a Nissan Patrol or a Jeep Wrangler).

Detailed definitions can be found at: Vehicle Standard (ADR Definitions and Vehicle Categories) 2005 made under the *Motor Vehicle Standards Act 1989*.

Data sources and limitations

The main source of fatal crash data used in this analysis is the National Crash Database. Data is sourced from jurisdictions, and covers calendar years 2008 to 2015.

Most jurisdictions categorise light vehicles for crash data purposes as vehicles less than 4.5 tonnes GVM, however, New South Wales uses 4.5 tonnes tare weight and Queensland uses 2.45 tonnes tare weight to categorise light commercial vehicles.

BITRE analysis of vehicle data suggests that a threshold of 2.5 tonnes tare weight is broadly equivalent to a GVM of 4.5 tonne, however, the higher threshold of 4.5 tonne tare weight results in a number of common heavy rigid truck types (with a GVM greater than 4.5 tonnes) being classified as light commercial vehicles. Vehicle weights were used to re-categorise some crash vehicles:

- Where crash vehicle GVM was available, some vehicles were reclassified as heavy vehicles or light trucks (category NB1 vehicles with a GVM between 3.5 tonnes and 4.5 tonnes GVM). A total of 8590 vehicles in NSW were reclassified between 2008 and 2015 across all severity categories. This resulted in an overall decrease of 170 fatal crashes involving a light commercial vehicle between 2008 and 2015 compared with the jurisdictional vehicle classification.
- Where crash vehicle weights are not available, the jurisdiction's vehicle category has been used.

While this process reduced the number of crashes involving a light commercial vehicle, an unknown number of crashes involving a light commercial vehicle in NSW and Queensland may be mis-categorised.

It is important to note that a significant proportion of multiple vehicle crashes involving a light commercial vehicle also involve at least one light passenger vehicle. In 2015, 32 per cent of fatal crashes involving at least one light commercial vehicle also involved a light passenger vehicle, and 10 per cent of fatal crashes involving a light passenger vehicle also involved a light commercial vehicle.

The crash data used does not allow attribution of fault to a vehicle operator in multiple vehicle crashes.

Data used to produce crash rates was sourced from the Australian Bureau of Statistics Motor Vehicle Census (2015), Australian Bureau of Statistics Australian Demographic Statistics – Estimated Resident Population (2016) and BITRE' estimates of vehicle kilometres travelled by vehicle type (BITRE unpublished).

Deaths

There were 262 deaths in 2015 from crashes involving light commercial vehicles (21 per cent of road deaths), a reduction of 3.7 per cent compared with 2014.

Just over half (53.8 per cent) of the 262 deaths were light commercial vehicle occupants, with light passenger vehicle occupants accounting for 1 in four deaths (25.6 per cent) and other road users one in five deaths (20.6 per cent).

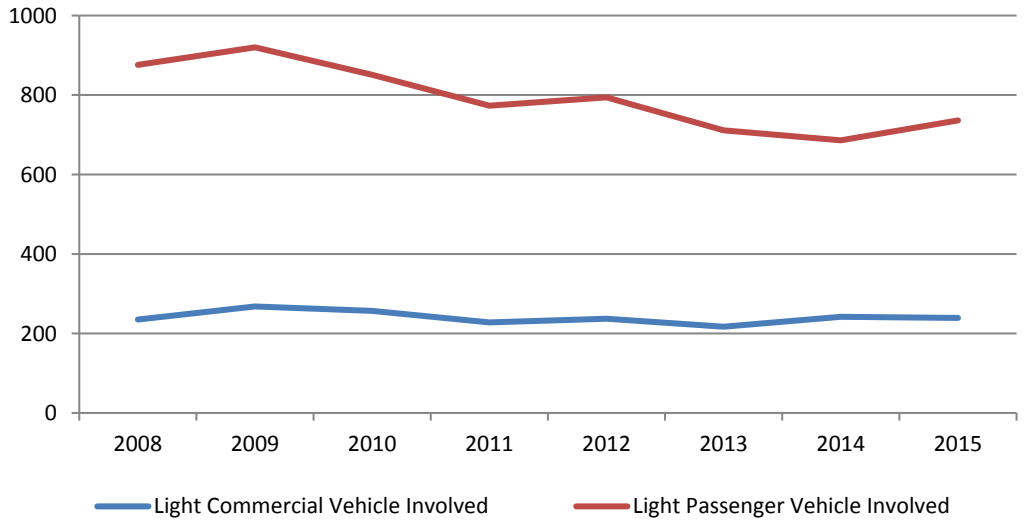
Deaths in crashes involving light commercial vehicles were down 5.0 per cent compared to the NRSS base period (average for 2008 – 2010). This was significantly less than the reduction in deaths in crashes involving light passenger vehicles (down 8.0 per cent on 2014 and 16.4 per cent compared to the NRSS base period).

Fatal crashes and crash rates

There were 239 fatal crashes involving a light commercial vehicle in 2015 (21.7 per cent of all fatal crashes), a decrease of 1.2 per cent on 2014.

In 2015, the number of light commercial vehicle involved fatal crashes was down 5.7 per cent compared with the National Road Safety Strategy base period (average for 2008 – 2010). Over the same period, the number of light passenger vehicle involved fatal crashes decreased by 16.6 per cent (Figure 1).

Figure 1 Fatal crash counts for light commercial vehicle involved and light passenger vehicle involved crashes, 2008-2015



Source BITRE National Crash Database (unpublished)

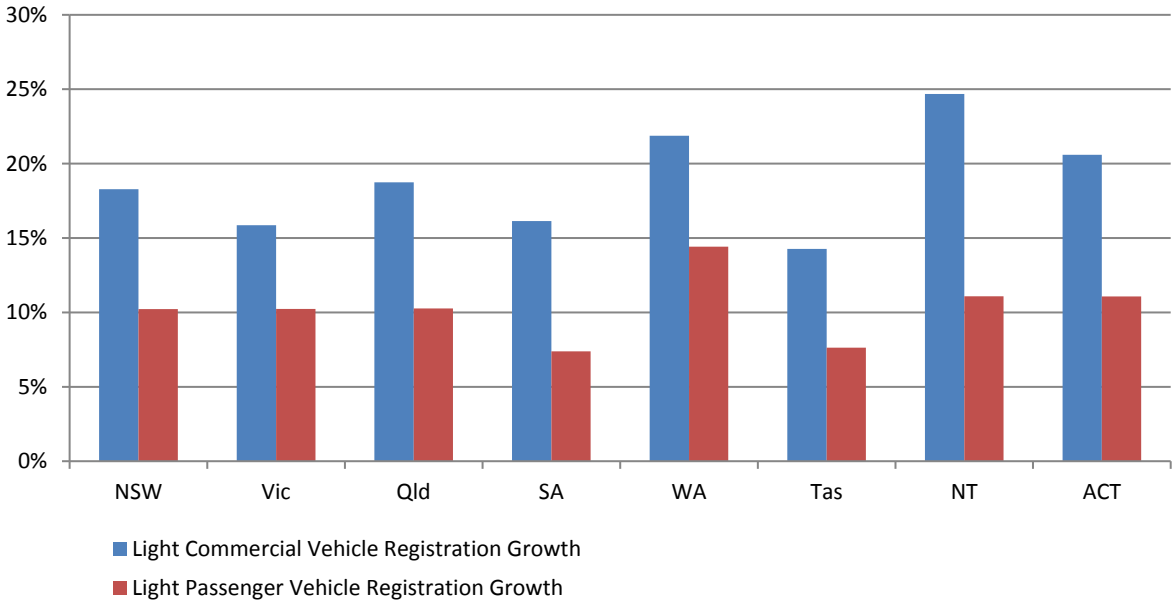
The higher number of crashes (and deaths) is partly due to greater exposure. Light commercial vehicles perform significantly more vehicle kilometres on average than light passenger vehicles, and kilometres travelled by light commercial vehicles increased at almost five times the rate for light passenger vehicles between 2008 and 2015.

In 2015:

- 2.9 million registered light commercial vehicles (approximately 1 in 5, or 16 per cent, of the registered vehicle fleet) performed 19 per cent of estimated total vehicle kilometres travelled.
- 13.5 million registered light passenger vehicles (75 per cent of the registered vehicle fleet) performed 70 per cent of estimated total vehicle kilometres travelled.
- The average light commercial vehicle travelled approximately 16,700 kilometres per annum and the average light passenger vehicle travelled approximately 12,900 kilometres per annum.

Growth in the number of new light commercial vehicle registrations outstripped growth in new light passenger vehicle registrations in all jurisdictions (Figure 2). Annual growth rates for light commercial vehicles registrations grew 3 to 4 per cent a year, with growth highest in Queensland and the Northern Territory. By comparison, light passenger vehicle registrations grew between 1.5 and 2.7 per cent a year.

Figure 2 Growth in vehicle registrations in the five years to 2015 by Jurisdiction



Source BITRE vehicle registration estimates (unpublished)

Higher growth rates for registered vehicles and greater average VKT travelled have meant that the growth in light commercial vehicles VKT outstripped growth in estimated light passenger vehicle VKT.

- Estimated vehicle kilometres travelled by light commercial vehicles grew by 23 per cent and total vehicle kilometres travelled by light passenger vehicles grew 5 per cent between 2008 and 2015.

Adjusting for the number of registered vehicles, average kilometres travelled per vehicle, and total kilometres travelled by vehicle type, fatal crash rates for light commercial vehicles between 2008 and 2015 were:

- 48 per cent higher *per vehicle* for light commercial vehicles compared to light passenger vehicles (0.94 fatal crashes per 10,000 registered vehicles compared to 0.63 fatal crashes for light passenger vehicles).
- 17 per cent higher *per billion VKT* than for light passenger vehicles (5.53 compared with 4.70).

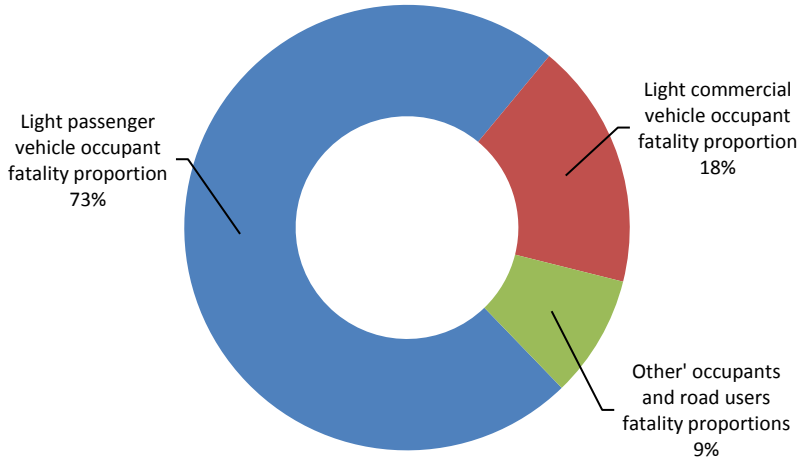
Risk to vehicle occupants

While light commercial vehicle fatal crash rates are higher than light passenger vehicle fatal crash rates, light commercial vehicle *occupant* fatality rates are lower than light passenger vehicle occupant fatality rates.

Figure 3 shows the proportions of occupant fatalities between road users when both a light passenger vehicle and a light commercial vehicle were involved in the same crash. The 'Other' category accounts for pedestrians, pedal cyclists, motorcyclists and other occupants of different vehicle types.

When at least one light commercial vehicle and at least one light passenger vehicle are involved in the same crash, occupant fatalities are 4 times more likely to be a light passenger vehicle occupant.

Figure 3 Fatal crashes involving light commercial and light passenger vehicles: proportions

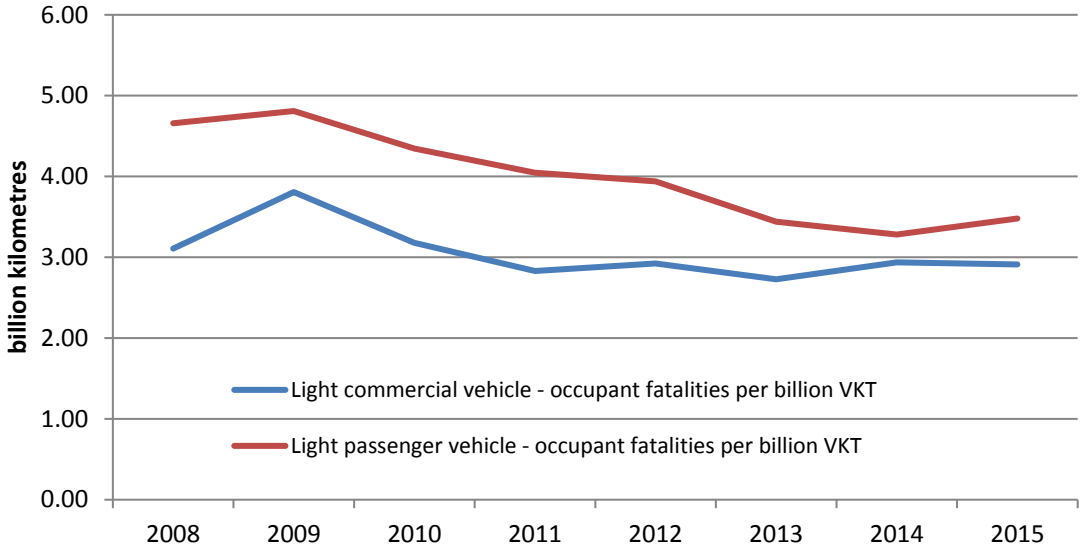


Source BITRE National Crash Database (unpublished)

The risk to light passenger vehicle occupants has reduced more than for light commercial vehicle occupants since 2008 (Figure 4). In 2015 light commercial vehicle *occupant* fatalities occurred at a rate of 2.9 per billion VKT, significantly higher than the light passenger vehicle *occupant* fatalities rate of 3.5 per billion VKT.

While light commercial vehicle occupant fatality rates are 30 per cent lower than light passenger vehicles, fatal crash data indicates that on average there were 18 per cent more light passenger vehicle occupants (including uninjured occupants) per vehicle than light commercial vehicle occupants.

Figure 4 Light commercial and light passenger vehicle occupant fatality rates per billion vehicle kilometres travelled

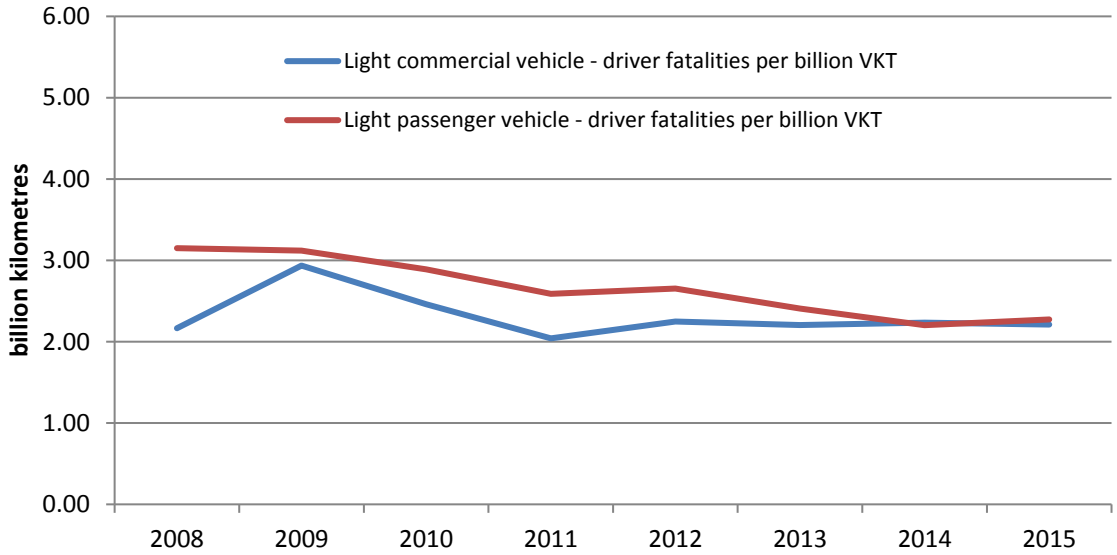


Source BITRE National Crash Database (unpublished)

Figure 5 shows a significant reduction in light passenger vehicle driver fatality rates since 2008 (from 3.1 to 2.3 deaths per billion VKT). While fatality rates for light commercial vehicle drivers appear to have declined since 2008 the trend is less clear.

In 2014 and 2015, drivers of light commercial vehicles and light passenger vehicles had similar fatality rates (approximately 2.2 deaths per billion VKT).

Figure 5 Light commercial and light passenger vehicle driver fatality rates per billion vehicle kilometres travelled



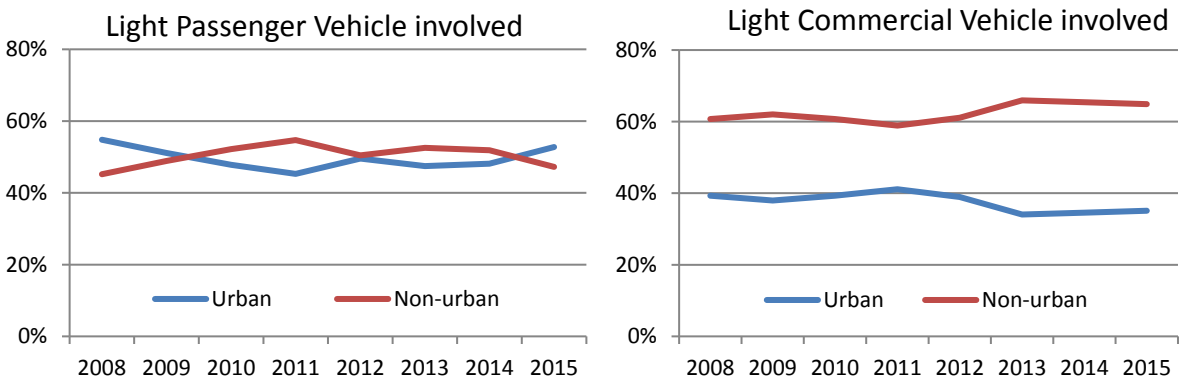
Source BITRE National Crash Database (unpublished)

Fatal crash geography and types

Urban and non-urban areas

A greater proportion of light commercial vehicle involved crashes occur in non-urban areas (more than 60 per cent) with an associated recent decrease in urban areas (Figure 6).

Figure 6 Fatal crashes by urbanisation category, 2008-2015

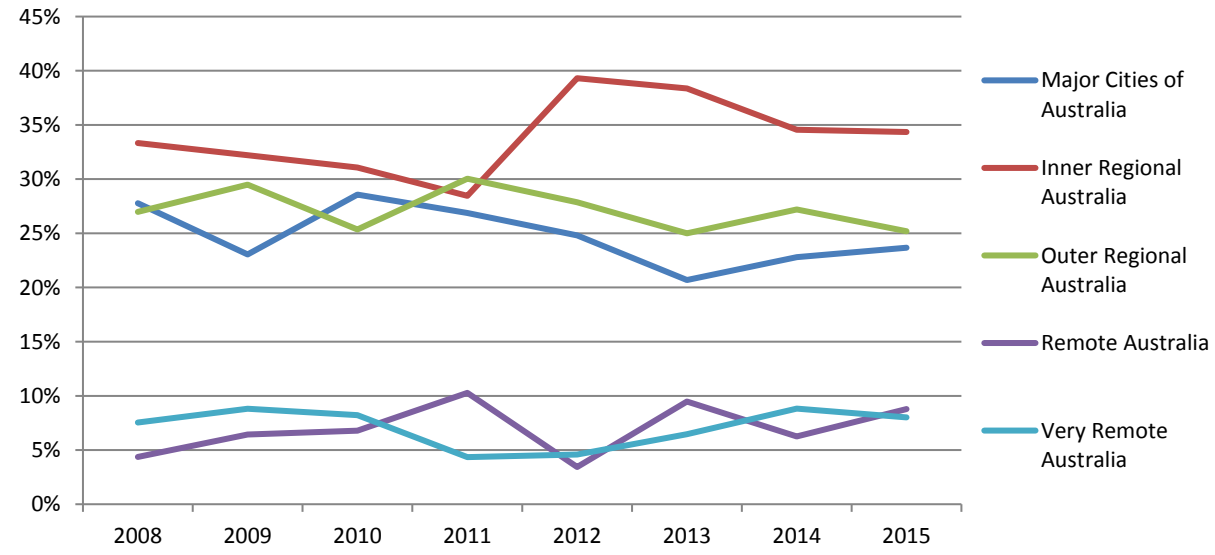


Source: BITRE National Crash Database (unpublished)

Major cities, regional and remote areas

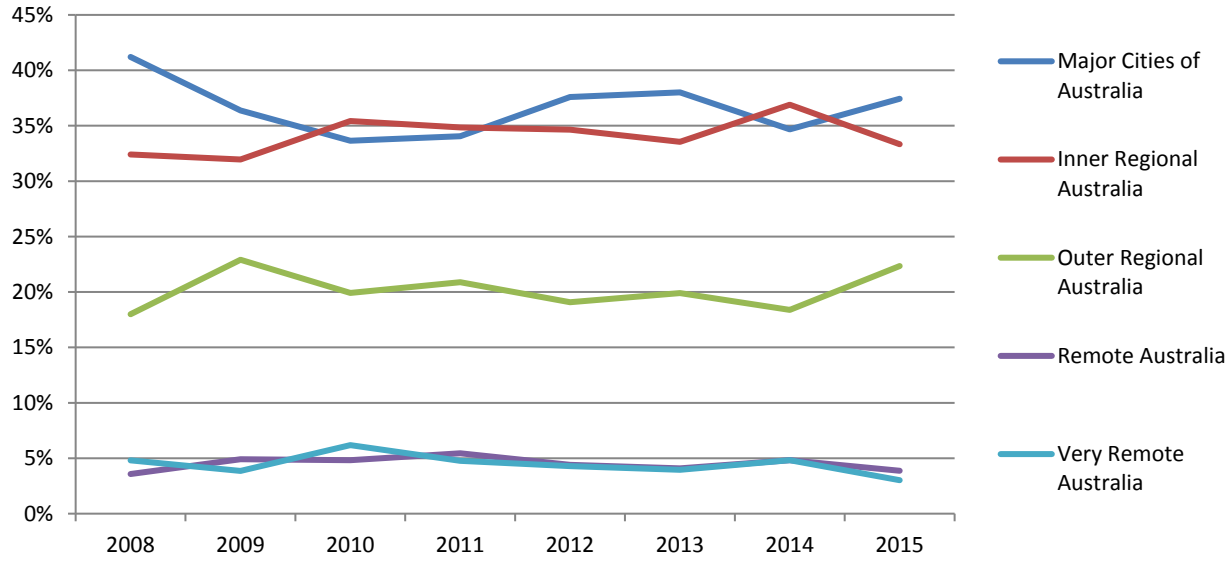
In terms of ABS Remoteness Area, light commercial vehicle involved fatal crashes have increased slightly in inner regional areas, decreased in major cities and outer regional areas and increased in remote areas, between 2008 and 2015 (Figure 7). An equivalent increase in inner regional areas has not occurred for light passenger vehicles (Figure 8).

Figure 7 Fatal crashes involving light commercial vehicles by Remoteness Area, 2008-2015



Source: BITRE National Crash Database (unpublished)

Figure 8 Fatal crashes involving light passenger vehicles by Remoteness Area, 2008-2015



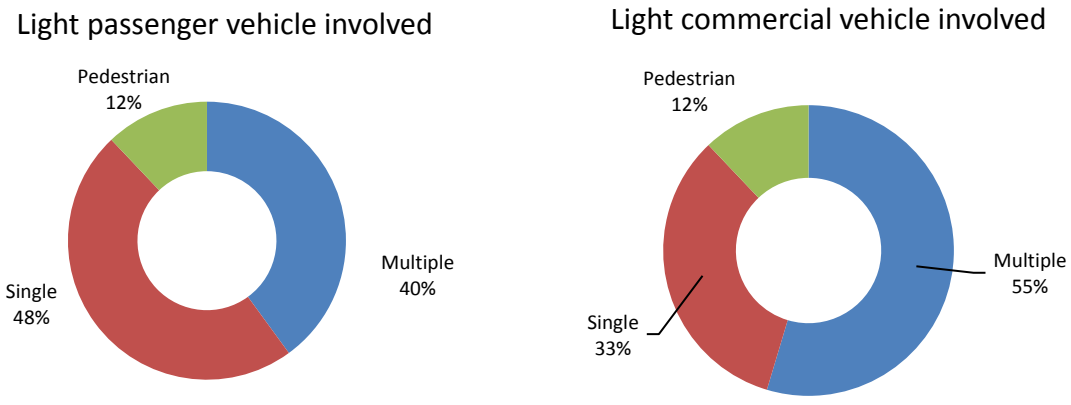
Source: BITRE National Crash Database (unpublished)

Major crash types and categories

Pedestrian, single and multiple vehicle fatalities

There was no difference in the proportion of pedestrian involved fatalities for light commercial and light passenger vehicle involved fatalities, but light commercial vehicles are more likely to be involved in fatal multiple vehicle crashes than light passenger vehicles (Figure 9).

Figure 9 Pedestrian involved, single and multiple vehicle fatalities, 2008-2015

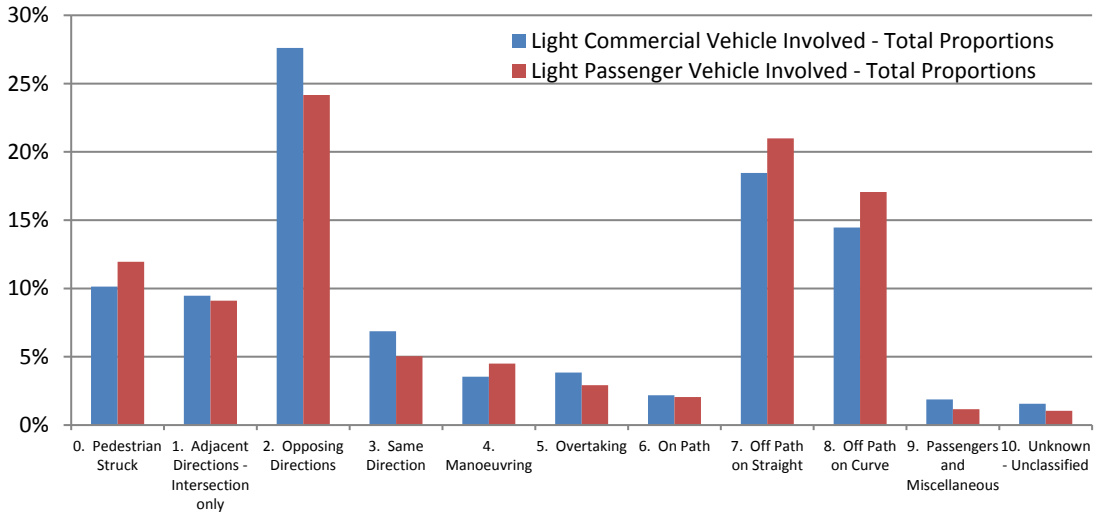


Source: BITRE National Crash Database (unpublished)

Major crash groups

Compared with light passenger vehicles, light commercial vehicles are more likely to be involved in fatal head on and fatal same direction crashes and less likely to be involved in off path fatal crashes and pedestrian-involved fatal crashes (Figure 10).

Figure 10 Major crash groups: light commercial vehicle involved crashes and light passenger vehicle involved crashes, 2008-2015

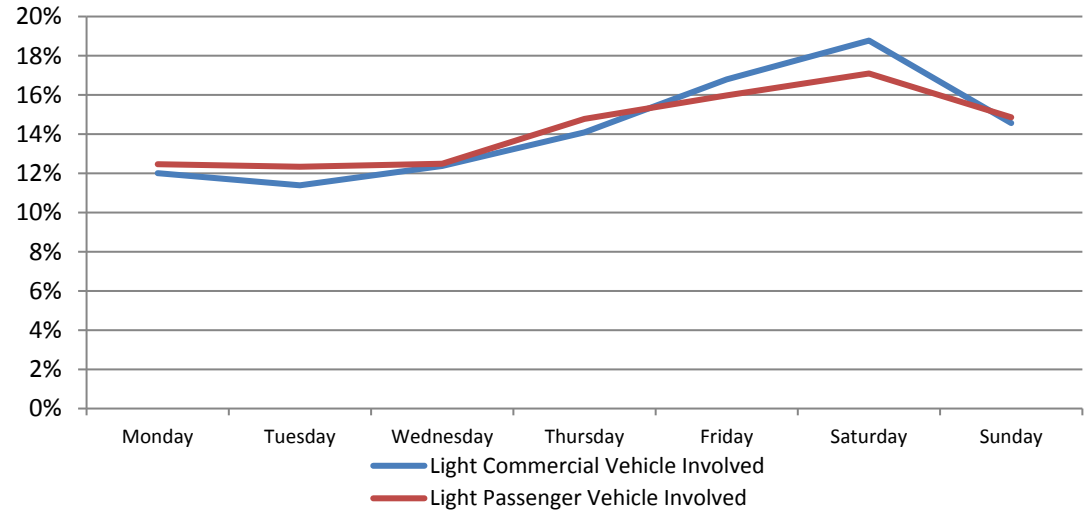


Source BITRE National Crash Database (unpublished).

Day and time of fatal crashes

Light commercial vehicle fatal crashes are highest from Thursday through to Sunday. Light passenger vehicle fatal crashes show a similar trend. Both vehicle types display a peak in crashes on Saturday (Figure 11).

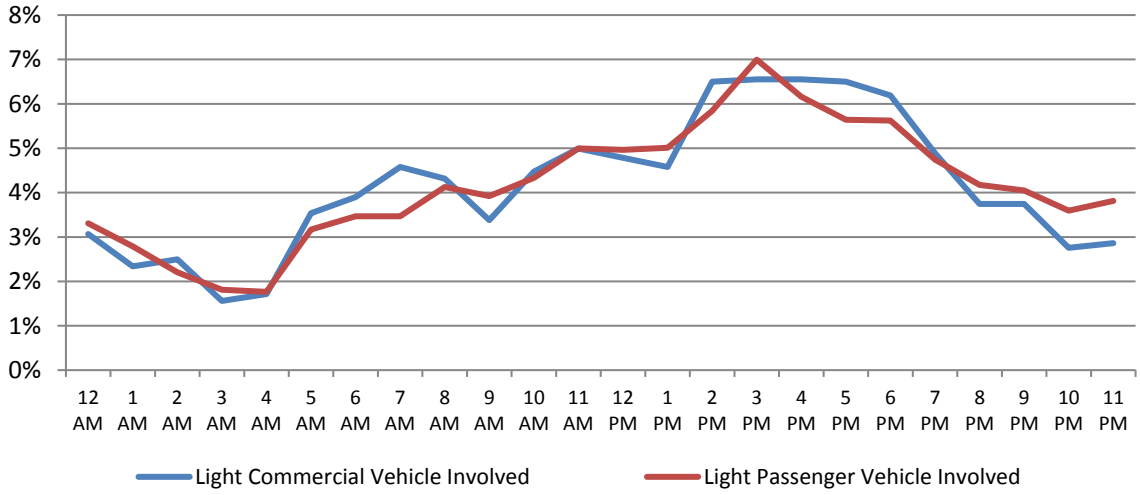
Figure 11 Proportion of fatal crashes by day of week: light commercial vehicle involved and light passenger vehicle involved



Source BITRE National Crash Database (unpublished)

Both light commercial vehicle fatal crashes and light passenger vehicle fatal crashes follow a similar trend by time of day, with light commercial vehicle fatal crashes slightly higher between the hours of 5 AM and 8 AM, then slightly lower from 7 PM to midnight (Figure 12).

Figure 12 Proportion of fatal crashes by time of day: light commercial vehicle involved and light passenger vehicle involved



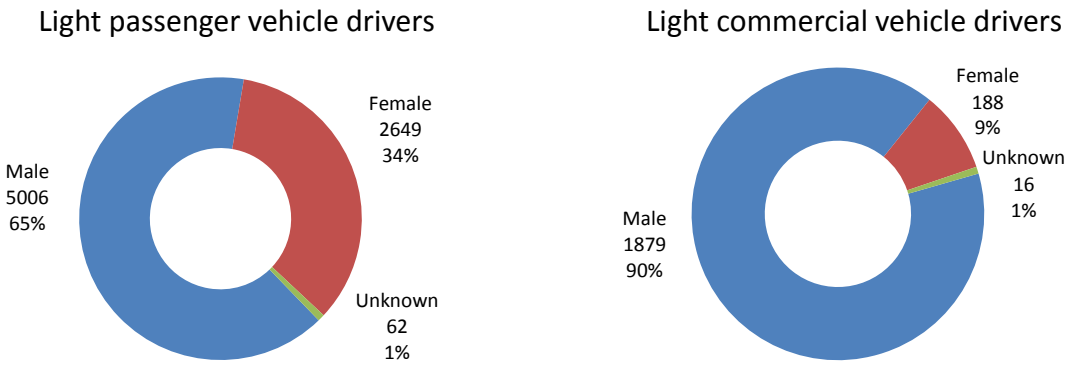
Source BITRE National Crash Database (unpublished)

Driver demographics

Gender

Ninety per cent of light commercial vehicle drivers involved in fatal crashes were male compared to only 65 per cent of light passenger vehicle drivers involved in fatal crashes (Figure 13).

Figure 13 Fatal crashes by gender: light commercial and light passenger vehicle drivers

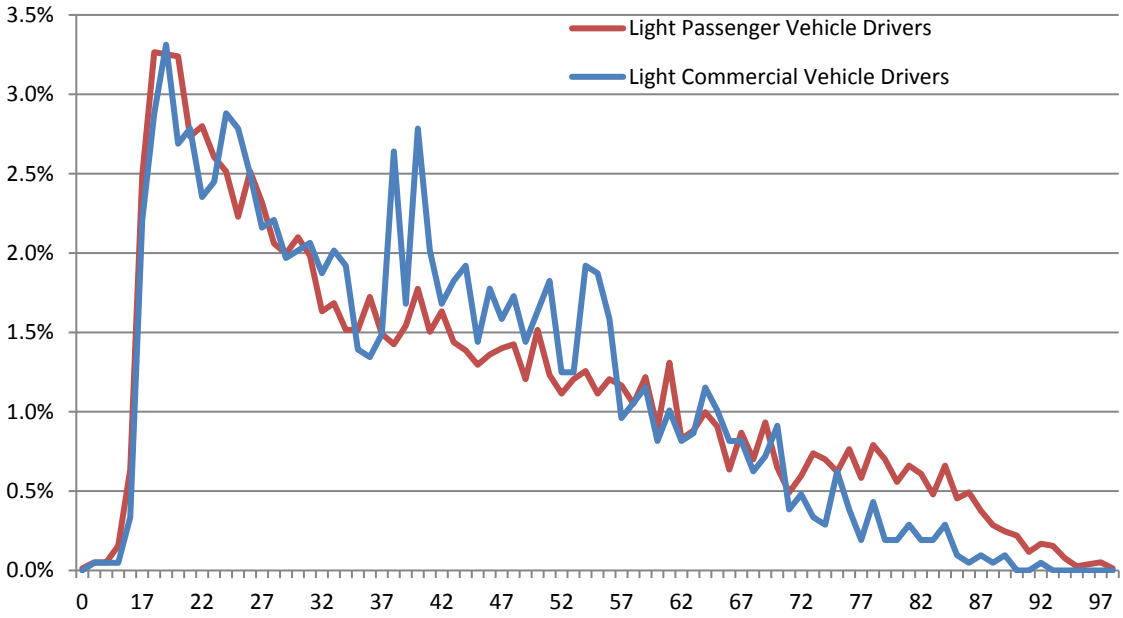


Source BITRE National Crash Database (unpublished)

Age

Light commercial vehicle drivers between the ages of 35 and 55 are more likely to be involved in a fatal crash than light passenger vehicle drivers in the same age group, and those in the 70 plus age group were less likely to be involved in a fatal crash (Figure 14).

Figure 14 Fatal crashes by age: light commercial vehicle and light passenger vehicle drivers



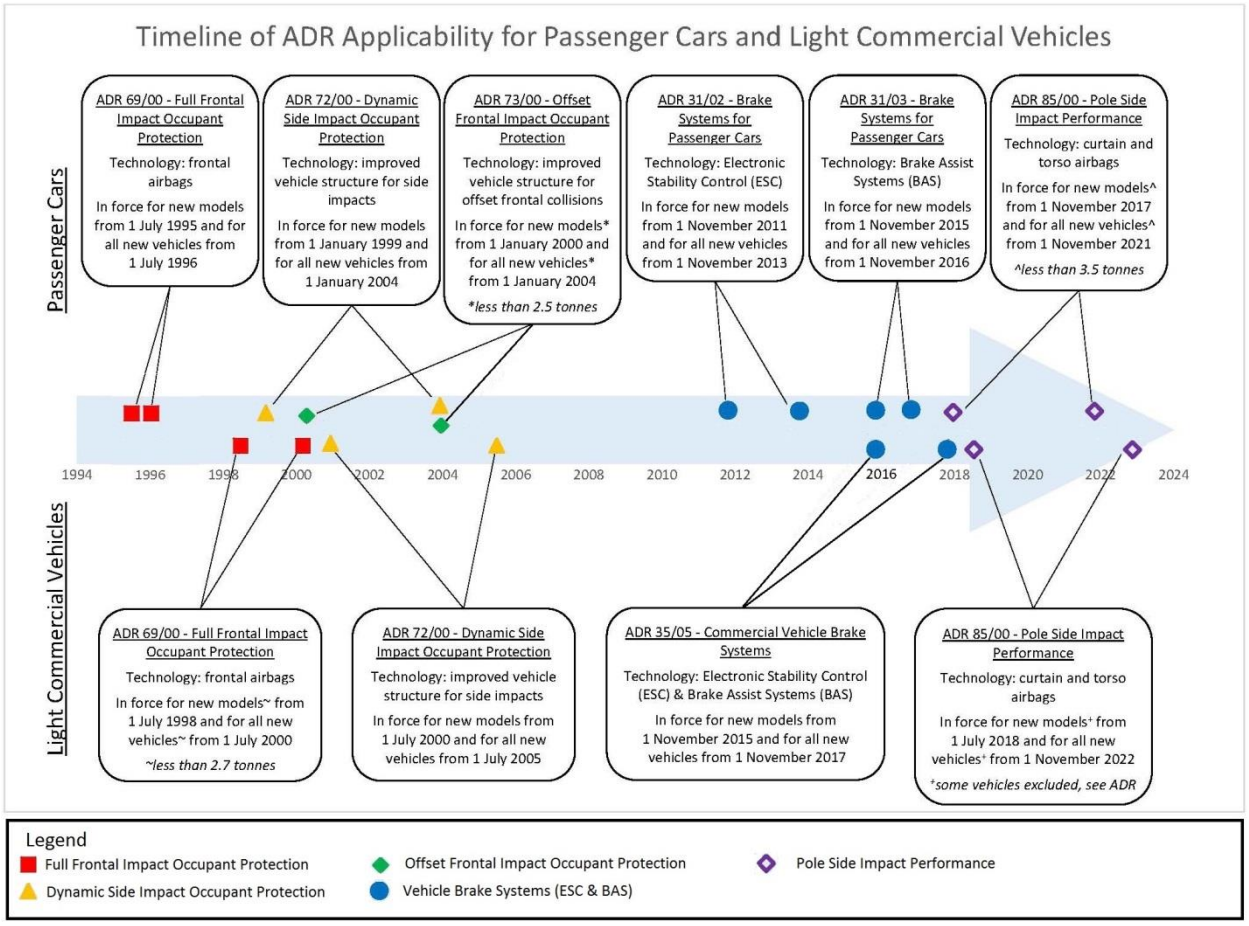
Source: BITRE National Crash Database (unpublished).

Light commercial vehicle - safety standards

The Commonwealth *Motor Vehicle Standards Act 1989* requires that all new road vehicles, whether manufactured in Australia or imported, comply with national vehicle standards (known as Australian Design Rules or ADRs) before they can be offered to the market for use in transport. The ADRs are mostly performance based standards for vehicle safety, emissions control and anti-theft protection.

Key safety ADRs for light vehicles include full frontal, dynamic side and offset frontal occupant protection, brake systems for passenger cars, and pole side impact performance (Figure 15).

Figure 15 Timeline of key safety ADR applicability for passenger cars and light commercial vehicles



Source Department of Infrastructure and Regional Development

Table 1 provides a summary of major safety related ADRs applicable to light vehicles. ADRs apply to vehicles in accordance with the applicability dates set out at the beginning (usually in an applicability table) of each standard. These dates—not the year listed in the title of the standard—are the key to identifying which ADR applies for a particular year of manufacture of a new or used vehicle.

Most light vehicle safety Australian Design Rules apply to light commercial vehicles, the exception is offset frontal impact occupant protection.

As shown in Table 1, the requirement for light vehicles to comply with safety ADRs has been phased in for new vehicle models, with existing vehicle models allowed several years to comply or be phased out. Where new Australian Design Rules apply to light commercial vehicles, the application dates to new vehicles are delayed compared to light passenger vehicles.

For example, front airbags (ADR 69/00) applied to *new models* of: passenger cars from 1 July 1995; other light passenger vehicles from 1 January 1998; and to light commercial vehicles from 1 July 1998. *Existing models* that did not comply with the front airbags ADR 69/00 could be sold until 1 January 1996 for passenger cars, 1 January 2000 for other light passenger vehicles, and 1 July 2000 for light commercial vehicles.

For more recent ADRs, the delay in applicability dates for light commercial vehicles have been reduced. The pole side impact ADR (85/00) application to new light commercial models was delayed by 6 months compared with new light passenger vehicle models, and the application to all existing light commercial vehicle models was delayed by 12 months compared to light passenger vehicle models.

Table 1 Major safety related ADR applicability to light passenger and light commercial vehicle categories

ADR	*Primary technology*	*Passenger cars (MA)*	*Other light passenger vehicles, e.g. SUVs (MB, MC)*	*Light commercial vehicles (NA)*
ADR 69/00 – Full Frontal Impact Occupant Protection	Frontal airbags	In force for new models from 1 July 1995 and for all new vehicles from 1 January 1996	In force for new models from 1 January 1998 and for all new vehicles from 1 January 2000	In force for new models~ from 1 July 1998 and for all new vehicles~ from 1 July 2000 ~less than 2.7 tonnes GVM
ADR 72/00 – Dynamic Side Impact Occupant Protection	Improved vehicle structure for side impacts	In force for new models from 1 January 1999 and for all new vehicles from 1 January 2004	In force for new models from 1 January 2000 and for all new vehicles from 1 January 2004	In force for new models from 1 July 2000 and for all new vehicles from 1 July 2005
ADR 73/00 – Offset Frontal Impact Occupant Protection	Improved vehicle structure for offset frontal collisions	In force for new models* from 1 January 2000 and for all new vehicles* from 1 January 2004 *less than 2.5 tonnes GVM	Not applicable to MB and MC category vehicles	Not applicable to light commercial vehicles
ADR 31/02 – Brake Systems for Passenger Cars**	Electronic Stability Control (ESC)	In force for new models from 1 November 2011 and for all new vehicles from 1 November 2013	In force for new models from 1 November 2011 and for all new vehicles from 1 November 2013	See ADR35/05
ADR 31/03 – Brake Systems for Passenger Cars**	Brake Assist Systems (BAS)	In force for new models from 1 November 2015 and for all new vehicles from 1 November 2016	In force for new models from 1 November 2015 and for all new vehicles from 1 November 2016	See ADR35/05
ADR 35/05 – Commercial Vehicle Brake Systems**	Electronic Stability Control (ESC) & Brake Assist Systems (BAS)		In force for new models from 1 November 2015 and for all new vehicles from 1 November 2016	In force for new models from 1 November 2015 and for all new vehicles from 1 November 2017
ADR 85/00 – Pole Side Impact Performance	Curtain and torso airbags	In force for new models^ from 1 November 2017 and for all new vehicles^ from 1 November 2021 ^less than 3.5 tonnes GVM	In force for new models^ from 1 November 2017 and for all new vehicles^ from 1 November 2021 ^less than 3.5 tonnes GVM	In force for new models+ from 1 July 2018 and for all new vehicles+ from 1 November 2022 +some vehicles excluded, see ADR

** MB, MC and NA category vehicles may meet the requirements of ADR 31/… or ADR 35/…

Source: Department of Infrastructure and Regional Development, Vehicle Safety Standards (pers. comm. November 2016)

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Vehicle Standard (Australian Design Rule – Definitions and Vehicle Categories) 2005 Amendment 9 (see F2016L00790) Commencement Date – 14/5/2016.

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Contact us

Department of Infrastructure and Regional Development
Bureau of Infrastructure, Transport and Regional Economics (BITRE)
GPO Box 501, Canberra ACT 2601, Australia

Phone: (international) +61 2 6274 7210
Fax: (international) +61 2 6274 6855
Email: bitre@infrastructure.gov.au
Website: www.bitre.gov.au