A Review of Casualty Crashes involving Heavy Vehicles in Tasmania

Department of Infrastructure, Energy and Resources
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Traffic & Infrastructure Branch
Department of Infrastructure, Energy and Resources
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2. Understanding Casualty Crashes involving Heavy Vehicles

2.1 Heavy vehicles

A heavy vehicle is any motor vehicle greater than 4.5 tonnes GVM. The GVM (Gross Vehicle Mass) is the maximum loaded mass of the vehicle, as specified by the vehicle manufacturer. The term ‘heavy vehicle’ refers to both trucks and buses.

For driver licencing purposes, heavy vehicles are divided into five categories as shown in the table below.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIGHT RIGID (LR)</td>
<td>A vehicle greater than 4.5 tonnes but no greater than 8 tonnes GVM or seats more than 12 people (including driver).</td>
</tr>
<tr>
<td>MEDIUM RIGID (MR)</td>
<td>Any 2 axle rigid vehicle greater than 8 tonnes GVM</td>
</tr>
<tr>
<td>HEAVY RIGID (HR)</td>
<td>A vehicle 8 tonnes GVM and above, with 3 or more axles</td>
</tr>
<tr>
<td>HEAVY COMBINATION (HC)</td>
<td>A prime mover, single semi-trailer, or rigid vehicle with trailer over 9 tonnes GVM.</td>
</tr>
<tr>
<td>MULTI COMBINATION (MC)</td>
<td>A Heavy Combination vehicle with more than one trailer.</td>
</tr>
</tbody>
</table>

Table 2.1 – Heavy vehicle categories

To drive heavy vehicles safely requires special skills and experience, and minimum age and experience criteria must be satisfied before a driver can apply for a licence. Heavy vehicle drivers must hold a licence for the particular category of heavy vehicle that they are driving.

2.2 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. Crash categories are as follows:

- fatal — a person dies within 30 days of the crash;
- serious injury — a person is admitted to hospital for at least 24 hours;
- minor injury — a person is admitted to hospital for less than 24 hours;
- first aid — a person is treated at the scene; and
- property damage only.

The term ‘casualty crash’ is used to collectively describe fatal, serious injury, minor injury and first aid crashes.
The Table below sets out the crash statistics for Tasmania for the five-year period (2005-2009). The numbers 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.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Total number of crashes</th>
<th>Number of crashes involving heavy vehicles</th>
<th>Percentage of crashes involving heavy vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>220</td>
<td>41</td>
<td>18.6%</td>
</tr>
<tr>
<td>Serious</td>
<td>1,296</td>
<td>94</td>
<td>7.3%</td>
</tr>
<tr>
<td>Minor</td>
<td>5,631</td>
<td>340</td>
<td>6.0%</td>
</tr>
<tr>
<td>First aid</td>
<td>1,977</td>
<td>102</td>
<td>5.2%</td>
</tr>
<tr>
<td>Property damage</td>
<td>22,597</td>
<td>1,704</td>
<td>7.5%</td>
</tr>
<tr>
<td>Not known</td>
<td>3,195</td>
<td>114</td>
<td>3.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34,916</strong></td>
<td><strong>2,395</strong></td>
<td><strong>6.9%</strong></td>
</tr>
</tbody>
</table>

Table 2.2 – Crash history for five-year period (2005-2009)

During the five-year period (2005-2009) there were more than 34,000 reported crashes and over 9,000 of these were casualty crashes (fatal, serious injury, minor injury and first aid).

Heavy vehicles were involved in 6.3% of casualty crashes. This broadly reflects vehicle registration statistics which show that trucks and buses make up 7.2% of all vehicles registered in Tasmania.

Heavy vehicles were involved in 19% of fatal crashes. Collisions involving a heavy vehicle and a car are much more likely to have fatal consequences than a collision between two cars because a heavy vehicle has much greater mass and momentum.

2.3 Time of day

The pattern of casualty crashes involving heavy vehicles by time of day shows higher numbers of crashes between 0800 and 1700 hrs when most heavy vehicles are operating.
2.4 Day of week

The variation of casualty crashes for heavy vehicles by day of week shows a substantially lower number of crashes at the weekend. This reflects the fact that most heavy vehicle activity occurs on weekdays.

![Chart 2.2 - Casualty crashes involving heavy vehicles (2005-2009), Day of week](image)

2.5 Speed limit

The distribution of heavy vehicle crashes by speed zone shows that slightly more than half occur on rural roads (those with a speed limit of 80 km/h or greater).

![Chart 2.3 - Casualty crashes involving heavy vehicles (2005-2009), Speed limit](image)
2.6 Type of crash

Chart 2.4 shows the type of crash for all vehicle casualty crashes, and Chart 2.5 shows the type of crash for heavy vehicle casualty crashes alone.

It can be seen that, while loss-of-control (off-straight and off-curve) crashes account for 42% of all casualty crashes, they only account for 21% of heavy vehicle casualty crashes. Heavy vehicles are half as likely to be involved in a loss-of-control crash compared to other vehicles.

On the other hand, heavy vehicles are almost three times more likely to be involved in a head-on casualty crash. The circumstances of these head-on crashes are discussed later in this Report.

Further analysis found that pedestrian and intersection crash types are more prevalent in urban areas (where the speed limit is 70 km/h or lower) and off-straight, off-curve and head-on crashes are more prevalent in rural areas (where the speed limit is 80 km/h or greater).
2.7 Type of crash – fatal crashes

Chart 2.6 shows the type of crash for all fatal crashes, and Chart 2.7 shows the type of crash for heavy vehicle fatal crashes only.

When considering only fatal crashes, the trends that were apparent in all casualty crashes remain prominent.

Heavy vehicles are only about one-third as likely to be involved in a loss-of-control crash compared to other vehicles. Off-straight and off-curve account for 44% of all fatal crashes but only 16% of fatal crashes involving heavy vehicles. There were no off-straight fatal crashes involving heavy vehicles.

Heavy vehicles are almost twice as likely to be involved in head-on fatal crashes.
2.8 Cause of crash – fatal and serious injury crashes

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

By reading the description and examining the sketch contained in the TAR, it is possible to make an assessment about which road user was most responsible for the crash occurring. The objective of this analysis is not to assign blame but to gain a better understanding of the mechanisms of crashes involving heavy vehicles that can then inform strategies to reduce their incidence.

Each of the 136 TARs for fatal and serious injury crashes involving heavy vehicles for the five-year period (2005-2009) were analysed accordingly. The total number of crashes is too small to provide statistically robust conclusions but it does provide a useful insight.

The crashes fell into four categories:

- 20% were single vehicle crashes involving only the heavy vehicle.
- 67% involved more than one vehicle, and appear to have been the fault of the other road user (not the heavy vehicle driver).
- 8% involved more than one vehicle, and appear to have been the fault of the heavy vehicle driver.
- 5% involved more than one vehicle, but it was not clear which road user was at fault.

Based on this data, multiple vehicle crashes involving heavy vehicles are eight times more likely to be caused by the other road user. This provides strong evidence that heavy vehicle drivers exhibit a much higher degree of driving skill than the average motorist.

It also suggests that the special training and licencing requirements that apply to heavy vehicle drivers are having the desired effect. Annual vehicle inspections of buses and random roadworthiness checks on heavy vehicles reduce the risk of vehicle defects that could cause a crash.

2.9 Head-on crashes

The Traffic and Infrastructure Branch produced ‘A Review of Serious Casualty Head-on Crashes in Tasmania’ in March 2009. It was found that head-on crashes were very dispersed but are most likely to occur on high-speed, high-volume roads and typically involve one driver losing control of their vehicle and crossing onto the wrong side of the road.

Heavy vehicles are over-represented in head-on crashes but it is not clear why.
Casualty Crashes involving Heavy Vehicles

There were 48 fatal and serious injury head-on crashes involving heavy vehicles during the five-year period (2005-2009). Analysis of the roads where these crashes occurred found that:

- 42% were on roads that form part of the National Highway – such as the Midland, Bass and East Tamar Highways. The lane widths on these highways are more than sufficient to accommodate heavy vehicles and sealed shoulders are also provided.
- 46% were on roads with a marked centreline. Nearly all of these were State roads. Centrelines are only marked on roads which are at least 5.5 metres wide.
- 12% were on roads without a centreline.

This indicates that many of the head-on crashes are occurring on our widest roads with few occurring on narrow roads. As with the other types of crashes involving heavy vehicles, it was found that the overwhelming majority of head-on crashes were the fault of the other road user (not the heavy vehicle driver).

Disturbingly, some of the fatal head-on crashes appear to have been deliberate acts by the driver of the other vehicle. However, the total number of these type of crashes is low and does not account for the over-representation of heavy vehicles in head-on crashes.

The Tasmanian Road Safety Strategy – Infrastructure Program is funding the installation of treatments specifically designed to reduce or prevent head-on crashes including:

- audible centreline markings;
- wire rope safety fencing along painted medians; and
- dual carriageways.

2.10 Distribution of crashes

Most crashes involving heavy vehicles are widely dispersed across the Tasmanian road network.

Analysis was carried out to identify whether there were any sections of road with an over-representation of heavy vehicle loss-of-control crashes. There was only one location in Tasmania that had more than two loss-of-control casualty crashes reported in the same vicinity during the last five years (2005-2009).

This was on the Birraree Main Road, immediately north of the Egmont Bridge, where there had been three casualty crashes involving northbound trucks on the same bend. Curve warning signs with 45 km/h advisory speed plates have already been provided, but to emphasise the risk of trucks losing control, special tilting truck warning signs have been installed.

Arrangements are also being made to investigate whether improvements can be made to the superelevation around the curve.
3. Summary

A heavy vehicle is any motor vehicle greater than 4.5 tonnes GVM. The GVM (Gross Vehicle Mass) is the maximum loaded mass of the vehicle, as specified by the vehicle manufacturer. The term ‘heavy vehicle’ refers to both trucks and buses.

Trucks and buses account for 7.2% of all vehicles registered in Tasmania. During the five-year period (2005-2009) heavy vehicles were involved in 6.3% of casualty crashes and 19% of fatal crashes. Collisions involving a heavy vehicle and a car are much more likely to have fatal consequences than a collision between two cars because a heavy vehicle has much greater mass and momentum.

Analysis of the type of crashes found that while loss-of-control crashes account for 42% of all casualty crashes, they only account for 21% of heavy vehicle casualty crashes. **Heavy vehicles are half as likely to be involved in a loss-of-control crash compared to other vehicles.**

The Traffic Accident Reports for all fatal and serious casualty crashes involving heavy vehicles for the last five years were analysed in detail to develop a better understanding of the cause of the crash. **It was found that multiple vehicle crashes involving heavy vehicles are eight times more likely to be caused by the other road user (not the heavy vehicle driver).** This provides strong evidence that heavy vehicle drivers exhibit a much higher degree of driving skill than the average motorist.

It also suggests that the special training and licencing requirements that apply to heavy vehicle drivers are having the desired effect. Annual vehicle inspections of buses and random roadworthiness checks on heavy vehicles reduce the risk of vehicle defects that could cause a crash.

There was only one section of road in Tasmania where there was a cluster of heavy vehicle crashes. This was on a bend in Birraree Road, immediately north of the Egmont Bridge. The warning signage of the approach to the bend has been upgraded and improvements to the superelevation round the curve will be investigated.