2011 MAJOR ACCIDENT INVESTIGATION REPORT

National Truck Accident Research Centre

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The National Truck Accident Research Centre is an independent research facility wholly funded by National Transport Insurance, in Australia & New Zealand. It is NTI’s belief that effective research focusing on current information is a crucial qualification to a greater insight into serious heavy vehicle crashes. Fundamentally, truck crash research is a prerequisite for achieving sustainable improvements in road safety, not only limited to customers but all road transport operators who share the road.

This report continues a unique series of longitudinal studies involving the tracking of a workforce of Australian heavy vehicle drivers involved in accidents, since 1998. These studies of quantitative evaluations are undertaken biannually by the National Truck Accident Research Centre. This research focuses on primary data specifically reviewing major heavy truck crashes managed by the National Claims Centre. Such incidents have an aggregate cost greater than (>)$50,000.

The research into major losses in 2009 follows quantitative studies completed on major truck crash incidents reported during 2003, 2005 and 2007. For the duration of the 2009 period, 323 major incidents were reported at a cost of a$44m.

Since the 2003 study, NTI insured equipment numbers have grown by 48% whilst major crashes over (>)$50,000 have increased marginally by 7%. There was a 1% decrease in the number of major incidents reported, when compared to those investigated for the 2007 period, the average financial loss per incident increased by 6.2% to a$136,472.

...fundamentally, truck crash research is a prerequisite for achieving sustainable improvements in road safety.
The loss per incident includes property damage, accident scene repatriation, load transhipment, salvage, recovery and towing outlays. Losses in relation to freight on-board and personal injury are not included.

In terms of portfolio growth, during 2007, NTI insured 113,526 items which increased to 120,567 by the end of 2009. Representing a growth of 6.2% in numbers, the accident frequency rate, in relation to major incidents over (> $50,000), improved to 2.7 incidents per 1000 units.

This research concentrates on heavy vehicle accidents in the hire and reward freight sector with vehicles having a payload exceeding five tonnes.

National Transport Insurance (NTI) is Australia’s principal truck insurance underwriter. NTI provides insurance, risk appraisal, claims and accident management services to the road transport and earthmoving industry.

NTI currently insures more than 131,000 items of plant and equipment having an insured asset value of a$9.4B. Since 2002, NTI has settled 41,000 notified losses (per. item) with claims payments exceeding a$570M.
2.0 Investigating and Reviewing Evidence

For the purpose of this research, investigators group and assess a wide variety of evidence. Such information is extracted by the following means:

- NTI Claims Database
- 24 hour accident assist national support centre (90% of all incidents reported via this channel.)
- Claim Forms and Accident Reports.
- Police reports.
- Independent investigators.
- Interviews with repair managers, drivers, owners, risk surveyors and witnesses and,
- On-scene crash recovery operators.

Additionally, proxy / surrogate measures are factored into accident investigations with consideration of single vehicle accidents (SVA), time of day, time at task, freight task etc.

The new research studies the following criteria in each and every incident:

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3.0 Summary of Findings 2009

- Inappropriate speed for the conditions continues to be the predominant cause for heavy truck crashes in Australia. The 2009 study found that 31.8% of reported incidents could be attributed to inappropriate speed particularly when altering direction.
- Fatigue and inappropriate speed found to be responsible for 1 in 2 serious truck crashes. (41.9%)
- Fatigue related serious truck crashes reduced by 50%.
- 1 in 4 serious truck crashes occurred on Australia’s National Highway 1.

- Since 2002 the report notes a 27% decrease in serious truck crash incidents reported (damage > $50,000). When comparing the 2009 result to crashes investigated in the 2007 period; the average financial loss per incident increased by 6.2% to A$136,472.
  - With 18.9% of losses, Monday was found to be the worst day. Mondays and Tuesdays account for 37.5% of serious crashes.
  - June & April were the worst months for major incidents.
  - The worst time of day was 1100 – 1400 hours.
  - NSW, with 36.5% of major truck crashes, experienced deterioration from the 2007 study. This could be attributed to an increase in crash incidents on the Pacific Highway.

- Losses on the Hume Highway have dropped substantially since 2003 from 11.1% to 2.5% of major truck crashes.
  - Semi Trailers were disproportionately overrepresented in 60.1% of major crashes though only responsible for 38% of the articulated freight task. (Loaded tonne - / - km.)
  - B – Doubles are the safer alternative, carrying 46% of the freight task with 28.8% of major accidents.
  - In 7 out of 10 of serious truck crashes, no other vehicle was involved.
  - In 86% of serious truck crashes, the vehicle was within 500 km of its point of departure. 50% of incidents occurred within 100 kms.
  - In 71.2% of serious truck crashes, the vehicle was involved in an outbound journey from home base.

- In 29.5% of serious truck crashes where another vehicle was involved, the NTI insured driver was totally responsible in 44% of the incidents.
  - In fatal crash incidents involving another vehicle, the third party driver was at fault in 82% of incidents.
In fatal crash incidents involving another vehicle, the third party was at fault in 82% of the accidents.
4.0 Conclusions

The Australian road freight sector remains in transition. Fundamentally the freight task is in growth; nevertheless weak trading conditions on the high volume eastern seaboard are being experienced as demand contracts. Operations without a specific niche and long term, well established customers are further exposed to fluctuations in the cost of doing business. Environment, equipment finance and safety compliance outlays remain a growing concern for the foreseeable future with expected long term ramifications.

Fatigue related crash incidents have reduced substantially...

Be that as it may, road transport safety in Australia continues to maintain a high standard and as evidenced in this research, results continue to improve particularly with regard to the frequency of serious truck crash incidents. Road quality and infrastructure, particularly rest areas and parking bays, is an ongoing concern in regional areas and of an improved standard on new motorways, however in country areas and some major highways, road quality is sometimes severely affected by lack of funding and poor maintenance.

During the course of these studies since 2003, the insurer’s portfolio, vehicles insured, has increased by 48% whilst major crash incidents have increased marginally by 7%. In the 2009 research the overarching finding is that there was fewer major truck crashes recorded however such losses have increased by 6.2% in average cost of claim when compared to the prior research.

Fatigue related crash incidents have reduced substantially during the period since 2003.

On a case by case basis, to ensure consistency of the comparable model, the National Truck Accident Research Centre reviews all truck accidents where material damage exceeds a$50,000. This study of major truck accidents focuses on claims settled during 2009. This is the fourth in a series of biannual quantitative evaluations tracking the behaviour of a cohort of Australian heavy vehicle operators.
5.0 Accident Day

Information compiled and analysed in the 2009 study found the worst day to be Monday with 18.9% of major incidents occurring within this 24 hour cycle. This was slightly down on prior results nevertheless, Mondays and Tuesdays still accounted for 37.5% of crashes which is consistent with earlier studies.

Otherwise, excluding Saturdays and Sundays, crash rates progressively decreased during each week before a marginal increase on Friday. Irrespective of the fact that for various freight tasks the working week may commence on differing days, it could be argued that there is a correlation with driver’s fitness for duty, or lack thereof, where they have not worked and not had sufficient rest throughout the weekend.

Insofar as single vehicle accidents (SVA’s) 54.5% occur Monday through to Wednesday with 27.5% between midnight and 0700. The question of increased pressure on the freight task during this period of the week is relevant.

A further investigation with regard to driver fatigue and day of week is detailed later in this report.
Information reviewed in the 2009 study found that the worst month was June with 10.2% of major incidents occurring in this period. Further, April incidents grew substantially when compared with previous studies. Unseasonal autumn weather conditions, particularly in central and eastern regions may have attributed to a marginal increase in crash incidents during this period.

Where in the past, accidents increased noticeably during the months of October through November this was not apparent in the 2009 research.
7.0 Accident Time

Information processed and analysed in the 2009 study found yet again that the worst time of day was between 1100 – 1400 hours. This was consistent with findings in the 2005 and 2007 report although these results differed from the 2003 study which found the predominant period to be between 0400 – 0600 hours. Taking into account all studies, it was evident in the 2009 research that incidents between the hours of midnight to 0600 fell significantly.

It is further noted that there was a spike between the hours of 1500 and 1800 with fewer incidents reported between 8pm and midnight.

Indisputably, the research consistently finds that most major crashes occur when most traffic is using the network. Further reference to the impact of fatigue and crash times are addressed later in this report.
Research into major incidents in 2009 again noted that New South Wales (NSW) continued to dominate major crashes (36.5%), this however was a weakening on the 2007 result (30.7%) which had been an improved result on 2005 (35.4%) and 2003 (43.1%). Arguably the most recent research is a more indicative result of the NSW performance.

It is noted, 33.8% of road freight movements travel through or within NSW (BTRE 121 Est. Billion tkm Freight Movements 2010) thus putting the result into perspective. Statistically, the Queensland & WA result remained unchanged, whilst the evaluation recognized that major incidents had decreased in Victoria, Tasmania and the ACT. South Australia experienced a marginal increase in major truck crashes.

8.1 Accident Location – Australian Road Network
The newest concern remains that of accidents which have been identified as ‘Off Road’ and therefore outside the ongoing monitor of road enforcement agencies.

The 2009 research with respect to accident location highlights a worsening position with respect to incidents occurring on Australia’s National Highway 1. In earlier published studies 1 in 6 major truck crashes had taken place on this segment of the network whereas this recent research concluded that almost 23% of major crash incidents occurred on the national highway.

Research findings in the 2007 study identified less incidents on the Pacific Highway, NSW, nonetheless that outcome was not sustained with an increase in major truck crashes in this research period.

It is indeed noteworthy that losses on the Hume Highway have dropped substantially since 2003. No doubt this can be attributed to the earlier duplication of the Hume in Victoria and more recent works from Wodonga to Woomargama, Holbrook, Kyemba, Gundagai and Coolac in NSW. Otherwise, considering freight movement, Queensland’s Bruce and Warrego Highways experienced no improvement and remain the most dangerous highways on the national network for all road users.

Overall 37% of major crash incidents occurred on designated highways with improved results in metropolitan, regional and remote areas. The newest concern remains that of accidents which have been identified as ‘Off Road’ and therefore outside the ongoing monitor of road enforcement agencies. Such losses were associated with, vehicle theft, malicious damage or fire, food processing installations, road works or mine sites.
Research into major incidents in the 2009 once more found that freight onboard at the time of loss was predominately general at 26%. Claims results indicated that there was a marginal improvement in grain haulage and livestock to 9.6% of major truck crashes.

Bulk tippers overall, specifically working locally on earthworks, deteriorated to 15.8% of major incidents. This result is up from 5.6% in 2005 and is evidence of the expanding fleet in metropolitan operations.

Refrigerated goods and car/carrier hauliers were also steady with improved results.
10.0 Accident Vehicle Configuration

...with market pressure for higher capacity equipment, the result again confirms, that the larger they are, the safer they are.

Vehicle configuration was introduced into NTI’s research into major incidents in the 2005 report. Such criteria was appropriate given the expected growth in the Australian freight task with an escalation in the size of articulated trucks and the augmented uptake of larger articulated truck combinations leading to a higher utilisation of multi-combination equipment. Factors contributing to the growth in the road freight task include improvements in inter-urban road infrastructure, increased demand in time-sensitive freight services and increased average vehicle carrying capacity.

The freight task (excluding rigid vehicles), based upon (articulated) loaded tonne-km travelled, is shared between semi-trailers carrying 38% of all (artic) freight with B-doubles 46% and the residual being transported by roadtrains and an assortment of multi-combination units. (Source: ATRF 2010 David Mitchell & others BTRE).

The share of freight carried by B – doubles continues to grow at 2.2% per annum. (Source: ABS Survey of Motor Vehicle use, 1992 – 2005). The number of B – doubles has increased substantially since 2000, but their average annual kilometres has not increased at the same rate (Source: NTC 2007).

In the 2009 research, semi trailers were disproportionately over represented with 60.1% of major incidents. This result has marginally worsened since the prior study irrespective of the fact that the freight task in this configuration has decreased to 38%. As previously reported, this result is to be expected given the fact that in many instances, this configuration operates on the worst of the network, with ageing equipment and drivers with less experience.

Importantly, with market pressure for higher capacity equipment, the result again confirms that the larger they are, the safer they are. B – Doubles now carry 46% of freight and registered 28.8% of major truck crashes. This followed the 2007 research where B – doubles were better performers with 21% of losses. This of course can be attributed to the fact that B-doubles are newer, better maintained vehicles, with experienced and highly trained drivers using the best of the road network.
Undoubtedly, there needs to be an increased safety focus for all road users, particularly those regularly sharing the roads with heavy vehicles.

Confirming past studies, it has once again been established that a high proportion of crashes in the 2009 study occurred on the outbound leg (71.2%). Historically, the vast majority of severe incidents occur on outbound trips, and ironically not on the return journey where the expectation would be that the driver has ‘grown’ fatigue during the journey.

Given that such incidents are found to occur on outbound legs, from a risk management perspective, the driver must be required to satisfy management that he or she is ‘fit for duty’ at the commencement of the task. Additionally, stress created at the commencement of the trip through inefficient loading practices, late departures and unachievable time slots ultimately leads to driver fatigue. It is to be expected that the ‘Chain of Responsibility’ legislation will influence this current result.

Yet another indicator that fatigue influences major crash incidents is that of research findings into single vehicle accidents. Again it is noted that 7 out of 10 major truck crashes are single vehicle accidents where no other vehicle was found to be involved. This is an improved result on prior research although it follows there was an increase in multi-vehicle incidents.

In cases of all serious multi-vehicle accidents, it was found that the driver of the heavy vehicle was negligent in 44% of the incidents. In fatal crash incidents involving more than one vehicle the third party driver was at fault in 82% of the accidents. This report questions the relevance of road safety agencies highlighting the increase of fatalities involving heavy vehicles given that in most cases the driver of the goods carrying vehicle is not responsible. Undoubtedly there needs to be an increased safety focus for all road users, particularly those regularly sharing the roads with heavy vehicles.
...more than 50% of incidents occurred within 100 kms from commencement of journey.

The 2009 evaluation has established that 86% of major crash incidents occurred within 500 kms of point of departure, irrespective of whether the journey was outbound or on the homeward leg. This is an identical result to prior research.

Further more than 50% of incidents occurred within 100 kms from commencement of journey

Such information also confirms that from a fatigue viewpoint the far greatest exposure is within the initial five to six hours of a journey, thus the importance of strictly monitoring ‘fitness for duty’.
This area of the study evaluates accident cause, irrespective of that alleged by the driver at the time of the incident. This most recent research has found crashes attributed to inappropriate speed for the prevailing conditions, accounted for 31.8%. This was an increase on past findings however whilst it was established in the 2007 report that fatigue was found to be the accident cause in 20.3% major crashes, this improved substantially to 10%. No doubt this improved result may be attributed to a range of reasons not limited to the 2008 introduction of driving hours reform.
This improved result dropped the combined speed / fatigue factor to 41.9% although all of the gain here was in the fatigue result. From a road safety perspective these two causal factors remain a major concern, even though there is strong evidence of improvement. Inappropriate speed for the conditions is a training, driver management and operational issue.

Vehicle theft continued to be insignificant and there was a marginal increase in losses attributed to fire. There were less incidents involving mechanical failure.
Research into major incidents in the 2009 study found that drivers under the age of 45 were involved in considerably fewer accidents proportionally than that found in the investigations conducted on the 2003, 2005 and 2007 crash database.

Once again drivers over the age of 45 were involved in higher proportions when comparing the studies but this could obviously be attributed to the fact that the average age of all heavy vehicle drivers continues to escalate. Consequently, the average age of drivers involved in major truck crashes continues to increase to 44.8 years from 38.5 years in the 2003, 40.5 years in 2005 and 43.2 years in 2007.

Further, the 2009 research found that in 27.8% of serious truck crashes, the driver was over 50 years of age. This is a factor that continues to deteriorate from 2003 (18.5%), 2005 (20.3%) and 2007 (25%).
Although it could be argued that many insurers desist from the practice of accepting drivers under the age of 25 years, NTI for some time has guardedly supported the acceptance of younger drivers which would suggest that those accepted under ‘managed and monitored’ apprenticeships are returning improved results.

As in prior research in 2009, there was no evidence of drivers under the age of 25 years increasing in their involvement in major truck crashes.
15.0 Accident: Focus on Fatigue

In 10.1% of major incidents in the 2009 study, fatigue was found to be a significant cause. This was an improved result as stated earlier in this report.

74.2% of accidents occurred on outbound journeys, with 86.1% in 2007, 73.8% in 2005 and 69.6% in the earliest study. The worst day was Friday with 1 in 5 crashes, a notable change given that past research had found Monday thru Wednesday to be prominent.

With the Queensland and Victorian result improving there was a noted deterioration in NSW and SA after a substantial improvement in the 2007. The Western Australian result worsened marginally at 12.9% of large crash incidents reported in that State.

There were no reported incidents in Tasmania, the ACT or the Northern Territory.

The 2009 study establishes that 80.06% of fatigue related incidents occurred within 500 km from commencement of the journey either outbound or on the home leg. This finding was a substantial increase on 2007 with (72.3%).

81% of major crashes found to be attributed to driver fatigue occurred on outbound journeys within 500 km of the point of departure. This result followed the 2007 finding of 89.3%. This finding is an obvious concern where driver management (insofar as fitness for duty) is taken into account.

The average age of fatigued drivers, involved in these incidents (44.3 years) mirrored earlier findings of 36.75 years (2003), 40.56 years (2005) and 42.5 years (2007), simply confirming that the driver pool is ageing.
In 10.1% of major incidents in the 2009 study, fatigue was found to be a significant cause.

Although this research established less fatigue related serious heavy vehicle crashes, 64.5% of accidents deemed to be fatigue influenced were reported between the hours of midnight and 0600. This followed the 2007 finding of 53.8% with 56% in 2005 and continued to be a serious concern for those operations continually working through these hours. There was a substantial improvement from 0600 hours to midday.
Inappropriate speed for the conditions continues to be the predominant cause for heavy truck crashes in Australia. The 2009 study found that 31.8% of reported incidents could be attributed to inappropriate speed particularly when altering direction. This result was comparable although a marginal increase to prior studies with 27.4% of major accidents in 2007, 27.3% in 2005, and 26.1% in 2003.

The vast majority of truck crashes in this segment occurred on outbound journeys with 71.1% in the latest evaluation. Although slightly down this is consistent with earlier findings of 83% in 2007, 79.6% in 2005 and 70.8% in 2003.

NSW again led the result with 35% of incidents followed by an improved Victorian report with 19.5% and Western Australia with 11.3%. Queensland was overrepresented with 21.6%.

Mondays and Tuesday accounted for 47.3% of losses attributed to inappropriate speed.
17.0

About the Author

Owen Driscoll

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Mr Driscoll conducted the inaugural research study into severe truck crashes for 2003. Subsequent reports have been published for 2005 and 2007.

He has 35 years experience in the road transport insurance sector and is a founding member of NTI. He is an advisor on safety and risk management programs and a facilitator of accident research and training systems. He has held executive positions with NTI in areas of administration, underwriting operations and risk management.

Mr Driscoll has undertaken studies in accident investigation, workplace law and logistics management at Deakin University and with the Australian & New Zealand Institute of Insurance and Finance. He has also completed studies on Road Safety evaluation with Queensland University of Technology’s Centre for Accident Research and Road Safety.

He is a Director and the Company Secretary of the industry accreditation program, TruckSafe Pty. Ltd.
Reference Information

National Transport Insurance Risk Services unit – Accident Investigation.

**National Transport Commission;**

**Australian Bureau of Statistics;**
http://abs.gov.au/ausstats/abs@nsf/productsbytitle/A01D73D3FC683459CA256B7C007DF414

**Australian Transport Safety Bureau;**


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