



# MAJOR ACCIDENT INVESTIGATION 2020 REPORT

Covering major incidents in 2019

**NTI** National  
Transport  
Insurance

**NTARC**



**“OUR PRIORITY IS  
TO ENSURE EVERY  
SINGLE TRANSPORT  
OPERATOR ARRIVES  
HOME SAFELY.”**

## **FOREWORD**

2020 marks a significant milestone for the NTARC Major Accident Investigation Report series, with a shift from biennial publication on incidents two calendar years prior to annual publication reporting incidents from the immediately prior year.

This shift is to provide timely information on a regular basis, thereby empowering the transport industry to respond more rapidly to emerging trends.

The most significant finding from a review of NTI's large loss incidents in 2019 was a marked increase in truck driver deaths. Truck driver deaths in NTI large losses (corrected for growth in the NTI-insured fleet) doubled between 2017 and 2019.

With the assistance of state and territory road agencies NTI has been able to collate the data for all truck occupant deaths, with 50 truck occupants losing their lives in 2019.

This is the highest figure in a decade and an increase of over 30% compared to 2018. This is not a trend that anyone wishes to see continue and as an industry we must redouble our efforts to make sure every single person in the transport industry gets home safe.

The release of this report comes at a pivotal time in Australian road transport, with separate reviews of heavy vehicle regulation currently being undertaken by the National Transport Commission, the Productivity Commission and a federal senate enquiry.

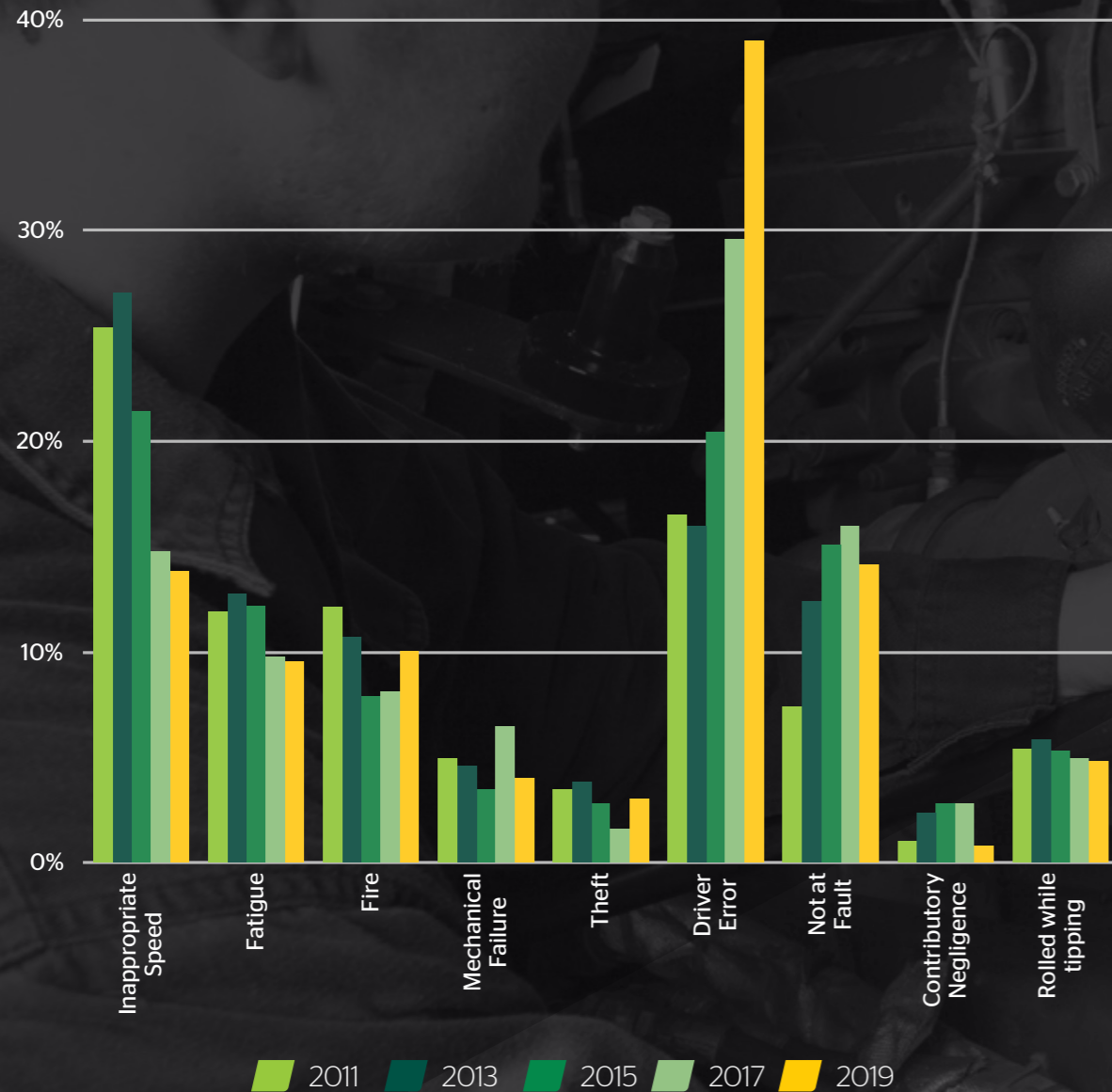
These reviews, combined with the comprehensive data on incidents involving heavy vehicles, provide a once in a generation opportunity to revisit how safety is managed in our industry. By bringing data and expertise together, hopefully we can keep Australia moving towards a safer and more sustainable future.

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# SUMMARY OF FINDINGS

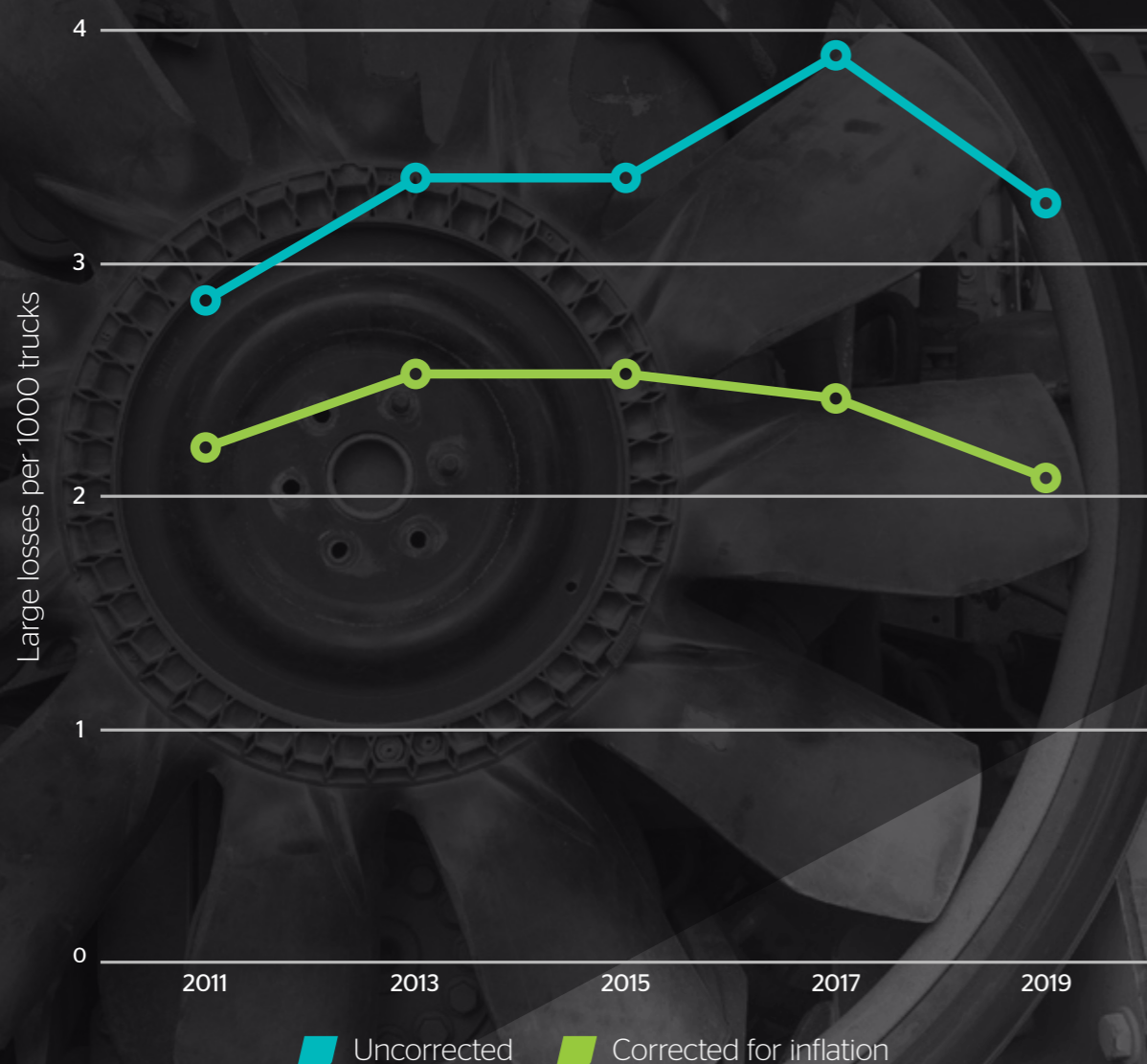
## INCIDENT CAUSE AND YEAR



## SUMMARY OF FINDINGS

- Overall frequency of large losses (corrected for inflation) dropped from around 1 in every 400 nti insured heavy vehicles in 2017 to 1 in every 500 in 2019.
- Driver error losses increased sharply from 29.6% to 39% after a significant increase in incidents resulting from inattention/distraction.
- Where a truck and a car were involved in a fatal crash, the car was at-fault 80% of the time.
- The proportion of incidents resulting in at least one fatality increased from 3% to 4.8%. This was overwhelmingly driven by an increase in truck driver deaths.
- In 2017, no NTI-insured truck drivers lost their lives in a multi-vehicle crash, whereas in 2019 there were multiple instances of truck vs. truck crashes where one or more truck drivers were killed.
- Fatigue losses provide conflicting conclusions - there was a continuation of the downwards trend in the proportion of large losses resulting from fatigue, which decreased to a record low of 9.6%. Fatigue, unfortunately, remains the single largest cause of truck driver deaths. 34.8% of truck driver deaths in NTI losses were as a result of fatigue.
- Losses from non-impact fires increased from 8.1% to 10% of large losses, this increase was predominantly driven by an increase in wheel end fires.

## LARGE LOSS FREQUENCY



## INTRODUCTION

This report is the 9th in a series examining issues and trends in heavy vehicle road safety using data from heavy motor insurance claims of greater than \$50,000 incident cost involving at least one vehicle insured with NTI.

This report examines 848 incidents which occurred in calendar year 2019, an increase of 92 over the calendar year 2017 data examined in the previous (2019) report. 34 of these claims would have been excluded if the \$50,000 threshold was corrected for the effect of inflation between 2017 and 2019.

Behind the scenes there has been an expansion of the data fields captured during the incident reviews undertaken as part of the development of this report. To align with the data structures utilised by police and transport departments, a road user movement code has been determined for all incidents using the VicRoads definitions for classifying accidents.

Additional detail was also captured for vehicle configurations, body types and cargo carried. Some of these fields allow additional information in this report, while some will facilitate additional future research.

Looking to the future, NTI is committed to working with our customers and the industry to improve our understanding of factors influencing safety outcomes. This way we can provide the insights transport operators need to stay safe on Australia's roads.



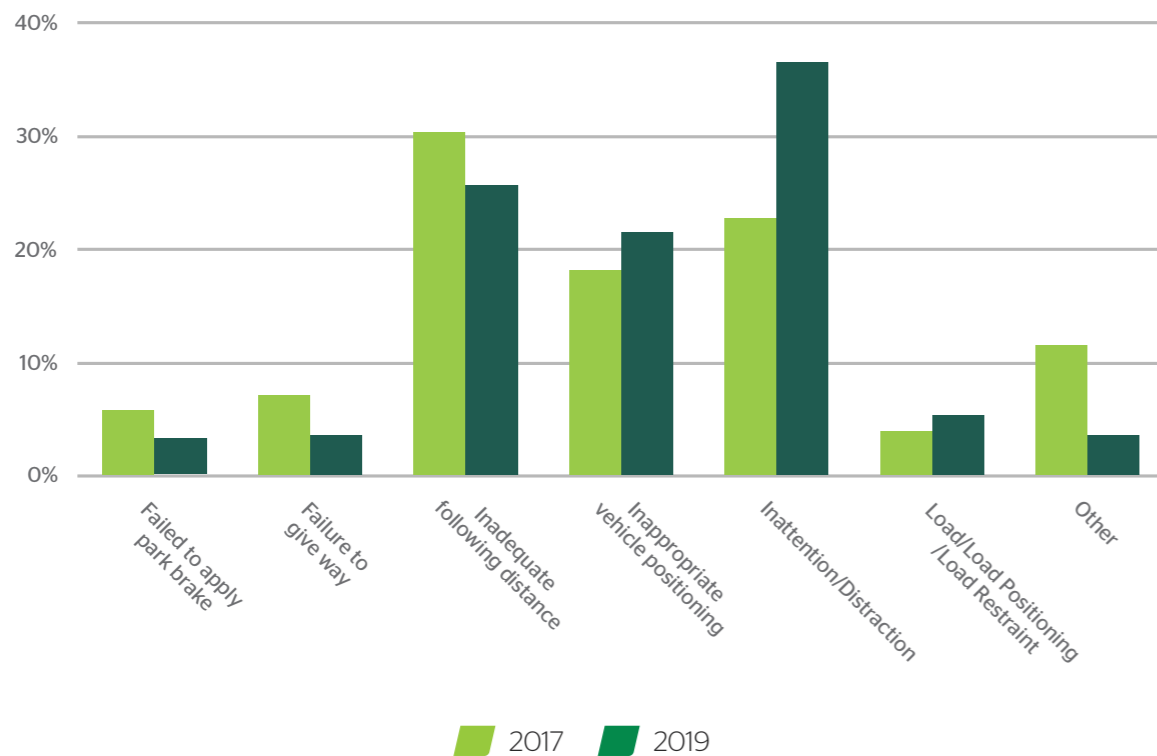
# IN DEPTH

# DRIVER ERROR - INATTENTION/DISTRACTION

Driver error losses have increased sharply in 2019 to 39% of all major incidents, up from 29.6% in 2017. This was predominantly driven by a sharp increase in the number of incidents caused by driver inattention or distraction.

This chart shows the distribution of sub-causes within driver error incidents.

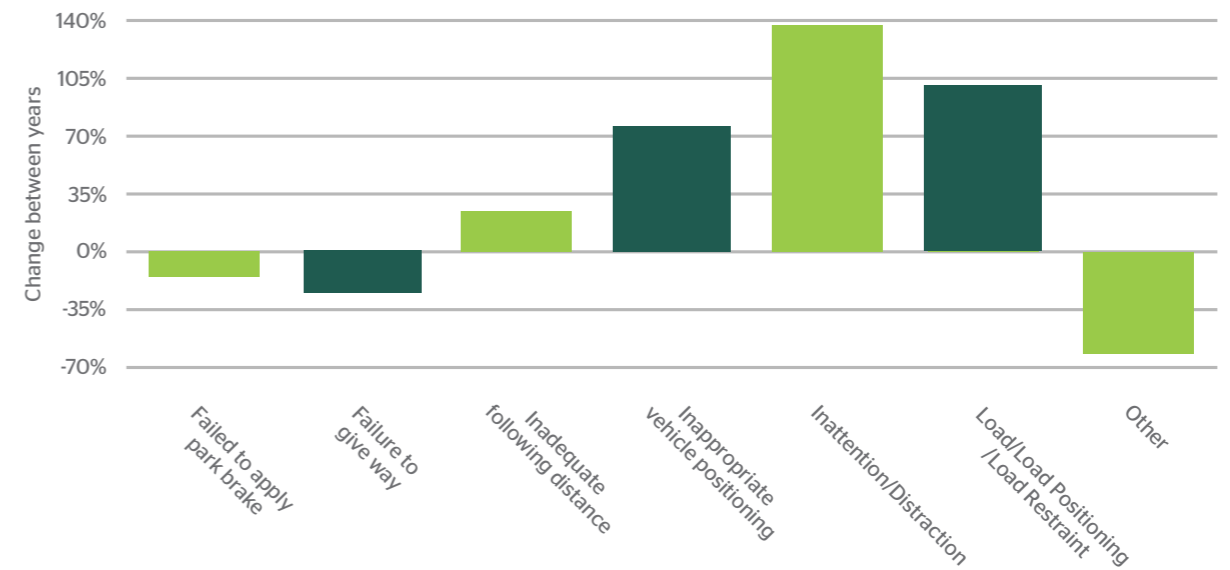
## Driver error incidents by sub-cause



Care must be taken in interpreting this graph as it does not show the overall proportion of large losses resulting from this sub-cause, but rather shows the distribution of sub-causes within driver error losses. For example, the number of inadequate following distance incidents actually increased, but the proportion of driver error losses caused by inadequate following distanced dropped.

This graph shows the proportional change in number of driver error incidents by their sub-cause between 2017 and 2019.

## Proportional change in number of driver error incidents by subcause between 2017 and 2019

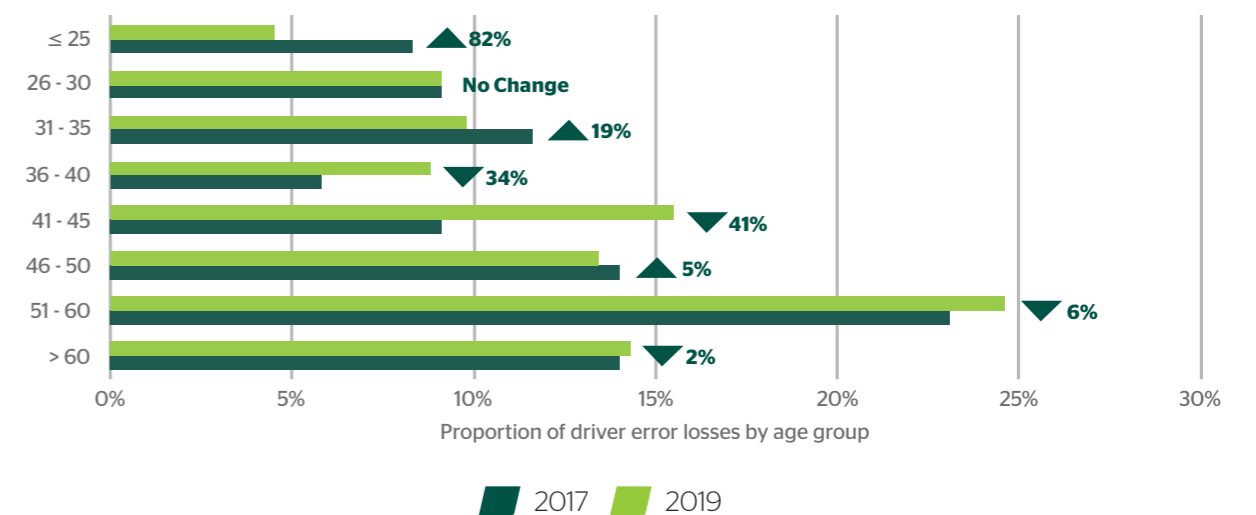


This shows that the number of inattention/distracted losses more than doubled between 2017 and 2019. Looking at these incidents in more detail, the three most common mechanisms for these incidents are:



When comparing these incidents to all large losses, the proportion of 'Off path on straight' as the incident mechanism is of note, making up 41.3% of inattention/distracted incidents but only 25.1% of all incidents. In short, as a result of not paying attention to the driving task, these trucks are veering off straight sections of road.

Comparing the age profile of drivers involved in inattention/distracted losses with the age profile for all large losses reveals some interesting trends.

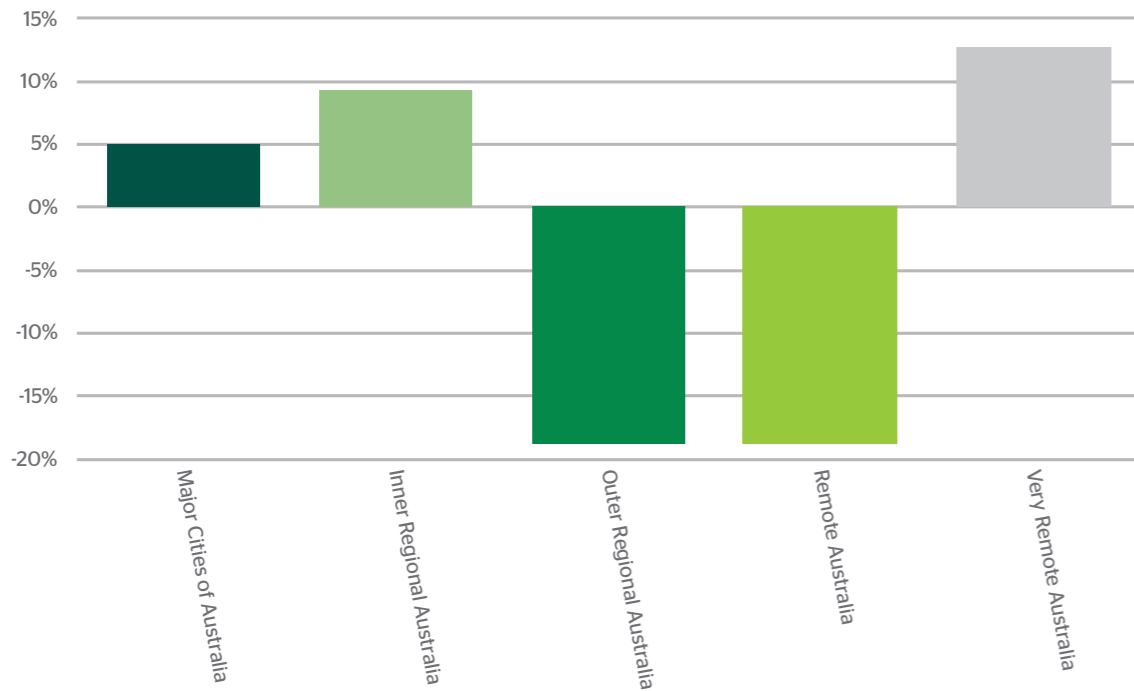




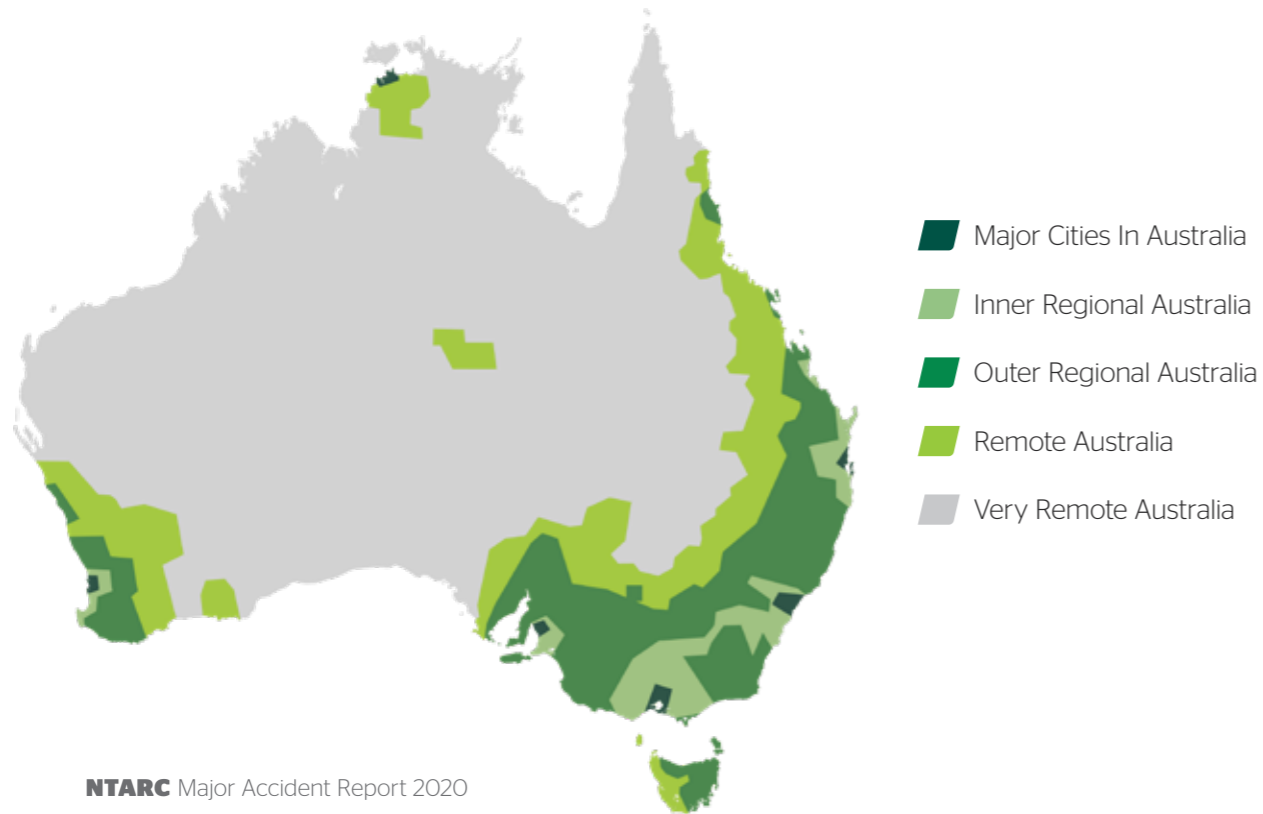
For an inattention/distraction loss, the drivers were significantly less likely to be in their mid-30s to mid-40s, while drivers aged 25 years and under were over-represented by 80% when compared to all large losses. Nearly a third of all of NTI's large losses involving a driver 25 years or under in 2019 were the result of inattention/distraction.

These inattention/distraction losses are less likely to occur in Outer Regional and Remote Australia when compared to all large loss events.

### Difference in proportion locations for inattention/distraction incidents compared to all large losses

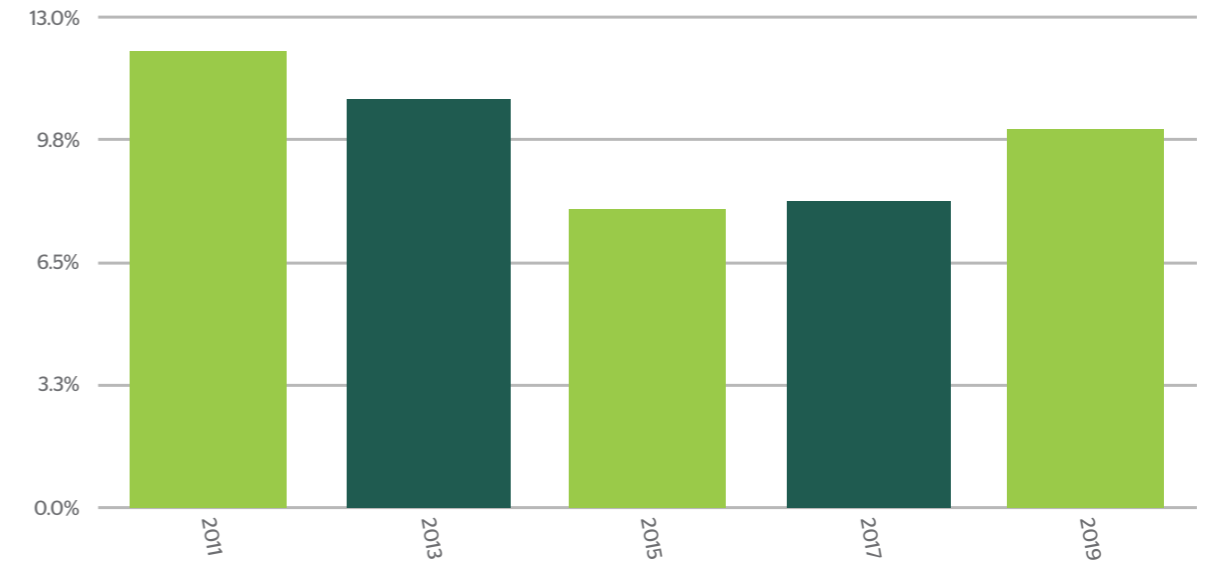


### Regional versus Remote



## IN DEPTH: NON-IMPACT FIRE

### Non-impact fire



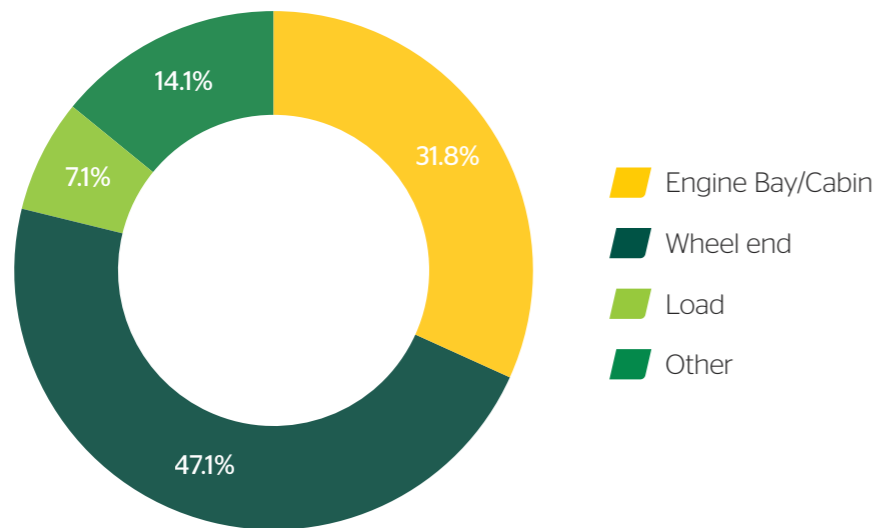
2019 saw a rise in large loss incidents resulting from non-impact fires, increasing from 8.1% of large losses in 2017 to 10% in 2019. Looking in more detail, the growth in fire losses was

driven by an increase in wheel end fires, which increased in proportion from one in three to almost half (47.1%) of all non-impact fire incidents.

**“THE GROWTH IN FIRE LOSSES WAS DRIVEN BY AN INCREASE IN WHEEL END FIRES.”**

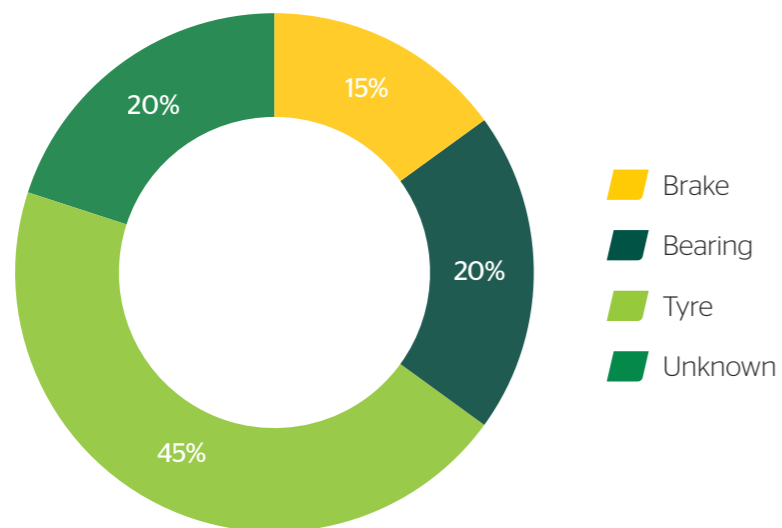
### Fire incidents by sub-cause

Significant transport industry media attention was focused on non-impact fire events in 2019, primarily around what would be categorised in the NTARC schema as engine bay/cabin - mechanical fires. In the 2019 claims data there was a decrease in the proportion of non-impact fires resulting from engine bay/cabin fires and the split between electrical and mechanical origins remained consistent with previous years, with 55.6% due to electrical failures, 40.7% mechanical and 3.7% of indeterminate cause.



### Wheel end fires by source

Examining the root cause of wheel end fires, the proportion of fires arising from tyre failures increased, from 30% in 2017 to 45% in 2019. In 2019 a smaller proportion of wheel-end fires resulted from wheel bearing failure.



**“A SMALLER PROPORTION OF WHEEL END FIRES RESULTED FROM WHEEL BEARING FAILURE.”**

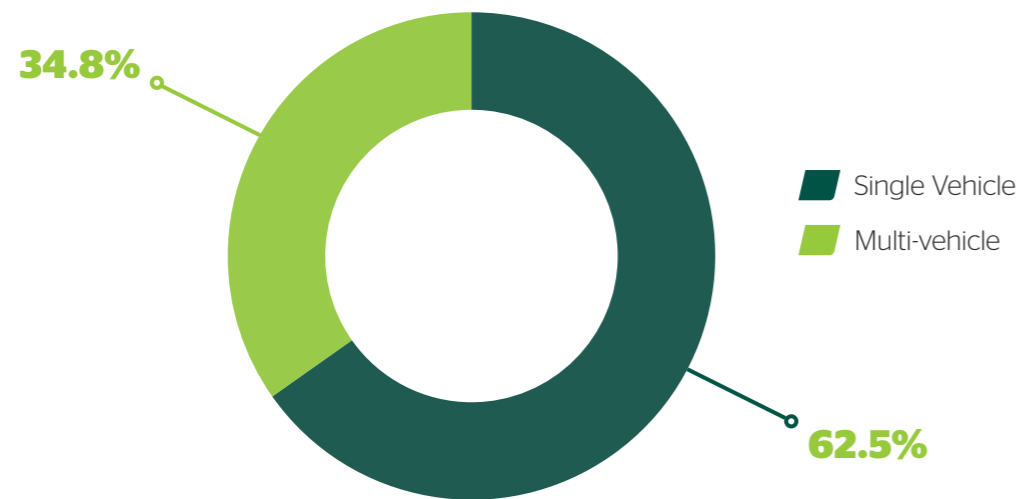
# IN DEPTH: TRUCK DRIVER DEATHS

In the 2019 claims data there was a marked increase in the number of incidents where truck drivers lost their lives. The number of drivers who died in major incidents involving an NTI insured truck was over 2.5 times higher in 2019 than in 2017.

There was a 75% increase in driver deaths in single vehicle crashes, combined with a number of truck drivers who lost their lives in multi-vehicle truck on truck crashes. No truck drivers lost their lives in multi-vehicle crashes involving a car and an NTI insured vehicle in 2019.

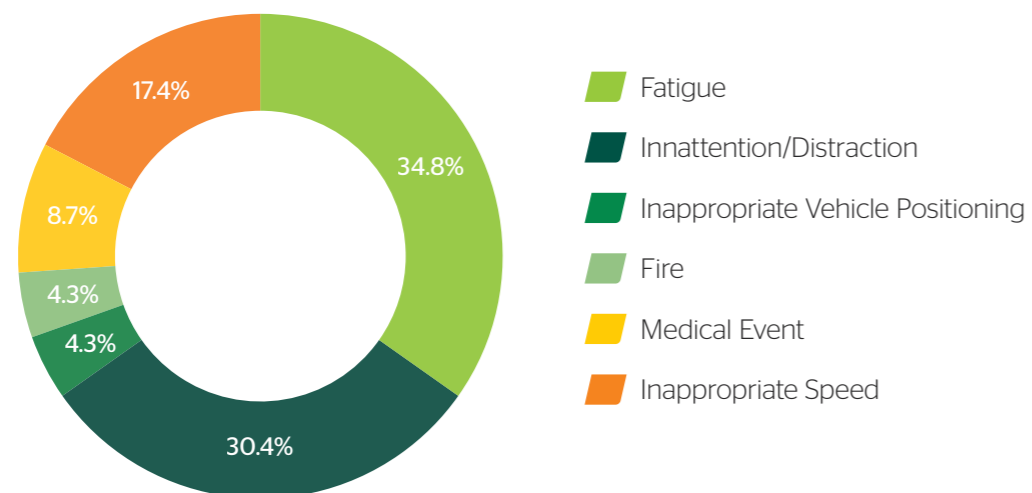
## Truck driver deaths by crash vehicle count

This marks a significant departure from 2017 where there were no truck driver fatalities in multi-vehicle crashes involving an NTI insured vehicle, irrespective of the third party vehicle class.

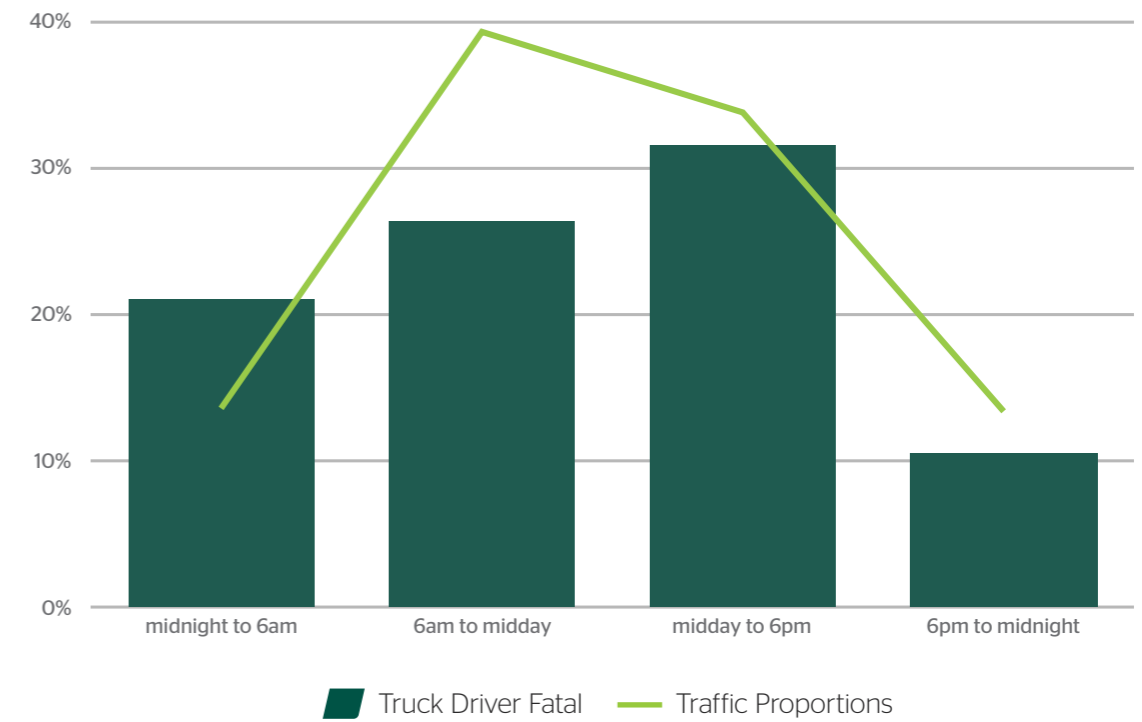


## Truck driver deaths by cause

Looking at the underlying causes of crashes in which truck drivers died, fatigue is the largest single cause closely followed by inattention/distraction crashes.



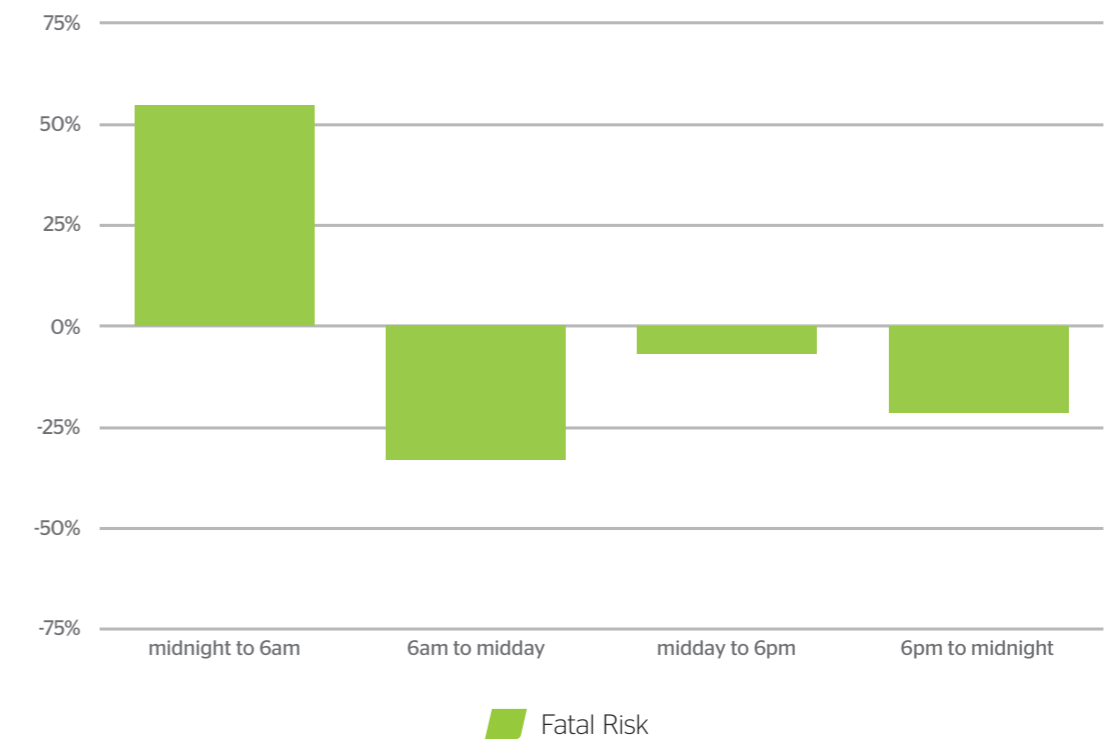
## Truck driver deaths by time of day



While two thirds (67.9%) of truck driver deaths occurred during 'day time' (6am to 6pm), of particular concern was that 1 in 5 (21.1%) truck driver deaths occurred between midnight and

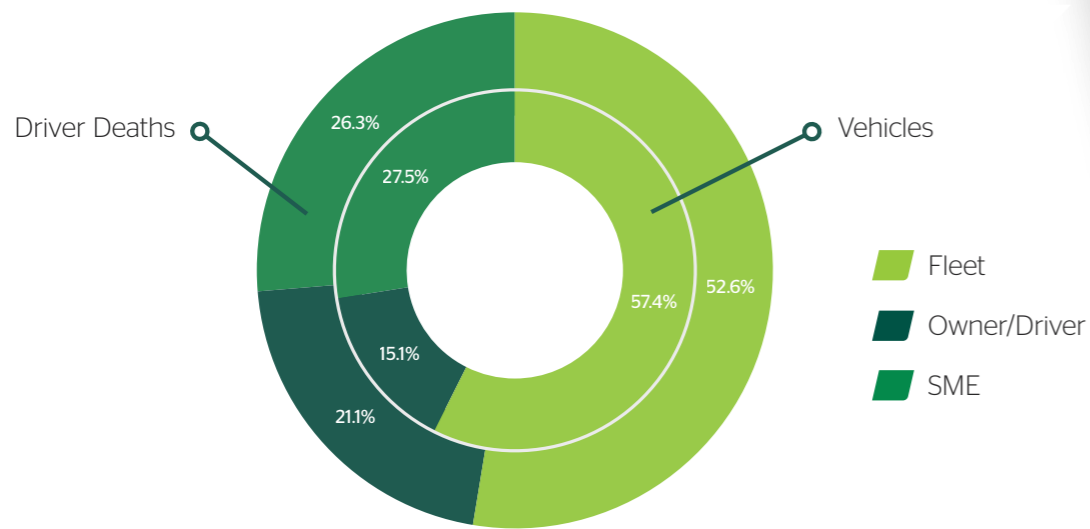
6am. This time period accounts for only 13.6% of truck movements which equates to a 55% higher risk of a truck driver dying between midnight and 6am than the daily average.

## Fatal crash risk by time of day corrected for traffic volume



The following graph plots driver deaths against the size segment of the transport business and NTI's insured portfolio.

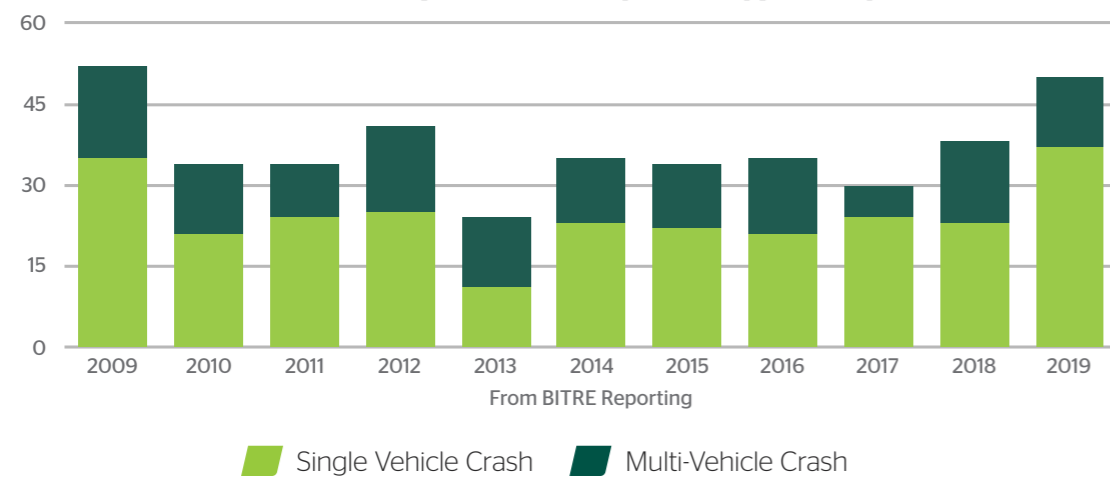
### Truck drive deaths by size segment



Analysed against a size segment, owner-drivers were over-represented in truck driver deaths by 39% while SME (4% under-represented) and Fleet (8% under-represented) drivers were less likely to be killed in the course of their work.

Looking beyond NTI's data, the Australian Road Deaths Database compiled by the Bureau of Infrastructure and Regional Economics tracks truck occupant (e.g. driver or passenger) deaths.

### Truck occupant deaths by crash type and year



Data for truck occupant deaths in multi-vehicle crashes for 2019 is not available from BITRE at time of publication. As such the figures shown above were assembled from state and territory data.

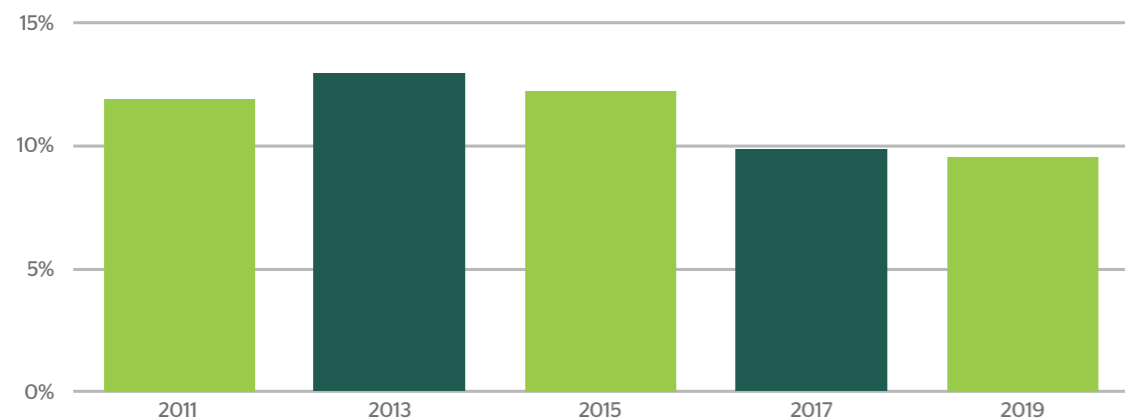
A sharp rise in truck driver deaths in single-vehicle crashes in 2019 is visible in the data, with more truck occupant lives lost just in single vehicle crashes in 2019 than in all crashes in 7 out of the past 10 years. With 50 truck occupants killed in 2019, it represents the greatest number of truck occupant deaths in a decade.

**“FLEET DRIVERS WERE LESS LIKELY TO BE KILLED.”**

# IN DEPTH: FATIGUE

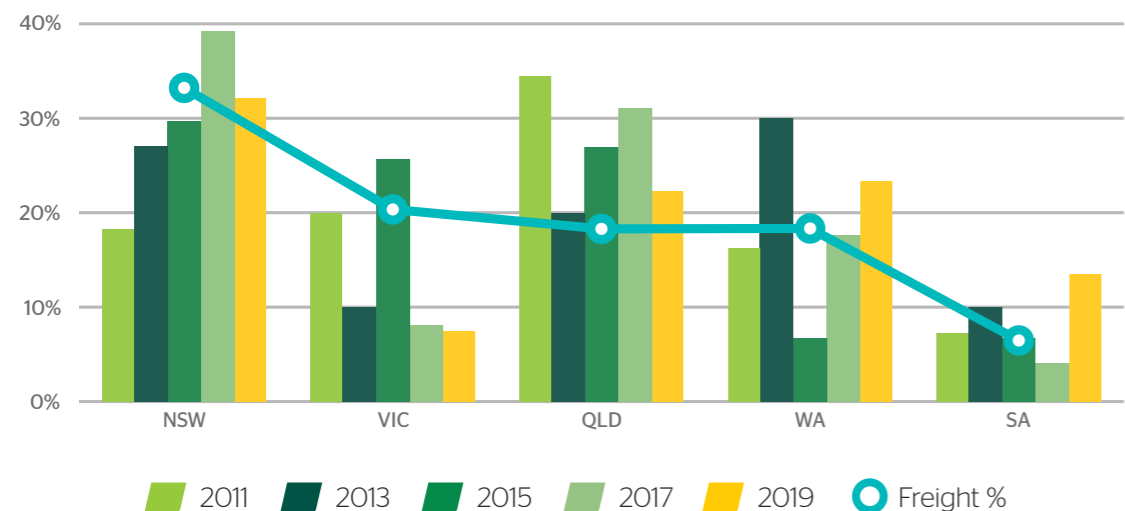
The proportion of NTI's large loss incidents caused by fatigue continued to decline, dropping slightly from 9.8% to a historical low of 9.6%. This positive trend must be balanced against the fact that fatigue remains the largest cause of truck driver deaths.

## Fatigue



Looking across the country, NSW had the largest proportion of fatigue losses (32.1%), although not by as large of a margin as in 2017 (39.2%). Western Australia had nearly a quarter of NTI's fatigue incidents (23.5%), slightly ahead of Queensland (22.2%). South Australia had a large increase, recording its largest proportion of NTI's fatigue losses (13.6%) in the history of this report series.

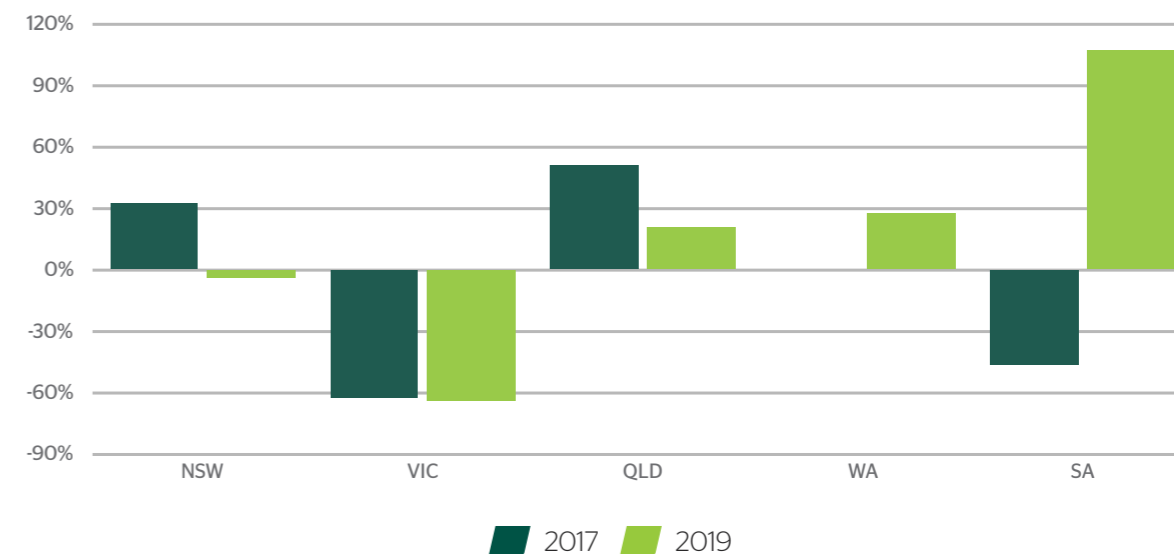
## Fatigue by state



Once corrected for the proportion of the freight task moved in that state, the worst performing state in 2019 was South Australia with the risk of a fatigue loss in South Australia being double (108% higher) the national average.

Of the states with sufficiently large sample sizes, Victoria had the lowest number of fatigue crashes for a given freight volume, with the risk of a vehicle being involved in a fatigue loss around 1/3 of the national average (-64%).

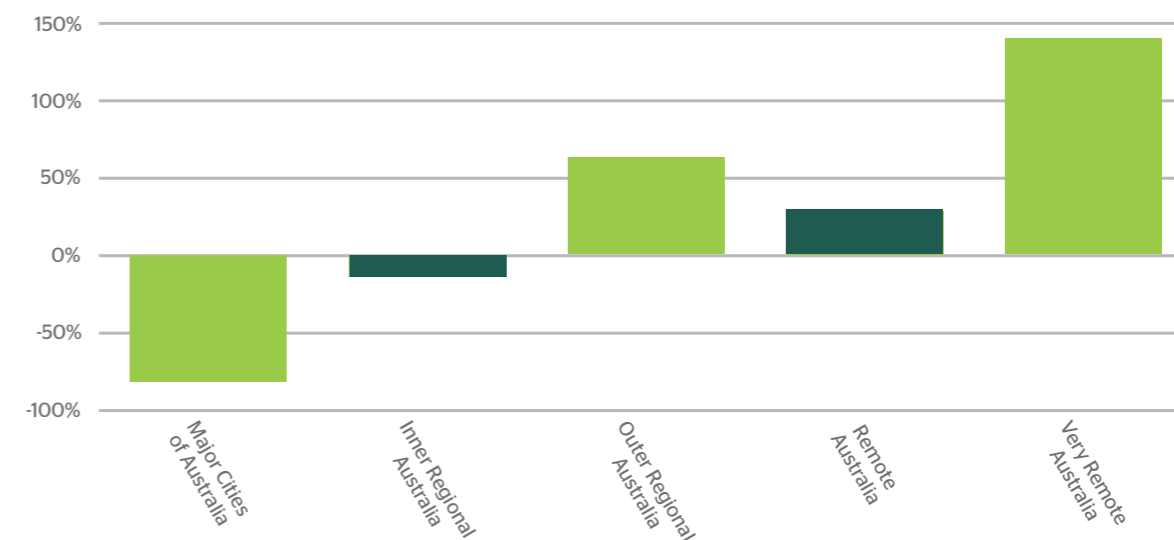
## Relative fatigue risk corrected for freight task



Looking at how these fatigue losses unfolded, 72.8% were categorized under the 'Off path on straight' mechanism, compared to 25.1% for all crashes, 18.5% were 'off path on curve'.



## Difference in proportion locations for fatigue incidents compared to all large losses

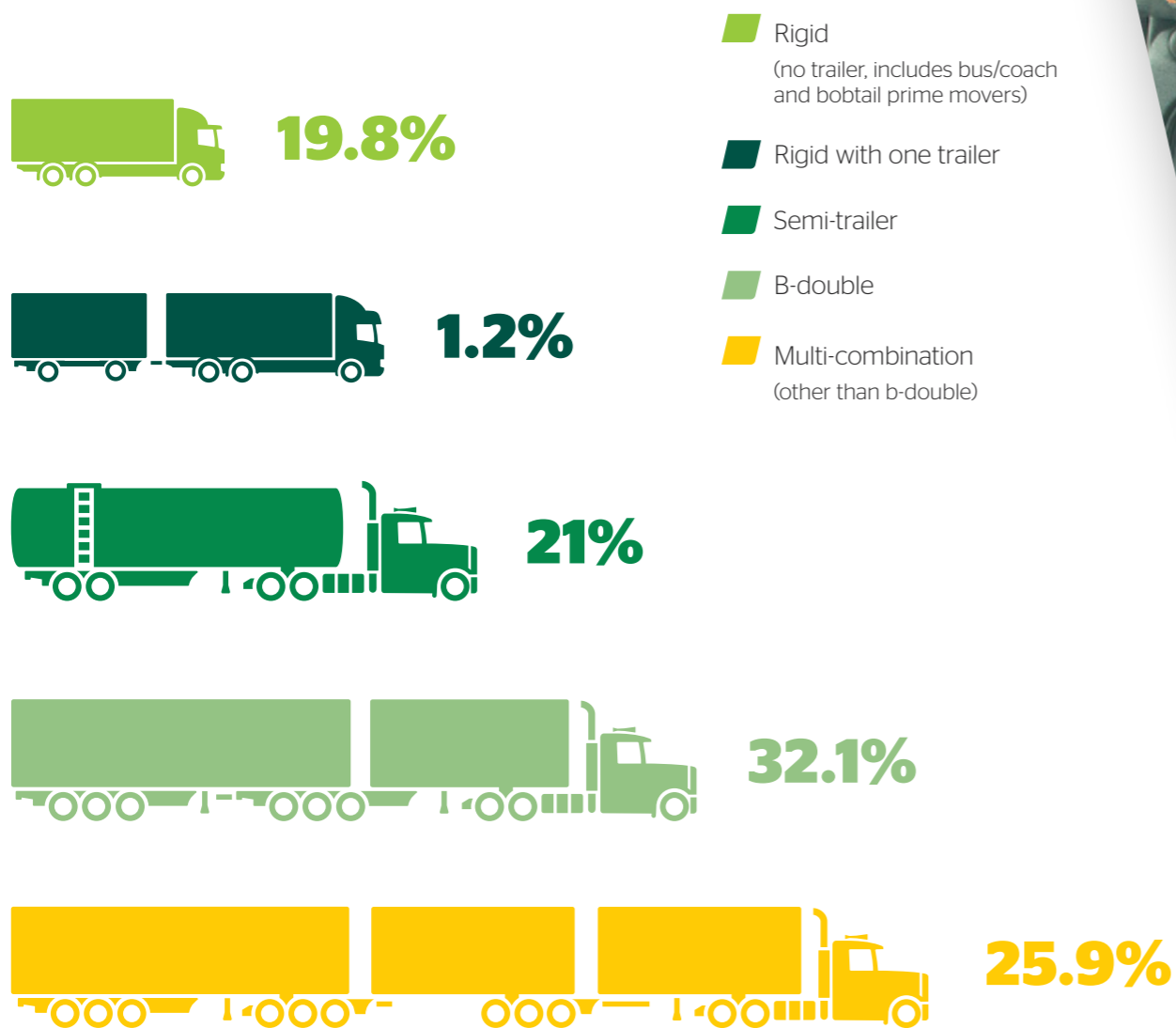


24.7% of fatigue losses occurred in 'very remote' Australia, compared to only 10.3% of all losses. Or stated another way, making fatigue losses 2.4 times more likely to occur in a remote area when compared to all large losses. Conversely, fatigue losses in locations coded as 'Major Cities' were 82% less frequent compared to all incident categories.

Comparing the proportion of fatigue losses by combination type against all losses provides some interesting insights; multi-combination vehicles (excluding B-doubles) make up 11.1% of all of NTI's large loss events, however account for more than double that proportion of fatigue incidents (25.9%).

Similarly, B-doubles make up 21.5% of all of NTI's large losses but 32.1% of fatigue losses. Conversely, the rigid truck and one trailer (predominantly truck and dog tippers) make up 6.9% of all of NTI's large losses but only 1.2% of fatigue events. These relationships are consistent with the operating radii and freight task performed by these respective configurations and confirm the difference in risk profiles between different segments of the road transport industry.

### Fatigue



**“VICTORIA HAD THE LOWEST NUMBER OF FATIGUE CRASHES FOR A GIVEN FREIGHT VOLUME.”**

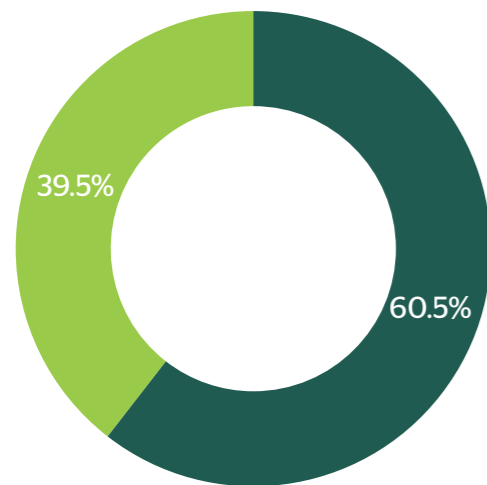
## IN DEPTH: CAR AND TRUCK CRASHES

This section is a departure from the structure of previous NTARC reporting, rather than simply reporting multi-vehicle crashes on whether the NTI-insured party was or was not at fault, instead incidents involving car and truck interaction have explicitly been separated out.

In prior years, the proportion of truck-on-truck crashes within the multiple vehicle crash dataset, particularly the subset of incidents involving a fatality, was small enough that it could reasonably be grouped together. For example in 2017, every multi-vehicle fatal crash involving an NTI vehicle was a car and truck incident.

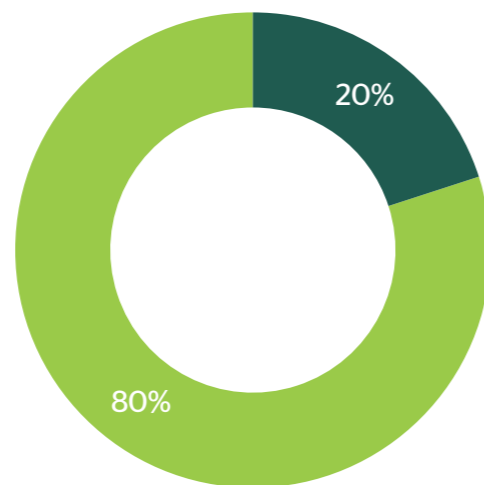
As reported in the 2019 Major Accident Investigation Report, in 2017 the car was at fault in 83% of fatal truck and car crashes. In 2019 where an NTI insured truck and a car were involved in a multi-vehicle crash resulting in at least one fatality the car was at fault 80% of the time.

### At fault party for non-fatal truck and car crashes



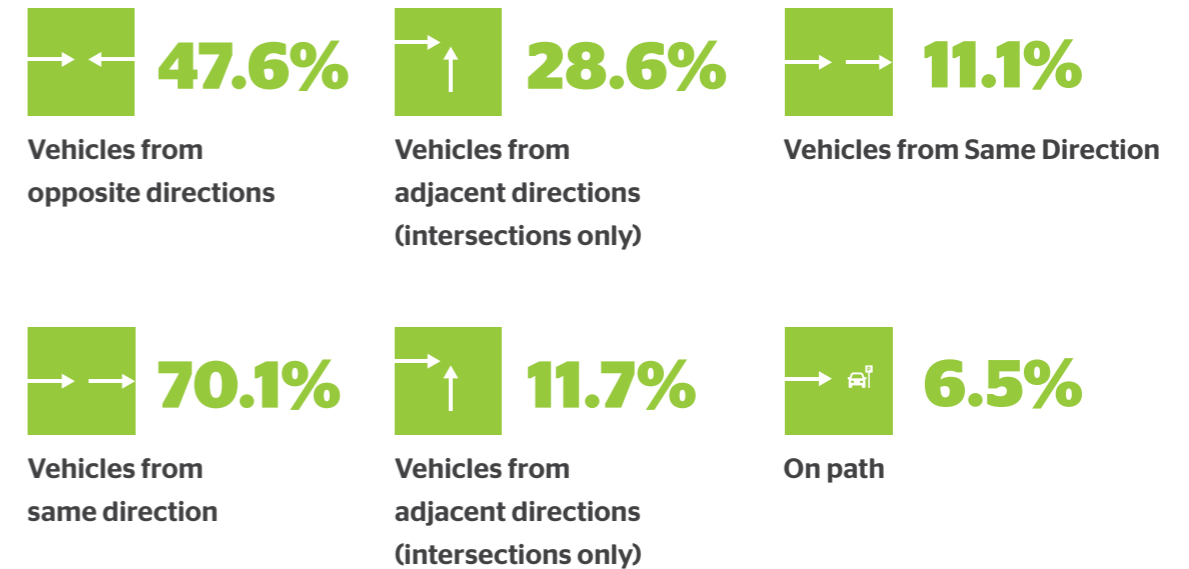
Truck at fault Car at fault

### At fault party for fatal truck and car crashes



Truck at fault Car at fault

Where a car and a truck were involved in a crash not involving a fatality, the car was at fault 39.5% of the time. Looking at this more closely, there exists a very distinct difference between truck and car crashes when looking at how they unfold. The three most common mechanisms for car and truck crashes where the car is at fault are:



In short, when trucks hit cars, they run into their rear. When cars hit trucks, they are either head-on or 't-bone' type incidents.

The contribution of suicide to these incidents was again evaluated.

Measured against these criteria, the findings for the contribution of suicide to fatal truck and car crashes in 2019 are consistent with those for incidents in 2017. Overall 37.9% of fatal truck and car crashes involving an NTI insured truck were indicated or strongly indicated to be suicides by the driver of the car.

**“IN A MULTI-VEHICLE CRASH RESULTING IN AT LEAST ONE FATALITY THE CAR WAS AT FAULT 80% OF THE TIME.”**

# IN DEPTH: STEER TYRE FAILURE

One of the key findings in the previous edition of this report series was the proportion of NTI's mechanical failure large loss events that resulted from steer tyre failures. Between 2015 and

2017 there was a jump in the generally small proportion of losses caused by mechanical failures from 3.5% to 6.5%. In 2019 this dropped to 4%, returning to a level more consistent with prior years.

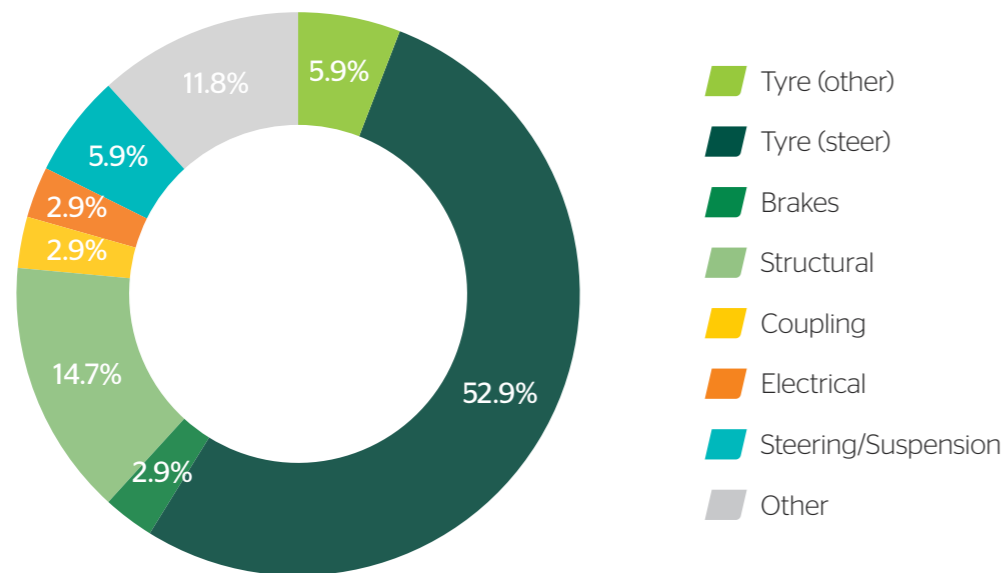
## Proportion of large losses resulting from mechanical failure



Looking at the underlying cause of these mechanical failure losses, once again steer tyre failures caused over half of the incidents. Despite the tremendous safety risk posed

by these high speed catastrophic failures, little to no discussion of reform to sum of axes restrictions has taken place since the publication of the 2019 report.

## Mechanical failure losses by sub-cause



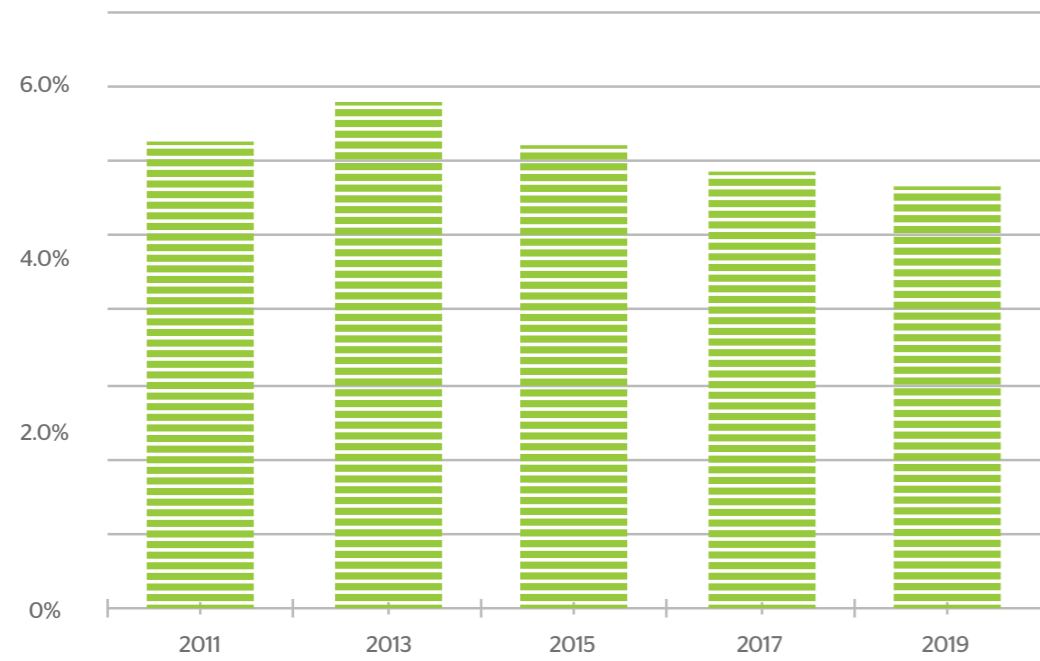




# BY THE NUMBERS

### Rolled while tipping loses as a proportion of all large losses

In the 2019 report, the issue of roll-over while tipping losses was highlighted, particularly around deliveries of lime sand in the south-west WA wheat belt. In 2019 the frequency of Rolled While Tipping losses remained essentially consistent at 4.8% of large losses, compared to 5% in 2017.



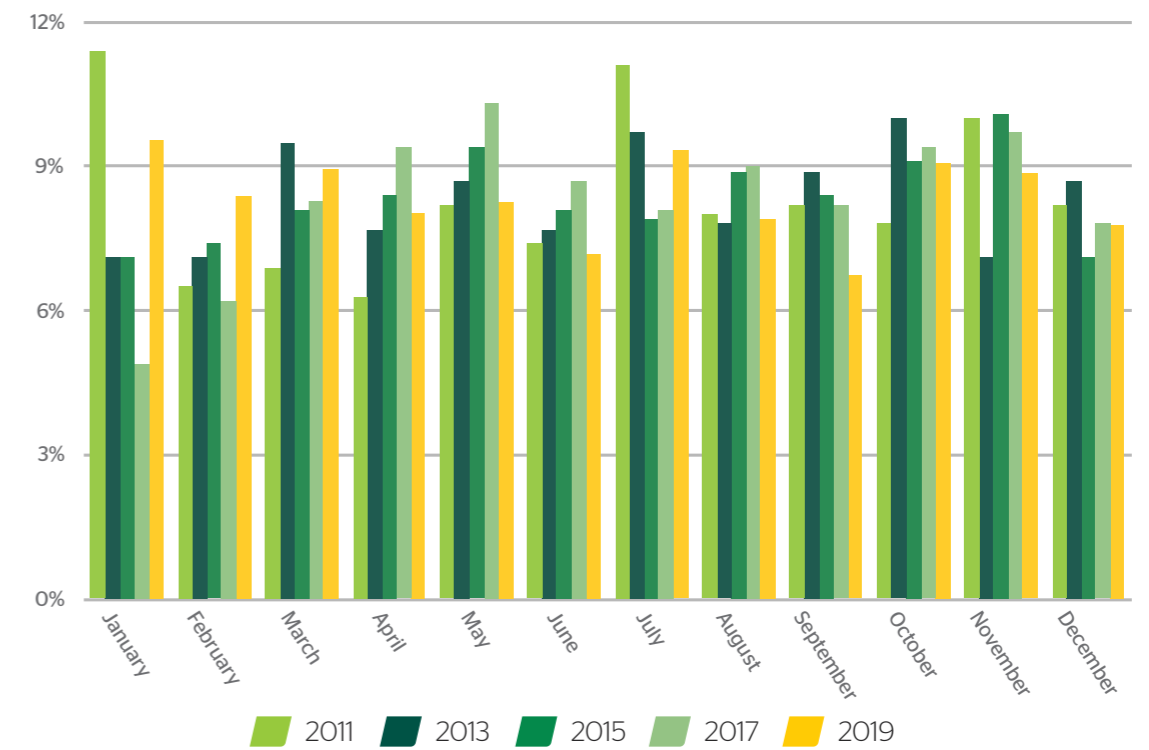
### Direction of travel

After a small increase in 2017 to 72.3% of large losses occurring on the outbound leg, the 2019 outbound proportion fell back to 68.3%, closer to levels seen in prior years.



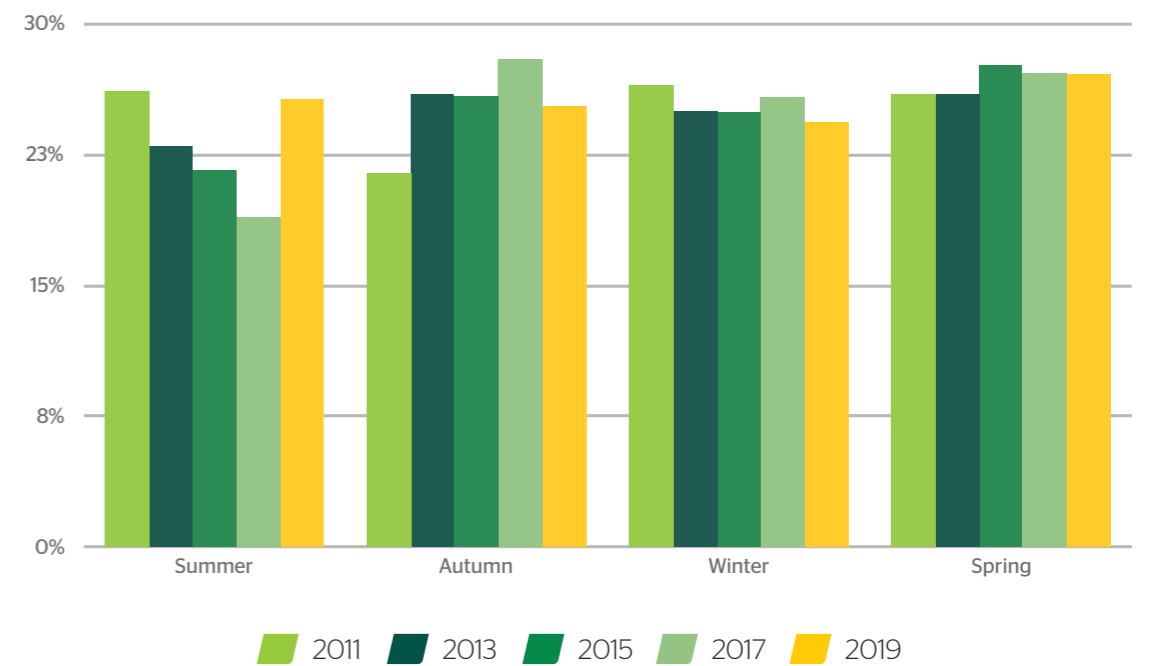
### Month of the year

Bucking the long term trend of fewer losses in January and February, 2019 had a proportion of losses in those months in line with the yearly average.



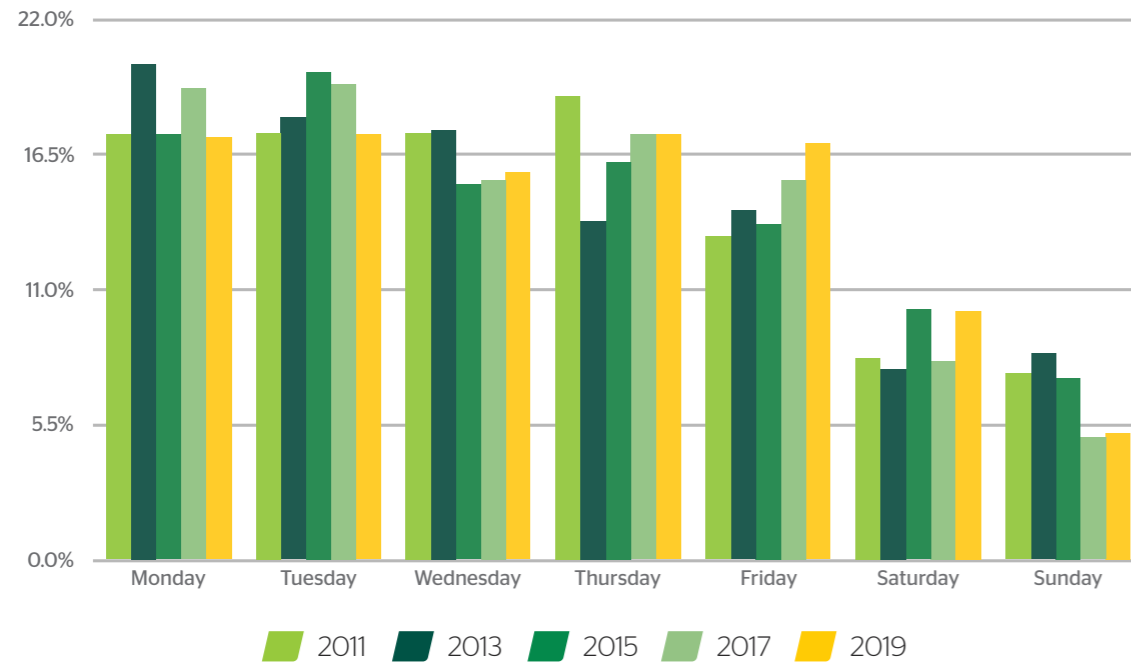
### Incident season

As a result of the change in claims frequency in January and February identified in the previous section, losses in 2019 were distributed across the seasons more evenly than in prior years.



## Day of the week

In 2019, there was a levelling off of risk between days of the working week, with only Wednesday showing a slightly lower proportion of losses at 15.6% compared to 17-17.3% for other working days. Saturday remains of particular concern. While it has only 60% of the incidents of 'working' days it has less than half the traffic, giving a 21% higher frequency of losses when corrected for traffic volume.



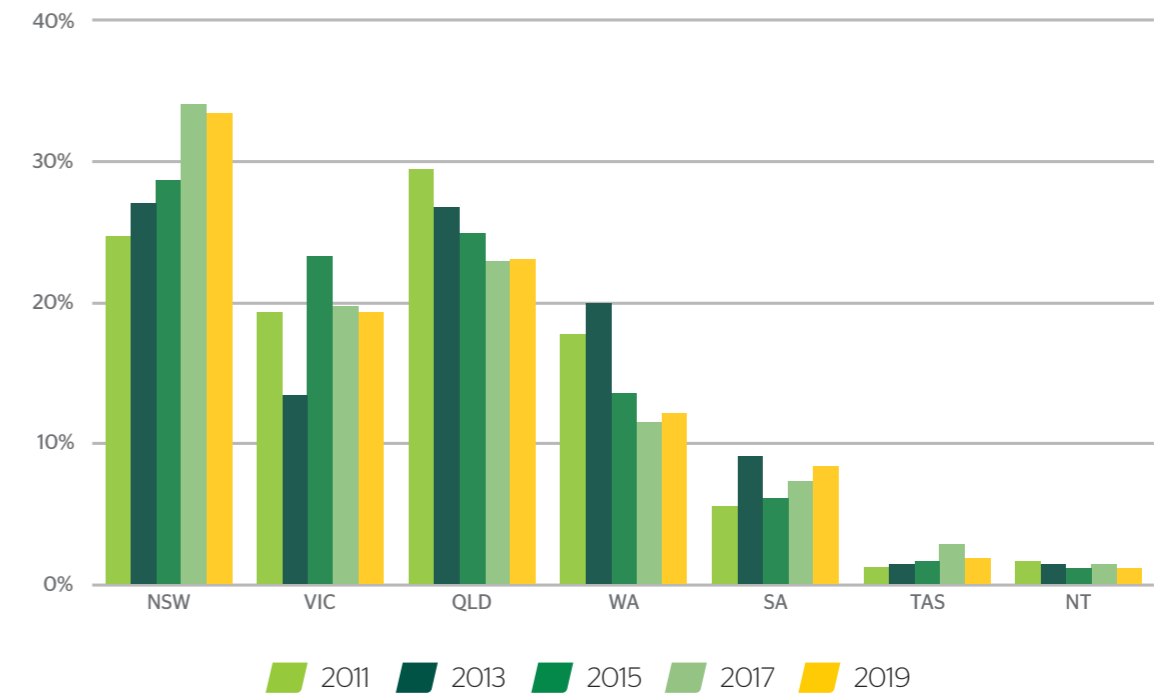
## Time of day

Distribution of losses by time of day remains consistent with previous years, correspondingly the status of midnight to 6am as the highest risk period for large losses once correcting for truck traffic volumes also remains unchanged.



## Accident location

The proportion of losses in Western Australia and South Australia rose slightly with corresponding falls in New South Wales and Tasmania.



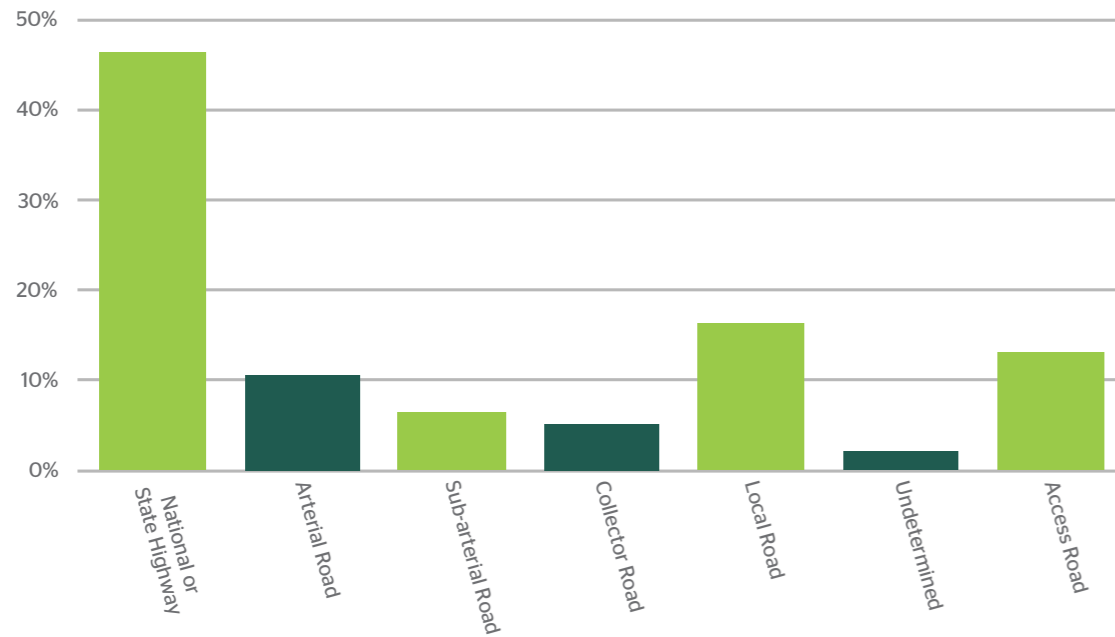
Once corrected for the volume of freight moved in each state, the worsening in South Australia's proportion of large losses results in it taking Queensland's mantle as the highest crash risk state. Western Australia, in no small part due to the tremendous volumes of remote and regional road freight associated with the mining sector, remains the best performing state.

## Relative proportion of large losses by state correcting for freight task



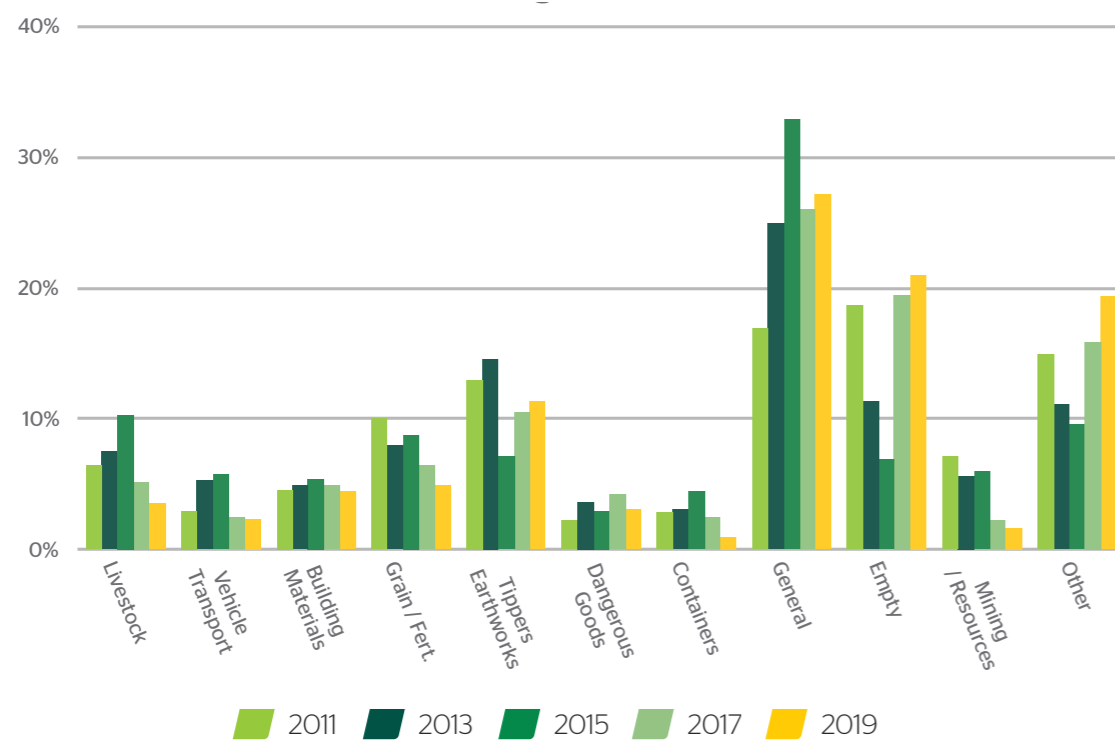
### Road category

For this report, the NTARC road category classification has been aligned to the Commonwealth Government's PMSA road hierarchy. Nearly half of large loss incidents occur on national or state highways.



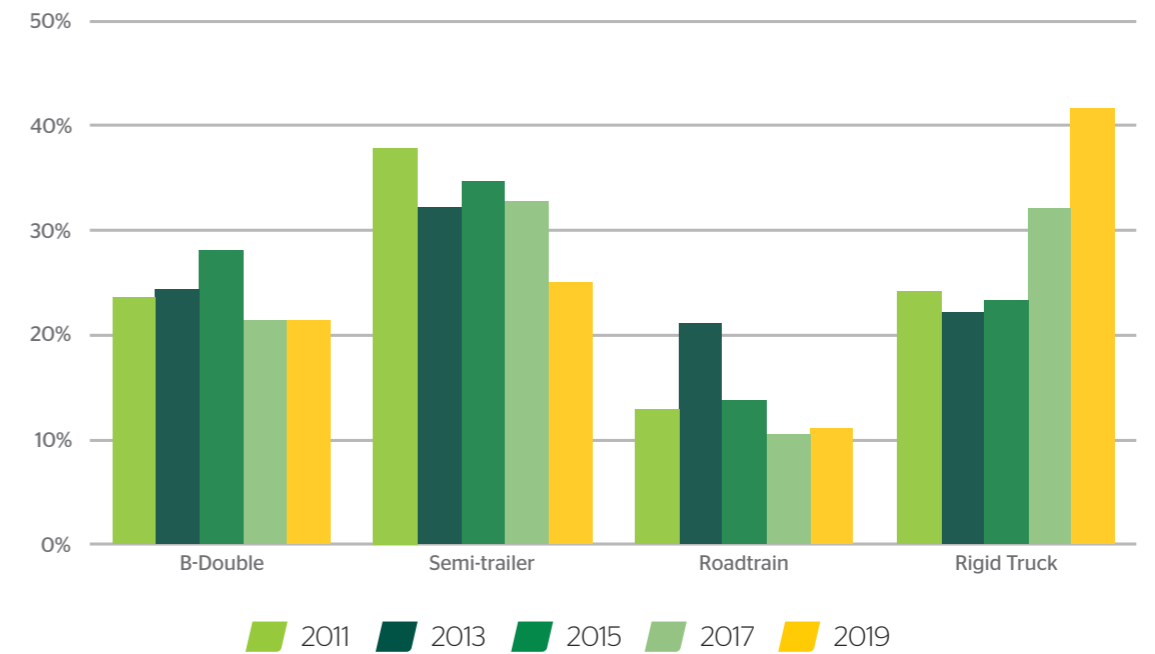
### Freight category

2019 saw an ongoing improvement in the performance of livestock and grain/fertiliser carriers, however some proportion of this, particularly around the transport of grain, is likely attributable to reduced freight volumes due to prolonged drought.



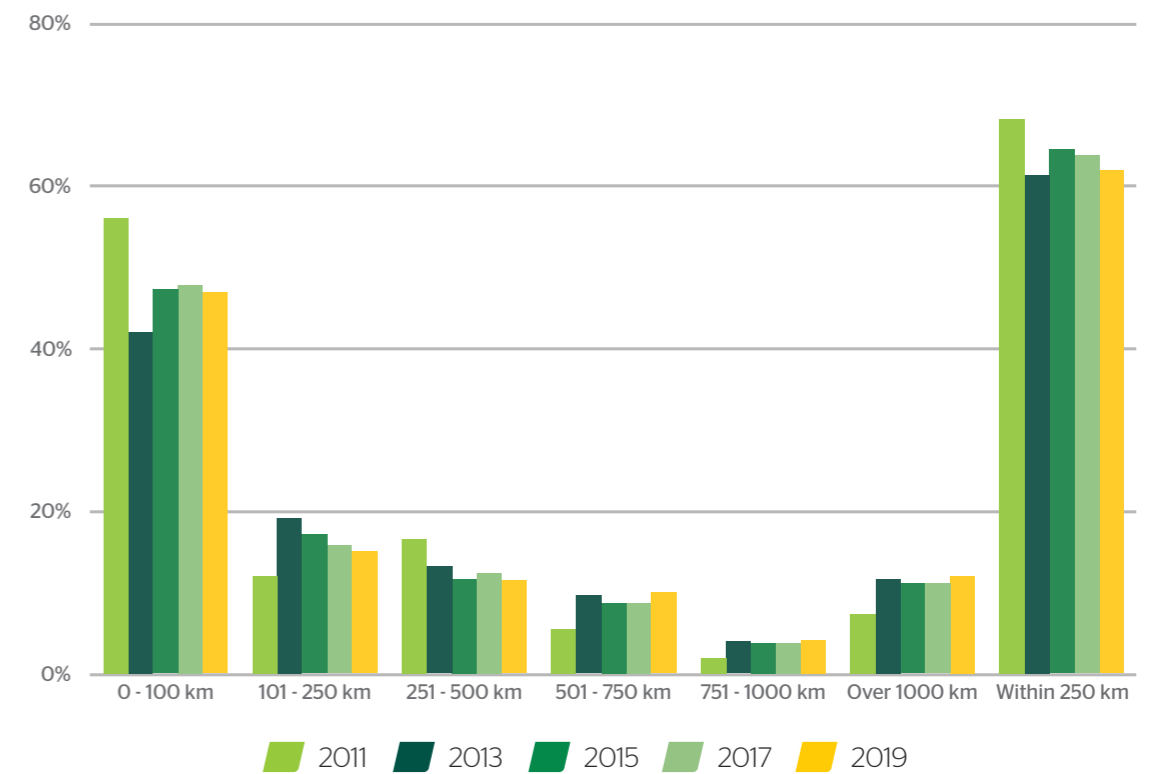
### Vehicle configuration

The proportion of large losses involving rigid trucks increased sharply between 2017 and 2019. This trend is of concern particularly when viewed together with the increase in rigid truck-involved fatal crashes.



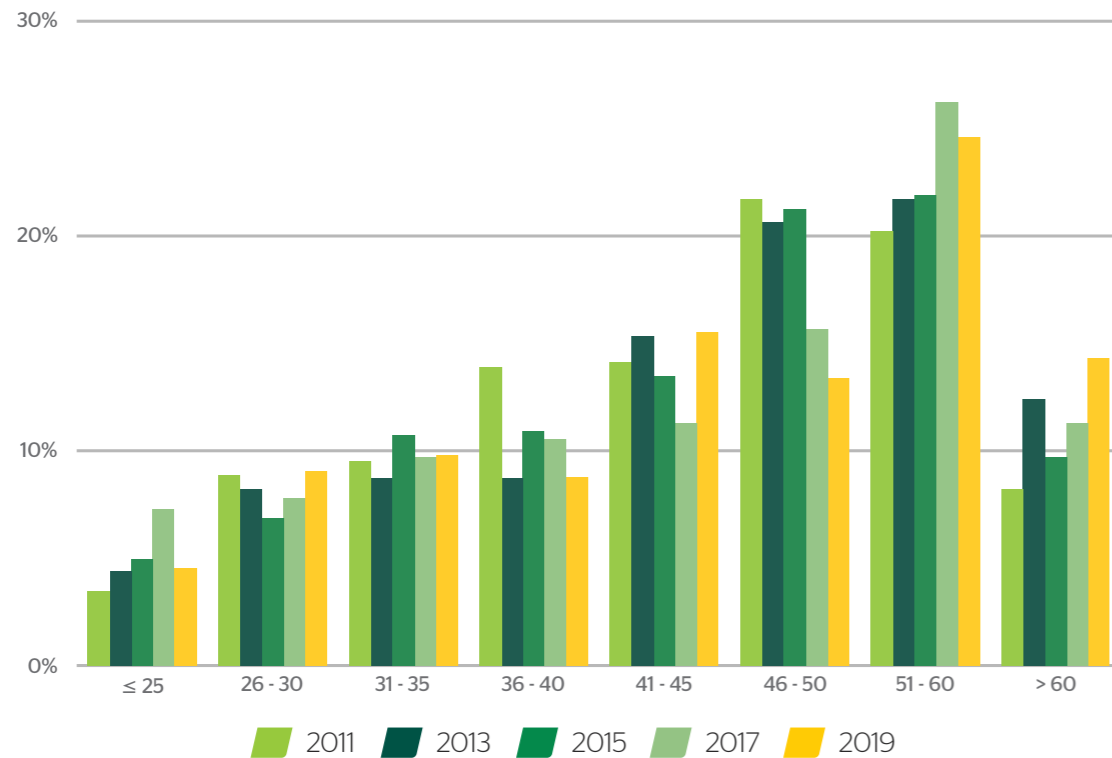
### Distance from point of departure

Distribution of large losses by distance from base remained largely consistent with previous years.



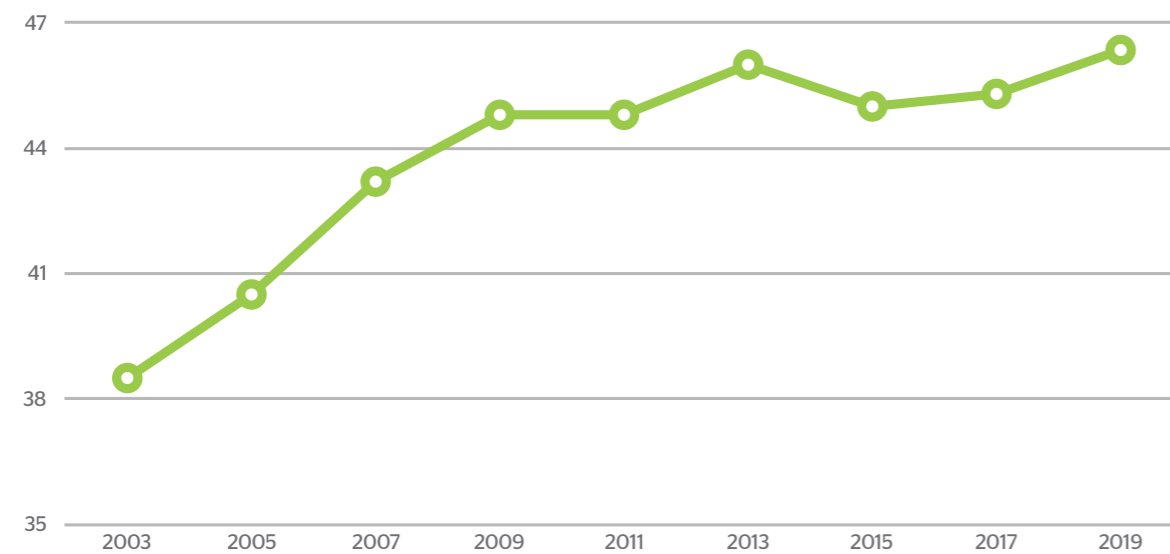
## Driver age

After a sharp rise in the proportion of losses involving drivers aged 25 and under in 2017, in 2019 this dropped back to levels similar to prior years. The proportion of losses involving drivers over 50 years of age increased to nearly two in every five losses (38.9%).



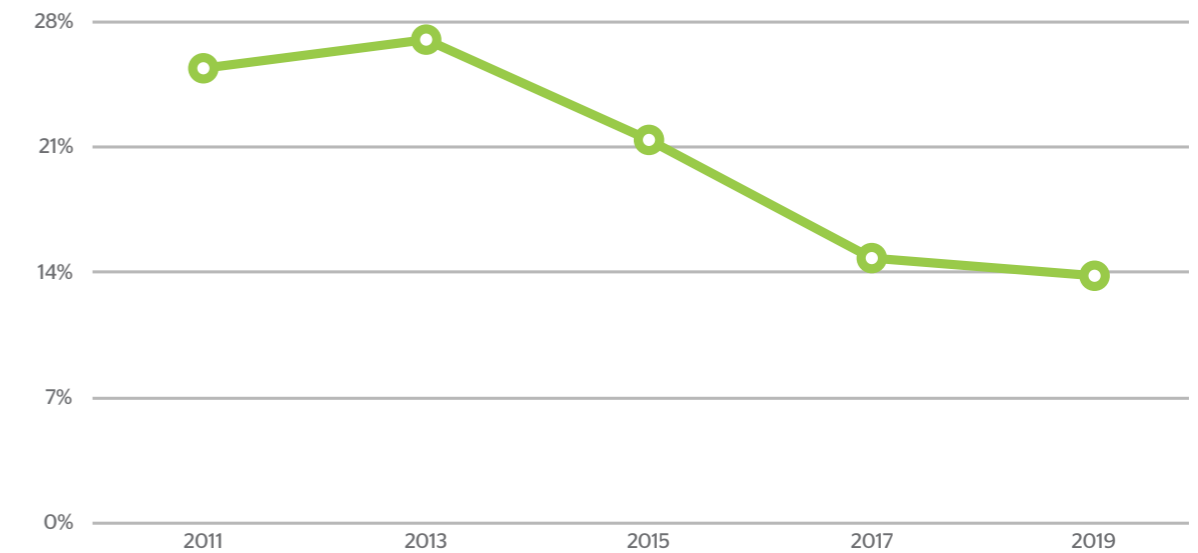
## Average age

The overall average age of drivers involved in large losses increased to 46.4 years, the highest figure in the history of this report series.



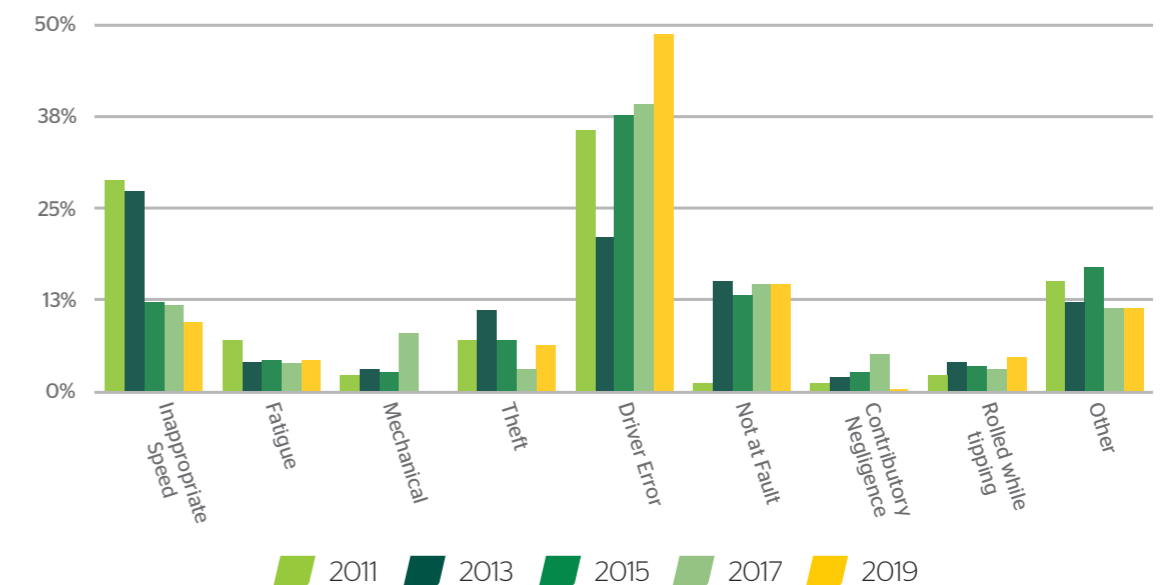
## Inappropriate speed

The proportion of NTI's large losses resulting from inappropriate speed decreased slightly when compared to 2017 data. Caution needs to be applied when comparing 2017-onwards data to earlier years as due to a change in internal definitions. Comparing data between 2015 and 2017, this resulted in an approximately 8 percentage points decrease inappropriate speed incidents with a corresponding increase in driver error incidents.



## Rigid trucks

Looking specifically at rigid trucks (with or without a trailer), there were no mechanical failure large losses in 2019 involving a rigid truck compared to 5% of rigid truck large losses in 2017 and around 2.5% of losses in prior years.



By contrast, losses due to driver error increased by 9.5 percentage points to 48.7% of rigid truck large loss incidents. One third (33.1%) of these driver error losses for rigid trucks were due to inadequate following distance, compared to only one quarter (25.8%) for all vehicle types.



## THE AUTHOR

### ADAM GIBSON

Starting his career in the transport and logistics industry as a heavy vehicle consulting engineer, Adam developed a deep interest in the not just the how of heavy regulation, but also the why.

This led to Adam leading the NHVR's Roadworthiness Program which was one of the responses resulting from a spate of serious truck accidents. He then returned to the commercial world taking a role as an Engineer with Penske Commercial vehicles before joining the team at NTI.

Adam is passionate about achieving road safety outcomes through industry-led initiatives where the interventions to improve safety relate directly to the specific hazard being addressed since 2002.



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Kim is an industry expert specialising in transport and logistics. He has previously held positions as Transport Economist, and Manager of Transport Operations and Strategy for Australia's largest network Transport Operator before becoming a principal consultant and researcher in the field of freight analytics and productivity.

He has published over 100 research papers for major domestic and international clients and journals, and has worked with some of Australia's and Europe's leading transport regulatory agencies.

Kim is the National Chair for CILT-Australia and a Director of the Industrial Logistics Institute. He continues to be a fractional Principal Fellow with the Department of Infrastructure Engineering at the University of Melbourne since 2002.



## THE COMPANY

As Australia's Number 1 Truck Insurer, NTI prides itself on being a part of the transport industry.

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NTI is a foundation sponsor of the Australian Trucking Association and supports a number of important causes such as Women in Transport, the Burrumbuttock Hay Runners and research into Motor Neurone Disease.



**“THE INSIGHTS  
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OPERATORS NEED  
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ON AUSTRALIA’S  
ROADS.”**

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