

**Safety Culture and the Australian Heavy Vehicle Industry:  
A Concept in Chaos – An Industry in Need**

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This thesis uses ethnographic methods alongside other research techniques. Ethnography seeks to describe a culture using the culture's own language.

A number of quotes within this thesis use crude language which may offend some readers. These quotes are not intended to cause offence, nor are they included for the sake of being crude. It was deemed important to avoid censoring these comments in order to maintain the integrity of the culture of the industry. The author apologises for any offence caused.



### **Statement of Original Authorship**

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

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**Date:** 11/06/14



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## **Abstract**

Every year Australian heavy vehicle drivers are involved in a significant number of injuries and fatalities. A number of researchers have suggested safety culture could be used to improve safety within the heavy vehicle industry. To date, however, no major research project has explored safety culture within this industry. Further, standard safety culture perspectives are ill-suited to the strong combination of both autonomy and regulation within the industry. Thus, to explore safety culture within the heavy vehicle industry, there is a need to enhance the current understanding of safety culture.

The purpose of this research was to enhance the current understanding of safety culture by providing a new theoretically grounded framework of safety culture; and to utilise this framework to explore safety within the heavy vehicle industry. An initial analysis of the safety culture literature revealed theoretical ties to organisational culture and traditional concepts of culture found in the anthropology and cultural psychology literature. Due to their unique strengths and weaknesses, and the complementary nature of these conceptualisations, they were synthesised and a new conceptualisation of safety culture created. This synthesised conceptualisation holds that shared beliefs, attitudes and values (culture) of organisation members interact with their surroundings (context) to produce safety-related behaviours and outcomes.

In order to apply the developed framework to the heavy vehicle industry, the research adopted the following five aims: (a) examine the suitability of key components of the synthesised conceptualisation of safety culture to the heavy vehicle industry; (b) identify factors previously identified within heavy vehicle industries which comprise the key components of the framework; (c) identify major factors within the heavy vehicle industry which have eluded previous research; (d) identify the best approach to investigating the effect

of culture on safety in the heavy vehicle industry; and (e) examine how cultural and contextual factors affect safety-related behaviours in the heavy vehicle industry.

A three-part research program was developed.

Study One consisted of a systematic review of the heavy vehicle health and safety literature. This literature was analysed using the synthesised conceptualisation of safety culture, providing a preliminary framework of safety culture within the heavy vehicle industry. A number of safety-related behaviours and their associated outcomes were identified. Additionally, contextual factors, including those related to government, the organisation, customers, the workers union, and the road and work environment, and a selection of potential cultural beliefs, attitudes and values, were identified which related to the identified behaviours and outcomes.

Study Two consisted of semi-structured interviews with key industry stakeholders. These interviews were used to identify major factors absent in previous research and to determine the best approach to explore relationships between key components of the synthesised conceptualisation of safety culture and associated behaviours and outcomes. Interview data was analysed using grounded theory coding techniques. Study Two provided additional depth to many of the factors identified in Study One. Additionally, this study uniquely identified the importance of a number of industrial groups and affiliations, the general public and sub-contractual arrangements. Further, it found a high degree of perceived heterogeneity within the industry. Thus, in order to explore the effect of contextual and cultural factors on behaviours and outcomes, the next phase of the research needed to target individual organisations.

Study Three consisted of three case studies with specific transport organisations. Using a combination of ethnography and grounded theory research techniques, Study Three sought to both explore the culture of the industry and the impact of culture and context on

behaviours and outcomes. The case studies consisted of interviews with drivers and organisational personnel, participant observation of drivers, and document analysis. A detailed account of the context surrounding drivers from each organisation was provided. Further, a number of cultural traits, common across the organisations, were identified. Finally, the relationship between culture and context, and behaviour and outcomes was explored.

The current research contributed to the existing knowledge of safety within the heavy vehicle industry. Evidence of an industry-wide culture was found. Further, the way in which contextual factors were seen to interact with this culture led to the identification of potential best practices for organisations and customers, as well as changes to existing contextual factors that are ill-suited to the prevailing culture. Hence, a number of potential guidelines for safety interventions within the industry were identified. Future studies could aim to statistically validate the findings of the current research.

The current research also contributed to the field of safety culture through the developed model of safety culture. This synthesised conceptualisation was demonstrated to be suitable for the heavy vehicle industry, and may be applicable to other related industries. Further, none of the examined safety behaviours could be explained through solely contextual or cultural factors. The synthesised conceptualisation provided in this research offers unique insight into safety behaviours unable to be gained using existing approaches to safety culture. Future research could seek to explore the potential benefits of this framework within other industries.

### **Key Words**

Safety Culture, Organisational Culture, Occupational Health and Safety, Heavy Vehicle, Truck Safety, Truck Crash.



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## Definitions of Terms and Abbreviations

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### Culture and Safety Culture-Related Terms

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*Both ‘culture’ and ‘safety culture’ are terms with many definitions and as such no single definition is provided here. However, the below terms are used to refer to distinct approaches or conceptualisations within the culture and safety culture literature.*

<b>Anthropological conceptualisation</b>	The anthropological conceptualisation of culture holds that culture is a series of shared factors typically consisting of attitudes, beliefs and values.
<b>Functionalist approach</b>	The functionalist approach to safety culture holds that safety culture is a pattern of shared behaviour and emphasises organisational structures and systems which influence this behaviour.
<b>Interpretive approach</b>	The interpretive approach to safety culture holds that safety culture is shared patterns of meaning, typically operationalised as shared beliefs, attitudes and values.
<b>Normative conceptualisation</b>	The normative conceptualisation of culture holds that culture is the knowledge of the best that has been said and thought. When transferred to safety culture this conceptualisation emphasises comparing organisational structures and systems to current ‘best practices’.
<b>Pragmatist conceptualisation</b>	The pragmatist conceptualisation of culture holds that culture is about routine behaviour (practices) which

results from shared underlying beliefs, attitudes and values.

### **Synthesised conceptualisation**

The synthesised conceptualisation of safety culture, proposed within the current research, holds that safety culture is the assembly of underlying assumptions, beliefs, values and attitudes shared by members of an organisation (anthropological culture), which interact with an organisation's structures and systems and the broader contextual setting (normative culture) to result in those external, readily-visible, practices (pragmatic culture) that influence safety.

- ***Contextual factors***

Within the synthesised conceptualisation, contextual factors are any factors which influence behaviour but are external to the members of a given population.

- ***Cultural traits***

Within the synthesised conceptualisation, cultural traits consist of beliefs, attitudes and values shared by members of a given population.

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### **Study Specific Terms**

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*The following terms are used within the current research and may hold ambiguous meanings. As such, the terms refer to the following definitions within the research.*

#### **Autonomy**

For the purpose of this research, autonomy refers to freedom from external supervision, such as in the context of truck drivers who are absent from

the presence of a supervisor.

### **Driver**

Unless otherwise qualified (e.g. car driver), driver refers to a heavy vehicle driver.

### **Heavy vehicle**

For the purpose of the current research, a heavy vehicle specifically refers to an automobile used to transport freight. Though no explicit cut-off was applied, heavy vehicles are typically classified as weighing over 4.5 tonnes.

### **Organisational staff**

For the current research, organisational staff refers to any employee of a transport organisation not employed to drive a heavy vehicle.

### **Observation**

Within the current research, observation specifically refers to the participant-observation technique used within ethnography. This technique consists of the researcher participating in typical daily rituals and directly interacting with the observed individual to gain an insider perspective.

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## **Heavy Vehicle Industry Terms**

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*There are many terms used by members of the industry and within the current research which may alienate the reader. Whilst these terms have been defined (where possible) at their first introduction within the text, the following list of terms and abbreviations used within the current research is provided for reference.*

**AFM (Advanced Fatigue Management)**

Advanced Fatigue Management is one of three fatigue management schemes offering significant flexibility in driving hours, with higher requirements for organisations than other schemes.

**Articulated truck**

An articulated truck is a vehicle consisting of a towing engine (referred to as a prime mover) and one or more trailers.

**B-double**

A B-double is a two-trailer truck combination consisting of a prime mover attached to a shortened trailer fitted to allow a standard semi-trailer to be attached from behind.

**Body truck**

A body truck is a small heavy vehicle in which the trailer and towing engine are a single entity. That is, the trailer cannot be removed from the truck. Typically a body truck is quite small and may only possess two axles.

**BFM (Basic Fatigue Management)**

Basic Fatigue Management is the second fatigue management scheme which allows a maximum of 14 hours' work in a given 24-hour period. Additional requirements include maximum night-time hours, maximum intervals between rest periods, and minimum rest durations.

<b>Bonneted truck (also conventional)</b>	A bonneted truck or conventional truck is a prime mover in which the driver cab is situated behind the axle and the engine is housed below a bonnet protruding in front of the driver.
<b>Cab</b>	The cab (cabin) of a truck is the enclosed space within which the driver is seated when driving.
<b>Cab-over</b>	A cab-over truck is a prime mover in which the cab is situated over the axle and has a vertical (flat) front rather than a bonnet.
<b>COR (chain of responsibility)</b>	Chain of responsibility legislation states that each member of the supply chain is responsible for the safety of goods transport. Thus, a customer or manager may be held accountable for failing to ensure safe transport.
<b>Crate (livestock crate)</b>	A crate or livestock crate is the specific form of trailer used to transport livestock. The crate is typically two levelled, has openings along the side to allow air movement, and contains sealed off pens to minimise cattle movement.
<b>Extendable trailer</b>	An extendable trailer is a trailer with a modifiable length allowing for longer loads to be safely carried, without impeding on the ability to use the trailer for shorter loads.
<b>FM (Fatigue management)</b>	Fatigue management refers to regulations relating to the management of fatigue. The

regulations revolve around legislated work and rest periods monitored through the use of work diaries. There are three fatigue management schemes (standard, basic and advanced) which incrementally allow increased maximum durations of work with additional required safety precautions.

**Gate**

A gate is a metal frame inserted into the side of a trailer, or behind a load, to provide a solid barrier to prevent goods from shifting during transport.

**General freight**

General freight is a broad category of freight types typically encompassing any form of freight that does not have specific legislating requirements.

**Heavy haulage**

Heavy haulage refers to the transport of goods which are above the legal weight range of goods, thus requiring permits and specialised equipment.

**Line-haul**

Line-haul is the transport of goods between major cities.

**Local**

Local driving typically refers to goods being transported within 200km (the maximum distance that goods can be transported without a work diary) of the transport company depot.



<b>Long-distance</b>	Long-distance driving typically refers to trip lengths over 200km from the transport company depot (thus requiring a work diary). This can include inter- and intra-state transport.
<b>Log books</b>	Log books are the common name used to refer to work diaries. The term used to be correct, however, the term was replaced with work diaries when the fatigue management legislation changed.
<b>NHVAS (National Heavy Vehicle Accreditation Scheme)</b>	The National Heavy Vehicle Accreditation Scheme is an accreditation body which provides accreditation that permits organisations to either use basic or advanced fatigue management, conduct their own maintenance or manage their own vehicles.
<b>NOD (normalisation of deviance)</b>	Normalisation of deviance is a process by which unsafe behaviour is conducted without consequence, and so the behaviour becomes acceptable.
<b>Non-conformance</b>	Non-conformance notifications/slips etc. refer to a report issued to a driver and kept on record when a driver acts in a manner contrary to organisational policies. A non-conformance typically states what the improper behaviour was, what should be done in future, and what

approach will be used to punish this behaviour or ensure it does not reoccur.

**Over-dimension**

Over-dimension freight is any type of transport which has a width, height, or length beyond that which can be legally carried without a permit.

**Prime mover**

A prime mover is the towing unit of an articulated truck, and thus is a truck which is not built with a trailer.

**Rigid truck**

A rigid truck is a heavy vehicle in which the trailer and towing engine are a single entity. That is, the trailer cannot be removed from the truck. Further, the trailer is not free-moving and is rigidly attached to the engine unit.

**Road train**

A road train is a category of vehicle combinations consisting of a prime mover and multiple trailers. This includes B-doubles and various three (triple) and four (quad) trailer configurations.

**Semi-trailer**

A semi-trailer can refer to a trailer attached to the prime mover, however, it typically refers to a specific articulated truck vehicle combination in which a prime-mover tows a single trailer.

**SFM (Standard Fatigue**

Standard Fatigue Management is the default fatigue management scheme which allows a

<b>Management)</b>	maximum of 12 hours' work in any given 24-hour period. A number of additional requirements are also present which govern the maximum intervals between rest periods and minimum rest durations.
<b>SOR (serious occurrence report)</b>	Serious occurrence reports are reports of incidents that have occurred within other organisations, which are relayed to a transport company. These are typically used for educational purposes.
<b>Speed limiter</b>	A speed limiter is a device fitted in the engine of a truck which limits the maximum speed the vehicle can accelerate to.
<b>SSO (serious safety occurrence)</b>	Serious safety occurrence is another name for an SOR (see above).
<b>Taut-Liner</b>	A taut-liner is a form of trailer in which the side walls are comprised of curtains (typically canvas) pulled taut. There are often platforms within the trailer allowing multiple levels of freight.
<b>Work diary</b>	A work diary is a book used by heavy vehicle drivers to record work and rest hours for the purpose of demonstrating fatigue management compliance.

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## **Chapter 1: Introduction – The effect of culture on safety in the heavy vehicle industry**

### **1.1. HEALTH AND SAFETY IN THE HEAVY VEHICLE INDUSTRY**

Transport is a crucial component of the Australian economy, accounting for approximately 5% of gross domestic product (GDP), and directly contributing to almost all other sectors within Australia (Department of Infrastructure, Transport, Regional Development and Local Government, 2009). Situated within the transport sector is the road freight, or heavy vehicle, industry, in which health and safety is a major concern. Heavy vehicle drivers face many health and safety issues which are common to other industries, but have the additional concern of road safety as a regular component of their work. Safety in the heavy vehicle industry can generally be broken into road safety and workplace health and safety.

Over 18% of the Australian road toll in the 12 months to the end of December 2012 can be attributed to crashes involving heavy vehicles (Department of Infrastructure & Local Government, 2013; Department of Infrastructure, Transport, Regional Development, & Local Government, 2013). These deaths included heavy vehicle operators and the general public, showing that heavy vehicle road safety is not solely a workplace safety issue, but is also a public health concern. As well as loss of human life and related injuries, crashes may also cause additional damage due to the nature of materials transported. A leading truck insurance

company found that during 2011, 461 national truck crash incidents accounted for AUD\$54.7m in claims payments (Driscoll, 2013).

Aside from road crashes there are a number of other occupational safety concerns in the industry. Injury compensation data from Queensland, released shortly prior to the onset of this research, revealed that between 2008 and 2009 the transport and storage sector received 2718 accepted injury claims, at a rate of 21.7 per 1000 workers. This rate was second only to the manufacturing industry and approximately 50% higher than the all-industry average (Queensland Workplace Health and Safety Board, 2010). Over 60% of serious injuries within the transport and storage sector are musculoskeletal disorders (Workplace Health and Safety Queensland, 2009). Furthermore, there are a number of health concerns prominent in the Australian heavy vehicle industry, including poor mental health, obesity, arthritis and rheumatism, lung diseases, heart and intestinal problems (The Work Outcome Research Cost-Benefit (WORC) Project, 2008).

In recent years, the Australian heavy vehicle industry has been the target for a number of policy initiatives and strategies aimed at improving health and safety. Due to the number of incidents and injury claims per employee, the National Occupational Health and Safety (OHS) Commission (2002) identified the transport and storage sector as one of four primary targets for the 2002-2012 National OHS Strategy. Five years after the inception of the National OHS Strategy, the number of incidents and injury claims per employee in the transport and storage sector had decreased by 22%. Despite this sector-wide decline, the road freight transport sub-group (the heavy vehicle industry), which accounts for 29% of employees in this sector, only showed an 11% reduction (Australian Safety and Compensation Council, 2010). The heavy vehicle industry, therefore, appears to be more resistant to national safety initiatives than other related industries. Health education research has shown that 'off the shelf' or global intervention strategies, that are applied to audiences

they were not specifically designed for, can have differing levels of effectiveness due to the impact of cultural norms and values (McLeroy et al., 1994). These issues point to the need to explore the impact of culture on safety (commonly referred to as safety culture) in the heavy vehicle industry.

## 1.2. SAFETY CULTURE

Safety culture has seen significant attention within the literature in recent years (for detailed analysis see reviews by Choudhry, Fang, & Mohamed, 2007; and Guldenmund, 2000). There is significant debate within the literature about the nature of safety culture and how it can be defined and measured. Whilst some researchers view safety culture in terms of shared beliefs and values, others perceive it in terms of organisational structures and systems. Naevestad (2009) referred to these researchers respectively as interpretive and functionalist scholars. Dependent on the view of safety culture held by a researcher there are also different approaches used to measure or explore it. Due to limited consensus over definitional or operational concepts, one group of researchers referred to safety culture as ‘a concept in chaos’ (H. Zhang, Wiegmann, von Thaden, Sharma, & Mitchell, 2002, p. 4).

## 1.3. SAFETY CULTURE AND THE HEAVY VEHICLE INDUSTRY

A number of researchers have indicated that safety culture could provide a useful avenue for improving safety in the heavy vehicle industry (P. Gander et al., 2011; McCorry & Murray, 1993; Short, Boyle, Shackelford, Inderbitzen, & Bergoffen, 2007). However major research has yet to explore the effect of safety culture on safety in the heavy vehicle industry. Thus, there is a lack of existing research demonstrating how the safety culture concept could be applied to this industry.

There may be a number of barriers to the use of existing safety culture approaches within the heavy vehicle industry. Due to the high levels of autonomy heavy vehicle

operators have regarding safety issues (Arboleda, Morrow, Crum, & Shelley Li, 2003), safety culture may be difficult to apply to this industry. In industrial and organisational settings with high levels of autonomy or de-centralisation, safety concerns may be overlooked due to varying margins for error within different sub-units, systematic censorship and distortion of information regarding negative events, and inadequate communication (Pitzer, 1999). In such settings, safety culture can be a powerful means by which a sufficient level of integration can occur within an organisation, thereby enabling autonomy to continue in such a way that all parties work towards the same ultimate goals (Grote, 2008). However, the heavy vehicle industry is a special case, in that the degree of freedom and autonomy means that in many ways drivers serve as their own boss, working with little or no supervision. Unlike many other industries, the degree of time spent away from the organisation (particularly line-haul drivers), may lead to drivers identifying themselves separately from their organisation (Sully, 2001). Therefore, it is clear that functionalist approaches which emphasise organisational structures and systems are too limited to explain safety within the heavy vehicle industry.

It could be argued that this lends support to utilising an interpretive approach (emphasising shared beliefs, attitudes and values), yet this may also be too limiting. As previously indicated, there have been a number of policy initiatives and strategies aimed at improving safety within the heavy vehicle industry. Heavy vehicle drivers are subject to a wide variety of regulations to which they must adhere or risk punishment. They may also be subject to a number of organisational and customer policies and requirements. A solely interpretive approach would fail to take these aspects into account.

#### 1.4. THE PERFECT COMBINATION: A CONCEPT IN CHAOS – AN INDUSTRY IN NEED

The fractured state of the field of safety culture, combined with the uniqueness of the heavy vehicle industry, presents an interesting nexus within which to conduct research.



Firstly, there is a need to explore the effect that culture has on safety in the heavy vehicle industry. Secondly, there is a need to enhance the existing understanding of safety culture. Whilst past researchers have simply redefined safety culture to suit a target problem (Guldenmund, 2000), defining safety culture relative to the heavy vehicle industry would further contribute to confusion of the field. Additionally, it is difficult to theoretically justify defining the concept to suit a single research problem. Thus, it is impossible to accurately address the effect of safety culture in the heavy vehicle industry without first addressing the confusion of the field.

The current research, therefore, seeks to return to the theoretical roots of safety culture and identify the core components of the concept to provide clarity to the concept of safety culture, and identify underlying factors that should be considered in the heavy vehicle industry. This further benefits the heavy vehicle industry by ensuring that the current research is theoretically grounded, rather than merely a blind application of concepts used within other industries.

### 1.5. THE CURRENT RESEARCH

Due to the nature of health and safety in the heavy vehicle industry, and barriers to using existing approaches to safety culture, there are two principal aims of the current research. The first objective is to enhance the current understanding of safety culture and provide a theoretically grounded framework of safety culture. The second objective is to use this framework to explore the effect of culture on safety within the heavy vehicle industry. This research thesis starts by reviewing literature that pertains to safety culture, and uses it to develop a theoretical framework of safety culture. This framework is referred to as a synthesised conceptualisation of safety culture.

A three-part research program was developed to examine the efficacy of this synthesised conceptualisation of safety culture, and use it to explore the effect of culture on

safety in the heavy vehicle industry. The first study was comprised of a systematic literature review pertaining to heavy vehicle health and safety. Whilst there has not been a lack of major research exploring safety culture in the heavy vehicle industry, by exploring the literature regarding health and safety in heavy vehicle industries worldwide it is possible to develop an understanding of the factors which have been seen to influence health and safety outcomes. These factors can be interpreted through the synthesised conceptualisation of safety culture. Results of this review were used to identify factors to be considered when exploring the effect of culture on safety in the heavy vehicle industry, and begin to develop an industry-specific theoretical framework of safety culture.

The second study was comprised of a series of semi-structured interviews with 31 key industry stakeholders. This served to confirm the findings of the systematic literature review in Study One, and identify any major factors not found in the literature. Additionally, this study served to identify the best approach to directly examine the effect that culture has on safety in the industry. Findings from this study determined the best approach to investigate the effect of culture of safety was to conduct case studies with individual transport companies.

The third study consisted of three case studies with specific transport companies situated in Queensland, Australia. The case studies were comprised of interviews with drivers and management staff and observations of drivers, along with analysis of safety documents to corroborate information provided by participants. These case studies provided in-depth information of contextual and cultural factors that were present for drivers in companies being investigated, and the manner in which they influence safety.

## 1.6. THE CONTRIBUTION OF THIS THESIS TO THE EXISTING BODY OF KNOWLEDGE

Whilst further research is required to confirm the findings of this thesis, this study contributes to the body of knowledge on both safety culture and health and safety within heavy vehicle industries. Many theses commonly apply existing models and frameworks to novel problems. Conversely, the requirement of this thesis to develop a new framework of safety culture means that both the initial literature review and framework, and the results of the current research, hold direct contributions to knowledge.

This thesis provides a novel approach to safety culture, which was useful in interpreting existing literature and understanding safety within the heavy vehicle industry. The use of the synthesised conceptualisation of safety culture to interpret literature demonstrates its efficacy in informing research. Similarly, the conceptualisation's application to the heavy vehicle industry provides a unique understanding of behaviour not possible with existing approaches to safety culture. Further, the current research offers the first major research findings of safety culture in any heavy vehicle industry worldwide. Finally, the findings may serve to significantly improve safety within the industry, due to an increased understanding of the cultural and contextual setting within which interventions are applied.

## 1.7. CHAPTER OVERVIEW

The remainder of this chapter provides an overview of the chapters in this thesis. Chapter 2 is comprised of a literature review of safety culture. The purpose of the review was to develop an understanding of the current standing of the field, and to develop a theoretical framework for application within the current research. Throughout the review it is recognised that safety culture has theoretical ties to more traditional concepts of culture found in anthropology and cultural psychology literature. These traditional concepts are then used to further understand the current safety culture literature. The different scope, strengths and

weaknesses of these concepts mean they can be viewed as separate aspects of a larger concept. The review concludes by presenting the synthesised conceptualisation of safety culture which holds that safety culture is the assembly of underlying assumptions, beliefs, values and attitudes shared by members of an organisation, which interact with an organisation's structures and systems and the broader contextual setting to result in those external, readily-visible, practices that influence safety.

Chapter 3 outlines the research and the methods used for data collection and analysis in this thesis. The research comprises three major studies. Study One is a systematic literature review examining peer-reviewed literature regarding heavy vehicle health and safety. The purpose of this review is to interpret the existing research in the light of the synthesised conceptualisation of safety culture. Thus, the review provides a theoretical framework of safety culture specific to the heavy vehicle industry and demonstrates the applicability of the synthesised conceptualisation to this industry. Study Two consists of a series of semi-structured interviews conducted with key industry stakeholders. The purpose of Study Two is to further inform the findings of Study One to enhance the theoretical framework, and identify the best approach to explore the effect of safety culture in the heavy vehicle industry. Study Three is comprised of three case studies with specific transport organisations. Study Three aims to identify the effect of contextual and cultural factors on safety in the industry. The case studies are comprised of interviews, observations and document analysis.

Chapter 4 provides results of the systematic literature review that comprised Study One. The literature on heavy vehicle health and safety was classified according to the health and safety outcomes to which they related. The literature regarding these outcomes was analysed through the lens of the synthesised conceptualisation of safety culture to develop an industry-specific theoretical framework of safety culture.

Chapter 5 contains results of the semi-structured interviews. From the interviews, factors identified in Study One were further developed, and additional factors identified, further developing the theoretical framework. Additionally, a number of differences between sections of the industry were identified, highlighting the need to avoid treating the industry as a homogenous entity. Study Two concludes that case studies are the most efficacious approach to use for Study Three to identify specific cultural factors present within organisations and the way they interact with contextual factors to influence behaviour.

Chapter 6 presents a brief overview of the case studies and a summary of Chapters 7 to 11. Chapter 7 discusses the organisational context for each studied organisation, providing specific details of the management strategies used within the organisation. Chapter 8 presents the broader contextual factors identified within the case studies which surround the organisation and their drivers. Chapter 9 reports on each of the cultural traits identified in the case studies. Finally, Chapter 10 concludes Study Three's results by exploring the manner in which previously identified factors influence specific safety behaviours within the studied organisations.

Chapter 11 provides a discussion of the overall research program, examining how it compares with existing research. This final chapter provides critical analysis of the current research limitations. Chapter 11 also discusses how the current research contributes to the existing field of knowledge on both safety culture and heavy vehicle driver health and safety. Lastly, future directions for research based upon the findings of the current research are discussed.



## **Chapter 2: Returning to the Roots of Culture – A Review and Reconceptualisation of Safety Culture**

A modified version of this chapter was published as:

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### **2.1. INTRODUCTION**

‘Safety culture’ is a term with many definitions in the academic and professional literature (see reviews by Choudhry et al., 2007; and Guldenmund, 2000). The phrase safety culture was first used by the International Nuclear Safety Advisory Group (INSAG) in a report following the 1986 disaster at the Chernobyl Nuclear Power Plant. Amongst other causal factors, it was reported that a lack of safety culture, both within the Chernobyl plant and at a national level, contributed to the incident (INSAG-1, 1986, as updated in INSAG-7, International Nuclear Safety Advisory Group, 1992). Five years after the disaster INSAG gave the following definition of safety culture:

Safety Culture is that assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.” (INSAG-4, 1991, p. 1).

Safety culture research has been conducted by individuals from various disciplines, leading to different conceptualisations of safety culture. Despite much research, there is a lack of widely-accepted definitions of safety culture (Guldenmund, 2000; Hopkins, 2006).

Guldenmund (2000) suggested that this has led many researchers to re-define safety culture in relation to their research topic. Due to the number of definitions of safety culture, and the nature of the issue under investigation, research has focussed on many factors, including organisational management systems, policies and procedures, job design, work pressures, training, employee involvement in decision making, and perceptions and attitudes regarding the work environment (Arboleda et al., 2003; Choudhry et al., 2007; Cox & Cheyne, 2000; Grote, 2008; Håvold, 2010; O'Toole, 2002; Parker, Lawrie, & Hudson, 2006).

Disagreement regarding the nature and content of safety culture presents a barrier to the advancement of the field beyond a loose collection of safety research. Whilst the nature of safety, risks and hazards may differ between organisational settings, thereby permitting different focuses between researchers, it is questionable whether culture and, therefore, safety culture, is differentiated. Distinct from the broader field of safety science is the specific use of the word 'culture' in safety culture. Thus, exploration of the meaning of the term culture may provide insight for the development of safety culture. Despite the lack of consensus in the field, there is some agreement that a positive safety culture is an organisational culture that places a high priority on safety-related beliefs, values and attitudes (Cooper, 2000; Guldenmund, 2000; Short et al., 2007). Whilst the literature presents safety culture as a specific issue, it can be viewed as a sub-component or effect of organisational culture, and not a culture in itself (Antonsen, 2009; Choudhry et al., 2007; Guldenmund, 2000; Haukelid, 2008; Hopkins, 2006). Organisational culture thus appears a useful avenue to explore the meaning of culture in safety culture.

## 2.2. ORGANISATIONAL CULTURE AND SAFETY CULTURE

Fisher and Alford (2000) found over 164 definitions of organisational culture. Despite a broad variety of definitions Guldenmund (2000) identified seven common characteristics of organisational culture, these being that it is (1) an abstraction and so is difficult to define and



operationalise; (2) relatively stable over time; (3) multi-dimensional; (4) shared by groups of people; (5) may contain several coexisting aspects (e.g. a 'service climate' or a safety culture); (6) leads to overt practices; and (7) serves a functional purpose (e.g. culture is "*the way we do things around here*"). One of the more commonly referenced definitions of organisational culture is:

shared values (what is important) and beliefs (how things work) that interact with a company's people, organizational structures and control systems to produce behavioural norms (the way we do things around here) (Uttal, 1983, p. 66).

Another definition is provided by Schein (1990) who argued that any group with a significant shared history may have developed a culture and as such, organisational culture is simply the culture held by members of a given organisation. This culture was defined as:

(a) a pattern of basic assumptions, (b) invented, discovered, or developed by a given group, (c) as it learns to cope with its problems of external adaptation and internal integration, (d) that has worked well enough to be considered valid and therefore (e) is to be taught to new members as the (f) correct way to perceive, think, and feel in relation to those problems (Schein, 1990, p. 111).

If organisational culture is merely the culture held by members of an organisation, then it can be argued that safety culture also has theoretical ties to traditional concepts of culture. It is, therefore, somewhat peculiar that safety culture literature rarely ventures beyond brief discussions of organisational culture in establishing its own theoretical basis. Due to difficulties in conveying culture to the business world, culture is often translated into business concepts (Fisher & Alford, 2000). Whilst it is important to communicate organisational and safety culture effectively to the business community and thereby increase its application, this communication must ensure fidelity to the original concepts. Basing safety culture purely upon the organisational culture literature adds a risk of cumulative error, leading to a loss of original concepts of culture. In order to explore the meaning of culture in safety culture, it is

beneficial to briefly return to traditional conceptualisations of culture, found in the anthropological and cultural psychology literature.

### 2.3. APPLYING TRADITIONAL CONCEPTIONS OF CULTURE TO SAFETY CULTURE

According to Tharp (2007), efforts to define culture have invariably led to exasperation. Definitions of culture number in the hundreds and differ in specificity (Cohen, 2009; Triandis, 1996). Brinkmann (2007) identified three conceptualisations of culture, namely normative, anthropological and pragmatist conceptualisations, which can be viewed as broad categories encompassing much of the research regarding culture. These conceptualisations provide a useful starting point for discussions about the nature of culture in safety culture. Whilst there are many issues of contention within these conceptualisations, this chapter provides a general overview of these conceptualisations, exploring how they can be, or have been, applied to safety culture.

The normative conception holds that culture is the knowledge of “the best that has been said and thought” (Arnold, 1993). In this conceptualisation, culture is seen as a substance which can and ought to be possessed by an individual, resulting in the person being ‘cultured’ (Brinkmann, 2007). When applied to a group setting this conceptualisation can similarly be used to describe a group as cultured or uncultured. Brinkmann (2007) argued that this conceptualisation can be used to describe the ‘normative differences’ between individuals and groups.

The anthropological conceptualisation of culture holds that culture is possessed by all, being comprised of factors that ensure conduct is repeated (Brinkmann, 2007). This view of culture focuses on the shared factors, rather than the evaluation of characteristics which are present or absent. This conceptualisation is dominant within the anthropological and cultural psychology literature, and many definitions of culture utilise this conceptualisation. Whilst a

full analysis of the social anthropology literature is beyond the scope of this thesis, a few points warrant discussion.

Due to the difficulties inherent in defining culture many authors rely on examples drawn from other fields to describe culture. For example, Triandis (1989) likened culture in a society to memory for an individual. Rohner (1984) explained culture as a set of rules such as those governing sports or the use of language. Triandis (1989) stated that culture pertains to a number of domains, including language, economic, political and religious systems, along with religious and aesthetic patterns, and social structures to name a few. Later, Triandis (1996) stated that, within many definitions, culture commonly consist of a number of “shared factors... (that) provide the standards for perceiving, believing, evaluating, communicating, and acting” (p. 408) among a group of individuals who share a common language, history and location.

Psychology has traditionally focussed on predicting behaviour to a greater degree than has anthropology. Cross-cultural psychology has sought to understand differences in behaviour between cultures. Due to the need for safety culture to be linked to behavioural outcomes, cross-cultural psychology provides a useful starting point for discussing how the anthropological conceptualisation of culture relates to safety culture. Chiu and Hong (2006) stated that there are many aspects of a culture including: (1) a material culture relating to methods used to achieve goals; (2) a subjective culture consisting of shared knowledge and ideas; and (3) a social culture consisting of rules and norms. Cooper and Denner (1998) reviewed a number of psychological theories relating to culture. One theory was ‘culture as core societal values’, which strongly relates to the anthropological conceptualisation of culture. These theories define culture as a set of shared beliefs or values, reflected in the systems and practices of a group, and in the thoughts, emotions and motivations of

individuals (C. Cooper & Denner, 1998). Thus, the shared factors of the anthropological conceptualisation of culture are commonly beliefs, attitudes and values.

The final conceptualisation provided by Brinkmann (2007) was the pragmatist conceptualisation. Based on practice theory the pragmatist conceptualisation holds that culture is essentially about practices. Social models have generally sought to understand behaviour in terms of cognitions regarding behavioural consequences or group norms. However, practice theory (Reckwitz, 2002) holds that social order is not mental qualities and interactions but about tangible practices, described as the routine handling of objects, treatment of individuals and approaches to understanding the world around us. Despite the emphasis on behaviour, the pragmatist conceptualisation posits that behaviour only classifies as cultural ‘practices’ when attributions can be made regarding underlying values and reasons. This conceptualisation is, therefore, inextricably linked to the anthropological conceptualisation, which focuses on these beliefs, attitudes and values.

As can be seen by the above discussion, the concept of culture can be interpreted in a number of ways, resulting in different understandings of the purpose of investigating culture and the core components that form culture. The three conceptualisations presented above do not necessarily cover the entire array of possibilities of culture, yet they serve as fundamental building blocks that can be used to explore safety culture. The remainder of this chapter will focus on applying these conceptualisations to safety culture, providing specific examples, where relevant, of these conceptualisations as they have been applied to safety culture. Finally, due to the unique strengths and limitations of each conceptualisation, this chapter provide a synthesised conceptualisation of safety culture.

### 2.3.1. The normative conceptualisation of safety culture

When discussing safety culture, Pidgeon (1991) stated that “a normative element is implicit in the original use of the term” (p. 130). Similarly, Guldenmund (2000) noted that the

INSAG report “follows a normative approach” (p. 245). The definition implied that safety culture leads to safety as the overriding priority (a predetermined ‘best’), rather than determining commitment to safety. Hopkins (2006) stated that for some authors, “only an organisation which has an over-riding commitment to safety can be said to have a safety culture” (p. 876). Over time this conceptualisation of safety culture has evolved, with some acknowledging that safety culture can exist to differing extents within organisations. For example, Parker et al. (2006) provided a list of defining characteristics for five types of safety cultures: pathological, reactive, calculative, proactive and generative. Despite this shift, the core evaluative component of this conceptualisation remains in much literature.

When using a normative-like conceptualisation of safety culture, safety professionals first evaluate the presence and strength of safety culture within an organisation. If it is determined that an organisation lacks safety culture, or has a weak safety culture, the professional then begins to create or strengthen safety culture. If, however, an organisation has a strong safety culture, the professional ensures processes are in place to maintain this culture. In both of these examples safety culture can be viewed as a tool or solution to be applied to an organisation to improve or maintain safety performance. Haukelid (2008) noted that this ‘instrumental’ approach is common within management literature regarding safety culture.

This emphasis of safety culture as a solution has been present since the first uses of the term. INSAG reported that “safety culture had not been properly instilled... prior to the Chernobyl accident” and that “the need to create and maintain a ‘safety culture’ is a precondition” for safety (International Nuclear Safety Advisory Group, 1992, p. 22 ). Despite emphasising the need to create and maintain a safety culture, the INSAG failed to adequately define or describe the content of safety culture. INSAG report 4 (International Nuclear Safety Advisory Group, 1991), which expressly sought to clarify the meaning of safety culture,

reinforced the emphasis on creation and maintenance of safety culture without a clear concept of what safety culture is. INSAG's model of safety culture simply stated that 'policy level', 'managerial' and 'individual' commitment leads to safety culture.

At the extreme end of this outcome-orientated approach, Cooper (2000) suggested that:

the creation of a safety culture simply becomes a super-ordinate goal, that is achieved by dividing the task into a series of sub-goals that are intended to direct people's attention and actions towards the management of safety (p. 116).

Cooper proposed a model, which has been adapted for use in specific settings (e.g. Choudhry et al., 2007), in which safety culture was the product of psychological, behavioural, and situational factors. Despite being labelled as a model of safety culture, each of these factors were recognised to be distinct from safety culture, in that safety culture was merely determined by the interaction between these factors (M. Cooper, D., 2000). Thus, Cooper again emphasised creating a safety culture without explaining what it is.

Whilst many have argued that managers should have the goal to develop or create a 'positive' or 'good' culture (e.g. Choudhry et al., 2007; M. Cooper, D., 2000; Crum & Morrow, 2002; International Nuclear Safety Advisory Group, 1991, 1992; Sully, 2001), others argue that culture cannot be managed in a top-down approach, but emerges from even the lowest levels of an organisation (Haukelid, 2008). Naevestad (2009) stated that, as some deeper levels of culture may not be changeable, reversions to previous behaviour are likely. It is clear from this debate that some aspects of culture are not amenable to manipulation. As the normative conceptualisation holds that culture can and ought to be possessed by groups, researchers must focus on changeable aspects of an organisation. Thus, much research has focussed on organisational policies, procedures and structures, leading to blurring distinctions between safety culture and safety management research, and safety culture serving as a benchmark to measure organisational policies and procedures.

Focussing on management and organisational approaches is, however, not appropriate for all industries and settings. Much safety culture research has focussed on tightly controlled industries, yet, there are industries without such tight control. In such industries, the intrinsic motivation of workers may be of greater relevance than organisational structures and systems. Additionally, given the debate about the extent to which it is possible to change a culture, emphasising creation of safety culture may neglect other cultural factors. Due to the effect of cultural norms and values, health research has shown that ‘off the shelf’ intervention strategies, applied to audiences for which they were not designed, can have differing results (McLeroy et al., 1994). Similarly, it has been suggested that “without a positive safety culture and climate it could be said that there is already resistance in the environment into which safety schemes and programmes are being implemented” (Russell, 2000, p. 40). Thus, there are aspects of culture, separate from adaptable systems and procedures, which can counteract safety initiatives. As such, it is important to explore alternative conceptualisations of safety culture.

### 2.3.2. The anthropological conceptualisation of safety culture

The anthropological conceptualisation of culture, though dominant in social anthropology, cultural psychology and organisational culture, is often overlooked within safety culture research. Nonetheless, the conceptualisation is present within many definitions of safety culture. Antonsen (2009) stated that most literature reviews of safety culture conclude that it is “a set of safety related attitudes, values or assumptions that are shared between the members of an organisation” (p. 183). This definition epitomises an anthropological conceptualisation of safety culture. Nonetheless, the majority of safety culture research focuses on organisational structures and practices.

In a review of safety culture, Naevestad (2009) discussed two common approaches in the field. One approach labelled the ‘interpretive approach’, understands safety culture as

shared patterns of meaning. Based in social anthropology, this approach advocates the use of ethnographic and qualitative research. There are however, few qualitative studies of safety culture (Glendon, 2008). Many authors who use an interpretive approach position their research as the effect of organisational culture on safety, rather than safety culture.

Examples of the interpretive approach include the writings of Karl Weick, Andrew Hopkins and Nick Pidgeon. Weick published a number of articles focussed on the effect of organisational cultures on safety, viewing culture as shared beliefs and expectations utilised by organisational members to assist in the simplification of complex tasks, typically for the worse (Weick & Sutcliffe, 2007; Weick, Sutcliffe, & Obstfeld, 1999). Similarly, Pidgeon (1997) discussed ‘institutional vulnerability’ arising from cultural patterns and assumptions. Finally, Hopkins (1999) discussed two shared values which contributed to an Australian coal mine disaster.

Despite the presence of the anthropological conceptualisation in theoretical discussion of safety culture, it is often overlooked in research. This may occur because attitudes are typically placed in the realm of safety climate (the aggregate of employees’ perceptions and evaluations of the priority of safety in their organisation) rather than safety culture (Guldenmund, 2000). However, safety climate research typically focuses on employee attitudes and perceptions relating to the structures, processes and procedures used by an organisation which bear on safety, and the perceived priority the organisation’s leadership places on safety (Jiang, Yu, Li, & Li, 2010; Johnson, 2007; Neal & Griffin, 2002; Zohar, 2010). Thus, though influenced by attitudes, safety climate is primarily a proxy measure of organisational structures and systems, and thus aligns with the normative conceptualisation. Conversely, within an anthropological conceptualisation of safety culture, any shared beliefs, attitudes and values that have a bearing on behaviours are relevant. For example, research has found cultural tendencies towards fatalism, denial, and knowledge gained from personal



experience over reported truths to have contributed to incidents (Håvold, 2010; Hopkins, 1999).

This approach may also have received less attention due to difficulties associated with conducting qualitative research in organisational settings. Fisher and Alford (2000) stated that it is difficult to convince managers that ethnographical organisational culture research is worth the investment of time and effort. Further, as the purpose of such research is to understand, rather than evaluate, an organisation's culture (Reiman & Oedewald, 2007), managers may not perceive this as valuable. Similarly, Hopkins (2006) stated that "in the absence of an accident, the ethnographic method can only speculate or hypothesise about the impact of organisational culture on safety" (p. 886). Whilst the anthropological conceptualisation is not limited to ethnography, as findings may be quantitatively validated and correlated with behaviour, this approach has not seen significant application in the literature.

The approaches of Hofstede (1980) and Triandis (1996) provide a useful starting point for applying this conceptualisation to safety culture research and practice. Hofstede (1980) explored the differences in work-related behaviours between different cultures, identified by national borders. Differences between these cultures were explained using four cultural dimensions. These dimensions were individualism-collectivism, power distance, uncertainty avoidance, and masculinity. Triandis (1996) later reconceptualised these dimensions as cultural syndromes, which he defined as "a pattern of shared attitudes, beliefs, categorisations, self-definitions, norms, role definitions, and values that is organized around a theme" (p. 408). Whilst neither Hofstede nor Triandis claim to have encapsulated entire cultures in these dimensions, this approach could be useful in summarising key aspects of safety culture which impact upon behaviour. As these specific dimensions may not apply to

safety culture, further research is needed to identify syndromes or dimensions that influence safety, and whether they are common throughout different organisations and industries.

The anthropological conceptualisation differs from the normative conceptualisation in that, rather than evaluating the presence and absence of organisational practices, it emphasises exploring shared beliefs, attitudes and values. Further, it seeks to understand the culture of an organisation rather than change the culture to meet a predetermined benchmark. Due to the anthropological conceptualisation's emphasis on shared psychological factors, it can be applied to a broader range of organisations (whether tightly controlled or fairly autonomous) and can inform intervention design and implementation through understanding the effect safety culture may have. If an organisation identified dimensions which impact upon safety, these can be targeted through training or policies which bypass the problematic cultural dimension. Despite the benefits of the anthropological conceptualisation, however, Schein (1992) stated that behaviour is not solely influenced by culture but also by contextual variables. Thus, if safety culture is intended to provide improved safety performance, contextual variables must also be considered.

### 2.3.3. A pragmatist conception of safety culture

Safety is ultimately a collection of behaviours, or the results thereof. Thus, when applying the pragmatist conceptualisation of culture to safety culture, safe behaviour and safety culture are interchangeable. Thus the pragmatist conceptualisation has limited applicability to safety culture, in that it provides no insight into why behaviour occurs. However, as reported previously, identification of cultural practices requires knowledge of underlying reasons. Hopkins (2006) suggested that many organisational culture authors focussed on behaviours, yet that the concept of "*the way we do things around here*" suggests an evaluation of correctness and, therefore, underlying beliefs (p. 876).

Nævestad (2009) identified a second approach to safety culture – the functionalist approach that understands culture as a pattern of shared behaviour and was suggested to be the dominant approach within safety culture research. The functionalist approach, however, differs considerably from the pragmatist conceptualisation of culture. The pragmatist conceptualisation of culture holds that practices are based in underlying beliefs and values, whereas functionalist research often searches for shared behaviours and utilises theories from social and organisational psychology to identify causes of behaviour (Guldenmund, 2000; Nævestad, 2009). As stated by Nævestad (2009) and Guldenmund (2007), safety climate questionnaires are the primary measuring instrument utilised in this stream of research (for a detailed review of safety climate see Zohar, 2010). In the absence of accepted definitions and models of safety culture, research has typically been conducted relatively independent of the wider field of safety culture, leading to safety as the only common factor in this research. Thus, safety climate questionnaires have had little success in producing replicable findings in either the content of safety climate or its relationship to behaviour (Guldenmund, 2007). Whilst the functionalist approach to safety culture has struggled to prove its validity and relevance to outcomes, and departs from the pragmatist conceptualisation, the emphasis on behaviour is important. Safety culture can only be of practical benefit if it is directly related to behaviours and outcomes.

#### 2.3.4. Is there a need for a new conceptualisation?

Each of the above conceptualisations has unique strengths and limitations. The normative conceptualisation is useful in measuring the strength of organisational systems and structures, and thus identifying weaknesses which can be changed. However, as cultural beliefs and values can, at times, be a barrier to health and safety initiatives, the sole use of this conceptualisation may limit the applicability of safety culture research. Without understanding the underlying beliefs and values of an organisation's culture, safety initiatives

may be resisted within the organisation. The anthropological conceptualisation, however, encapsulates those aspects of safety culture that were unaccounted for within the normative conceptualisation. Thus this conceptualisation has the ability to develop an understanding of how safety initiatives can be effectively implemented. When utilised alone, however, this conceptualisation fails to account for contextual influences on behaviour. Finally, the pragmatist conceptualisation places a strong emphasis on outcomes and behaviour. However, related research typically fails to adhere to existing definitions and models of safety culture. Thus, this conceptualisation fails to take into account deeper cultural beliefs and values, and may fail to acknowledge the range of organisational systems and structures that may interact with new safety initiatives.

Though the above strengths and weaknesses do not invalidate these conceptualisations, they are commonly viewed as competing ideas within the literature. For this reason, it is not surprising that demonstrating the predictive validity of safety culture has proved difficult. To increase the applicability of safety culture research and practice and improve its predictive validity, it is necessary to recognise the relevance of each conceptualisation as part of the larger picture of safety culture. By synthesising these conceptualisations, research can focus on one or more of these conceptualisations without excluding the others. Further, the existing safety culture research can be interpreted as different aspects of a broader concept. It is thus beneficial to briefly explore literature that has attempted to bridge the gaps between these conceptualisations.

#### 2.3.5. The synthesised conceptualisation of safety culture

A number of authors have suggested approaches to culture and organisational culture which combine the anthropological and pragmatic conceptualisations. Geertz (1973) posited that culture be treated as a hierarchy of meanings and symbols, which is separate from the social systems and interactions that these produce. In this way, Geertz highlights the

importance of identifying underlying meanings that produce practices. Similarly, Tharp (2007) stated that “it is emotional preference that maintains cultural activities and practices” (p. 229). In this sense, the culture an individual identifies with causes a preference towards behaviour, leading to behavioural practices. Thus, culture is typically viewed as a set of underlying beliefs and values (anthropological culture) which motivate behavioural practices (pragmatic culture).

As the normative conceptualisation of culture has a uniquely individual focus, there has been little literature linking the normative conceptualisation with the anthropological and pragmatist conceptualisations. As previously discussed, the normative conceptualisation, by stating that culture can and ought to be possessed by a group, has led to an emphasis on changeable characteristics. Schein (1992) argued that behaviour is both the result of culture (anthropological culture) and specific situational factors. Similarly, Pidgeon (1997) argued that for culture to be a useful subject it must be considered in light of organisation systems. Thus, the focus of the normative conceptualisation can be combined with the anthropological conceptualisation, providing better predictability of pragmatic culture, or behaviour.

Drawing on each of the aforementioned conceptualisations of culture, a synthesised conceptualisation of safety culture can be created (see Figure 2.1). Safety culture can be viewed as the assembly of underlying assumptions, beliefs, values and attitudes shared by members of an organisation (anthropological culture), which interact with an organisation's structures and systems, and the broader contextual setting (normative culture), to result in those external, readily-visible practices (pragmatic culture) that influence safety. Thus, within this synthesised conceptualisation of safety culture, safety outcomes can be viewed as the result of behaviour which is influenced by both cultural and contextual factors.

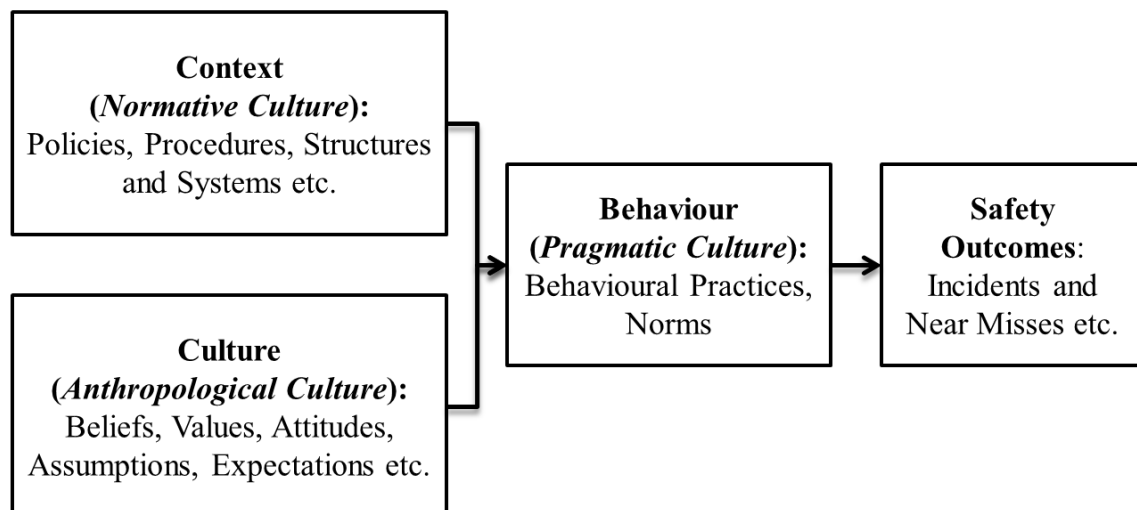


Figure 2.1. A synthesised conceptualisation of safety culture

There are a number of practical benefits to using a synthesised conceptualisation of safety culture to organisational safety research. Organisational safety research has generally sought to achieve two goals: (1) understand the causes of incidents (particularly seen through accident models); and (2) identify how best to manage organisations to reduce the risk and severity of incidents. Whilst safety culture research has provided a useful focus on improving organisations in the hopes of reducing incidents, the field has struggled to prove a direct relationship between safety culture and incident occurrences. This may have been largely been due to the divide between research focussing on normative and pragmatic views of safety culture, and those utilising an anthropological conceptualisation, labelled as the functionalist and interpretive approaches by Naevestad (2009). As behaviour is not solely caused by shared beliefs and values but is also the result of the interaction of these shared factors with contextual factors, researchers have been unable to predict behaviour by solely focussing on one approach.

Using a synthesised conceptualisation of safety culture will also present a number of benefits to safety culture practice and research. The benefits to safety culture practice come through better prediction of behaviour via a stronger understanding of the collective effects of

cultural and contextual factors. With this understanding, more effective safety initiatives can be designed and implemented. Further, by identifying interactions between existing cultural and contextual factors, structures and systems which produce undesirable effects can be modified.

A synthesised framework also holds a number of benefits to research. Much research to date has positioned the existing conceptualisations of safety culture as competing ideas (e.g. Nævestad, 2009). This has limited growth of the field through separating research findings into two related but contrary groups. Functionalist research has identified a large number of systems, structures, policies and procedures, yet struggled to demonstrate that they can truly influence safety. Similarly, interpretive researchers have identified underlying beliefs, attitudes, values and assumptions, yet have not statistically validated the existence of these factors and their impact on safety. By utilising a synthesised approach researchers will be able to better demonstrate the relationships between these factors and safety, and combine the findings of research from each approach into a single framework, thus, better understanding the knowledge that has already been gained in this field.

## 2.4. CONCLUSIONS AND MOVING FORWARD

In recent years safety culture has received significant attention in the literature. Despite much research, there is little consensus regarding definitions and key components of safety culture. This disagreement has led many researchers to redefine safety culture prior to investigating a new topic, adding further diversity. Without understanding what is meant by ‘culture’ in the phrase safety culture, there is a risk that safety culture may become simply a catchy title for safety management. Whilst safety culture is often tied to organisational culture, it is rare for discussions to venture into traditional conceptualisations of culture. This chapter has explored how three general conceptualisations of culture have been applied to safety culture. Due to the unique strengths and limitation of each conceptualisation, using a

single conceptualisation in safety culture research limits the applicability of any findings. A synthesised conceptualisation of safety culture reduces these limitations whilst providing the benefits of each conceptualisation. Future research and practice in the field of safety culture could benefit from utilising this synthesised conceptualisation to augment existing approaches to safety culture.



## **Chapter 3: The Current Research – Research Outline, Aims and Method**

### **3.1. THE CURRENT RESEARCH**

Apparent resistance of the heavy vehicle industry to national safety initiatives highlights safety culture as an avenue to understand and improve safety. To date, no major published research has explored safety culture in heavy vehicle industries worldwide. Due to the unique nature of heavy goods transport, specifically the high degree of driver autonomy coupled with significant regulations and policies, existing approaches to safety culture are insufficient for the industry.

As discussed in Chapter 1, two principal research problems led to the current research. First, there is a need to explore the effect of safety culture on safety in the heavy vehicle industry. Second is the need to enhance existing understanding of safety culture. The interrelated nature of these problems means it is impossible to address the first issue without addressing the second. The current research has two objectives: (1) to enhance the current understanding of safety culture and provide a theoretically grounded framework of safety culture; and (2) to utilise this framework to explore the effect of culture on safety within the heavy vehicle industry.

In order to develop the theoretical framework of safety culture, Chapter 2 consisted of an analysis of the literature regarding safety culture. Links were identified between safety

culture, organisational culture and traditional views of culture found in anthropology and cultural psychology. Three traditional conceptualisations of culture were identified as having been applied to differing extents within safety culture literature. The conceptualisations broadly focus upon organisational structures and systems, shared beliefs and values or immediate causes of behaviour. It was argued that these conceptualisations could be synthesised into a single framework of safety culture, and safety culture was defined as the assembly of underlying assumptions, beliefs, values and attitudes shared by members of an organisation, which interact with an organisation's structures and systems and the broader contextual setting to result in those external, readily-visible, practices that influence safety.

### 3.2. DESIGN AND METHODS

Having developed a framework of safety culture, it can now be applied to the heavy vehicle industry. The rest of Chapter 3 describes the design and methods of this research study. Rather than provide separate method statements within the study results chapters (Chapters 4 to 10), it was decided to present an aggregated methods chapter. The decision to provide an aggregated methods chapter was made to minimise disruption of flow between study results and was deemed beneficial to the reader.

#### 3.2.1. Aims

In order to apply the synthesised conceptualisation of safety culture to the heavy vehicle industry, the current research employs the following aims:

- a. Examine the suitability of the key components of the synthesised conceptualisation of safety culture (culture, context and behaviour) to the heavy vehicle industry
- b. Identify factors previously identified within heavy vehicle industries, which comprise the key components of the framework

- c. Identify major factors within the heavy vehicle industry which have eluded previous research
- d. Identify the best methodological approach to investigating the effect of culture on safety in the heavy vehicle industry
- e. Examine how cultural and contextual factors affect safety-related behaviours in the heavy vehicle industry

### 3.2.2. Methodology

To address the aims of this research a combination of ethnography and grounded theory is used. Each of these research approaches are discussed below.

#### 3.2.2.1. Ethnography

Ethnography was initially developed for use in understanding distant cultures and has been widely used throughout the social sciences (Giampietro, 2008). Giampietro (2008) stated that ethnography is not simply a method, but a methodology or global cognitive standpoint akin to a paradigm. However, Atkinson, Coffey and Delamont (1999) suggested that ethnographic research has seen many different forms, predominantly influenced by the dominant paradigms of the time period (for example, modernism between 1950 and 1970). Regardless of the ontological and epistemological perspective of the researcher, ethnography is effectively the exploration and description of a culture or society (Murchison, 2010). As the current research focuses on safety culture in the heavy vehicle industry in an Australian context, ethnographic methods will be employed.

Ethnography uses a number of methods, including participant observation, informal conversations, interviews and document analysis (Giampietro, 2008; Murchison, 2010). Observations are often conducted in a controlled environment with minimal interaction between researcher and participant. The participant-observer model used by ethnographers

relies on an interactive relationship between the observer and the observed, and is conducted in the naturalistic setting (Giampietro, 2008; Murchison, 2010). Whilst these methods can be used to describe safety culture in the heavy vehicle industry, alone they may be insufficient to identify the relationship between culture and safety.

#### 3.2.2.2. Grounded theory

In order to identify the relationship between culture and safety in the heavy vehicle industry, a second approach named grounded theory will also be utilised. Grounded theory, initially developed by Glaser and Strauss (1965, 1967), is a methodological approach in which theory is developed from data. Grounded theory uses a constant comparative process. First, data is obtained and coded, revealing patterns and themes. Then, through theoretical sampling (the selection of participants and questions on the basis of emerging concepts) further data is obtained and analysed, leading to the formation of an emerging theory, consisting of a series of themes and the relationships between these themes.

Grounded theory has developed along two divergent paths, with the founding authors taking different standpoints. The main differences between these standpoints are the methods applied, and the extent to which preconceived ideas influence the emergent theory (Heath & Cowley, 2004). The need to ensure the findings of this current research are relevant to safety culture means some degree of prior theory is necessary. Whilst a theoretical framework of safety culture has been developed, the specific content of each component of this framework is unknown. Further, previous research has not demonstrated the combined effect of cultural and contextual factors on safety, leaving the current research to formulate relationships between factors.

For the purposes of this study, the methods outlined by Corbin and Strauss (1990) will be used. Whilst grounded theory was originally drawn from specific epistemological standpoints, Corbin and Strauss (1990) stated that grounded theory is a *method* and as such

can be utilised by all researchers. Corbin and Strauss (1990) outlined three types of coding to use when analysing data, including open coding, axial coding and selective coding. Open coding is conducted first and aims to identify key concepts or categories for further evaluation. Axial coding is subsequently conducted as these categories begin to develop. Axial coding identifies sub-categories and the relationships between these sub-categories and with the broader category. Finally, selective coding occurs in the late stages of grounded theory, associating the identified categories around a key theme.

### 3.2.3. Methods

To address the five stated aims of the current research, ethnographic and grounded theory methods are combined in a three-part research program. The current research can thus be described as both: (1) an ethnographic endeavour, designed to identify and describe the culture, context and common practices related to safety within the heavy vehicle industry; and (2) a grounded theory exploration of how culture and context influence safety outcomes.

Study One consisted of a systematic analysis of the literature regarding heavy vehicle safety, exploring previously identified behaviours and potential cultural and contextual factors which influence safety. Study Two consisted of a series of semi-structured interviews conducted with industry stakeholders to examine whether any key factors eluded previous research, and identify the best approach to examine relationships between culture, context and behaviours. Grounded theory relies on the use of theoretical sampling as a result of obtained data. As the findings of Study Two revealed high levels of variance across the industry, it was determined that Study Three should consist of a series of case studies of organisations within the industry. Due to the heterogeneity of the industry, the specific cultural and contextual factors present within a given organisation may differ. Thus, in order to explore the interactions between cultural and contextual factors and the manner in which they influence behaviour, it is necessary to examine these factors in specific organisations.

Each of these case studies is also detailed below. Prior to discussing the methods of each study, it is important to note the role of the researcher in the study and the potential influence they had on the data.

#### 3.2.3.1. The role of the researcher

With the exception of some of the semi-structured interviews conducted in Study Two, all data collected for the current research was collected by the author of this doctoral thesis. The interpretive nature of grounded theory and ethnography means that raw data is analysed by the researcher who categorises this data around themes. Pre-existing assumptions and knowledge held by the researcher may shape themes which emerged. Additionally, it is important to note that due to the sensitivity of some safety issues, in that many behaviours within the industry may contain both legal and safety implications, the presence of the researcher may have shaped the behaviours that occurred and influenced responses of participants. It is important to reflect upon my role as the doctoral scholar within this research.

Prior to beginning this research I had little knowledge of the heavy vehicle industry. I had seen trucks while on the road and had only a few interactions with truck drivers while working part-time at a furniture store as they delivered goods. I somehow remained sheltered from a number of commonly held ‘facts’ about the industry. It was only after starting this research that I found friends and acquaintances sharing with me about ‘issues’ within the industry, including stereotypical descriptions of truck drivers driving all day and night and taking drugs to stay awake. Even within the university, I regularly encountered pre-conceptions about the industry, ranging from those highlighted above, to more intricately detailed descriptions of how truck drivers supposedly used multiple log books to bypass fatigue laws, and of the apparent complete and utter power held by customers. While hearing

these preconceptions I was simultaneously learning about the industry from the inside perspective of industry members.

Being unaware of commonly held preconceptions regarding the industry, the data and my own interpretations of it may carry less bias than otherwise possible. Due to the high representation of industry members within the research, the data may be favourably skewed by industry members in an attempt to appear in a socially desirable manner. Other members of the research team, however, had previously conducted research surrounding the industry and had a less favourable view of the industry. Thus, throughout the study I was regularly required to justify my interpretations of data to other team members. In this way, analysis of data presented in this thesis was open to the emergence of themes without preconceived bias, while also being critically analysed for authenticity.

Whilst I have no relevant salient experiences in memory which would have influenced the data collection and interpretation process, it is important to recognise that the sum of experiences I have had may have influenced these processes. It is possible that, should another student have conducted this research, different themes and topics may have emerged. Being a largely qualitative thesis, the data collection requires follow up questions to be formulated in response to statements made by participants. During the research I was regularly required to formulate such questions as each interview was approached with a desired direction and a very small selection of pre-planned questions. A different researcher may have perceived different statements to hold more meaning or relevance and thus formulated different questions, leading to different data collected. Further, during the Study Two interviews and the observations in Study Three handwritten notes were used for data collection. As it is difficult to record every statement made when taking written notes, a different researcher may have focused their recording on different aspects of the discussion. Finally, even with the exact same data collected, a researcher with different values and life

experience to my own may have coded the data differently and there may have been differences in the themes that emerged. Thus, whilst I can think of no relevant salient experiences, the sum of my life experiences may have shaped the data collection and analysis in ways that cannot be predicted.

It is worth noting, however, that in the latter stages of the research a manager from Workplace Health and Safety, Queensland, with a long connection to the industry, reviewed the findings of this research. This reviewer commented that the understanding of the industry presented in the findings resonated with his own understanding. Thus, even though my own life experiences may have shaped the data collection and analysis, it can be said that there is a significant degree of credibility in the findings of the research.

It is also important to consider the degree to which my presence may have shaped behaviours and responses of industry members while taking part in the research. Whilst the extent to which my presence altered the behaviour and comments of individuals remains unknown, some important points can be made. Firstly, I was aware of the potential for censorship of information and changed behaviour in my role as researcher. Prior to collecting data I informed participants about confidentiality and emphasised that I was not ‘checking-up’ or judging the industry, rather I was attempting to understand safety from their perspectives as a way to inform the industry through recommendations coming from the findings of this study. Participants appeared to trust me enough to share very personal aspects of their working lives. Participants often discussed negative behaviours openly and articulated well the reasons for behaving in certain ways. This may be reflective of the fact that drivers and industry members who engaged in risky behaviour believe that their behaviour was acceptable and felt no need for self-censorship. Contrasting this openness were occasions when participants were unwilling to discuss drug use during interviews. Typically, however, once audio recording or note taking had stopped participants were



willing to share stories about illegal activities. Given that the purpose of this research was to explain behaviour through culture and context, the detailed information shared by participants offered a rich source of data. The remainder of this chapter focuses on the methods used in each of the three studies.

#### 3.2.3.2. Study One

In the absence of previous safety culture research it is unclear what cultural beliefs, attitudes, expectations and values, contextual influences and behaviours may comprise the key aspects of safety culture within the heavy vehicle industry. Chapter 2 suggested that the synthesised conceptualisation of safety culture could provide a means to combine a range of safety culture research into a single framework. It may be possible to similarly inform safety culture using general safety research. Thus, in order to focus the current research, Study One consists of a systematic literature review of heavy vehicle safety, targeted at profiling previously identified factors. The results of this review can be found in Chapter 4.

##### 3.2.3.2.1. Aims addressed

- a. Examine the suitability of the key components of the synthesised conceptualisation of safety culture (culture, context and behaviour) to the heavy vehicle industry
- b. Identify factors previously identified within heavy vehicle industries, which comprise the key components of the framework

##### 3.2.3.2.2. Method

To profile previously identified factors it was necessary to access existing literature on heavy vehicle safety. To this end, a thorough search was conducted using a number of databases including EBSCOhost (including separate searches of CINAHL and Medline), Emerald, INFORMIT, Proquest and Sciencedirect. The following search phrases were used

(or the equivalent depending on the search criteria of the relevant databases): (*“heavy vehicle” OR “heavy goods vehicle” OR “large goods vehicle” OR “truck” OR “lorry”*) AND (*“health” OR “safety” OR “accident” OR “injury” OR “crash”*).

Due to the large number of results different approaches were used to limit the search. To exclude articles with only passing reference to the search terms, searches were, where possible, limited to the title, abstract and keywords. Additionally, to maximise the quality of research, only peer-reviewed journal articles were included. Whilst the searches were restricted to peer-reviewed articles, a selection of grey literature was also reviewed. Grey literature was drawn from reports conducted in Australia about the Australian heavy vehicle industry. These reports were used to supplement the limited available Australian research. Grey literature was obtained primarily from websites of Australian research centres and typically consisted of government reports.

Each article was assessed for eligibility based upon the key components of safety culture. Results needed to show significant contextual, cultural or behavioural factors linked with safety outcomes (qualitative data was not assessed for significance). A small selection of papers which did not statistically explore a relationship between such factors and safety outcomes were still included due to face validity. For example, papers demonstrating links between cultural or contextual factors and behaviours already known to influence outcomes were included.

Screening eliminated articles with a primary focus on other road users, the environmental impacts of truck traffic, and the effect of truck emissions on the general public. Other articles, typically from developing nations, focussed on HIV and sexual risk behaviours, and these were excluded due to insufficient evidence regarding HIV as a concern in the Australian heavy vehicle context. While important fields of study, these topics were eliminated as they were irrelevant to the aims of Study One.

### 3.2.3.3. Study Two

A series of semi-structured interviews were conducted with key industry stakeholders. In the absence of previous safety culture research, there was insufficient data obtained on potential cultural beliefs, attitudes and values. It was also unknown if the reviewed safety research provided sufficient detail on the context and behaviour related to safety culture in the Australian heavy vehicle industry. Thus, in addition to reviewing past safety research, it was necessary to gain more detailed information. An inside perspective of the key factors within the industry was warranted. Due to the specific barriers to standard safety culture conceptualisations within the industry, it was also necessary to determine the best way to examine the relationships between cultural, contextual and behavioural factors.

#### 3.2.3.3.1. Aims addressed

- c. Identify major factors within the heavy vehicle industry which have eluded previous research
- d. Identify the best methodological approach to investigating the effect of culture on safety in the heavy vehicle industry

#### 3.2.3.3.2. Method

Study Two consisted of semi-structured interviews with industry stakeholders. Whilst the specific interview questions were unstructured, the key topics investigated were guided by the used framework of safety culture and by the data gained from previous interviews. Interviews were conducted by two researchers, the doctoral scholar and a project officer who was part of the broader research team. Typically, interviews were conducted face-to-face in the participant's place of business. A small number of the interviews were conducted over the phone due to access difficulties. With the written consent of participants, comprehensive notes were taken during interviews, and telephone interviews were audio-recorded.

Interviews were transcribed verbatim by the interviewer, and the data analysed by both researchers, enabling a constant comparison to be made. After several analyses some degree of saturation in the number of concepts and the depth of information was achieved, and Study Two was concluded.

#### 3.2.3.3.3. Participants

A total of 31 industry stakeholders were interviewed (response rate ~50%), consisting of 23 transport company managers, plus three government officials (two police officers, one transport branch representative), two industry association representatives and three heavy vehicle drivers. Due to the sensitive nature of safety and the number of regulations which surround safety within the industry, there is a need to ensure the confidentiality of participants. This is particularly important as the research is in part funded by a number of government departments who have a role in regulating safety. For this reason no further details will be provided about the age, gender or history of participants.

Interviewees were accessed using a snowballing technique, whereby initial contacts identified potential participants and these participants referred the research team to future participants. Whilst the sample may have been biased due to a low response rate and referred participants, Study Two focused primarily on broader contextual and cultural issues and not the attitudes and values of participants, and thus this potential bias should not have adversely affected the results. After 31 interviews it was found that little additional information was being gained through additional interviews. Further, due to the findings of Study Two with regards to the best methodological approach to investigating the effect of culture on safety, it was determined that no further interviews would be required.

#### 3.2.3.3.4. Analysis

Data obtained during Study Two was subjected to a constant comparison method, allowing immediate findings to direct later stages of Study Two. Transcripts were analysed using the methods detailed by Corbin and Strauss (1990; see section 3.2.2.2). Throughout the interview process, open coding and later, axial coding, was utilised. As Study Two was concluded in order for Study Three to begin, selective coding was not used in Study Two.

#### 3.2.3.4. Study Three

A number of key findings regarding differences throughout the industry were identified by Study Two. First, there is a significant degree of heterogeneity within the industry, typically related to organisational factors including the type of goods carried, distance carried and size and location of the organisation. Thus, it was determined that in order to explore the relationships between culture, context and behaviour it was necessary to conduct case studies with specific transport organisations sampling these heterogeneity-related factors.

##### 3.2.3.4.1. Aims addressed

- e. Examine how cultural and contextual factors effect safety-related behaviours in the heavy vehicle industry

##### 3.2.3.4.2. Method

Study Three used a series of three case studies undertaken with specific transport organisations. This approach enabled depth of information, whilst exploring the broader industry, through a purposive selection of cases sampling the industry's diversity. Stake (2010) stated that a case study is not a methodological choice, but a decision regarding the target of investigation. Therefore, whilst the application of multiple case studies is unusual within either ethnography or grounded theory, in the present study this decision is a result of theoretical sampling in grounded theory.

Stake (2010) delineates between three forms of case studies: (1) intrinsic case studies, in which a single case is selected due to intrinsic interest; (2) instrumental case studies, in which a single case is selected to inform upon a broader theme; and (3) multiple or collective case studies, in which a selection of cases are selected to provide knowledge of a broader collection of cases. In this study a collective case study approach was used where organisations were selected in order to develop understanding of safety culture in the broader heavy vehicle industry. As a case study is simply a target of investigation, the methods of investigation used for these cases were drawn from ethnography, specifically interviews, document analysis and observations, and the data was analysed using a grounded theory approach.

In two of the three studied organisations, the researcher was required to complete inductions, enabling an understanding of the basic training received by all staff whilst ensuring researcher safety. In the third company the manager requested the researcher read the organisation's terms and conditions document, serving the same purpose as the inductions. Interviews were then conducted with staff members. The interviews lasted between 30 minutes and two hours and covered a variety of topics. The first questions were typically aimed at eliciting information regarding the history of the individual and identifying major safety concerns in their work role. Later questions sought to identify contextual, cultural and behavioural factors which influence these safety concerns. For example, the researcher typically asked what a driver was required to do to manage safety concerns, and reasons why a driver may or may not complete these activities. Participants would be asked about specific behaviours and outcomes identified in Studies One and Two, which were not spontaneously discussed. Finally, it is worth noting that as the researcher developed a greater awareness of safety within the industry, participants were asked to confirm information (for example, "one driver told me that drivers can be fined for spelling errors on their log books,

is that true?”). Prompts were seldom required as participants appeared eager to share their perspectives on safety. For a series of sample prompts and questions see Table 3.1.

Table 3.1: Typical prompts and questions used within interviews and observations

Conceptualisation Component	Sample Prompts/Question
Safety Outcomes	<p>What are the major hazards faced by drivers? / What are the major hazards you face?</p> <p>What are the biggest causes of crashes?</p> <p>What are the biggest causes of injuries?</p> <p>Are musculoskeletal injuries, like strains etc., common?</p>
Behaviour	<p>What should a driver / do you have to do to avoid these hazards?</p> <p><i>(later in an interview)</i> Is there anything else a driver/you need/s to do to avoid crashes/injuries?</p> <p>Is speeding an issue when driving?</p>
Context/Culture	<p>Why do some drivers X (e.g. not wear seatbelts)?</p> <p>Why do you X (e.g. wear a seatbelt)?</p> <p>What are the main causes of X (e.g. fatigue)?</p>

Typically conducted after the interviews, observations of drivers occurred during their usual shifts. Most observations lasted the duration of the shift, although some lasted for a portion of the shift. Observations lasted between four and 15 hours, with the exception of two which lasted two hours as the researcher was taken to another depot at the end of the driver's journey.

During observations the researcher conducted informal interviews similar in nature to the staff member interviews, with drivers asked to list major hazards they face, detail behaviours they engage in to avoid an incident related to hazards, and why they would or would not complete these activities. Additionally, questions were asked which specifically related to tasks witnessed. For example, drivers were commonly asked why they were or were not wearing a seatbelt.

Finally, safety documents provided to new drivers within each company were perused to supplement interviews and observations and to cross-reference information.

#### 3.2.3.4.3. Case Study Participating Organisations

A number of organisations were approached for participation in Study Three. The transport companies that were approached varied from large (over 100 trucks) to small (less than 10 trucks) and carried a range of goods including general freight, dangerous and liquid goods, livestock and mixed freight. The approached organisations were based in a number of locations including capital cities and regional areas, and carried goods either interstate, within state over long distances and locally. Many organisations refused to participate, some claiming busyness while others were going through safety investigations. One organisation withdrew due to a major contract loss which forced depot closure. Thus, selection bias may have occurred due to organisations with recent incidents refusing participation. Selection of cases was also partially influenced by availability alongside theoretical sampling. Three organisations were selected that were willing to participate in the research. The key differences between these organisations are displayed in Table 3.2. As with Study Two, the sensitive nature of safety, number of regulations surrounding heavy vehicle transport, and the funding sources of this research require a high degree of confidentiality for participants. Thus, no further details will be provided about the age, gender or history of participants.



Table 3.2: Characteristics of Recruited Case Study Organisations

Characteristics	Company A	Company B	Company C
Size	Medium (~50 trucks)	Medium (~50 Trucks)	Small (<10 Trucks)
Location	A capital city	A capital city	A regional centre
Cargo	General goods	A range of specialised goods	Livestock
Distance	Medium-long distance (intra and interstate)	Predominantly local with some medium and long distance	Short-medium distance (within region)
Trucks	Articulated (semis and B-doubles)	Articulated and rigid (Heavy haulage, crane mounted rigid, rigid body trucks, semis, B-doubles)	Articulated (semis, B-doubles and road trains)

*Company A* is a medium-sized family-owned and operated transport company. The organisation employs approximately 100 staff and owns over 50 prime movers. Company A carries general goods locally and between capital cities. A large proportion of their freight comes from a single regular customer.

Semi-structured interviews and observations were conducted with 10 staff members. Four managerial, administrative and operational staff (two managers, one health and safety officer and one operations manager), along with six heavy vehicle drivers, took part in interviews. Six observations were also conducted with heavy vehicle drivers. Whilst the organisation conducts a number of overnight journeys, many of the regular freight runs are designed to allow the drivers to return home overnight. Thus, typical observations included the driver leaving the depot, loading freight, driving to the target destination, unloading

freight and returning to the depot. After conducting interviews and observations a number of policy documents were acquired from the organisation including a driver's manual containing all relevant policies, pre-trip vehicle inspection sheets, applications and non-conformance forms.

*Company B* is a medium sized transport company, employing approximately 100 staff with over 50 trucks. This organisation has a number of branches transporting different goods. Goods carried by Company B range from heavy haulage and long loads, to the carriage of construction materials and smaller consumption goods and are transported over both intra and interstate long distances and locally. Due to the diversity within Company B, the organisation has a number of managers overseeing branches within the company. Company B has a number of major customers rather than a single customer.

Ten interviews were conducted within Company B. Participants consisted of the compliance officer, and part owner, of the company, two regional managers who each oversee approximately half of the fleet, five branch or depot managers, two driver trainers, and an operational manager. Eight observations were conducted, typically covering a driver's shift. Finally, a copy of the operations manual was acquired. This document is provided to all drivers, typically with information tailored to the branch the driver is to work in.

*Company C* is a small-sized transport company based in a regional centre. Family owned and operated, the organisation consists of six prime movers and various trailers, and employs between six and 10 people at any point in time. Company C transports livestock within the region, generally travelling to a livestock grazier to collect cattle and transport them to another property or a livestock agent. Unlike Company A and B, Company C generally conducts work as it arises from local graziers and agents. While Company C has many regular customers, they are not bound to specific customers.

At the onset of the case study the company was undergoing an accreditation audit from Trucksafe. As such, rather than begin with interviews the initial phase of data collection consisted of observing the audit. Following this observation the researcher conducted a number of interviews and observations with members of Company C. Five interviews were conducted with the owner/manager, compliance officer, two drivers, and the owner/driver/head-mechanic. During the interview process, there was an overlap between two interviews during which the compliance officer and the owner/driver/head-mechanic were both interviewed simultaneously in addition to their separate interviews. In this instance the interview started with the owner/driver and was later joined by the compliance officer before the first interviewee departed. Three observations were conducted. A copy of the driver terms and conditions provided to all drivers which outlines safety policies and practices was acquired.

Whilst the sample size was noticeably smaller in Company C, it is important to recognise that Company C was significantly smaller than the other companies and, thus, the observations and interviews were conducted with all but one driver and all of the relevant organisational staff. As the case studies utilise qualitative data, sample size is not a reflection of the quality of data collected. It was found that the information obtained aligned with that from companies A and B, with only differences specifically relating to livestock transport. A significant degree of overlap and saturation occurred between cases, thus, no further data was needed from Company C.

#### 3.2.3.4.4. Analysis

Both the observation and interview data was analysed through the coding methods outlined by Corbin and Strauss (1990). This consisted of open, axial and selective coding. Due to the importance of adhering to the theoretical underpinnings of culture identified in Chapter 2 and developed in Studies One and Two, the open coding categorised data

according to: (1) contextual; (2) cultural; and (3) behavioural categories. Axial coding then identified themes within these categories and further sub-themes. Finally, selective coding was conducted during which the relationship between cultural and contextual variables and behaviour was identified. The results of Study Three are discussed in Chapters 6 to 10. As these case studies were aimed at identifying patterns within the broader industry, the identified themes are presented in aggregate form. Where data emerged from only a single company it has been noted within the relevant sections.

### 3.3. ETHICS CLEARANCE

Ethical clearance was approved by QUT's Human Research Ethics Committee in September 2010, approval number 1000000907. An amendment to Ethics was approved in November 2011, approval number 1100001426.

## **Chapter 4: Study One - Safety Culture and the Heavy Vehicle Industry: Just because it hasn't been studied doesn't mean we know nothing**

### **4.1. STUDY ONE RESULTS OVERVIEW**

Study One consisted of a systematic review of literature about heavy vehicle health and safety. The purpose of conducting this review was to examine whether the synthesised conceptualisation of safety culture was suitable for the heavy vehicle industry, and what factors might comprise this conceptualisation within the industry.

#### **4.1.1. Method**

Methods used to identify relevant literature were outlined in section 3.2.3.1.2. Five databases were searched for relevant articles using a combination of search terms requiring at least one common name for heavy vehicles (heavy vehicle, heavy goods vehicle, large goods vehicle, truck or lorry) and one health and safety related term (health, safety, accident, injury or crash). In order to maximise the quality of literature, searches were restricted to peer-reviewed journal articles (though a selection of grey literature was also included in the findings for reasons outlined in section 3.2.3.1.2). After conducting searches, articles were selected using criteria based upon the synthesised conceptualisation of safety culture, which holds that safety outcomes are the result of behaviour which is influenced by cultural and

contextual factors (section 2.3.5). That is, each article was required to demonstrate contextual, cultural or behavioural factors relevant to safety outcomes.

Findings from selected papers were analysed using the synthesised conceptualisation of safety culture. As stated in section 2.3.3, safety culture is only of practical benefit if directly linked to behaviours and outcomes, thus each factor identified in this review must be linked with a specific safety outcome. Due to the nature of the industry, there are a number of health and safety concerns including those that relate to crash, non-crash injury and health outcomes (see section 1.1). Prior to conducting further analysis, articles were classified according to the specific form of safety outcome to which they related (in some cases resulting in multiple classifications for a single article). Within this broader classification, specific findings were classified according to the key components of the synthesised conceptualisation of safety culture (behaviour, context and culture). For each category of safety outcomes, relevant behaviours which result in these outcomes are first discussed, followed by contextual and cultural factors which either directly influence these behaviours, or where seen to influence outcomes without specifying a given behaviour. A brief summary of selected papers is provided in section 1.1.2, followed by the specific findings of the review relative to each outcome category.

#### 4.1.2. Selected papers

A total of 132 peer reviewed journal articles met the selection criteria for Study One. Articles covered a broad range of topics, which could be categorised by relevant health and safety outcome (see Table 4.1). First, 54 papers either directly attempted to predict crash likelihood or severity, or highlighted factors found to be common in crashes. An additional 41 papers examined factors known to be related to crashes yet did not investigate relationships between these factors and crash outcomes. These 77 papers were collectively categorised under crash outcomes. Second, 11 papers explored the prevalence and severity of

non-crash injuries and factors related to injury occurrence, and an additional six papers explored factors related to injury outcomes without demonstrating the relationship to injuries. These 17 papers were categorised under non-crash injury outcomes. Third, 19 papers were identified which explored the likelihood of health outcomes, and two additional papers explored factors known to be related to health outcomes. These 20 papers were categorised under health outcomes. Finally, though not a category per se, nine papers categorised as miscellaneous papers were identified that contained potentially relevant information regarding cultural and contextual variables which influence safety (e.g. analysis of attitudes towards enforcement). Each category is discussed below.

Table 4.1: Breakdown of peer-reviewed articles according to category of investigation

Category of papers	Number of articles
Crash outcomes	95
Injury outcomes	17
Health outcomes	21
Miscellaneous papers	9
<b>Total</b>	<b>142*</b>

\*Total number exceeds eligible articles due to articles which addressed multiple categories

## 4.2. CRASH OUTCOMES

A significant portion of the papers included in this review related to the occurrence and severity of crashes, or examined factors known to influence crash-related injuries and fatalities. As the synthesised conceptualisation requires contextual and cultural factors to influence outcomes via behaviours, it is necessary to identify behaviours which contribute to crashes.

*Driving whilst fatigued.* Driving whilst fatigued has received significant attention within the literature. Hanowski et al. (2007) conducted a camera observation study of 24

single drivers and 24 two-up driver groups, over trips of a minimum of six days, recording 68 critical incidents. Of the 21 incidents initiated by truck drivers, the main causes were poor driving technique (52%), aggressive driving (24%), heavy vehicle design and physics (14.3%), lack of driver capability (4.8%), and fatigue and/or falling asleep (4.8%). Thus, whilst fatigue is not necessarily the most important cause of critical incidents, fatigue can increase the chances of hazardous scenarios.

Carter et al. (2003) surveyed 4000 male drivers from the general population and 1389 bus and lorry (truck) drivers in Sweden regarding sleep debt, sleepiness and traffic incidents. Professional drivers reported higher levels of sleep debt, which was correlated with traffic incidents at leisure, commuting and during work. Thus, perceived sleep debt has a significant relationship to the likelihood of crashes.

Brodie, Bugeja and Elias (2009) explored coroners' reports from 61 heavy vehicle driver crash fatalities in Victoria, Australia. Amongst other contributing factors, it was argued that fatigue may have played a major role in a number of fatalities. Fatigue is difficult to assess after a fatal incident, however a number of drivers had worked in excess of 10 hours, and nine of the 61 cases were believed to have resulted from the driver falling asleep, largely due to a lack of evasive manoeuvres. In an earlier study, Haworth, Heffernan and Horne (1989) analysed coroners' reports from fatal multiple vehicle crashes involving trucks within Victoria. Reports identified heavy vehicle driver fatigue as contributing to 3.7% of these crashes (car driver fatigue in 5.4%). However, through the use of a number of criteria for detecting fatigue involvement, including extended driving hours, evidence of falling asleep at the wheel, comments made regarding tiredness, incorrect lane use without evidence of intoxication, and night time driving, Haworth et al. (1989) estimated that 7.6% of these incidents resulted from heavy vehicle driver fatigue (car driver fatigue 12.4%).



Similarly, Hakkanen and Sunmola (2001) analysed crash data from 337 fatal two-vehicle crashes involving trucks in Finland between 1991 and 1997, finding that 2% of drivers had fallen asleep, 4% were tired at the time of the incident and 13% had exceeded legal driving hours. Finally, Chen and Chen (2011) examined 10 years of crash data from Illinois, USA, to analyse injury severity in multi and single vehicle truck crashes. This article emphasised differences between crash types, yet a number of factors were correlated with injury severity in one or both crash types. Amongst other findings, fatigue and falling asleep increased the likelihood of truck driver fatalities within multi-vehicle crashes. Some of the above studies lacked sufficient controls to demonstrate that fatigue is over-represented in crashes, however, it appears that driving whilst fatigued influences crash likelihood and severity.

*Drug and alcohol use.* Drugs and alcohol are well known to reduce cognitive ability and so increase risk of crashes, but only two studies identified this effect in truck drivers. Brodie, Bugeja and Elias' (2009) previously discussed analysis of coroners' reports found that 10 of the 61 fatalities involved illicit drugs, and one alcohol intoxication, representing 18% of analysed fatalities. Given that 17% of Australian truck drivers are likely to have used illicit drugs within the past 12 months (WORC 2008), and it is unlikely that these drivers are constantly influenced by substances, drug use is over represented in the fatal crashes. In one older study, Golob, Recker and Leonard (1987) found that alcohol was the principal cause of 353 of 9508 truck collisions in California, further implicating the effect of alcohol on crashes in heavy vehicles. Additionally, however, Zhu and Srinivasan's (2011) analysis of the US large truck crash causation study found an increase in severity of truck occupant injuries resulting from crashes in which the truck driver was influenced by illicit substances.

Although few studies demonstrated an effect from alcohol and illicit drugs, a number of studies have explored the prevalence of drug use in heavy vehicle drivers worldwide (Gjerde

et al., 2012; Labat et al., 2008; Leyton et al., 2012; Mir, Khan, Ahmed, & Abdul Razzak, 2012; Silva, Greve, Yonamine, & Leyton, 2003). In Brazil, prevalence of illicit drugs at time of testing ranged from 5.63% to 9.3% (Leyton et al., 2012; Silva et al., 2003). In France, Labat et al. (2008) tested urine samples of 1000 truck drivers, finding cannabinoids in 8.5% of drivers, opiates in 4.1%, alcohol in 5.1%, buprenorphine in 1.8%, and a number of other drugs at lower prevalence rates, indicated to be much higher than the general population. Two studies compared drug use in truck drivers to other road users. In Pakistan, truck drivers utilised higher levels of illicit drugs than other commercial drivers (Mir et al., 2012). However, in Norway truck drivers had lower levels of drug use than car and van drivers. Thus, patterns of drug use vary significantly between countries. One Australian study investigated rates of stimulant use in Australian truck drivers. Mabbott and Hartley (1999) interviewed 236 western Australian truck drivers regarding the use of stimulant pills and found 27% of drivers used either licit or illicit stimulants to manage fatigue.

*Speeding.* Driving above the posted speed limit and/or too fast for the conditions is a well-known risk for traffic incidents. Golob et al's (1987) analysis of Californian collisions identified speeding as the primary causal factor in 2786 of 9508 crashes. McKnight and Bahouth's (2009) analysis of 231 truck rollover crashes drawn from the USA large truck crash causation study found failure to adjust speed to suit various conditions accounted for 46% of rollovers. Surprisingly, no other studies were identified linking speeding and crash likelihood, although this may be due to a general acceptance of speed as a contributor to crashes. This acceptance is supported by crash statistics so lowers the perceived need to directly study this effect. Chen and Chen's (2011) crash severity analysis, however, indicated that speed influences the severity of outcomes in single-vehicle truck crashes, yet not multiple vehicle crashes. Lack of an increase in severity in multi-vehicle crashes may be associated with the size of the truck and relatively limited impact of other vehicles regardless

of speed. Finally, Brodie, Bugeja and Elias's (2009) coroners' report analysis found that excessive and/or inappropriate speed was involved in 43.1% of fatalities in which speed was documented. Without available reports on the prevalence of excessive and inappropriate speeds of Australian trucks, it is unclear whether this proportion is a reflection of typical speeds; however, it is clear that speeding can lead to serious crash consequences.

*Seatbelt usage.* Similarly to speeding, non-use of seatbelts received little direct attention in the truck safety literature. Seatbelt use would be related to injury severity but not crash occurrence. The lack of substantial research is concerning given anecdotal evidence that Australian truck drivers are resistant to seatbelt use. Further, low levels of seatbelt use have been identified in USA truck drivers generally, and specifically in Hawaii (Cook, Hoggins, & Olson, 2008; Kim & Yamashita, 2007). Bunn, Slavova and Robertson (2012) analysed crashes involving two-up drivers where one driver was in a sleeper berth. Whilst a number of other contributing factors were identified, lack of restraint led to a 2.25 times higher likelihood of injury. Brodie, Bugeja and Elias's (2009) analysis of coroners' reports found seatbelt use was only recorded in 25 of 61 fatalities, thus may suffer reporting bias, and it is difficult to draw conclusions due to the lack of prevalence data for Australia. However, of the 25 cases in which seatbelt use was reported, 68% of fatalities occurred during non-use of seatbelts. Further research is needed to understand seatbelt use and its effects in truck safety.

*Driving errors and violations.* Research has implicated other driving errors and violations in crash severity and likelihood. Representing a varied group of behaviours, they essentially relate to the driven path of the vehicle and adherence to vehicle placement-related road rules. Golob et al's (1987) analysis of Californian collisions found that 5433 of the 9508 (57.1%) analysed crashes were primarily caused by improper turns, failure to yield, 'improper driving' and other violations. Sullman, Meadows and Pajo (2002) utilised the

driver behaviour questionnaire to survey 382 New Zealand truck drivers, finding that driving violations, but not errors or lapses, increased crash likelihood. Given that lapses were typically operationalised as safe but incorrect behaviours, and errors as narrowly avoiding an incident, it is not surprising that these behaviours were not correlated with crashes. McKnight and Bahouth's (2009) analysis of descriptions of truck rollovers also found that 29% of the rollovers resulted from inattention and 20% from control errors. Finally, Hanowski, Perez and Dingus (2005) conducted camera observations of 41 drivers during 2737 crashes, near-misses and crash-related conflicts, collectively labelled as critical incidents. It was found that driver distraction, a common cause for errors, accounted for 178 (6.5%) of critical incidents.

In terms of severity of crashes, Hakkanen and Sunmola's (2001) analysis of fatal two vehicle crashes in Finland revealed that, of 57 fatal crashes in which truck drivers were deemed principally responsible, 50.8% were primarily attributed to a cognitive error and 26.3% to an operating error. These errors were the primary cause of truck-driver-at-fault fatal crashes. Despite a 14-year gap and different sample populations between this study and crash prevalence reported by Golob et al. (1987), the higher proportions of fatalities versus crashes provide a tentative link between severity and errors and violations. Chen and Chen's (2011) crash severity analysis, however, directly demonstrated this impact, in some cases, finding that improper lane usage was correlated with crash severity in single-vehicle truck crashes, and both failing to give right of way and driving on the wrong side of the road in multi-vehicle crashes. Thus, general driving errors and violations significantly raise crash likelihood and potentially severity.

#### 4.2.1. Cultural and contextual causes of crashes

A number of articles identified cultural and contextual factors related to crash likelihood and severity, or risky behaviours. Prior to exploring the identified factors, two articles providing information on a number of factors should be discussed.

Chen and Chen's (2011) analysis of injury severity in multi and single-vehicle truck crashes identified a number of contextual and individual factors as playing a role in the severity of injuries. Identified contextual factors included vehicle and load-related factors such as: cargo type and defects, truck configuration and tyre defects; road factors such as traffic signals, sharp turns, steep grade, and lane and median width and design; environmental conditions such as rain or wet roads, fog/smoke/haze, icy roads, wind, time of day and light level; and other vehicle factors such as traffic level and relative number of trucks. Additionally, individual factors such as age and gender were identified.

Brodie, Bugeja and Ibrahim (2010) analysed 45 recommendations from 21 coroners' reports on fatal truck crashes in Victoria, Australia. As these reports came from public inquests due to non-truck-driver involvement, only multi-vehicle crashes were included. Coroners made recommendations where the inquest found the related factors to be relevant to safety. The 45 recommendations targeted heavy vehicle safety (40%), another vehicle or party (18%), and general road safety (42%). The most common recommendations related to environmental factors such as road signage, speed limits, barriers, lighting and visibility, and lighting on trucks. The second most common recommendations related to human factors, such as truck driver reporting of health issues. Additionally, vehicle factors, education campaigns, driving hours reviews, heavy vehicle tracking, and fatigue detection in trucks were the target of recommendations.

These two articles reveal that there are a broad number of factors which influence crash outcomes, that individual articles can inform multiple factors and that, in addition to cultural and contextual factors, individual factors may influence crash outcomes. Given the sheer number of factors identified within many articles, examining the findings of each article individually would result in significant overlap and duplication of findings. Thus, it is beneficial to aggregate the factors identified from multiple articles. Further, as the purpose of

this review was the identification of factors which form the key components of the synthesised conceptualisation of safety culture in the industry (context, culture, behaviour and outcomes), it is beneficial to describe individual factors in depth rather than emphasise every finding from specific articles. Finally, though individual factors are highly relevant to safety, safety culture is by nature a group level concept. Nonetheless, future research should investigate whether individual factors influence the relationships between culture, context and behaviour. As this research is the first major research project to examine safety culture within the heavy vehicle industry, the key components of safety culture form the focus of the current review and the findings related to individual factors are discussed in Appendix A.

#### 4.2.1.1. Contextual factors associated with crash outcomes

A number of articles identified contextual factors which influenced either the occurrence or severity of crashes. The contextual factors identified can be broadly separated into five categories – government, organisation, customer, road environment and work environment. Each of these are discussed below.

##### 4.2.1.1.1. Government and crash outcomes

The ability government bodies have to influence safety largely stems from enforcement. Whilst some examples of enforcement have obvious effects, others are less clear. Chen (2008) assessed crash rates in American trucking firms, comparing firms which were subjected to a compliance review with those never reviewed. In the USA, compliance reviews are conducted by an external body, assessing the policies and practices of companies with high crash rates, and may result in companies being banned from operating. Companies subjected to review showed significant steady declines in crash rates a number of years following their review. When compared with non-reviewed companies, crash rates were still higher. However, non-reviewed companies showed significantly smaller reductions in crash

rates over the same period. Thus, the mere threat of penalties on companies translates to changes in crash rates.

Specific policies have also been shown to be related to crash rates. Neeley and Richardson (2009) compared speed limit and truck length regulations and crash fatalities between a number of US states. Lower speed limits for both cars and trucks reduced fatalities, whereas truck-only lower speed limits did not reduce fatalities. Further, truck length laws were related to fatalities per crash, but not the number of crashes. Similarly, Garber et al. (2006) analysed crash data gathered between 1991 and 2000 within six US states to examine the impact of differential truck speed regulations, again finding no consistent safety effect of these policies. Another specific form of policy which has received attention within the literature is truck lane restrictions. Fontaine (2008) examined crash data from Virginia, USA, after the introduction of lane restrictions and found that overall crash rates were not affected but there was a reduction in the number of fatal and injury crashes. Conversely, Korkut, Ishak and Wolshon (2010) analysed crash data from Louisiana, USA, after the introduction of both lane restrictions and differential speed limits, and found a reduction in total crash rates.

Sullivan and Flannagan (2012) examined rates of US crashes where night time visibility could have been a causal factor both before and after the introduction of conspicuity measures, finding a reduction of 58%. In another example of enforcement, Sweena and Gaines (1999) found that the introduction of random drug testing in the USA significantly reduced crash fatalities for two years following their introduction. This reduction, however, disappeared after two years. Thus, consistent legislation and enforcement may be insufficient for prolonged safety.

Government enforcement regarding fatigue has received significant attention. This enforcement generally centres on legislated maximum driving or work hours and the use of

log books. McCartt et al. (2000) interviewed 593 US long haul truck drivers regarding falling asleep at the wheel, finding that the number of hours working and resting influenced their risk of falling asleep whilst driving. Three studies specifically examined safety benefits associated with changes in 'hours of service' (HOS) legislations that occurred in 2004 in the USA. Hanowski, Hickman, Olson and Bocanegra (2009) specifically examined whether the one-hour increase in maximum daily driving had a negative impact on safety. They found no increased risk during this additional hour. In a later study, however, Park and Jovanis (2010) analysed the likelihood of crashes occurring during subsequent hours of driving, finding that the relative likelihood of crashing in the eleventh hour of driving was 3.6 times that as in the first hour of driving, yet that the likelihood of crashing in the tenth hour was only 2.5 times higher. Finally, McCartt, Hellinga and Solomon (2008) compared sleep and rest time, driving hours, falling asleep at the wheel and driving hours violations before and after these changes, finding that despite an increase in rest and sleep time, and similar violation levels, falling asleep at the wheel was increased. In Australia, a review of driving hours legislation has been recommended by coroners (Brodie et al., 2010), indicating that driving hours enforcement have had insufficient effectiveness. However, given the adverse impacts of HOS changes in the USA identified above, it may be difficult to ensure an improvement to safety with driving hours changes.

Hall and Mukherjee (2008) analysed US heavy vehicle fatalities and crashes, finding that a maximum three to five percent further reduction in fatigue-related crashes could be achieved by further reductions in maximum driving hours, but that this reduction would require 100% enforcement. Enforcement of driving hours can be problematic. One survey of 100 New Zealand truck drivers regarding demographics, experience of fatigue, and compliance, found 33% of drivers exceeded regulated hours and only 69% exceeded nine hours rest between shifts (Baas, Charlton, & Bastin, 2000). Given that only 349 fines were



issued in New Zealand for fatigue breaches in 1994, it was argued that there was a clear lack of enforcement, due in part to falsification of log books. Snyder (2012) conducted an ethnographic study of US truck drivers, providing the story of one observed driver. Due to a number of pressures and delays, the driver labelled depot delays as 'rest' in order to drive through the night whilst fatigued. Thus, the driver was able to reach a location at which to rest sufficiently long to 'reset' the log book, and so reach the final destination by deadline. This example was given to show skilful use of log book regulations to meet a strict schedule. However, such behaviour reduces the effectiveness of such legislation.

#### 4.2.1.1.2. The organisation and crash outcomes

Throughout the literature a number of organisational factors were identified which influence safety. These factors can be broadly categorised as general organisational factors, employee management, and management practices.

*General company factors.* Cantor, Corsi and Grimm (2009) surveyed 415 US large trucking firm representatives, attempting to predict driver hours of service (HOS) and crashes, and examine the effect of electronic work diaries. Despite emphasising HOS, a number of general organisational factors were identified. HOS and crashes were correlated with the type of goods and distance carried, firm size, whether the firm was private, and past safety record.

Other studies also noted the role that firm size had on crashes (Monaco & Redmon, 2012; Moses & Savage, 1994). Generally, as firm size increases crash outcome risk decreases, although this trend reverses slightly in the largest of companies (Monaco & Redmon, 2012; Moses & Savage, 1994). Also noted was the effect of cargo type on crash outcomes (F. Chen & Chen, 2011; Monaco & Redmon, 2012; Moses & Savage, 1994; Stein & Jones, 1988). Stein and Jones' (1988) found that driving empty trailers, typical in many organisations prior to loading, increases crash risk. Moses and Savage (1994) examined the

cause of crashes in a US safety review database, finding that firms carrying general freight, rather than specialised freight, had higher crash rates, yet hazardous materials transport also exhibited higher crash rates. Monaco and Redmon (2012) also found that hazardous material transport exhibited higher crash rates, yet indicated that this may be due to higher reporting rates of minor incidents. Further, Chen and Chen (2011) found that hazardous materials correlated with higher severity injuries in both single and multiple-vehicle crashes. Thus, both temporary cargo states, such as empty and defective cargo, and typical freight task have an effect on crash rate and severity.

Monaco and Redmon (2012) and Moses and Savage (1994) also demonstrated links between the distance goods were carried and crash rate. They found higher crash rates in interstate transport (Monaco & Redmon, 2012), yet decreased crash rates with increased total organisational miles travelled (Moses & Savage, 1994). These results are difficult to compare although it may be that total miles travelled better measures the size of the organisation than the length of trips. Nonetheless, the distance goods are carried appears related to crash outcomes. Friswell and Williamson (2013) surveyed 270 Australian truck drivers and found links between vehicle types and distance travelled and the experience of fatigue. The frequency of experienced fatigue was similar between drivers from all vehicle types, however short distance light truck drivers experienced fatigue due to insufficient rest breaks and higher levels of urban traffic, while long distance heavy vehicle drivers experienced fatigue related to long hours, particularly overnight, and specifically during dawn.

*Employee management.* The main employee management factor emphasised in the literature was the difference between owner operators and fleet drivers. Birdsey et al. (2010) found that owner operators had higher crash morbidities in US trade union morbidity data. Similarly, Mayhew and Quinlan (2006) interviewed 300 Australian truck drivers, finding that owner operators had higher injury and crash rates than fleet drivers. Conversely, Monaco and

Redmon (2012) found that owner operators and subcontractors reduced crash rates for contracting firms. Thus, despite higher crash rates, owner operators may under-report minor crashes, opting to conduct repairs privately. In Brazil, Lemos et al. (2009) also revealed that obstructive sleep apnoea was correlated with informal employment. Whilst the existence of informal trucking is not known in Australia, owner-operators may be the closest correlate. The above research indicates that owner-operators are a high-risk group within the industry.

Driver payment was also identified as influencing crash outcomes. Rodriguez et al. (2006) observed demographic, operations, compensation and crash data from 2368 drivers from a single firm following a pay rise. Drivers employed prior to the pay rise and retained exhibited lower crash incidence and were more likely to remain with the firm. It is unclear whether consecutive pay rises would be required to maintain lower crash incidence. Staplin and Gish (2005) found that high turnover rates increase crash rates, and so the safety performance of drivers maintained after the pay rise may be an artefact of retainment. Snyder's (2012) ethnographic study of US truck drivers also highlighted payment of drivers, finding that payment by distance, rather than time, lead to distance being viewed as money and, therefore, creates pressure to drive further than safely possible. This research has shown that pay rates and levels are related to crash outcomes.

*Management practices.* Within the literature a number of management practices were identified as relating to crash outcomes. These included training, supportive versus demanding management styles, scheduling, company policies, and monitoring and enforcement of these policies. After initial recruitment, drivers are typically exposed to training. Despite training being common, only two peer-reviewed articles linked training to crash outcomes. Hanowski et al's (2007) critical incident camera observation study argued that training could reduce technique errors, which were responsible for 32% and 52% of critical incidents initiated by single and two-up drivers respectively. Crum and Morrow

(2002) found that voluntary attendance at safety and training sessions reduced perceived fatigue. Thus, whilst training could reduce crashes, mandatory attendance may increase pressure and, therefore, perceived fatigue in drivers. In an earlier non-peer reviewed study, Haworth et al. (1991) surveyed 286 articulated truck drivers in Melbourne, Australia, regarding their behaviours and attitudes. Of those, 121 had experienced an injury crash. Among other findings, drivers who had experienced an injury-crash reported lower levels of training.

Management style, supportive or demanding, can also influence safety. Swartz and Douglas (2009) found that supportive management styles decreased owneroperator's intentions to commit unsafe acts. Using the job demands-control model to explore fatigue and job satisfaction in 1181 truck drivers, de Croon et al. (2002) found that the level of job control, work load and supervisor demands all predicted fatigue. Similarly, Morrow and Crum (2004) found that pressure to drive increased perceived fatigue. Regarding the extent of such pressures, Sabbagh-Ehrlich, Friedman and Richter (2005) interviewed 160 Israeli port truck drivers, of which 41.9% stated that their employee forced them to exceed legislated hours. In addition to explicit pressures, work stress has been correlated with drug and alcohol use in Pakistani truck drivers (Mir et al., 2012), and constant time pressure and disrespectful treatment linked with increased drug use in US long distance truck drivers (Shattell, Apostolopoulos, Sönmez, & Griffin, 2010).

Scheduling can be a major source of pressure in truck driving and is responsible for the amount of driving completed by drivers, and thus fatigue (de Croon et al., 2002; de Pinho et al., 2006; Maldonado, Mitchell, Taylor, & Driver, 2002; Soccolich et al., 2013; Stein & Jones, 1988). McCartt et al. (2000) found falling asleep at the wheel to be associated with arduous schedules, higher ratios of work to off-duty hours, and driving while fatigued at night time. Crum and Morrow (2002) surveyed 116 managers and 279 drivers regarding fatigue

and close calls, finding that size of delivery window and levels of night time driving were associated with perceived fatigue. Further, of 683 Finnish truck drivers interviewed by Pertula, Ojala and Kuosma (2011), 27.8% often felt fatigued while driving and 46.8% attributed nodding off to work factors, including both long shifts and shorter sleeps, and inability to choose break times. Similarly, Charlton and Baas (2001) conducted surveys and psychomotor tests with 606 New Zealand truck drivers regarding fatigue. It was found that shift length and the number of days worked in a week were associated with decreased psychomotor performance.

As previously stated, Sabbagh-Ehrlich et al. (2005) found that 41.9% of drivers report that their organisation forces them to work beyond their legal driving hours. It is unlikely that this occurs formally through written schedules, however scheduling combined with management pressures may contribute to this problem. Similarly, Beilock (1995) examined the schedules of 500 US truck drivers in the Florida peninsula, estimating that 14 to 26% of schedules required the driver to exceed legal HOS, and an additional 17 to 33% were suspected of requiring breaches. Thus, drivers may be less influenced by government legislation as a result of direct pressure from their organisation.

Heavy work schedules have been associated with poorer levels of sleep. Braekman et al. (2011) surveyed 476 Belgian truck drivers. Perceived unrealistic work schedules were correlated with poor sleep. This effect may be influenced by the restriction of possible sleep locations. Baulk and Fletcher (2011) examined work and sleep diaries in order to compare sleep on the road with that at home, finding that sleeping at home significantly reduced perceived fatigue.

To explore the causes of poor scheduling, Braver, Preusser and Ulmer (1999) interviewed 270 schedulers from Wyoming and Tennessee, USA, regarding the acceptance of jobs and scheduling of drivers. Schedulers reported considering revenue (75%) deadlines to

meet (24%) and hours of service (9%) in the acceptance of jobs. When scheduling, participants reported considering trip mileage (58%), speed limits (27%) and past route experience (13%). Two-thirds of schedulers reportedly used rule of thumb travel time estimates, with 14% expecting an average speed over 60mph. Combined, these findings demonstrate that organisations may become overloaded due to failure to account for deadlines and hours of service in the acceptance of jobs. This may lead to heavier scheduling of individual drivers, allowing little room for delays, and often require drivers to maintain high speeds. Thus, scheduling is a major factor to consider when examining the role of organisations in safety.

Specific organisational policies can also influence crash outcomes, a few major examples of which appeared in the literature. Many researchers highlighted the influence of involvement in unloading and loading on fatigue and related incidents (Crum & Morrow, 2002; Maldonado et al., 2002; Soccolich et al., 2013). Whilst unloading and loading involvement is partially dictated by customer policies, the organisation is also responsible for these practices. Similarly, the decision to utilise two-up or single driving impacts driver sleep quality (Maldonado et al., 2002). Finally, Sullivan and Flannagan's (2012) conspicuity measures study, highlighted in section 4.2.1.1.1, indicated that some organisations choose to exceed legislation, so specific policies and practices should be considered. Regardless of policies used, without organisational monitoring and enforcement, they will have little impact. Only one study tied organisational monitoring to crash outcomes. Moses and Savage (1994) found that firms which under-report crash involvement reported higher crash rates than those with accurate reports. Thus, inaccurate monitoring is either caused by other factors which influence crashes, or directly leads to increases in incidents due to reduced detection, enforcement and self-assessment.

#### 4.2.1.1.3. Customers and crash outcomes

Customers play a significant role in heavy vehicle crash outcomes. Despite little reference in the literature, it is important to note that customers may influence organisational policies. Three studies were identified that directly linked customers with crash outcomes, all of which related to fatigue. As previously noted, Braver et al. (1999) found that 75% of schedulers consider revenue, and only 25% consider deadlines when accepting jobs. Thus, customers may be free to insist upon unreasonable deadlines when offering sufficient money. As the size of the delivery window influences perceived fatigue (2002), customers can be seen to heavily influence safety. Additionally, Kemp, Kopp and Kemp (2013) collected qualitative and quantitative data from 435 truck drivers in the USA and found that many drivers experienced time pressures, which typically stemmed from customer delays. These time pressures were associated with physical fatigue and emotion exhaustion. Finally, Snyder's (2012) ethnographic study, and the associated example driver, demonstrated these effects as customer delays led the driver to drive when fatigued in order to reach a deadline. Whilst in other industries customers may have a less significant role in safety, reducing the degree of attention customers have received in safety culture literature, it can be seen that customers are an important contextual influence on safety within heavy vehicle industries.

#### 4.2.1.1.4. Road environment and crash outcomes

Drivers spend the majority of their time on the road, so contextual factors related to road environment are important for heavy vehicle safety. The literature identified a number of road environment factors that influence safety, including other vehicles, environmental conditions and road design and condition. Whilst the organisation can limit night-time driving, these factors are generally beyond the control of the industry.

*Other vehicles.* Bjornstig et al. (2008) examined 293 north Swedish passenger car fatalities resulting from multiple vehicle crashes from 1995 to 2004. Though half of these

fatalities occurred from crashes with heavy vehicles, the car driver was at fault in 81% of the fatalities. Thus, cars present a hazard to truck drivers. Further, 8% of the crashes involving a car and a truck showed signs of car-driver suicide through intentionally crashing. Similarly, Hakkanen and Sunmola (2001) analysed 337 fatal two-vehicle trailer-truck crashes in Finland from 1991 to 1997. Only 16% of trailer-truck drivers in these crashes were principally responsible. Thus, in 84% of crashes, the truck driver was considered a second participant in the crash.

The synthesised conceptualisation of safety culture relates to safety outcomes which are caused by behaviours influenced by contextual and cultural factors (section 2.3.5). Regardless of the culture of drivers, if another vehicle causes the incident there is little that a truck driver can do to avoid crashing. Whilst other vehicles influence crash outcomes, they may not always do so in a way amenable to interpretation with safety culture. Nonetheless, it is important to recognise the impact of other vehicles to maintain realistic ideas regarding the industry's ability to improve safety. Additionally, however, other vehicles can influence driver safety through stress and resultant fatigue. Cherry and Adalakun (2012) surveyed truck drivers in Knoxville, Tennessee, USA, regarding perceived traffic threats to productivity and safety. Principal threats identified were aggressive drivers, congestion, car lane changing behaviour and merging vehicles. Due to increased driving time, lost productivity and the additional cognitive load of avoiding erratic car drivers, truck drivers may experience greater fatigue.

*Environmental conditions.* In addition to other vehicles, environmental conditions may influence crash outcomes. Blower et al. (1993) analysed Michigan heavy vehicle crashes, finding that crashes were 1.4 times more likely at night. Bunn et al. (2009) similarly found crash patterns were associated with time of day, with truck drivers more likely to be at fault during the day. When compared with higher crash rates at night, this pattern may reflect other



vehicle faults increased at night. Ranney et al. (2000), using driving simulator experiments demonstrated that glare from headlights increased the time taken to see pedestrians and to identify objects in mirrors, and led to lane position variability, slower speed on curves and steering variability. Thus night time crashes may be influenced by increased contrast of light and glare relative to background light levels. However, time of day can also play a significant role in fatigue (Crum & Morrow, 2002; Heaton, Browning, & Anderson, 2008) and falling asleep at the wheel when drowsy (McCartt et al., 2000). Time of day has been used as an indicator of fatigue involvement in crashes (Gander, Marshall, James, & Quesne, 2006). Additionally, it is worth noting one non-peer reviewed Australian study which conducted on-road evaluations of the fatigue experiences of 22 day shift, 21 night shift and 11 rotating shift truck drivers (A Williamson, Friswell, & Feyer, 2004). It was found that fatigue ratings showed a greater increase across a work week for night time drivers, yet that performance was not differentially affected by shift times.

Chen and Chen (2011) also identified a number of other environmental factors, largely relating to weather, which influence crash severity, including smog/fog/haze, cross winds, wet and icy road surfaces, and low light conditions. Similarly, Hakkanen and Sunmola (2001) revealed that truck drivers perceive weather to play a significant role in crash outcomes. Lastly, Young and Liesman (2007) compared 14,700 rollover truck crashes in Wyoming, USA, with wind speed and gust records from 21 weather stations, finding that wind readings showed a significant correlation with rollover crashes.

*Road design and condition.* The environmental factors identified in the literature were road design and condition. Golob and Recker's (1987) study exploring causal factors of crashes revealed distinct patterns of crashes on different highways and highway sections. Sharma and Landge (2012) conducted zero-inflated negative binomial regression on heavy vehicle crashes on a selected highway, correlating crashes to road design factors. They found

that the number of highway access points, and narrower lanes and shoulders, increase crash risk. Australian coroners' recommendations also commonly targeted road signage, posted speed limits, safety barriers, and lighting and visibility in order to reduce crash fatalities (Brodie et al., 2010). Similarly, Bunn et al. (2009) found that posted speed limits were associated with rates of truck driver at-fault crashes. Thus, a number of road-related factors including road dimensions, access points, visibility and posted speed limit have been shown to influence crash rates.

Archer and Young (2009) utilised simulated changes to traffic signals aimed at decreasing the risk of truck crashes resulting from traffic light violations. A number of changes to traffic signal operation were found to reduce risk. Whilst the details of these changes are irrelevant to this chapter, traffic signals can clearly influence crash outcomes. Finally, road design and condition may also influence fatigue due to availability of rest locations. Crum & Morrow (2002) and Morrow and Crum (2004) found that inability to find adequate rest locations increased fatigue-related near misses. Similarly, in Israel, Sabbagh-Ehrlich et al. (2005) found that difficulty finding a park when tired was associated with crashes. This fits with Snyder's (2012) account of the driver travelling additional hours into the night because no parking was available at the first location. Many of the above factors were also identified in two non-peer reviewed Australian studies examining the interactions between heavy vehicles and the road system. These studies highlighted the following issues as being relevant to heavy vehicle safety – height clearances, horizontal alignment, signage, lane size, length of on/off-ramps, road edge drop-off, clear zones, railway level crossings, clearance times for intersections, visibility distance, delineation markings, shoulder sealing, roadside hazards, safety barriers and pavement quality (Styles, Mabbott, Roberts, & Tziotis, 2008; Tziotis, Pyta, & McLean, 2009).

#### 4.2.1.1.5. Work environment and crash outcomes

Work environment factors identified in the literature differed from road environmental factors in that the organisation has some control over these factors. These factors include vehicle design and maintenance, passengers and cargo-related factors.

*Vehicle design and maintenance.* Chen and Chen (2011) found semi-trailer trucks and truck tyre defects were associated with more severe injuries in multiple-vehicle crashes, highlighting that both design and maintenance of vehicles are relevant to safety. In regards to maintenance issues, Hakkanen and Summala (2001) reported technological faults as a common cause of truck drivers' at-fault crashes. Similarly, Jones and Stein (1989) compared the roadworthiness of 734 trucks involved in 676 crashes with a randomised control selection of trucks, revealing that crashes were 1.5 times more likely with brake defects and two times more likely with steering defects. Further, through examining data drawn from the US large truck crash causation study, Blower, Green and Matteson (2010) found that when a truck had one or more defects the truck driver was 1.7 times more likely to have contributed to the crash. This could be explained by Haworth et al's (1991) survey of truck driver behaviours and attitudes, which found drivers involved in an injury crash were less likely to examine their vehicle for defects. With regards specifically to brake defects, however, one non-peer-reviewed Australian report analysed a number of truck crashes involving brake failure on long and steep road sections. It found drivers were often provided with insufficient information about auxiliary braking systems and that failure of these systems was often not clearly signalled to the driver (Trevorrow & Eady, 2010).

Regarding the design of trucks, a number of studies identified correlates of crash outcomes. Braver et al. (1998) analysed photos of fatal crashes between cars and trucks and found under-ride to be severely underreported by police, as it was reported in only 6% of fatal crashes but evident in 63% of the sample. Potential for under-run was also emphasised

by two non-peer-reviewed Australian studies which highlighted the role of truck design related to size, stiffness, wheel guards and trims in contributing to a number of fatalities to members of the public involved in crashes with trucks (Rechnitzer, 1993; Rechnitzer & Foong, 1993). Hanowski et al's (2007) camera observation of drivers also revealed that 14.3% of critical incidents initiated by two-up drivers were caused by physical properties of vehicle design. Whilst details of these effects were not clarified it was suggested that vehicle design, in terms of weight, size and centre of gravity, was crucial to critical incidents.

Regehr and colleagues (2009) compared Canadian collision rates of various vehicle configurations and found longer vehicles had lower collision rates per kilometre travelled than other articulated trucks. Conversely, in Washington, USA, Stein and Jones (1988) found double trailer trucks were between two and three times more likely to crash than single-trailer or non-trailer trucks. Different legislative requirements between the US and Canada may partially account for the different crash patterns, however, it may be that grouping multiple vehicle types as 'long vehicles' could mask some variability within the Canadian study. Lastly, Archer and Young (2009) also reported that truck mass influences required braking distance and, thus, risk of red light running.

Lastly, a number of studies investigated the benefits of specific vehicle safety countermeasures. In these cases the potential benefits of countermeasures were investigated in controlled tests or computer modelling, and as such the actual benefits of these countermeasures cannot be ascertained. Nonetheless, rear-view video systems were demonstrated to improve stop rate in controlled reversing scenarios (Lee, Kourtellis, Lin, & Hsu, 2010), forward collision warning systems were suggested to be able to reduce rear-end truck crashes on US highways by 21% (Rakha, Fitch, Arafeh, Blanco, & Hanowski, 2010), and speed limiters set to 105km/h were suggested to be able to reduce crashes on non-congested Canadian highways (Saccomanno, Cunto, Hellinga, Philp, & Thiffault, 2009).

Taken together, the above studies indicate that vehicle design and maintenance plays a significant role in crash outcomes.

*Passengers.* Only one reference to passengers was identified in the literature. However, as they fall outside other identified factors, this finding forms a separate factor. Bunn and colleagues (2009) found that the presence of passengers was protective of crashes for drivers aged over 65 years. Whilst this raises questions as to why age effects were relevant, it is important to recognise passengers may influence safety.

*Cargo.* The final work environment factor influencing crash outcomes was cargo carried. Whilst this was noted as an organisational factor, it is clear that the cargo itself may also influence crashes as referred to in section 4.2.1.1.2.

#### 4.2.1.1.6. Summary: Context and crash outcomes

As behaviour is the result of both cultural and contextual influences, it was important to explore contextual factors identified in the literature which influence crash outcomes. The influence of specific factors was identified including government departments, the organisation, customers, road environment and work environment. Government bodies were seen to influence crash rates and severity through regulations and enforcement, utilising specific policies to improve heavy vehicle crash outcomes. Aside from directly influencing drivers, some policies exert influence via the organisation. The organisation a driver works for also has a major role in crash outcomes. General organisational factors seen to influence crash outcomes included the size of the company, the goods they carry, the distance over which these goods are carried, employee management practices like employment type, payment and retainment, and management practices such as training, management style, scheduling, policies and enforcement. Further, customers influence safety through financial power, specific policies and delivery windows which apply pressure on drivers. In addition to government organisations and customers, the road environment influences crash outcomes

through the presence of other vehicles, environmental conditions, and design and condition of roads. Finally, the work environment influences crashes through vehicle design and maintenance, presence of passengers and cargo type. Having developed an understanding of the contextual factors which influence crash outcomes it is important to examine potential cultural factors identified in the literature.

#### 4.2.1.2. Culture and crash

With a lack of previous safety culture research in heavy vehicle industries, no cultural factors have been identified within the literature. However, a number of attitudes, beliefs or values have been identified in heavy vehicle driver samples, which serve as potential cultural traits for further investigation. Baas et al. (2000) found that most drivers perceived fatigue to be a greater problem for other truck drivers than for themselves, potentially indicating a general tendency to view other drivers as worse than the self. Whilst Snyder (2012) identified cultural traits in US truck drivers, these traits may not be relevant to Australian truck drivers and no relationship to safety was established. Nonetheless, drivers were seen to hold negative views towards enforcement, took pleasure ‘working the system’, valued personal experience over rules and valued working hard and getting the job done. A number of the above findings were also evident within Haworth et al.’s (1991) non-peer reviewed survey of Melbourne truck drivers, which found that truck drivers generally held ill-feeling towards some government interventions and viewed themselves generally positive whilst labelling a select minority of ‘cowboys’ as being to blame for incidents. Additionally, it was also seen that drivers who had experienced an injury-crash rated themselves highly regarding their ability to manage fatigue, despite possessing what were deemed to be poor fatigue coping behaviours. Lastly, Davey et al. (2007) found that a desire to fit in with the ‘trucking image’ contributed to drug usage.

#### 4.2.1.3. Summary: Crash outcomes

Crashes are a major safety concern within heavy vehicle industries worldwide. A number of studies have explored the causes of crashes, identifying a number of risky behaviours and factors associated with these behaviours. Despite a lack of previous safety culture research, analysing these studies using the synthesised conceptualisation of safety culture highlights that much is currently known. A number of contextual influences on crash outcomes are present within heavy vehicle industries, including those drawn from government, organisations, customers, and the road and work environment. Additionally, a number of potential cultural traits have been identified, including viewing others as more dangerous, negative views of enforcement, working the system, valuing personal experience over rules, working hard and getting the job done, and fitting in with the trucking image. Figure 4.1 shows identified factors which related to crash outcomes in the same structure used in Figure 2.1 in Chapter 2. Thus, the figure shows that each of the identified contextual (section 4.2.1.1) and potential cultural traits (section 4.2.1.2) influence the behaviours identified in section 4.2, to result in crashes, injuries and fatalities.

#### 4.2.1. Non-crash injury outcomes

In addition to crashes, heavy vehicle drivers experience a range of other injuries, referred to here as non-crash injuries. Non-crash injuries thus serve as the second category of outcomes within the literature. As the synthesised conceptualisation holds that outcomes are the result of behaviour which is influenced by contextual and cultural factors (section 2.3.5), each of these components of the conceptualisation must be analysed with regards to non-crash injuries. Jones et al. (2011) examined mortality data from coroners' reports on 47 Australian fatalities from non-crash injuries between 2000 and 2009. Of the recorded 16 cases, six drivers had detectable levels of blood alcohol and illicit drugs. In regards to the events preceding the fatality, 47% occurred when tending to cargo, 66% of the drivers were

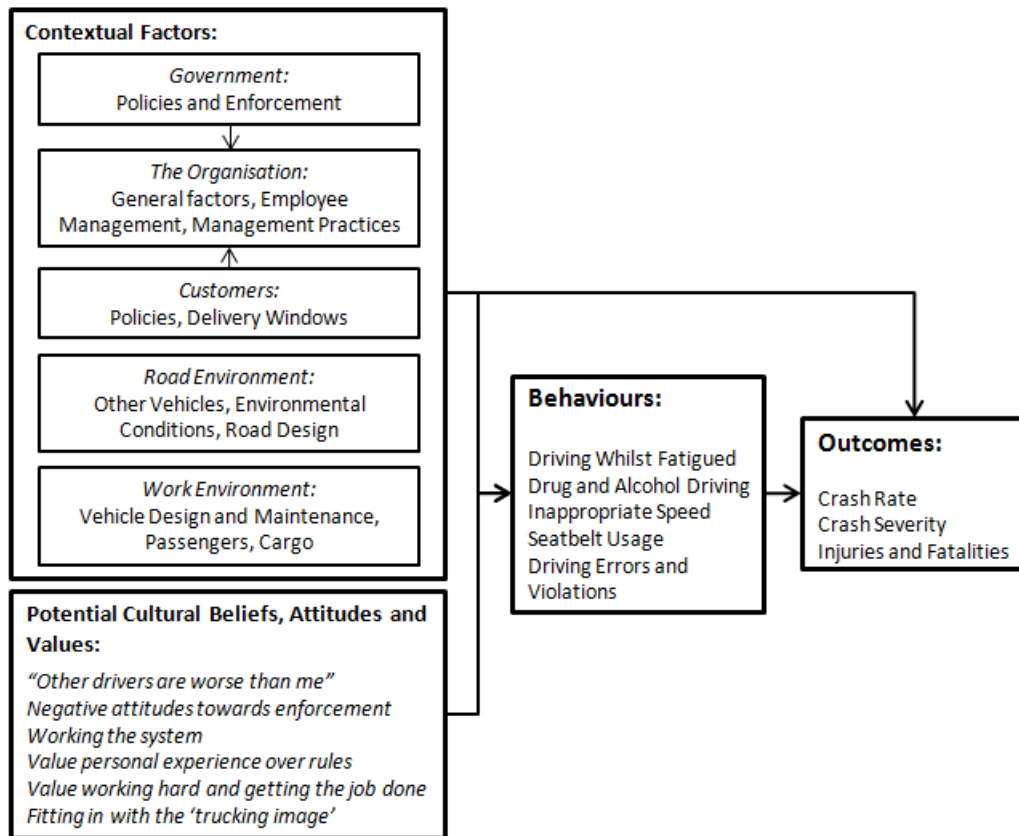


Figure 4.1: A preliminary synthesised conceptualisation of the safety culture in heavy vehicle crash outcomes

working alone, 45% were caused by brake failure-related vehicle movement and 70% involved the driver being crushed by the vehicle or another object. Thus, behaviours occurring around or in the vehicle or trailer during non-driving tasks must be considered.

Drivers may also suffer a range of less severe injuries during these tasks. Shibuya et al. (2010) sought to identify hazard scenarios from text descriptions of 136 Danish trucking firm incidents occurring during unloading and loading. Activities undertaken at time of an incident included ascending/descending from the cabin or trailer (57), moving at heights (60), operating the top panel of the trailer (15), or standing beside the vehicle (4). The mechanisms of injury were falls from heights (63), falls at the same level (19), slips or trips without falling (24), overexertion (7), being hit by an object (19) and being caught between objects (4). The



causes of the 63 falls from heights were errors in footing (31), slips and trips (13), defects or malfunctions (7), shoe catching (3), and loss of balance or control (10). Suggestions to improve truck driver safety in these situations included modifying procedures, stricter shoe requirements, better housekeeping, improved truck maintenance and raising awareness of non-crash injuries.

Three studies directly explored entering and exiting the vehicle. Fathallah and Cotnam (2000) compared impact forces when exiting vehicles with and without the use of steps and hand rails, finding that non-use of aids resulted in impact forces up to six times greater than with the use of aids. Similarly, Fathallah et al. (2000) compared risk of slip and fall in icy conditions when exiting a vehicle with or without these same aids. The probability of falling was between 0.7 and 0.9 without aids, and 0.45 and 0.55 with aids. Lastly, Patenaude et al. (2001) compared impact forces from 10 truck drivers either facing away or toward the truck upon descent. Facing away from the truck greatly increased impact forces and spinal compression.

Lincoln et al. (2004) explored text descriptions of incidents leading to back injury in 94 US army truck drivers. Incidents occurred when being struck by or against an object during motor vehicle crashes, falls resulting from slips/trips or loss of balance, and overexertion from lifting activities.

Jones and Switzer-McIntyre (2003) explored transport sector work claims related to falls from non-moving vehicles in Ontario during 1997. They identified 352 falls, typically from the back of the truck or trailer, truck steps, or cargo. Common injuries from these falls included sprain/strains, contusions and fractures, with 89.4% of drivers back at work within 12 months. Thus, these injuries are common but have minimal long term impact.

The final form of injuries identified in the literature were loco-motor disorders, typically resulting from prolonged strain. Jensen et al. (2008) compared these disorders

amongst bus drivers, long haul truck drivers, other truck drivers and the general public. Professional drivers had high risk of lesions of the ulnar nerve, intervertebral disc disorders were more prevalent amongst long haul truck drivers and bus drivers, and long haul truck drivers were at higher risk of carpal tunnel syndrome, synovitis and bursitis.

From the above studies a number of scenarios and behaviours related to non-crash injuries can be identified, included entering and exiting the vehicle, loading and unloading, working within the trailer and working from heights. A number of contextual and potential cultural factors were identified which influenced non-crash injuries. Identified individual factors can be found in Appendix A.

#### 4.2.1.1. Contextual factors associated with non-crash injuries

Identified contextual factors which influence non-crash injuries could be categorised under organisational factors, worker's unions and environmental factors. These are discussed below.

##### 4.2.1.1.1. The organisation and non-crash injuries

The organisation to which a driver belongs can influence non-crash safety through employment form, scheduling and pressures and specific policies. Mayhew and Quilan (2006) found that owner-operators had worse injury records than other drivers. Further, Williamson et al. (2009) surveyed 217 short haul truck drivers from Sydney, Australia, and found the number of injury claims in the past five years was associated with whether or not the driver had permanent work status. Thus, employment form can influence either the reporting of injuries or the number of injuries sustained.

Friswell and Williamson (2010) compared injuries with risk perceptions, revealing that organisational pressure was responsible for a significant proportion of injuries. One of the most direct methods of pressure is the use of strict schedules. Williamson et al. (2009) found

that work-life conflict was correlated with worsening injuries over time. Whilst not definitively related to scheduling, schedules that interfere with a driver's personal life appear to influence injury progression.

Shibuya et al. (2010) suggested that policies relating to the loading and unloading of vehicles and the use of personal protective equipment could significantly improve injury outcomes. Similarly, Williamson et al. (2009) revealed that time spent loading was related to worsening injuries. Given that companies often use policies regarding unloading and loading, at times banning driver participation, such policies may directly influence injury rates and severity. Given the link between level of manual handling and musculoskeletal injuries (Robb & Mansfield, 2007), it is evident that such policies should be explored.

#### 4.2.1.1.2. Workers union and non-crash injuries

Literature is unavailable which identifies customer and government effects on non-crash injuries, however one study has discussed the role of a workers union. Williamson et al. (2009) found that workers union membership was linked with worsening injuries over time, illnesses and injury claims over the past five years. The mechanism of influence and whether the relationship was causal is unknown, however, further research should explore the effect of unions and other similar bodies.

#### 4.2.1.1.3. Environmental factors and non-crash injuries

Environmental factors have also been linked to non-crash injuries. Due to a relative lack of research compared with crash outcomes, distinguishing between environment types has little benefit. However, two factors were identified – vehicle design and maintenance, and road factors.

*Vehicle design and maintenance.* Studies discussed above have demonstrated the importance of aids for exiting vehicles. Fathallah et al. (2000) found that 'step van' design

trucks produced low slip probabilities in icy conditions regardless of aid use. Additionally, Marshall and Wells (2011) tested the physical requirements of three trailer tarping systems – manual tarping, sliders, and rack and tarp – finding that manual tarping increased the risk of injury due to falls and physical requirements. Conversely, sliders reduced the risk of fall and physical strain. Finally, the design of seats can also influence back pain and repetitive strain injuries (Robb & Mansfield, 2007). Thus, truck design significantly influences non-crash injuries.

*Road factors.* In addition to crash outcomes, roadways can also influence non-crash injuries. Shibuya et al. (2010) found that road inclination at unloading and loading locations increased the risk of brake failure leading to crushing. Similarly, Friswell and Williamson (2010) found that roadways and access points contributed to many injuries in short haul truck drivers. Lastly, vibration experienced whilst driving, and within depots, can lead to back injuries and pain. As this type of injury does not result from crashes it has been included here. Bovenzi et al. (2006) assessed whole body vibration and duration in European professional drivers, finding that lower back pain could be best predicted through combination of both vibration intensity and duration. However, Robb and Mansfield (2007) examined back pain in 192 United Kingdom truck drivers, revealing that lower levels of vibration were associated with back pain. Thus, at higher levels of vibration the driver may be more prepared and able to resist the effect of vibration, whereas at lower levels they may be more vulnerable to injury. Kumar (2004) placed accelerometers on truck seats and strategic spinal locations of 14 heavy mining truck drivers during typical activities. It was found that international standards for vibration were exceeded 17 times for vertical seat vibration, 23 times for vertical lumbar vibration, once for vertical cervical vibration, and on many occasions in the sagittal and coronal planes. Thus road inclination during unloading and loading and road-related vibrations present a significant non-crash injury threat.

#### 4.2.1.1.4. Summary: Context and non-crash injuries

When compared to crash outcomes, significantly less literature regarding contextual factors and non-crash injuries was available. However, there was some similarity between the contextual factors identified for non-crash injury and crash outcomes. The organisation, again through employee management and management practices, significantly influences non-crash injury outcomes. Whilst neither government nor customers were seen to influence these injuries, they may still exert influence through organisations, or may simply have eluded previous research. The influence of workers unions was, however, unique to non-crash injuries. Environmental factors were relevant to non-crash injuries, although only vehicle design and maintenance and road factors were identified. Having developed an understanding of contextual factors related to non-crash injury outcomes, it is important to explore potential cultural factors.

#### 4.2.1.2. Cultural factors associated with non-crash injuries

Again, in the absence of previous safety culture research in heavy vehicle industries, only potential cultural factors could be identified. Two studies were reviewed which identified potential cultural beliefs, attitudes or values related to non-crash injuries. Shibuya et al. (2010) indicated that despite non-crash injuries being more prevalent than crash injuries, Danish truck drivers considered crashes to be the most important safety concern. Friswell and Williamson (2010) also found that truck drivers viewed road issues as their major concern. Whilst these views may be related to the potentially more severe average crash outcome over non-crash injuries, the apparent lack of emphasis placed on non-crash incidents was suggested to reduce precautions made for non-crash incidents. Friswell and Williamson (2010) also found that truck drivers viewed other truck drivers as more dangerous, potentially leading drivers to take higher risks under a false sense of security.

#### 4.2.1.3. Summary: Non-crash injuries

Non-crash injuries typically result from unsafe practices occurring during unloading and loading and entering and exiting the vehicle or trailer. Incidents are often the result of slips, trips, falls, loss of balance and overexertion, but can also result from repetitive strain. The current safety culture framework views behaviour as resulting from contextual and cultural factors. Regarding contextual influences on non-crash injuries, the organisation for which a driver works for, membership in a union, and vehicle and road factors were seen to influence these injury outcomes. Though few potential cultural factors were identified, it was seen that drivers may place higher priority on road safety over non-crash safety, and view other drivers as more dangerous than the self. These factors have been incorporated into the same format as Figure 2.1. in Chapter 2 to produce Figure 4.2. This figure demonstrates that the contextual (section 4.2.2.1) and potential cultural (section 4.2.2.2) factors identified within this section influence the behaviours and outcomes (section 4.2.2) related to non-crash incidents.

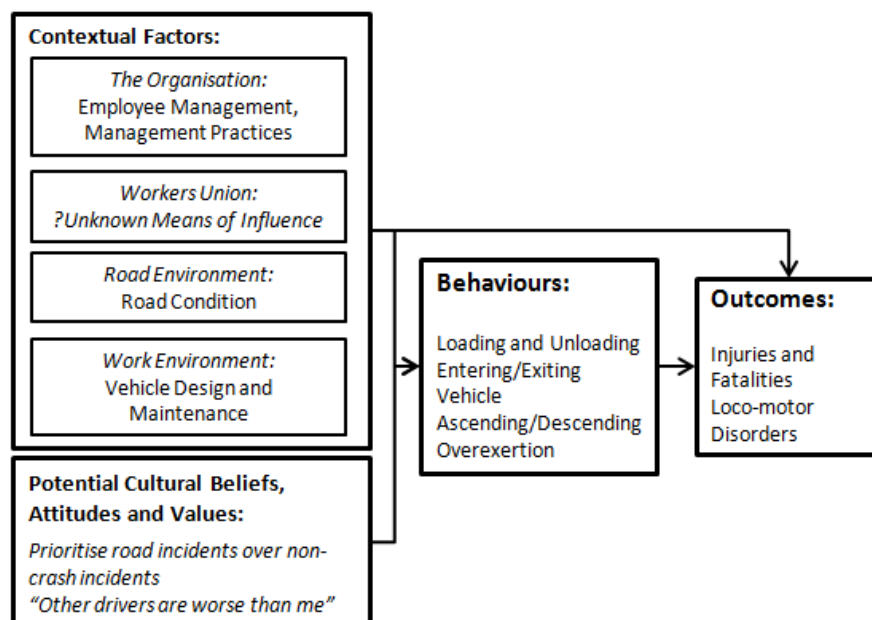


Figure 4.2: A preliminary synthesised conceptualisation of safety culture in heavy vehicle driver non-crash injuries.

#### 4.2.2. Health Outcomes

A number of papers were identified which focussed on health outcomes for heavy vehicle drivers. As these papers addressed distinct issues and typically provided only a small selection of factors, each health concern is addressed separately rather than aggregating factors. Behaviours such as drug use and inadequate sleep can be considered health concerns but have already been discussed.

*Cancer and respiratory disorders.* Both cancer and respiratory disorders are significant health issues which truck drivers can face. Balarajan and McDowall (1988) examined mortality data for 3392 professional drivers in London, revealing that lorry drivers had an increased risk of stomach and lung cancer, bronchitis, emphysema and asthma. Jarvholm and Silverman (2003) examined health records of Swedish construction workers from 1971 to 1992 on a computerised register. A total of 6364 truck drivers and 14,364 drivers of heavy construction vehicles were compared to 119,984 carpenters and electricians. Whilst construction vehicle drivers did not differ from the control, truck drivers had higher rates of lung cancer and prostate cancer, although only mortality from lung cancer proved significant.

Jakobsson et al. (1997) also examined the risk of lung cancer in Swedish professional drivers using census data from 1970 and cancer registry data for 1970 to 1971. Over 96,000 professional drivers experienced lung cancer, with long and particularly short distance truck drivers experiencing the highest risk. Cancer risk was higher in urban than rural areas, potentially explaining the higher risk of lung cancer in short distance truck drivers. This risk was attributed to vehicle exhaust and traffic congestion, which is consistent with other research showing lung cancer increased with exposure to exhaust (Garshick et al., 2008). Lastly, Steenland et al. (1990) examined lung cancer mortality within a multiple occupation union in the US, finding that only long-term driving of diesel trucks increased the risk of lung cancer. Smoking is a well-known risk factor for lung cancer, however only Jarvholm and

Silverman (2003) and Jakobsson et al. (1997) controlled for smoking status. Both studies found that additional variation was still attributable to truck driving. This was further verified by Robinson and Burnett (2005), who analysed mortality rates for US truck drivers between 1979 and 1990 finding that, even when adjusting for estimated smoking rates, long distance truck drivers demonstrated high rates of lung cancer, ischaemic heart disease and acute myocardial infarction. From these studies it can be seen that driving trucks generally increases risk of lung cancer and potentially other forms of cancer, along with respiratory disorders, though little is known about reducing risks associated with heavy vehicle driving.

*Eating and exercise.* Dahl et al. (2009) compared 2175 long haul truck drivers with 15,060 other truck drivers and the general population of Denmark for lifestyle-related diseases. All lifestyle-related diseases, except those related to alcohol, were more prevalent in truck drivers. Particularly strong trends were seen for diseases relating to calorie intake and exercise. Buxton et al. (2009) surveyed 542 US truck drivers, assessing relationships between work environment, sleep adequacy and diet. Increased fruit and vegetable consumption and decreased consumption of sugary drinks and snacks were correlated with attaining levels of adequate sleep, which was in turn correlated with working more hours and job strain. Good sleep adequacy was associated with supervisor support, lower job strain and job satisfaction. Thus, management practices and pressure were predictive of dietary-related disorders.

*General health.* General health outcomes were discussed in three studies. Jovanovich et al. (2008) examined stress and serum lipids in 417 Serbian professional drivers, 81 of which were truck drivers. Highest values of serum glucose, total cholesterol, LDL cholesterol and triacylglycerols and the lowest values of serum HDL cholesterol were found in truck drivers. These lipids were correlated with increased stress levels and are known to have adverse health effects including atherosclerotic lesions. Thus, stress levels in truck drivers are high and contribute to poor health. By exploring the relationship between job control, demands,



need for recovery and sick leave, de Croon (2003) revealed that the need for recovery after work predicted later sick leave, further implicating the effects of stress over time.

Though few contextual and cultural influences on general health outcomes were identified, Stasko and Neale (2007) interviewed 30 US truck drivers regarding access to health care. Most drivers had a family doctor, however those who did not cited cost as a barrier. Additionally, over a third of drivers stated their health care utilisation was reduced due to lack of access on-road. This is a significant problem for long distance truck drivers, as without accessible health care on-road they may be prevented from regular health checks.

#### 4.2.2.1. Summary: Health outcomes

A number of heavy vehicle driver health outcomes were evident in the literature. These included cancers and respiratory diseases, eating and exercise disorders, and general health concerns. The synthesised conceptualisation holds that outcomes are the result of behaviours which are influenced by cultural and contextual factors (section 2.3.5). Existing literature on health outcomes was difficult to analyse through the synthesised conceptualisation of safety culture due to a lack of identified behaviours, except for healthy eating and exercising, and receiving health care, and the complete absence of potential cultural traits. Nonetheless, it was seen that the organisation, region they work, and distance travelled influenced cancers, whilst management pressures, scheduling, and supervisor support influenced eating and exercise patterns. Lastly, health care access due to insufficient money or availability on-road influenced general health. These factors are again presented in Figure 4.3, which demonstrates what little information was present in the literature regarding how outcomes are influenced by behaviour, context and culture.

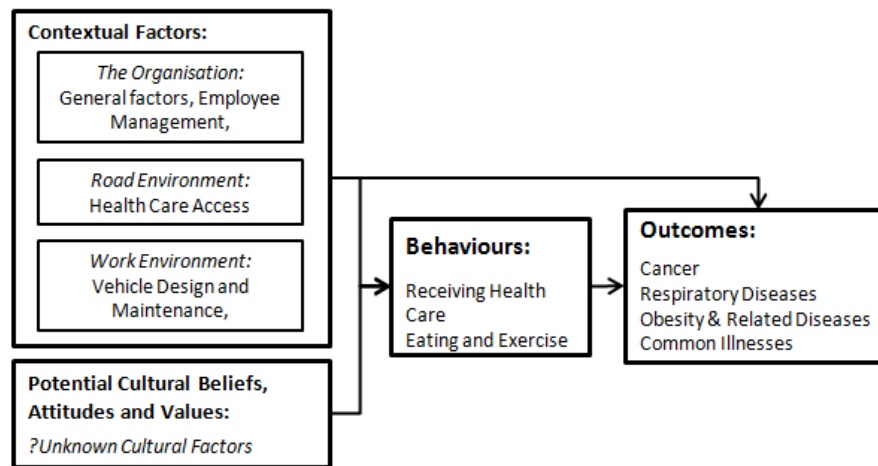


Figure 4.3: Preliminary foundation of a synthesised conceptualisation of safety culture in heavy vehicle health outcomes

#### 4.2.3. Miscellaneous articles

The final category of research consisted of those which identified contextual and potential cultural factors, without specifying a behaviour or injury scenario. Whilst cultural and contextual factors are only relevant to safety culture where they influence behaviour, a lack of previous research does not indicate that these factors do not influence behaviours. Further research should examine the impact of the identified factors on behaviour.

##### 4.2.3.1. Miscellaneous contextual factors

*Government policies.* Kuncyte et al. (2003) conducted a policy review on training for transporting dangerous goods in the USA, Canada, Sweden and the Netherlands. In Sweden there was an emphasis on accreditation for all trainers, while in the Netherlands emphasis was placed on examining the results of training. Contrarily, in Canada and the USA training is considered the responsibility of the organisation. It was argued that these differences in policies led to lower quality of training in the USA and Canada. Additionally, although

accreditation is beneficial, only the Netherlands directly ensures effective training. Given the importance of training, government policies regarding training may influence safety.

*Management practices.* Mejza et al. (2003) examined management practices of high compliance and safety performing companies through surveying managers from 48 passenger carriers and 181 freight carriers. It was found that high safety performing trucking firms apply screening criteria for new employees, emphasise pre and during employment training, conduct a wide variety of training and testing, and reward safe behaviour. Whilst the mechanisms through which better safety and compliance performance was achieved are unknown, the importance of training was further supported. Additionally, driver selection and positive rewarding of safe behaviour were unique findings of this study.

#### 4.2.3.2. Miscellaneous potential cultural factors

*Viewing other drivers as worse than the self.* Walton (1999) surveyed 1006 New Zealand truck drivers for perceptions regarding speed, consideration when driving, relative safety and relative skill compared with other drivers. Drivers tended to view others as less safe, less considerate on the road and as driving at faster speeds, though did not rate themselves as more skilled. Thus, it was argued that truck drivers rated others more negatively than themselves, though not themselves as more highly skilled.

*Attitudes towards enforcement.* Douglas and Swartz (2009) developed a scale for measuring attitudes to enforcement which was piloted with 135 US truck drivers. Factor analysis revealed that perceived effectiveness of enforcement (comprised of consistency and sufficiency), perceived effectiveness of regulations and general attitudes towards regulations were important factors. This pilot survey indicated that attitudes towards enforcement and regulations may serve as relevant cultural dimensions.

*Attitudes towards risk and safety.* Helmkamp et al. (2004) surveyed 1197 logging drivers before training and retested 21% following training. Initially, approximately half the

drivers stated that accidents were part of the job and had experienced a close call. Most drivers felt that safety management and safety meetings were important and over 75% said they would not take a risk for profit. These perceptions were not re-examined, however, training was rated as relevant and the materials as useful.

Despite the above study finding that drivers will not take risks for money, other costs may influence behavioural decisions. Summala and Pihlman (1993) assessed Finnish truck driving behaviour around road work sites following a government campaign targeting speed and safe distance from road workers. Whilst drivers did drive further away from road workers, speed was not influenced. It was argued that drivers were willing to take safety measures with little direct cost, yet small subjective costs may reduce compliance.

Lastly, Spielholz et al. (2008) surveyed 359 company staff and 397 drivers regarding major safety concerns and perceptions regarding organisational safety climate. Whilst company staff and drivers identified similar hazards, they differed in views of safety climate, as drivers expected to be injured and believed risk is part of the job. Both company staff and drivers viewed drivers as having primary responsibility over safety.

From the above studies a number of potential cultural traits can be seen. First, drivers may view risk and incidents as part of the job, and are therefore potentially unavoidable. Second, whilst drivers state that they would not take an increased risk for money, they may be unwilling to sacrifice money or other gains to improve safety and thus value safety if there is no cost. Lastly, drivers may be considered to hold the primary responsibility for safety.

*Attitudes towards feedback.* The last series of attitudes identified relate to attitudes towards feedback. Roetting et al. (2003) conducted focus groups with 66 US truck drivers regarding feedback from technology. Despite wanting feedback, drivers wanted constructive, individualised and respectful feedback from people they respect and perceived as knowledgeable regarding truck driving. Huang et al. (2005) confirmed these findings in 198

US long haul truck drivers, and identified a willingness to accept feedback from technology sources on the proviso that the technology was adequately designed. Zhang et al. (2006) conducted similar focus groups with 36 drivers, six management staff and six police officers from China. Drivers wanted more feedback, but considered feedback to be generally negative. Chinese drivers accepted feedback from technology because it is perceived to be accurate and scientific. Huang et al. (2008) then surveyed 200 Chinese long haul truck drivers. Results were similar, however, Chinese drivers showed no concern regarding the accuracy and design of technology. Thus, similar attitudes towards feedback were found in both Chinese and US truck drivers, with drivers desiring more feedback, and having a strong desire for positive feedback. However, Chinese drivers placed greater trust in technological feedback. It is important to assess how drivers relate to positive and negative feedback and whether behaviour change occurs as a result of feedback. Thus, at a general level, attitudes towards feedback may serve as a relevant cultural dimension.

*Safety climate.* The last paper that was identified in the literature is difficult to place into a single category. Huang et al. (2013) tested a safety climate survey for lone workers using truck drivers as an example. As discussed in Chapter 2 (section 2.3.2), safety climate can be defined as the aggregate perception of workers regarding the priority placed on safety by the organisation (Zohar, 2010) and is sometimes viewed as a snapshot of safety culture (Guldenmund, 2000). Conversely, it can be argued that it is merely a perception based measure of contextual factors, though potentially influenced by cultural factors. Huang et al. (2013) sampled over 7000 US truck drivers, finding a strong relationship between the survey tools and safe behaviour of individuals and safety performance of organisations. The factors which comprised safety climate at a management level were perceived organisational pro-activeness and priority placed on driver safety, and adequate supervision. Factors identified at the work-group level included safety promotion, delivery limits and disapproval of cell phone

use whilst working. From this study, it can be seen that certain safety climate factors may serve as relevant cultural dimensions within the current conceptualisation of safety culture.

#### 4.2.3.3. Summary: Miscellaneous articles

When viewing these articles in terms of the synthesised conceptualisation of safety culture, the above findings can generally be viewed as contextual or cultural in nature. Identified contextual factors included government policies, organisational employee selection, and training and positive safety reinforcement. Potential cultural factors included viewing other drivers as more dangerous, attitudes towards enforcement and regulations, attitudes towards risk and safety, attitudes towards feedback, and potentially safety climate. The synthesised conceptualisation holds that outcomes are the result of behaviour that is influenced by context and culture (section 2.3.5). The papers presented within this section do not relate directly to specific safety outcomes. Further, these papers lacked specific behaviours which had been shown by other research to influence outcomes. Nonetheless, the identified contextual and cultural factors may hold relevance to behaviours and outcomes. Using the same format as Figure 2.1, these contextual and cultural factors have been presented in Figure 4.4.

### 4.1. DISCUSSION AND CONCLUSION

The purpose of this chapter was to explore the literature regarding heavy vehicle driver health and safety through the lens of the synthesised conceptualisation of safety culture. Due to the nature of the industry, there are a number of health and safety concerns including those that relate to crash, non-crash injury and health outcomes. Conducting a systematic review of the peer-reviewed literature regarding heavy vehicle health and safety has identified a number of specific safety-related behaviours, along with a contextual influences and potential cultural influences.

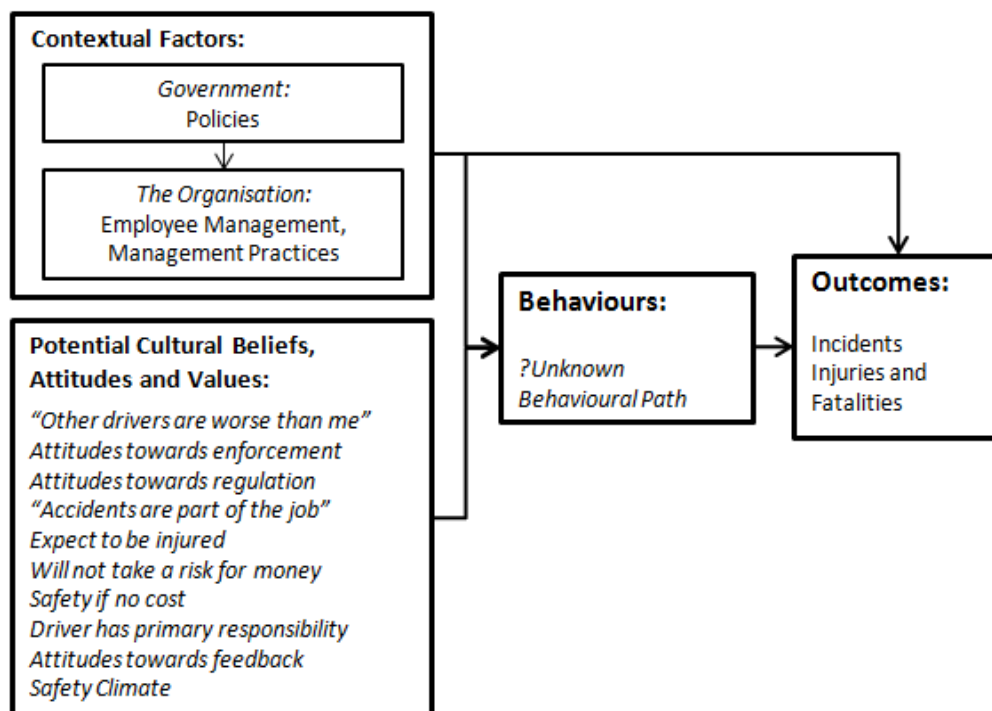


Figure 4.4: Additional factors which may be relevant to a synthesised conceptualisation of safety culture in the heavy vehicle industry

Regarding crash outcomes, behaviours identified included driving whilst fatigued, drug and alcohol use, speeding, seatbelt usage and general driving errors. Contextual factors which were seen to either influence these behaviours, or crash outcomes, included government departments, the organisation, customers, the road environment and the work environment. Potential cultural beliefs, attitudes and values targeted at other truck drivers, enforcement, safety rules, hard work and the trucking image were also identified.

Non-crash injuries received significantly less attention in the literature, however, safe practices when loading and unloading and entering and exiting trucks were seen as target behaviours. Contextual influences included the organisation and road and work environment, along with membership in a workers union. Two potential cultural traits were also identified,

which consisted of beliefs regarding the relative risk of non-crash injuries (when compared to crashes) and that other drivers pose a greater safety risk.

Health outcomes revealed no potential cultural traits, yet the roles of the organisation, road and working environment were again found to be related to these outcomes.

Additionally, a selection of miscellaneous factors were found that highlighted the role of government policies and organisational factors, along with potential cultural factors targeted at other truck drivers, enforcement, risk and safety, feedback and perceptions in the form of safety climate.

The synthesised conceptualisation of safety culture holds that outcomes are the result of behaviour which is influenced by context and culture. By analysing the literature through this conceptualisation, it is evident that, despite an absence of past safety culture research in heavy vehicle industries, much is already known. There has been significant research into behaviours related to safety outcomes, and a significant body of research has explored contextual influences contributing to this behaviour. Further, as culture has been defined as shared beliefs, attitudes and values (section 2.3.5), potential cultural factors could be identified in the literature. Findings from this current literature review provide a significant framework on which to base future research regarding safety culture in the heavy vehicle industry. Future research should identify additional contextual factors to be explored and further investigate the identified potential cultural beliefs, attitudes and values. Additionally, it is important to examine how research could investigate the relationships between cultural, contextual and behavioural factors within heavy vehicle industries. Collective findings from the literature presented here can be found in Figure 4.5 which comprehensively demonstrates specific outcomes illustrated through the literature, the behaviour that directly causes these outcomes, and the contextual and potential cultural factors which influence these behaviours and outcomes.



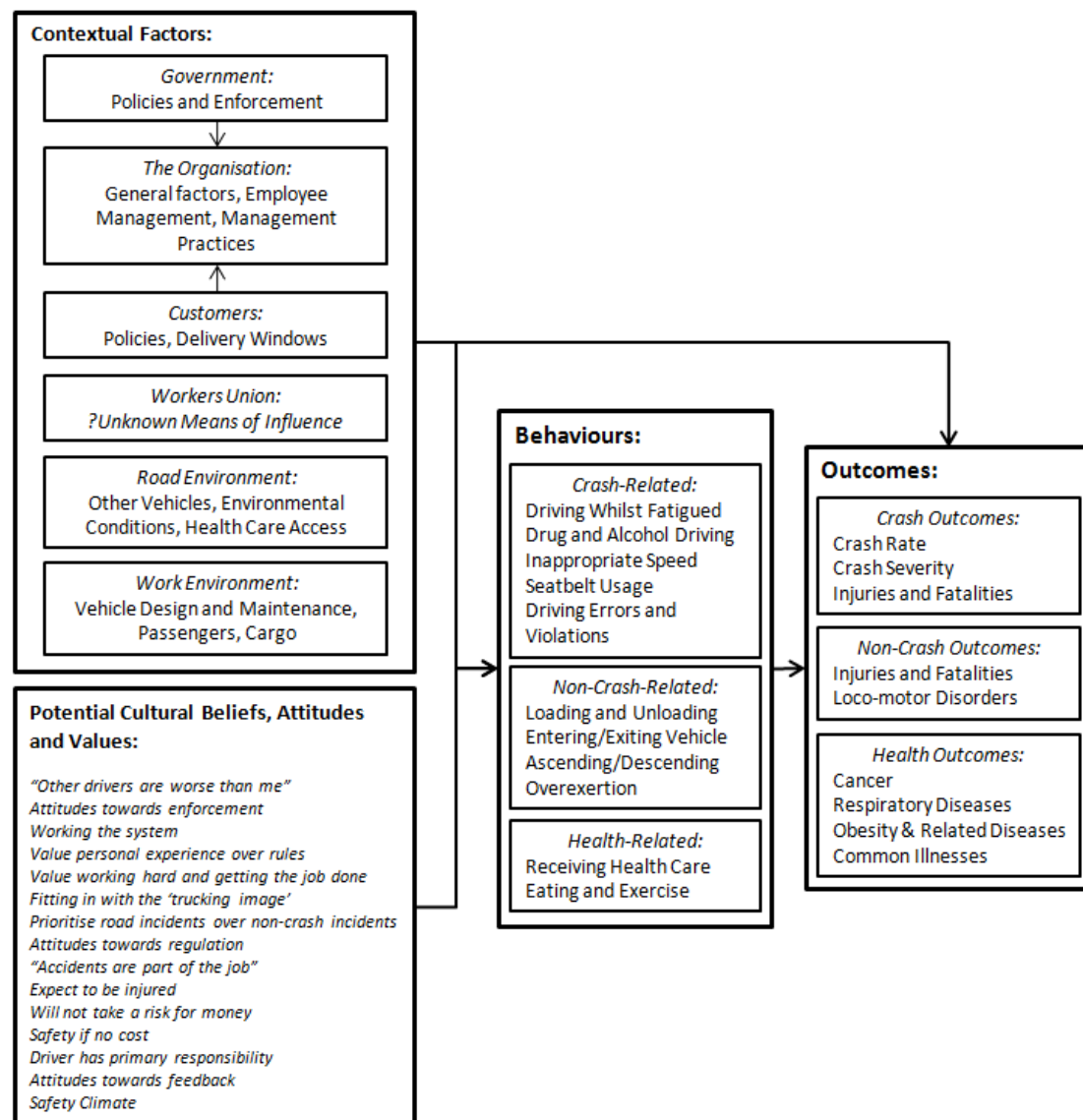


Figure 4.5: A preliminary synthesised conceptualisation of safety culture in the heavy vehicle industry



## **Chapter 5: Study Two – Scouting the Industry: Has the research missed anything? How can we investigate the effect of culture on safety in the heavy vehicle industry?**

### **5.1. STUDY TWO OVERVIEW**

The first purpose of Study Two was to identify major contextual, cultural and behaviour factors which have eluded past research in the heavy vehicle industry, in order to further develop the framework of safety culture from Study One. Further, as it is the interaction and combined effect of cultural and contextual factors which influence behaviour (see section 2.3.5), the second purpose of Study Two was to identify how best to investigate the relationships between culture, context and behaviour to lay the foundation for Study Three.

Study Two consisted of 31 semi-structured industry stakeholder interviews. The current chapter presents results of the interviews. The reporting of results in this chapter starts with findings relevant to the first purpose of the current research. The current framework of safety culture emphasises safety outcomes that are the result of behaviour which is influenced by culture and context. Thus, similarly to the manner in which Chapter 4 presented the results of Study One, this chapter begins by identifying behaviours which influence safety outcomes within the industry. These behaviours then provide a target for cultural and contextual factors to influence. Thus, the chapter then reports the contextual and cultural influences identified in Study Two. Throughout the chapter, in text quotations are used to explain the identified

factors. Conversely, boxed quotes are provided purely for depth of understanding of the text and emersion into the industry's perspective of safety.

A number of individual factors were also identified within Study Two, such as interpersonal relationships and demographics. Whilst these factors are worth considering in future research, to better understand the relative impact of culture and context in the presence of other factors, safety culture is essentially a group level phenomenon. As this research is the first use of the synthesised conceptualisation, and the first investigation of safety culture in the heavy vehicle industry, individual factors are not discussed in the current chapter and can be found in appendix A. The second section of this chapter discusses the findings of Study Two which relate to the second purpose of this study. A number of key differences within the industry were identified by participants. These differences may have a significant impact upon attempts to explore the effect of culture and context on safety within the industry. From these findings the methods and sample selection for Study Three are developed.

## 5.2. STUDY TWO RESULTS: DEVELOPING THE FRAMEWORK OF SAFETY CULTURE

Study Two identified a number of contextual factors and potential cultural beliefs, attitudes and values which influence safety within the heavy vehicle industry. A number of these factors were found in the literature reviewed in Study One; however, others were uniquely identified within Study Two. The following section begins by discussing the behaviours identified by participants as being linked with safety outcomes such as crashes and injuries. Following the identification of behaviours the contextual and cultural factors which were identified as influencing these behaviours or safety outcomes will be discussed. Whilst each of the identified factors will be discussed, those overlapping with findings in Study One will be given brief attention, whereas uniquely identified factors will be discussed in detail.

### 5.2.1. Safety outcomes and behaviours

The synthesised conceptualisation of safety culture emphasises the requirement for contextual and cultural factors to be linked with safety outcomes in order to be relevant to safety culture (section 2.3.5). Whilst contextual and cultural factors may hold intrinsic interest, if they do not influence safety outcomes they are irrelevant to the purposes of investigating safety culture. A number of specific health and safety outcomes and behaviours were identified by interview participants. As with Study One, these behaviours and outcomes can be broadly categorised as crash outcomes, non-crash injuries and health outcomes.

#### 5.2.1.1. Crash outcomes

Throughout the interview process a number of crash-related behaviours were identified. These primarily included fatigue, speeding, and drug and alcohol use. Whilst drug and alcohol misuse can have long-term health impacts, substance use was discussed by participants in relation to driving and is here considered a crash-related behaviour. As each of these behaviours was given significant attention within Study One, only a brief summary of findings is presented below.

*Driving whilst fatigued.* Fatigue was unanimously reported by interviewees to be the single largest safety issue. One manager suggested that fatigue is responsible for approximately 60% of single vehicle crashes. Fatigue was generally recognised to stem from stress, environmental factors, interpersonal factors and government legislation. However, drivers' decisions regarding fatigue management were said to determine fatigue-related incidents.

*Inappropriate speed.* The second most frequent safety concern raised by participants was speeding. Despite the use of speed limiters and satellite tracking, speeding is a regular occurrence within the industry. It was argued by managers that controlling speed reduces crashes. Whilst satellite tracking and organisational enforcement is used to reduce exceeding

the posted speed limit, managers indicated that correct speed for the conditions is a separate issue. Managers highlighted the importance of reminding drivers to drive to the conditions. Further, failure to reduce speed when cornering can result in rollovers, although one driver argued that this is caused by insecure loads and can occur when driving at a typically safe speed.

*Drug use.* Popular opinion holds that illicit drug use is a significant issue within the industry. There was some debate, however, as to the prevalence of drug use. One manager argued that car drivers are detected driving under the influence of drugs more often than heavy vehicle drivers. According to one police officer, drug use in heavy vehicle drivers is hard to quantify, partly as drivers warn one another of on-road enforcement, but that police officers do not see a large connection between truck driving and drugs. Nonetheless, it was suggested that police still detect a number of truck drivers under the influence of drugs. Work pressure, fatigue and financial pressures were argued to contribute to drug use. Additionally, some drivers were argued by managers to use combinations of drugs to manage highs.

*Alcohol use.* Alcohol misuse was a severe issue in the industry's past. Two managers recalled that drivers used to carry a carton of beer in their cab and would either be drinking or hung-over upon arrival at work. One manager even stated that the distance between towns used to be measured by the "*number of stubbies*" you could drink between them. This apparently "*died out*" with the introduction of zero tolerance for alcohol and drink driving reportedly no longer occurs.

#### 5.2.1.2. Non-crash injuries

Despite identifying a number of behaviour scenarios associated with non-driving injuries in the literature, relatively little attention was given to these injuries during Study Two. This may reflect the potential cultural belief that road incidents are much more significant than non-driving injuries (section 4.2.2.2). When asked about these injuries, a

number of managers stated that they never hear about them. This lack of awareness may be related to a potential over-representation, within this study, of managers of line-haul drivers, who typically do not conduct loading and unloading. Nonetheless, some concerns regarding musculoskeletal injuries were raised. Participants stated that during entering and exiting the cab of a heavy vehicle there is a heightened risk of both falls and muscle strains. Muscle strain was also seen to be a concern in manual handling conducted by local ‘multi-drop’ drivers. Thus despite little attention, the identified behaviours align with those identified in Chapter 4 (section 4.2.2).

#### 5.2.1.3. Health outcomes

Whilst heavy vehicle drivers have a reputation for being unhealthy, it was claimed by one manager that required medical checks have reduced this issue. Nonetheless, it was argued that truck drivers are over-represented in one cardiac rehabilitation unit in south east Queensland. Discussion surrounding health outcomes identified healthy eating, psychosocial concerns, and anxiety and stress.

*Healthy eating.* Healthy eating and exercise were identified in Study One (section 4.2.3). Whilst healthy eating was identified as an issue by interview participants, the long-term nature of outcomes related to eating, made eliciting information regarding the causes of these behaviours difficult. Further, healthy eating may be more related to individual decisions than shared beliefs, attitudes and values. Thus Study Two found little information regarding eating choices.

*Psychosocial concerns.* Psychosocial issues were raised as a concern by one government representative so questioning targeted this issue. One manager suggested these issues only become a problem when people label them so. However, it was noted that bullying may occur in some areas of the industry, and despite the pressure to “*harden up*” some individuals have lower tolerance for bullying. Further, it was suggested that some

drivers, particularly those who work nights, are accustomed to working alone and were said to be “*gruff*” and “*weird*”. Though it was unclear whether this may be the result of night work, or that night work attracts such individuals.

*Anxiety and stress.* Participants stated that the industry is full of stress caused by customers and managers. Further, some aspects of truck driving, particularly for drivers of dangerous goods trucks, are naturally stressful. This stress can lead to health concerns, and fatigue. Specific attention was given to post-traumatic stress disorder (PTSD). After significant incidents many drivers can experience PTSD and it was argued that there is a lack of support for these drivers and that WorkCover only offers three counselling sessions. Many drivers were suggested to be afraid to resume work after an incident, particularly fatality-causing incidents, regardless of fault attributions.

#### 5.2.1.4. Other minor concerns.

A number of other safety concerns were raised by interviewees, yet in insufficient detail to warrant discussion, including tail-gating, working alone and the associated risk of injury, seatbelt use, and working from heights. These issues may be significant;. However, as they were raised only briefly by few interviewees they will not be discussed further.

#### 5.2.1.5. Summary: Safety outcomes and behaviours

Study Two confirmed a number of risk behaviours and outcomes from Study One, including driving whilst fatigued, inappropriate speed, drug and alcohol use, dietary disorders, musculoskeletal injuries resulting from falls and muscle strains acquired when entering and exiting a heavy vehicle and participating in manual lifting. While receiving less attention in the interviews, issues such as tailgating, seatbelt use and working from heights were also raised as safety concerns. Finally, the addition concerns of psychosocial issues, anxiety and stress, and working alone were found. The above factors, along with safety



outcomes and behaviours identified in Study One, are presented in Figure 5.1. In the figure, any component which received additional information from Study Two is shaded grey.

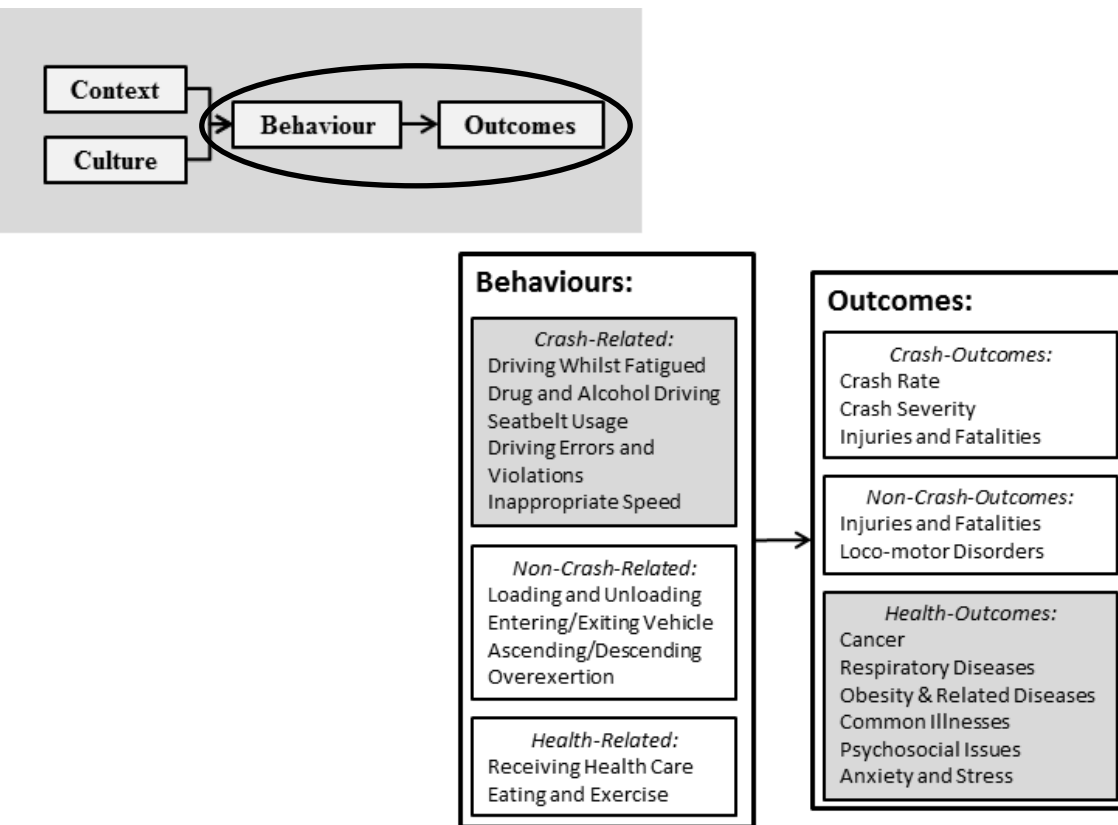


Figure 5.1: Safety-related behaviours and outcomes in the heavy vehicle industry – updated with results from Study Two

### 5.2.2. Contextual Influences on safety in the heavy vehicle industry

The synthesised conceptualisation emphasises safety outcomes that are the result of behaviour which is influenced by culture and context (section 2.3.5). As stated in section 2.3.4, behaviour is not a product of culture alone, but also specific situational or contextual factors. Thus, the context surrounding the driver will interact with the culture of drivers to result in patterns of behaviour. Throughout Study Two a number of contextual factors were identified, categorised as: (1) government; (2) industrial groups and affiliations; (3)

customers; (4) the general public; (5) the temporal context of the industry; (6) the organisation; (7) the contracting organisation; and (8) environmental factors. A number of factors relating to the role of government, the organisation, customers and two separate forms of environmental factors were identified in Study One. As such, the following section will focus on information unique to Study Two.

#### 5.2.2.1. Government

A number of government departments influence heavy vehicle safety, including police and government branches such as the Road Transit Authority (RTA), Department of Transport and Main Roads (DTMR), Queensland Workplace Health and Safety (QWH&S) and WorkSafe Victoria. These departments were primarily indicated by participants to influence safety through law enforcement, and the provision of permits and licences. The findings of Study Two with regards to the influence of government departments on safety aligned with those in Study One, however, additional information was gained regarding fatigue management, the role of specific government personnel, and permits and licensing.

*Fatigue management.* According to participants, fatigue management legislation significantly reduced fatigue in the industry. Whilst this was discussed to some degree in Study One, a number of key findings regarding the industry's perspective should be noted. The specific introduction of Basic Fatigue Management (BFM; in which drivers are permitted to work longer than under standard fatigue management yet must adhere to additional requirements), and the associated requirement for training and accreditation, was suggested to have had major impacts. Additionally, the introduction of chain of responsibility (COR) legislation was suggested by participants to have increased industry efforts to reduce fatigue. Many drivers are reportedly now "*well versed*" in the impact and management of fatigue. However, the exemption of local drivers (working within 200kms of the depot) may limit the impact of fatigue management.

A number of criticisms of the fatigue management legislation were raised. First, fatigue management regulations were argued to be too difficult to understand given heavy vehicle drivers have a lower intelligence. Second, fatigue management legislation was also argued to be a contributor to fatigue. When combining the restrictions of fatigue management legislation with work pressures, it was suggested that there be a minimum number of hours to which a driver must adhere. One manager even stated that work diaries give an “*incentive to drive when tired*” due to their inflexibility. The time at which a driver finishes work on any given day influences the next day’s departure time, thus, drivers may drive when fatigued in order to minimise the impact on the remaining journey. Third, a lack of infrastructure and unforeseen delays means drivers may become stranded between rest locations, thus choosing to either continue driving and risk punishment, or pull over on the side of the road. This may lead to poor sleep quality from road noises and potentially needing to skip dinner. Finally, punishment for clerical errors, and the ease with which some drivers may be able to falsify work diaries, present additional threats to the effectiveness of fatigue management legislation.

*Government personnel.* Attention was also given to the role of enforcement officers. Police officers were identified as implementing on-road enforcement; however, according to interviewed police this is restricted to the enforcement of traffic laws (due to their offence categories). It was claimed that police officers may struggle to detect the heavy vehicle drivers who operate outside of the law and may travel late at night.

Managers discussed transport inspectors, also referred to by one manager as the Department of Transport and Main Road’s (DTMR) “*own police*”. Whilst these officers can enforce a greater number of heavy vehicle laws than police officers, they were argued to offer more lenient penalties. It was suggested by participants that while police give fines, transport

inspectors focus on prosecutions and give infringement notices, which did not require monetary payment.

*Permits and licences.* Study Two uniquely identified provision of permits and licences as relevant to safety. Two interviewed police officers referred to a number of permits they provide for trucking companies, including those for movement of large machines and mining equipment, oversize loads, associated pilot vehicles, and certain special permits (such as drought relief restriction exemptions). Additionally, government departments influence safety through licensing drivers, although industry participants argued licensing to be insufficient and overly arduous. Further, it was suggested that through providing false references to licensing agencies it is possible to bypass certain requirements for licensing.

#### 5.2.2.2. Industrial groups and affiliations

A series of industrial groups and associations, along with groups external to the industry, were identified in Study Two. These groups included the Transport Workers Union (TWU), the Australian Trucking Association (ATA), accreditation schemes, external guidelines and workers' compensation. Whilst the effect of union membership was seen in Study One, accreditation, external guidelines and workers' compensation were not identified in the literature.

*Transport Workers Union.* The TWU organises a number of rallies and protests, applies political pressure on government, and has the power to investigate companies to identify mistreatment of drivers or illegal organisational behaviour. However, a number of issues were raised by members of the industry. In recent years the TWU has argued that heavy vehicle driver payment is insufficient, resulting in a number of safety issues. Whilst the effects of money on behaviour were identified by participants, it was suggested that a lack of pay is no excuse for illegal behaviours and that this TWU focus may be contributing to blame-shifting within the industry, thus reducing driver responsibility. Additionally, it was

suggested that the TWU can be overzealous in pursuing their goals. For instance, one manager detailed campaigns mounted against their company, during which TWU members slandered the company (claiming the company “kills truck drivers” despite zero fatalities), and a TWU representative suggested that if the company joined the TWU they would cease their investigation.

*Accreditation schemes.* A number of accreditation schemes exist within the industry, which eluded previous research. These schemes, though voluntary, may provide a competitive advantage to organisations. The benefits of accreditation may include permission to conduct certain activities, the ability to use accreditation as an excuse to increase compliance in staff and attracting business. Due to these benefits, the safety requirements these schemes place on organisations are positively rewarded.

*External guidelines.* A number of guidelines produced by industry groups outlining ‘best practices’ were identified. These voluntary guidelines can be ‘signed’ by companies concerned about safety. One such example was the Australian Steel Industry Logistics Safety Code (ASI LSC).

*We have codes of practice which drivers are tested on and they’re continually retested on it. It’s basically a booklet that describes fatigue and there is a question and answer section in it. They go through the fatigue one every three months or so. (General Goods Transport Company Manager Four)*

*Workers’ compensation.* Workers’ compensation, or WorkCover, was also discussed. Whilst the benefits of workers’ compensation, particularly for injured drivers, are significant, compensation was suggested to have unintended negative outcomes. These outcomes included encouraging a lack of responsibility in workers. Positively, however, raised premiums resulting from incident levels encourage managers to actively improve safety to reduce costs.

#### 5.2.2.3. Customers

As one interviewee stated, the two biggest influences on safety are the manager and the customer. This view was evident in the number of interviewees who expressed a desire to see greater customer interest in safety. Industry members indicated that the customer holds all the power, due to the ability to financially reward or punish organisations. However, one manager argued that trucking companies need to inform their customers where they negatively impact safety. This dynamic interplay between customers and companies was highlighted by one manager who stated that *“it is a power play whichever way you go”* along the supply chain.

The manner in which customers influence safety aligns with the findings of Study One. As previously stated, customers may significantly improve safety. One manager stated that many companies are *“forced to be safe”* by their customers. Whilst chain of responsibility (COR) legislation may help to improve customer-influenced safety, the logistics safety manager of one large customer company stated that they have a greater fear of injuring people than COR prosecution. Whilst some customers encourage safety, many overtly or covertly encourage unsafe behaviour. A number of industry members highlighted unsafe demands placed on transport companies and delays. Additionally, it was argued that customers often perceive themselves to be immune to COR.

*Customer-company transport-company fit.* One unique theme which emerged from the interviews was cultural matching between customers and transport companies. It was suggested by some participants that larger transport and customer companies place a higher priority on safety and, thus, seek similar-minded business partners. Conversely, smaller customers who do not understand their obligations, or simply want their goods delivered quickly, were indicated to hire like-minded organisations. This matching between customers and organisations may be influenced by the size of the task demand and ability of

organisations, indicating a necessitated relationship. Regardless, there appears to be a cycle of reinforced safety amongst larger companies. Conversely, smaller transport companies struggling to gain employment may accept jobs safer companies will reject, with the only alternative being a sub-contractual arrangement with a larger transport company.

#### 5.2.2.4. The general public of Australia

Study Two again revealed the role of other vehicles on the road, yet additionally identified concern regarding the public image of the industry. Thus, the general public was identified as a category separate to the road environment.

*Other vehicles on the road.* A number of participants indicated that many crashes are not the fault of heavy vehicle drivers. One manager suggested that in 50-60% of multi-vehicle crashes with non-trucks the other driver is solely at fault. These crashes are concerning for the industry, as the other vehicle typically receives the greatest damage to property and passengers. Whilst these exact figures may not be correct, one police officer noted that, within their region, only one of 13 fatal crashes involving trucks in the year (to date at the time of the interview) was the fault of the heavy vehicle driver and none of the 20 fatal crashes in the year prior. Thus, as stated by one manager, drivers are not as concerned by their own competency as they are by the “*competency of the guy coming towards you*”. The manager in question reported their organisation had only had one fatality which occurred when an elderly man cut across the path of a truck. It was stated that the driver was seriously impacted by this event because “*he’s killed somebody, that’s a big deal!*”.

Safety issues regarding other vehicles were attributed mainly to the impatience of car drivers. Participants talked about members of the public going to great lengths to pass a truck, often resulting in multiple unsafe or illegal acts. One driver said that in those situations they would not risk their own life for the stupidity of other drivers and thus may simply allow a crash to happen. Lastly, a number of managers also spoke about car drivers committing

suicide by driving into trucks. The prevalence of this behaviour is difficult to quantify, as deceased drivers cannot be questioned, though managers suggested this behaviour is evidenced by the way a car may appear to target the heavy vehicle.

*The general public's perception of the industry.* Significant concern was raised regarding the general public's perception of the industry, due to their influence on government decisions.

*Truck driving is not high profile or dignified, it's not high honour like a doctor or lawyer, people think truck drivers are drug-fucked scum who don't care... Everyone wants it on rail but when was the last time you saw a train pull-up at Woolworths to unload meat?*  
(General Goods Transport Company Manager Six)

Participants generally expressed that “*public perception is built up against*” heavy vehicle drivers. Interviewees referenced the stereotypes of drivers being addicted to drugs and dangerous, stating that the public believe they are “*all drug-popping murderers*”, or “*drug-fucked scum who don't care*”. Simply put by one interviewee, the “*heavy vehicle culture has been much maligned*”.

*Public perception is that truck drivers are all cowboys and they drive unsafely and they are out to kill motorists... They are people who have families and aren't listened to.* (Transport Association Representative One)

This image may be partly influenced by members of the industry commonly referred to as cowboys, rebels, rednecks or rogues. Participants argued that mass media, through selective news stories, contribute to this problem.

*Media make dramas out of accidents, even when they are not the truck driver's fault, so they get good media coverage. Bad media is rammed down the public's throat, so they believe everything bad about truck drivers.* (Truck Driver Two)



Interviewees argued that stereotypes regarding heavy vehicle drivers serve to deter individuals from seeking a career in the industry, leading to a driver shortage requiring employment of less desirable individuals, and can result in additional government policies. Members of the industry were frustrated by the weight given to public opinion regarding the industry and did not understand why *“people think they have the right to tell [drivers] what they can and can’t do”*.

#### 5.2.2.5. The temporal context of the industry

Throughout the interviews the idea that the industry has significantly changed over recent years was as a common theme. The temporal context of the industry may be relevant to safety, as artefacts of the past influence the current industry. Many participants claimed there have been significant shifts in the culture of the industry, with managers referring to an *“old culture”* and a *“new culture”*. This new culture was described as *“it’s smart to be safe”* and includes the recognition that safety saves money. Whilst the accuracy of the claimed changes may be questionable, one police officer noted that over 20 years ago *“it was easier to get someone for doing something wrong”*. Other participants argued, however, that there has been minimal ‘real’ change in the industry.

*It’s not that different from 30 years ago... It’ll never change; it is what it is... The only real differences is log books and user friendly vehicles* (General Goods Transport Company Manager Six)

Despite recognising changes, many participants suggested there is still significant room for improvement. Change was typically attributed to the role of previously discussed contextual factors, such as government enforcement and customers. Further, interviewees revealed an expectation that the national heavy vehicle regulator (which was yet to be launched at the time of interviews) may lead to further changes.

*Things are getting better, but still a long way to go* (Livestock Transport Company Manager)

*Opportunity for improvement is significant but the change is also significant* (Private Fleet Logistics Manager)

#### 5.2.2.6. The organisation

Industry members indicated that managers have the largest influence on the culture of the industry. Beliefs, attitudes and values of managers were said to filter down to drivers. While the ability of managers to shape culture is a contentious issue in the literature (e.g. Haukelid, 2008; Nævestad, 2009), industry members perceive management to play a significant role in safety. As many organisational factors identified in Study Two align with the findings of Study One, the following discussion focuses on new information, giving emphasis to the good and bad safety management practices and employee management.

*Practices of good safety management.* Participants described a number of good safety management practices including: (1) a commitment to safety; (2) adequate communication of safety concerns; (3) organisational monitoring of behaviours; (4) practical management strategies (e.g. prioritising safety over operational concerns, rewarding positive behaviour while punishing negative behaviours, and use of safe technologies); and (5) supportive management techniques (such as informing drivers that it is acceptable to run late).

*We have a process in place at the moment where we actually printed out some stickers to put on all our transit envelopes that just says if you're tired pull up and ring the 1800 number. And we sporadically do that just so we're not doing it all the time so it keeps it in front of the driver's faces that they know that they can pull up at any time, if they feel tired they need to stop.* (General Goods Transport Company Manager Four)

*Characteristics of poor safety management.* Industry members also highlighted negative practices with one manager stating that “*there are not a lot of bad drivers, just bad managers*”. Negative practices included prioritisation of profit over safety, application of overt and covert pressures, and poor driver infraction management. It was suggested that pressures typically result from the financial gain resulting from high performance. It was suggested that whilst upper management typically value safety, lower management may pressure drivers for financial gain. Further, high levels of competition and undercutting within the industry can increase pressure to acquire contracts, leading to “*cutting corners*”, as “*doing things legally costs more*”.

*Employee management.* Practices regarding employment, training and payment may also influence safety as previously demonstrated in Study One. Additional information was gleaned in the stakeholder interviews. First, it is important to note that most participants highlighted a perceived driver shortage within the industry, which may exert pressure on managers to employ sub-par individuals. Managers discussed the importance of good driver recruitment, noting that “*transport is not all driving*”. Attributes looked for in new employees include positive references and driving history, employment stability, the personality and demeanour of drivers, and their trainability. It was suggested that drivers will “*find [companies] that suit them*”, due to similar beliefs and values. Similarly, interviewees suggested that a “*good driver wants to keep their job with a good company*”. Thus, driver selection is also a matter of cultural matching between drivers and companies.

Whilst the influence of training was identified within Study One, a number of participants also discussed the importance of inductions. One manager claimed that the primary goal of inductions was to determine the fit between the individual and branches of the company. Inductions are also used by employers to offer training regarding safety policies and procedures. Further to formal training sessions, some managers referred to informal

training occurring through driver-driver mentoring, and one manager indicated this to be the only training conducted within their company. Finally, Study Two confirmed the finding that payment by trip or distance increased unsafe behaviour.

#### 5.2.2.7. The contracting organisation

Subcontractors, also referred to as contractors or subbies, form a significant portion of the transport industry. Subbies are typically individual drivers, though smaller companies may subcontract to larger organisations. The relationship between a subcontractor and the company they work for is similar to the organisation-customer relationship. It was suggested that in recent times customers have placed more emphasis on adequate safety management of subcontractors as a requirement for employment. Similarly to what was shown regarding owner-operators in Study One, subbies may pose a significant risk due to increased financial pressure.

*... it is the subcontractors they employ which I believe is probably one of our biggest risk areas. We don't have a direct relationship with them, we don't know what their standards and systems are. The head carrier is required to ensure they have processes to ensure they are compliant and legal. Not sure how robust that is. I have a personal feeling about the one man one truck subcontractor, I think if anyone is going to break the rules it will be those guys. Coz they are more interested in making a dollar than doing anything else.*

(Steel Transport Company Manager)

*It's getting too hard economically for an owner driver to survive these days. He's better off driving for an NQX or a Toll or somebody like that... than to be trying to get into the marketplace and do loads ad hoc wherever, he might work he might not then to make his truck payments.* (General Goods Transport Company Manager Four)

*Contracting company policies.* It was argued that when contractors are motivated to improve safety they will, thus the contracting organisations can significantly influence subbie safety. Similarly, one government representative stated that “*contracts drive change quicker than safety*”, as “*when safety is a personal issue, it can’t be done, but when it is a contractual issue, then they can do it*”. In the below quote one manager detailed his approach to managing subcontractors:

*“If we employ a contractor or a fleet driver to do a task, we would ask him to be Trucksafe accredited, NHVAS (National Heavy Vehicle Accreditation Scheme) accredited, fatigue accredited, and we would be asking him to do exactly the same things we do. We then actually go out and do an audit on them. Like myself, I am a qualified auditor, so I would go into their business and frequently audit their business down the path of all those compliance issues to make sure that they are being compliant. So the fleet driver would have satellite tracking, he would have his drivers accredited in fatigue, he would have some NHVAS maintenance and mass so his equipment is going to be roadworthy and his drivers are going to have a medical, and all those sorts of issues would be checked by us so that they meet at a minimum our standards... What normally happens with a fleet driver is that we can either see his tracking, or we put the satellite devices in their prime movers. So we get all the data regardless. So that way we can monitor speed and fatigue in all those fleet drivers. We only see the data if there is an issue or a compliance issue. So if he speeds we get an email and if he goes over his driving hours we receive an email.”* (General Goods Transport Company Manager Four)

#### 5.2.2.8. Environmental factors

Relatively little information regarding environmental factors was gained from Study Two. Whilst other vehicles were identified, they were re-categorised as the general public.

Only the influence of environmental factors on fatigue was further discussed in Study Two. Industry members highlighted that the need for constant concentration and the lack of comfort in the cab of the truck can contribute to fatigue. Night-time driving may lead to drivers fighting their 'body clock' in order to stay awake. Whilst there are a number of available rest stops for drivers, many managers and drivers suggested that sleep at such locations was impossible. For example, it was stated that noise from members of the general public make sleeping in such locations impossible. Additionally, it was suggested that there is insufficient infrastructure for the current demand. These issues led one organisation to roster all drivers to be home by night-time through the use of changeover drivers at midway points.

#### 5.2.2.9. Summary: Contextual influences on safety

Study Two added significant depth to the developing framework of safety culture with regards to the role of government, customers, the organisation and environmental factors. Additionally, a number of new factors were identified relating to the role of the general public, industrial groups and affiliations, the contracting organisation and the temporal context of the industry. The new information obtained in Study Two is summarised below.

Regarding government departments, Study Two identified COR and fatigue management legislations, as well as permits and licences, and the differences between police and transport inspectors. Although Study One identified the role of a workers' union, Study Two elaborated with a collection of similar external bodies, including the Australian Trucking Association (ATA), accreditation schemes, external guidelines and workers' compensation bodies, which were collectively categorised as industrial groups and affiliations. Study Two confirmed the role of customers in safety and provided insight into the mechanisms through which customers influence safety. Although other vehicles were identified in Study One, the combination of these vehicles and public perception regarding the industry were categorised under the general public. The role of the organisation was also

confirmed, though additional detail on specific organisational practices were highlighted, including general positive and negative practices, inductions, training and payment. Adequate rest locations, cabin design and the time of day were again revealed as important environmental factors. Additionally, however, Study Two uniquely found that the temporal context of the industry and the subcontractual relationship may be important for safety. When these findings are combined with those from Study One, a more developed framework of contextual factors which influence safety outcomes can be provided. Figure 5.2 contains the contextual factors which have been identified in Studies One and Two. In the below figure, components that received additional information from Study Two are shaded grey.

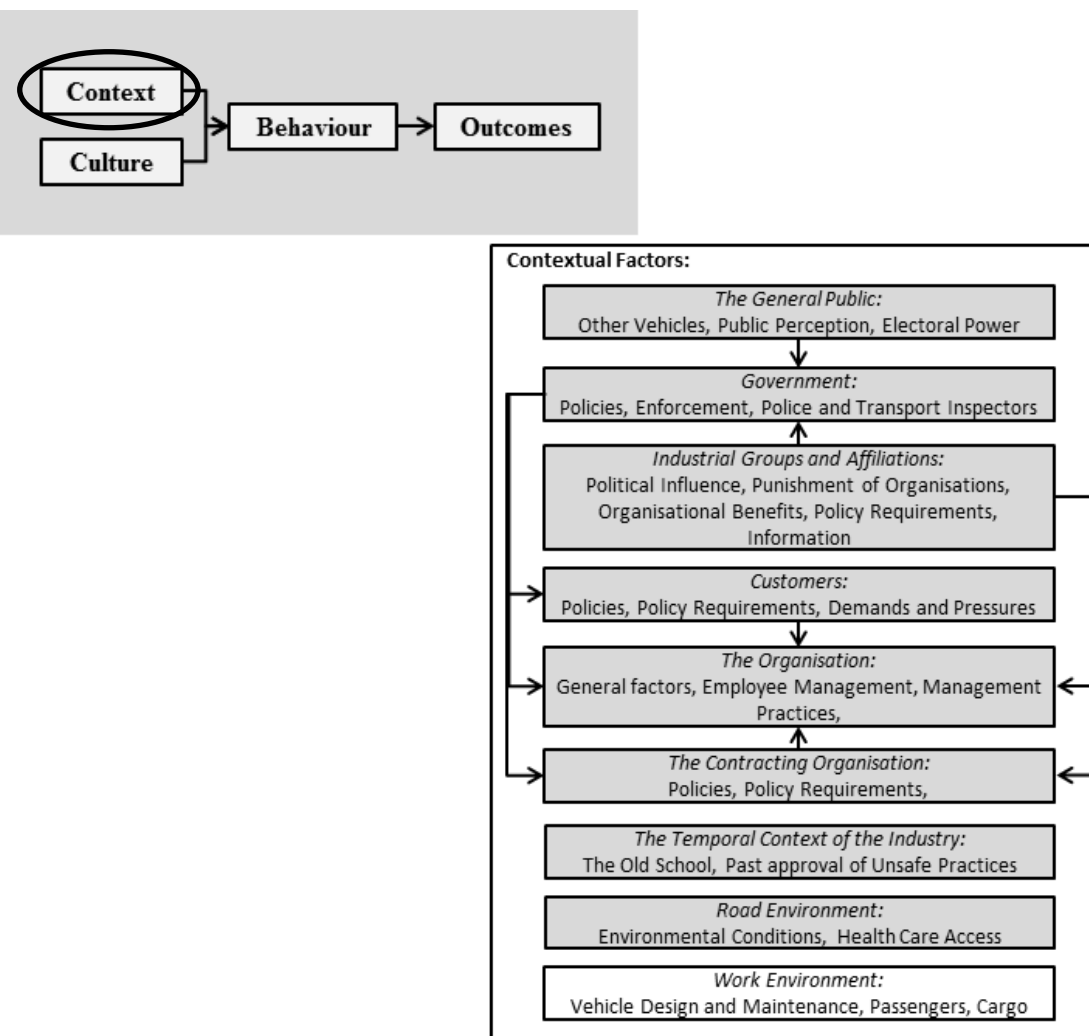


Figure 5.2: Contextual influences on safety in the heavy vehicle industry – updated with results from Study Two

### 5.2.3. Potential cultural beliefs, attitudes and values

The above discussion highlighted safety outcomes and behaviours and contextual factors which influence behaviours and outcomes. The remaining component of the synthesised conceptualisation of safety culture is cultural factors (see section 2.3.5) which are comprised of a series of shared assumptions, beliefs, attitudes and values. Study One highlighted a number of beliefs, attitudes and values shared by members of heavy vehicle industries which influence safety. These were labelled as potential cultural factors due to the lack of deliberate investigations of culture and shared nature of these factors. Study Two also identified a number of beliefs, attitudes and values which were suggested by participants to influence safety. Study Two's findings were largely drawn from managers and non-industry personnel, so the cultural factors identified remain referred to as 'potential' factors. It is unclear whether these factors are shared by drivers. Potential cultural factors identified in Study Two included beliefs and attitudes towards enforcement and regulations, beliefs about the general public, the 'old school', lifestyle and autonomy, money hunger, attitudes towards safety and risk, and attitudes towards family and friends. Each of these factors are discussed below, and where these findings overlap with similar findings in Study One this is noted.

#### 5.2.3.1. Beliefs and attitudes towards enforcement and regulations

Many members of the industry supported the need for enforcement, yet there was a belief that enforcement is insufficiently applied. Further, when enforcement is applied, it is often perceived as unfair or misdirected. These beliefs align well with attitudes towards enforcement identified within the literature.

#### 5.2.3.2. Beliefs about customers

As discussed, a number of managers and drivers stated that customers hold "*all the power*". Despite the fact that power relationships between customers and the industry may be



relatively equal in reality, this perceived power may result in drivers complying with unsafe demands. A number of other factors also influence this perception, including levels of competitiveness within the industry. Further, this belief may reflect the motivation of drivers, particularly when linked to the value placed on money and the ability of customers to offer financial reward (see section 5.2.3.5). This belief was spoken about by many of the industry members and warrants further attention.

#### 5.2.3.3. Beliefs about the general public

As noted in section 5.2.2.4, industry members believe that a negative image has built up around the industry. Participants found this image was unfair and inaccurate, and felt maligned. Whilst this may indicate overconfidence in the level of safety within the industry or, as shown in Study One, the view that other drivers are more dangerous (e.g. section 4.2.2.1), there was also a significant emphasis on the general public ‘telling them what to do’. However, this may also reflect an assumption that the industry should regulate itself. Thus, further investigation is needed to determine whether these attitudes and statements reflect a specific attitude toward the general public or a broader set of cultural factors.

#### 5.2.3.4. ‘The old school’

Members of the industry commonly discussed a ‘new culture’ and an ‘old culture’. Whilst discussions of the ‘old culture’ centred upon past practices and attitudes, individuals who still prescribe to these practices were referred to as ‘old school’.

*Remember that a lot of these people, it's an older workforce and some old habits are very difficult to change even though we try very hard to make sure those people don't do the wrong thing, there is always a case or so of 'I've been driving for 30 years and never had an accident', 'well you should go and by a lottery ticket because the way you are –*

*– restraining your loads you’re going to have one in the near future’... they roll the dice too often. (Steel Transport Company Manager)*

Old school individuals were commonly identified as being tough, taking greater risks, having unsafe habits, wearing injuries as a “*badge of honour*”, and holding a “*loyalty to the culture rather than to the company*”.

*They broke every rule in the book. It was the culture back in those days. There was an expectation from management – the culture was promoted to move freight quickly. (Manager of a medium sized transport company in Queensland)*

Similarly, it was indicated that old school individuals were more likely to engage in drug use. It was also suggested that in previous times, there was a mindset to take drugs and that this mindset was not questioned. Whilst these negative aspects were considered to be being replaced by a newer, safer, culture, the values and beliefs associated with perceived affiliation to the ‘old school’ may remain within the industry and warrant further investigation. Additionally, it is important to determine whether being ‘old school’ influences behaviour or is simply a description of people. If it is simply a descriptor, the characteristics used to identify someone as old school may be more relevant to behaviour than actually being ‘old school’.

#### 5.2.3.5. The lifestyle and autonomy

It was often suggested that life on the road carries a certain “*sense of freedom*” and that truck driving “*gets in your blood*”. It was stated that, whilst truck drivers initially view it as just a job, it eventually “*becomes part of them*”. This lifestyle, particularly when spending a long time on the road, may negatively impact drivers’ families, however, drivers were indicated to become accustomed to the lifestyle and unwilling to work in a different occupation.

Closely associated with the lifestyle of trucking is the high degree of autonomy held by drivers. Whilst autonomy is a natural part of the industry, it may also be the reason some drivers are attracted to the industry. It was argued that some drivers simply want to “*not answer to anyone*”. This autonomy, or the desire thereof, was commonly suggested to influence driving whilst fatigued, as only the driver is capable of knowing when they should rest and must make that decision alone. Additionally, some drivers reportedly desire input on trip planning and may opt to drive outside of hours to meet non-work commitments.

*Drivers choosing, a lot of it is. They're funny... I've been around drivers for 40 years and they are a world of their own. They make some bad decisions at times and one of them would be to keep driving instead of stopping within their 5.5 hours and having a 15-minute rest, some of them will drive for seven to eight hours and then have a break. (Steel Transport Company Manager)*

#### 5.2.3.6. Money hunger

A number of industry members suggested that there is an alarming level of ‘money hunger’ in the industry. Drivers, particularly under 40 years of age, were stated to “*need to have all the toys*”. Due to the desire for money, some drivers will exceed legal hours or drive with excessive speed in order to increase their pay. This was indicated to further contribute to drug use in order to stay awake. This directly contrasts the finding in the literature that drivers will not take risks for money.

#### 5.2.3.7. Attitudes towards safety and risk

As stated by one manager, despite seeing enough incidents to realise truck driving can be dangerous, many drivers believe that they are skilled enough to avoid an accident. Additionally, it was suggested that ‘cowboys’ within the industry take higher risks on a regular basis, believing that outcomes associated with unsafe behaviour will not occur for

them. These beliefs align with the emphasis on personal experience over rules, identified in Study One, which may lead drivers to falsely believe that they can avoid crashes and the belief that other drivers are more dangerous. Conversely, however, a small number of drivers were indicated to hold fatalistic attitudes towards incidents. This aligns with the expectation of injury identified in Study One (Spielholz et al., 2008). Further investigation regarding the differences in these attitudes is required.

#### 5.2.3.8. Attitudes towards family and friends

Heavy vehicle drivers place significant value on friends and family members. It was indicated that, in order to avoid letting down or delaying a changeover driver, or to ensure they are home early, drivers may take significant risks. Whilst these are normal desires, the risks associated with rushing when driving a truck are significant. Further investigation is required to determine whether this is truly a cultural factor or the influence of these friends and family.

#### 5.2.3.9. Summary: Potential cultural beliefs, attitudes and values

Study Two identified a number of potential cultural beliefs, attitudes and values which may form key components of safety culture within the industry. These included beliefs and attitudes towards enforcement and regulation, beliefs about customers, beliefs about the general public, the old school, the lifestyle and autonomy, money hunger, and attitudes towards safety, risk, family and friends. A number of these factors overlapped with findings of previous research. Beliefs and attitudes towards enforcement and regulation mirrored those found in Study One. Further, the findings regarding money hunger and the identified attitudes towards safety and risk added further depth to similar factors identified in Study One. The remaining factors were unique to Study Two. Factors identified in Study Two, along with those in Study One (but not within Study Two), have been combined in Figure 5.3. Specific

factors identified in both studies were thematically categorised for easier understanding, resulting in additional categories of work-related attitudes and beliefs and attitudes regarding the organisation. As many of these cultural factors gained additional information in Study Two, the entirety of this figure is shaded grey.

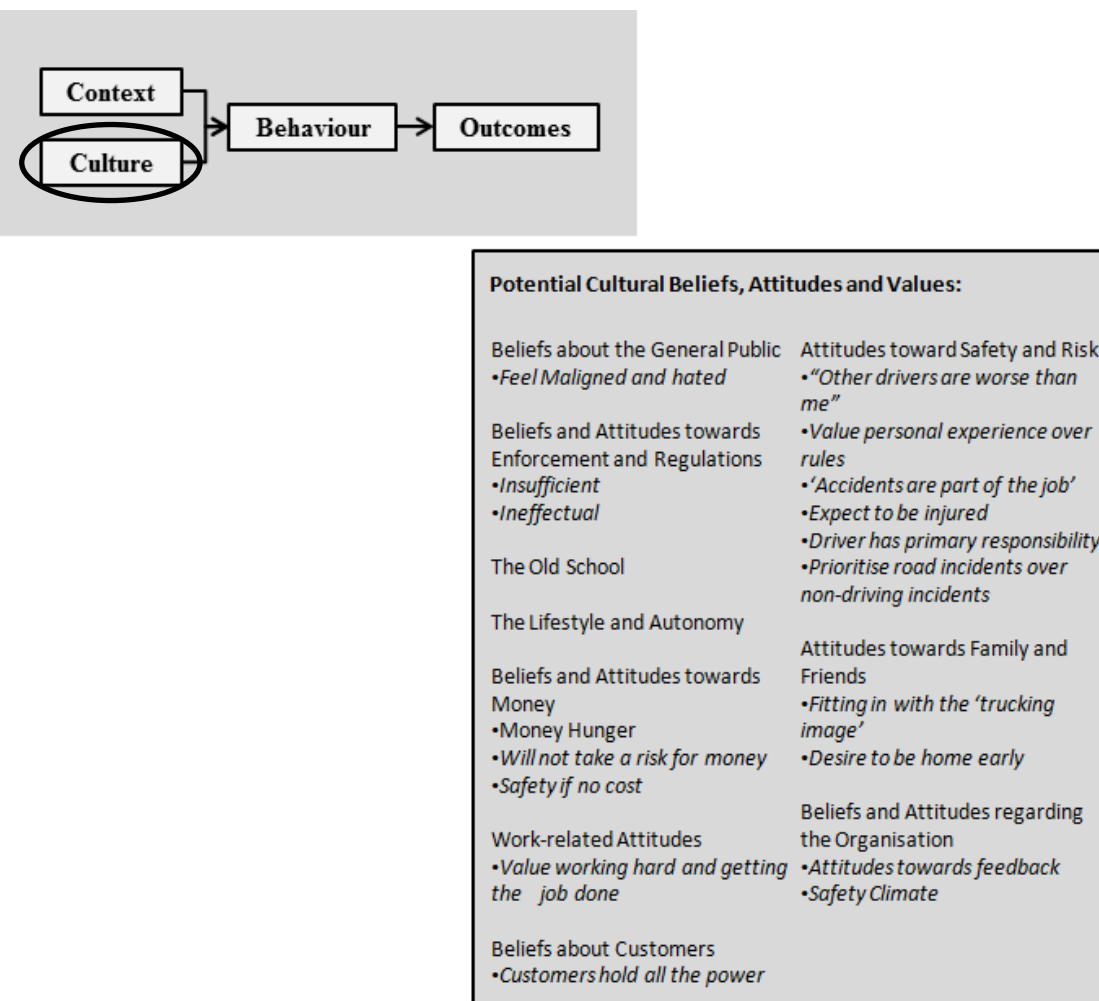


Figure 5.3: Potential cultural beliefs, attitudes and values which influence safety in the heavy vehicle industry – updated with results from Study Two

#### 5.2.4. A general framework of safety culture in the heavy vehicle industry

Study Two added depth and detail to the contextual and cultural influences identified in Study One by identifying a number of additional factors. New factors identified in Study

Two included contextual influences (such as the role of public perception, specific government personnel who enforce safety policies, the temporal context of the industry, and the role of subcontractual agreements) along with a number of additional potential cultural traits (such as beliefs about customers and the general public, attitudes towards family and friends, the old school, and the lifestyle and autonomy).

Combining the results of Studies One and Two allows a general framework of safety culture in the heavy vehicle industry to be provided (see Figure 5.4). As discussed in section 2.3.5, the synthesised conceptualisation emphasises outcomes which result from behaviours which are influenced by contextual and cultural factors. Whilst the specific details of the identified factors may differ between organisations, the framework provides a useful starting point for investigating the relationships between cultural, contextual and behavioural factors within the industry. In order to understand the effect of culture on safety it is necessary to understand how both culture and context interact to shape behaviours and, therefore, outcomes. Prior to investigating relationships between these factors, there is a need to identify the best method of exploration. Thus, the second aim of Study Two was to ascertain the best technique to explore the relationships between these factors.

### 5.3. PREPARING FOR STUDY THREE

A number of differences within the industry were evident throughout Study Two. Regional variation in government departments, voluntary accreditations, and differences in organisational and customer policies and procedures highlight that many drivers operate under very different contexts. Additionally, though Sully (2001) suggested that there may be a shared road culture across the industry, the results of Studies One and Two only partially support this finding. There were a number of potential cultural traits which appeared to either compete or only be present in some drivers. This may indicate the presence of smaller sub-cultures, multiple cultures within the industry, or that these factors are not part of the culture.

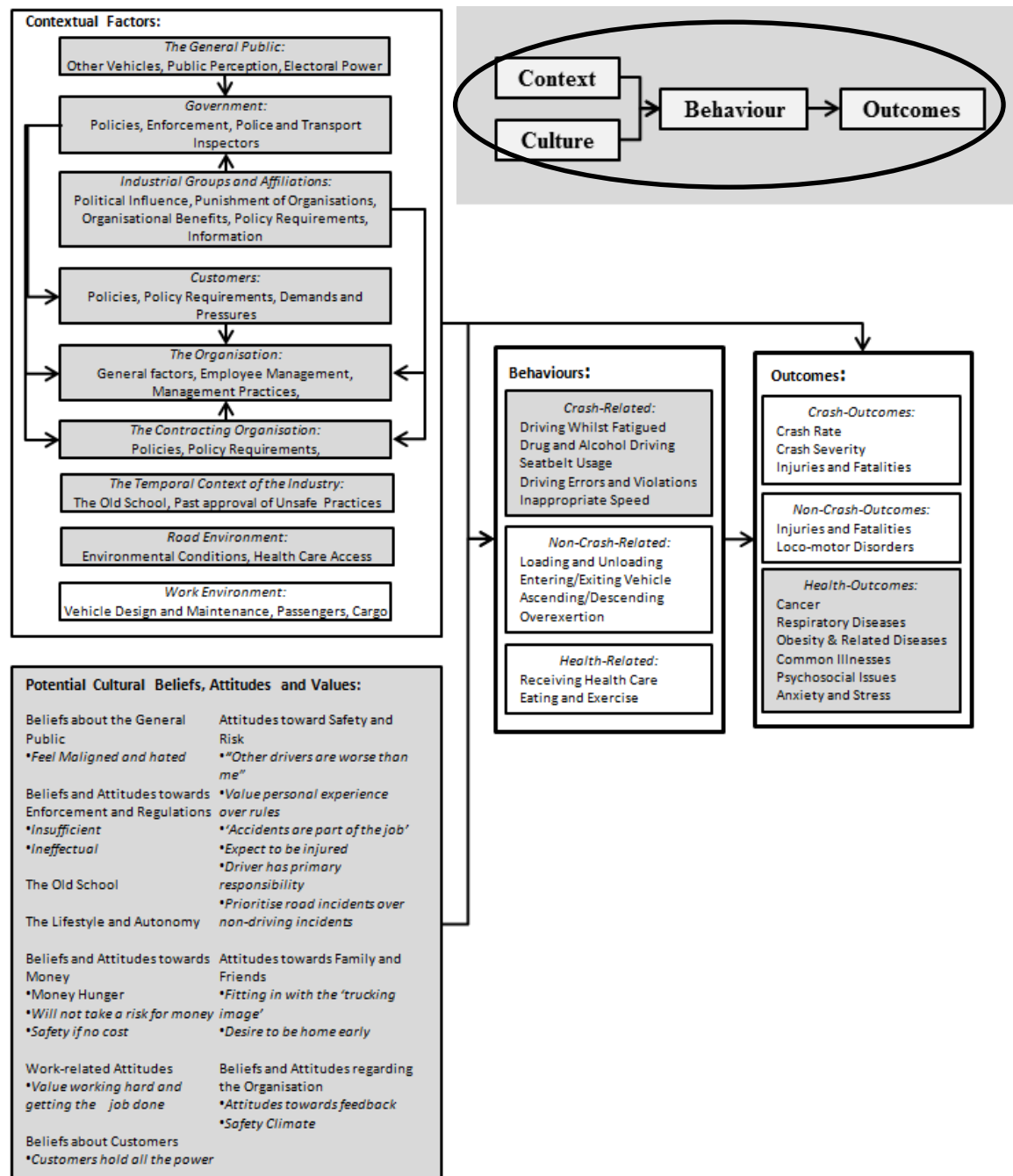


Figure 5.4: A general framework of safety culture in the heavy vehicle industry

As discussed in Chapter 2 (section 2.3.1), cultural beliefs, attitudes and values can be resistant to change. Thus, it was argued (section 2.3.5) that through understanding the existing culture, changes could be made in contextual factors that interact negatively with

culture. For Study Three to explore the positive and negative interactions between culture and context, it is important to find common cultural factors within the industry and examine their relationship to safety in the presence of contextual differences. Due to the difficulty in determining whether cultural factors are shared, there is a need to explore the culture of smaller subsections of the industry and then, through comparison, determine which factors are shared. Thus, Study Three must explore the relationship between contextual, cultural and behavioural factors in distinct subsections of the industry.

### 5.3.1. The heterogeneity of the industry

Study Two identified a number of differences within safety outcomes of transport organisations and drivers throughout the industry. These differences were commonly attributed to organisational factors, similar to the general organisational factors identified in Study One. This included the size of the transport company, the distance that goods are carried, type of goods carried, location of the depot, and size and type of trucks used. Each of these factors is discussed below.

#### 5.3.1.1. Size of transport company

A number of industry members suggested that the size of the transport organisation led to significant differences between organisations. It was suggested that due to differences in financial pressures, existing business structures and risks of detection and prosecution, smaller companies pose a significantly greater safety risk. Participants reported that small organisations (below five or 10 vehicles) comprise the majority of the industry. Whilst the proportions of business sizes within the industry was unclear, one manager suggested that approximately 85% of businesses were either owner drivers or small companies, 10% were family owned businesses with between five and 100 trucks, and the final 5% were comprised of large, often publicly owned businesses (see Figure 5.5).



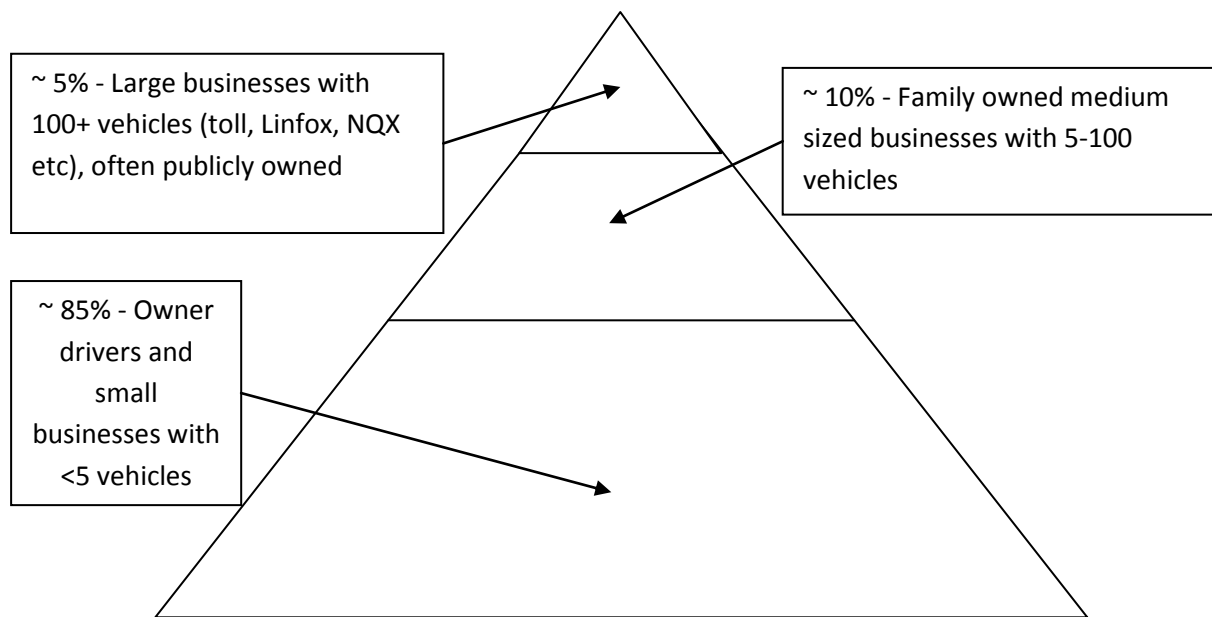


Figure 5.5: Overview of the industry by size of company\*

*\*Reproduction of a sketch provided by a manager of a medium-sized business.*

Financial pressures were indicated to produce the majority of differences between large and small companies. Being an owner driver was suggested to be the “*toughest job in the industry*”, due to the large costs of owning a heavy vehicle (e.g. vehicle cost, registration, insurance, maintenance and fuel). Thus, owner operators must ensure a regular flow of income. For this reason, both owner drivers and small businesses were said to take greater risks. Additionally, new small company owners were indicated to have little understanding about the costs associated with operating a transport company. This places further financial pressures on these organisations, leading to greater risk-taking behaviours. Larger companies, however, were suggested to be more financially secure. Thus, one manager from a large transport company stated that their business “*will do its own thing*”, but always complies with the existing legislation and regulatory framework.

*I have a personal feeling about the one man one truck subcontractor, I think if anyone is going to break the rules it will be those guys. Coz they are more interested in making a dollar than doing anything else. (Steel Transport Company Manager)*

The characteristics of good and poor safety management, discussed in section 5.2.2.6, were also suggested to align with the size of the company. For instance, in smaller companies, managers were said to prioritise profit over safety and give tighter schedules to drivers. There was also a perception within the industry that government departments target larger companies when enforcing policies. Due to the increased risk of prosecution one manager stated that *“the big guys play by the rules because they have more to lose”*. Conversely, it was argued that ‘the 85%’ of the industry, which pose a greater risk, remain undetected.

#### 5.3.1.2. Distance of haul

Another key characteristic differentiating between drivers and organisations was the distance over which goods are carried. Many participants strongly defended the character of line haul (or long-distance) drivers. For example, one manager stated that the *“guys on articulated trucks doing the long drives”* were *“generally good blokes”* who view their work as a *“decent full-time job”*. Local drivers, however, were indicated to be different. Despite insufficient detail as to how the drivers differed, a number of differences in the nature of line-haul and local work were identified. As simply put by one manager, local driving is *“shit work”*. Local driving is often very physical work requiring little intelligence and, thus, it was argued that intelligent people are not attracted to this kind of work. Local work was typically viewed as a ‘starting level’ for new drivers, as a company can easily send assistance in the case of an incident. As such, local drivers may be less experienced. Despite using local work as a platform for beginning line-haul work, it was noted that some drivers *“get stuck there”* due to family commitments and lack of success in getting better-paying jobs.

#### 5.3.1.3. Type of goods

Participants also indicated differences in the risks associated with different goods. It was suggested by participants that these differences have led to different subcultures between transporters of differing types of goods. For example, it was claimed that refrigerated goods transporters along the ‘coast highway’ have a particular propensity to speed and that petrol tanker drivers experience different levels of stress due to the higher potential for harm associated with crashes. Finally, as previously noted, certain goods sectors may also have their own codes of practice.

#### 5.3.1.4. Location of depot and organisation

The industry can be further differentiated through the location in which the company is operating. One large transport company manager argued that even within their own company there are regional variations between depots and, thus, there is a difficulty maintaining an organisation-wide culture. It was often noted by participants that sub-cultures between regions are common. For instance, one respondent highlighted differences between coastal and rural regions. These differences may be confounded, however, by the type of goods common to certain regions. One example of these variations was that Rockhampton is dominated by mining transport, whilst Cairns has a stronger farming influence.

#### 5.3.1.5. Size of trucks

Finally, it was suggested that safety within the industry differs according to the size of trucks being used. A number of interviewees suggested that there were differences between the drivers of larger and smaller trucks. Additionally, it was suggested that larger vehicles may pose inherently higher risks simply due to the size of the vehicle.

*I think the accident rate (between road trains and B-doubles or semis) would be quite significantly higher within the road train network.*

Interviewer: Is that simply because of the vehicle or...?

*Yeah I think so yeah, it's just the swept path of the road train as opposed to a B-double, I don't think the licensing process is good enough in Australia because they can get a B-double licence and jump into a road train. I think there is too much of a gap there for them.*

(General Goods Transport Company Manager Four)

#### 5.3.1.6. Case studies as a way forward

Given the need to examine sub-sections within the industry, and variations within the industry as highlighted above, Study Three aimed to sample a broad variety of the above factors. Based on the above findings, this would require examining separate organisations of different sizes, based in various locations, utilising diverse types of trucks, and carrying differing goods over different distances. Thus, Study Three uses case studies with specific transport organisations to explore the relationships between contextual, cultural and behavioural factors.

### 5.4. STUDY TWO CONCLUSION

Study Two aimed to identify factors within the heavy vehicle industry which have eluded previous research and to identify the best methodological approach to investigating the effect of culture on safety in the heavy vehicle industry. As discussed in section 5.2.4, Study Two added significant depth of information to factors identified in Study One and identified a number of additional factors. By combining the findings of Study One and Two, a framework of safety culture within the heavy vehicle industry was presented.

With regards to the best methodological approach to use for investigating the effect of culture on safety, it was noted that there was apparent variations with regards to contextual

and cultural factors, requiring the investigation of sub-sections of the industry. Throughout Study Two, industry members highlighted a number of organisational factors which were suggested to result in significant variance within the industry. Thus, it was apparent that the subsections of the industry which should be investigated in Study Three, which is the focus of Chapters 6 to 10, are specific transport organisations. This indicates that case studies conducted with transport organisations would provide the best approach with which to investigate the effect of culture on safety.



## **Chapter 6: Study Three Preface – Case Studies Summary and Chapter Breakdown**

### **6.1. STUDY THREE OVERVIEW**

The previous two studies identified a number of contextual influences and potential cultural traits that were demonstrated by previous research (Study One), or indicated by participants (Study Two), to influence safety-related behaviours. Thus these studies addressed the first three aims of the current research project (see section 3.2.1). That is: (1) Study One demonstrated that the key components of the synthesised conceptualisation of safety culture (culture, context and behaviour) were suitable for examining safety in the heavy vehicle industry (Aim A); (2) Study One identified a number factors previously identified within the industry which comprise the key components of the framework (Aim B); and (3) Study Two identified major factors which had eluded previous research (Aim C). From the findings of these studies, a general framework of safety culture in the heavy vehicle industry was developed.

Study Two also sought to identify the best approach to investigating the effect of culture on safety within the industry (Aim D). At the conclusion of Study Two, it was found that there were perceived differences within the industry, related to the size and location of the organisation, type of trucks utilised, type of cargo carried and distance carried. Thus, the industry cannot be analysed as a homogenous unit, as the culture of specific organisations

may differ and specific contextual factors, such as regulations, accreditation, customers and organisational structures and systems, may vary. These variations within the industry preclude the possibility of exploring the influence of culture and context on behaviour at an industry-wide level. Therefore, in order to examine how cultural and contextual factors influence safety-related behaviours, it is necessary to conduct case studies with specific transport organisations.

Study Three aimed to examine how cultural and contextual factors affect safety-related behaviours in the heavy vehicle industry (Aim E). Three case studies were used, forming what is known as a collective case study, where the cases are selected to inform the understanding of the effect of culture in the wider industry. Thus, the selection of cases required organisations which sample the diversity of the industry. By necessity, cases were partially selected out of availability, in addition to meeting the selection criteria. The three selected organisations possessed a number of differences, shown in Table 3.1 (see section 3.2.3.4.3). As stated when discussing the participants for this study, it is necessary to protect the confidentiality of participants. Therefore, no further details will be provided about the age, gender or history of participants when discussing individuals within the case studies. In some cases, such information is provided, but only where deemed relevant to the aims of the research and where confidentiality can be maintained.

Whilst a number of contextual and potential cultural factors have been identified in the previous two studies, Study Three explicitly aimed to examine the impact of such factors on behaviour. However, due to the lack of previous research on culture within the industry, and the lack of driver interviews in Study Two, the first two studies provided insufficient detail regarding the culture of the industry. In order to explore how cultural and contextual factors influence safety-related behaviours, there is a need to better explore cultural beliefs, attitudes



and values within the industry. Thus, Study Three also partially continues to address Aim C in identifying cultural factors that have eluded previous research.

Based upon the findings of Studies One and Two, it could be seen that each of the highlighted safety-related behaviours, (e.g. speeding, driving over hours, jumping from the trailer etc.) are conducted by individual drivers. Whilst organisational staff member behaviour influences the context surrounding the driver, it is ultimately the driver's behaviour that causes an incident (with exception to crashes caused by other vehicles). Thus, as the current safety culture framework seeks to explain these behaviours in terms of cultural and contextual factors, the current research must seek to explain the culture which is held by drivers and not by organisational staff.

The current theoretical framework for safety culture holds that behaviour is not influenced by culture alone, but also by specific contextual factors (see section 2.3.5). Studies One and Two found a number of these contextual factors present within the broader industry. In order to explore the effect of culture on safety-related behaviours, Study Three must provide a detailed description of the specific context surrounding the culture of the study sample, and thus the context surrounding the driver. Therefore, whilst the principal aim of Study Three was to explain behaviour using cultural and contextual factors, it must first provide a detailed account of the specific context relevant to the case study organisations and identify shared cultural beliefs, attitudes and values. The remainder of this chapter provides a broad overview of the reporting of Study Three's results in subsequent chapters.

## 6.2. STUDY THREE CHAPTERS OVERVIEW

Due to the degree of information obtained within the case studies the results have been presented over a number of chapters. Due to the overlap between cases, and the fact that the cases were selected to inform safety culture in the broader industry, the results of Study Three are presented in aggregate form according to the key framework components (context, culture

and behaviour). Thus Chapter 7 examines the role of the organisations, Chapter 8 explores other contextual influences, Chapter 9 examines cultural factors and Chapter 10 examines behaviour. On the first page of each chapter a small cut-out of the synthesised conceptualisation of safety culture, labelled chapter focus, is presented with the component/s relevant to the chapter circled.

Chapter 7 presents the results relevant to the influence of the organisation on safety. As the organisation is the foremost point of contact for heavy vehicle drivers, it is important to lay the organisational context as a foundation for other influences upon safety. While Studies One and Two sought to identify a range of possible influences to develop a preliminary framework which could apply to specific organisations and the industry as a whole, the purpose of this chapter is to detail the specific organisational structures and systems which are present for drivers within these companies.

Chapter 8 outlines the additional contextual influences on safety identified within Study Three. Study Three identified a number of contextual influences common to the case study organisations, which aligned with the findings from Studies One and Two. Additionally, Study Three identified an effect of national and global climate, the broader industry, and a number of affiliations not previously identified. Chapter 8 discusses: (1) the influence of national and global climate; (2) government departments and enforcement; (3) the general public; (4) the customer; (5) accreditation schemes; (6) the broader industry; and (7) environmental and situational factors. Again, unlike Studies One and Two, which identified a range of possible influences throughout the industry, this chapter discusses specific contextual factors that are present for drivers within the specific organisations.

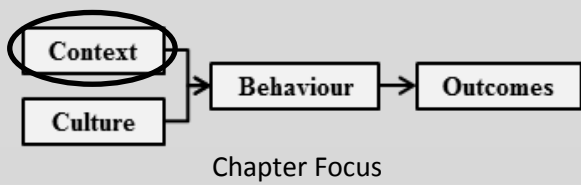
Chapter 9 presents the cultural factors identified within the case studies. The case studies confirmed a number of potential cultural traits identified within Studies One and Two and identified a number of new traits. The identified cultural traits can be categorised as

underlying cultural traits, and second and third order traits which are formed from lower traits. The majority of cultural traits identified were common throughout the case studies, thus implicating a degree of commonality throughout the industry regarding culture.

Whilst the ordering of Chapters 7, 8 and 9 was somewhat arbitrary, there are a number of benefits to the order used. The role of the organisation in influencing safety consists of a number of factors unique to each of the studied organisations. Further, as the selection of cases was based on organisational factors, Chapter 7 serves as a description of the participants. Other contextual factors, detailed in Chapter 8 showed a greater degree of commonality between organisations and many of the identified cultural factors discussed in Chapter 9 were shared by drivers from all companies. Thus, the ordering of these chapters permits the discussion to shift from organisation specific factors to shared factors. Further, if cultural factors were to be analysed first, subtle differences in the manifestation of cultural traits, which are explained by contextual variations, would be difficult to account for. Finally, the current framework makes a clear distinction between cultural and contextual factors. This is largely on the basis that culture is resistant to change, whereas context is more amenable to change. Thus it is necessary to avoid colouring the discussion of context with preconceived notions of culture which could prevent a more objective discussion of structures and systems.

Whilst cultural and contextual factors may have inherent effects on safety, within the proposed framework, behaviour was argued to not necessarily be influenced by either culture or context alone, but by a combination of culture and specific contextual factors (see section 2.3.5). The principal aim of Study Three was to explore how cultural and contextual factors affect safety-related behaviours. Chapter 10 discusses specific safety-related behaviours, emphasising the role of contextual and cultural factors in shaping these behaviours. Thus, Chapter 10 explores the impact of each of the factors discussed in Chapters 7 to 9 on behaviour.

Study Three also identified a number of individual factors which are important to consider in future research, yet do not align with the current framework. These factors have been discussed in Appendix A.



## Chapter 7: Study Three Results Part I – The Organisation

### 7.1. THE ORGANISATION

Study Three consisted of a series of three case studies with transport organisations. During these case studies, observations of drivers and interviews with organisational staff and drivers were conducted. Throughout the case studies a number of themes emerged regarding the manner in which the organisation influences safety. These included employee management strategies, such as recruitment, training, rostering and payment, and safety management strategies including communication, technological and material safety and policy monitoring and enforcement. As behaviour is not caused solely by culture but also by specific contextual factors (see section 2.3.5), it is necessary to be aware of the context surrounding the culture of drivers in order to understand how culture influences behaviour. Whilst the two broader themes of employee management and safety management were present in the results of Studies One and Two, as discussed in section 6.2, the purpose of the current chapter is not to merely identify potential organisational influences, but to give specific detail on the organisational structures and systems present within the case study organisations. Thus, while this chapter is essentially descriptive in nature and only takes into account structures and systems, without seeking to interpret meanings behind their use, this is necessary to provide the contextual framework with which culture interacts to produce

behaviour. Therefore, the current chapter does not seek to explain organisational practices from a cultural perspective, nor does it seek to explain culture through organisational practices. Rather, it describes the specific context surrounding drivers that will later be shown to interact with the culture of drivers to influence behaviour (Chapter 10).

In order to delineate between case study organisations, whilst avoiding duplication of data, these themes are presented in aggregate form, followed by details regarding individual organisations where relevant. These themes have been presented in the order above both to match the order used in Studies One and Two, and due to employee management strategies generally being the first influence of the organisation experienced by a new driver. Before exploring these themes, however, a brief discussion of the general limitations that organisations have in influencing safety are identified.

## 7.2. ORGANISATIONAL LIMITATIONS IN INFLUENCING SAFETY

Members of companies A and B discussed a number of limitations that an organisation has in influencing safety. First, drivers have significant autonomy from the organisation, due to time spent off-site and difficulties associated with direct monitoring. Thus, for many behaviours, the organisation can only take corrective measures after an incident, if they occur within the organisation's depot, or when given feedback from external sources.

*Unfortunately though you can't, as soon as someone is out the gate and round that corner, you can't see the truck anymore, you can't make them do anything. You can't tell them not to... you know you could tell them all you want not to tail gate that doesn't mean they're going to do it. Same as seat belts. All trucks are fitted with seat belts doesn't mean they're going to wear them you know. (Company A Manager One)*

*...you know the worst thing about truck driving is we're not sitting next to them so we can't see what they do away from our load or with other people. So unless we get a complaint no one is going to say look you are continually jumping off your load, you're going to jar your spine. We don't see it. If we see it here we can pull them aside and say hey you know, this, this and this. (Company A Health and Safety Officer)*

Further, particularly within Company B, it was evident that new sites visited by drivers may not be able to be inspected by organisational staff. Thus, the driver must ensure their own safety.

*I can't physically always go out and check a particular site and make sure the site is safe, that's sort of up to the driver when he gets there to make that judgment but I could certainly make sure that the piece that he's going to pick up or the item he's going to pick up, it's safe to do so on the particular equipment that he's going to take. (Company B Branch Manager One)*

There are a number of additional risks which are beyond the control of the organisation. For example, driver behaviours occurring outside of work hours may influence fatigue. As noted by one organisational staff member, the company is unable to control or monitor driver rest during legislated breaks.

*We don't know what they do at home. I can control it if they're here, like I can always, if I see them standing around outside I can always hunt them off to bed and you know shoo them off type thing but whilst they're at home. Same as in Sydney I can't basically pat them on the arse and put them into bed. And that is one of my main issues, I don't know what they do at home. (Company A Operations Staff Member)*

Due to such limitations, the organisation's primary role in safety is to prepare the driver to work safely.

*At the end of the day it's always that element you don't have control over and I'm referring to maybe other motorists on the road. That's why you have to have drivers that are always smart about what they're doing, you know? We tend to refer to our drivers as professional drivers, not truck drivers. We want to have professional drivers. Ones that can foresee where an incident may happen and avoid it, you know? Don't tailgate cars, don't speed. Don't drive beyond your hours. Just do everything in a timeframe where it's a safe timeframe. That's what we strive for. If someone says to me, 'I've got a load that I want you to load this afternoon and it's got to be at Sydney at seven o'clock tomorrow morning' I'd say 'ring someone else', because I can't do it and I won't do it. All of a sudden you're putting an element of risk by asking a driver to drive through the night. (Company B Operational Manager)*

### 7.3. EMPLOYEE MANAGEMENT

Whilst management strategies that relate directly to safety have the clearest relationship to outcomes, it is important to first discuss employee management strategies. Practices such as recruitment, training, rostering and payment form the basic foundations for safety management strategies. Thus, without understanding employee management strategies, it is impossible to truly understand the role of the organisation in safety. The following section outlines the specific approaches taken by the case study organisations with regards to recruitment, probationary employment periods, initial training and inductions, ongoing training, rostering and payment.

#### 7.3.1. Recruitment

The recruitment process determines whom the organisation deem sufficiently skilled and qualified to work in transport. Thus, recruitment decides who is permitted to drive a



truck. Each case study organisation took a slightly different approach to recruitment. The following discussion outlines the recruitment approaches taken by each company.

#### 7.3.1.1. Company A recruitment

Company A requires prospective employees to complete an application form and provide licence information and references. This information is then checked by the organisation. Company A previously used on-the-job assessment, however due to a driver shortage this assessment no longer occurs at this organisation.

*Our recruitment process is totally fallen down as a result of shortage of drivers. We're losing all our drivers to mines...we still have our application which you've got which you've obviously seen and we do our reference checks. In the past we used to put drivers into trucks and go for drives...we don't do that anymore because we don't have the luxury. ... even through reference checking we're putting drivers on that we're like iffy about because there aren't any. And we just have conversations around you know this is a probationary period and it's an opportunity for you to make sure you're happy and that vice versa because yeah there's just none out there. We sit trucks because there aren't drivers. We've got the work out there and we've got the equipment but drivers....and we're using more and more temp agencies too but we're finding the temp agencies have the worse drivers. Yeah lots of accidents. (Company A Manager Two)*

Due to the pressure this shortage has placed on Company A, the company feels forced to hire substandard drivers. Further, Company A has at times used recruiting agencies to meet increased demands. It was noted that recruitment agencies drivers are generally less safe, with one manager stating that “*the temp agencies have the worst drivers; lots of accidents*”. Though the reason for these drivers being less safe was unknown, it may be related to an inability to hold a term position, leading to employment through recruitment agencies.

*Well I mean generally there's drivers who like that environment where they can temp but from our experience I think it's the drivers who can't hold down jobs too who go to the temp agencies. And it's very interesting because some of our, obviously I audit the recruitment agency's driver's paperwork and sheets and things and we, all our drivers including temp drivers have to sit through the induction that you've received, that online one where they have to do it before they go out. So they know what's required. Anyway there's been an incident in the past where I've phoned an agency to obtain work diary sheets because the driver didn't hand any in to us and we didn't pay the agency because we didn't have all the paperwork. And the agency wasn't collecting work diaries and they're the employer... So how are they making sure in a chain of responsibility that the driver is doing the right thing and are they training them on how to fill them in? Because similarly again I'm getting recruitment agency drivers who aren't completing them properly and our program doesn't go in...it does go through how to fill them in properly but there's only so much you can do in 10 minutes or however long, 20 minutes to do the induction... And the other thing that's interesting too is that if as an agency they're not collecting work diaries and they're working for numerous employers how do they know what they've done in the previous 14 days or previous 28 days to know that they're legal to drive? (Company A Manager Two)*

A specific concern raised about recruitment agency drivers was fatigue management. When hiring drivers on a temporary basis, the organisation needs to know whether the driver is legally permitted to drive. Whilst the company can audit the work diary of the driver, they cannot determine if it is accurate, as the driver may use multiple work diaries. Though the recruitment agency should be aware of recent employment, it was indicated that they do not keep track of hours of service. Despite these risks, Company A feels compelled to use recruitment agency drivers.

*...at one stage the general manager said he would refuse to use recruitment agencies anymore because we were just getting so many accidents that we were having to pay for. Like just scratches and running into gates and poles and stuff like that. And I mean if there's less than a 2% profit margin basically we get no money for those trips or less because they're just making silly mistakes. And it was all agency drivers but then it's got to a point where there's no option. (Company A Manager Two)*

#### 7.3.1.2. Company B recruitment.

Company B utilises a thorough recruitment process to ensure every driver is capable and willing to work safely. One Company B manager stated he'd *"rather have the truck parked there with no driver in it than to put someone that I don't think is up to standard in the vehicle"*. Similarly to Company A, Company B requires prospective drivers to supply a full application, resume, copies of qualifications and medical examinations. Following initial acceptance, the new driver is subjected to an on-the-job assessment regarding pre-requisite driving ability and safety which is conducted by an organisational trainer and consists of an accompanied shift. During this time the trainer examines whether the driver can safely drive the vehicle and adhere to policies and regulations (further discussed in section 7.3.3.2).

#### 7.3.1.3. Company C recruitment

Company C begins recruitment by interviewing prospective drivers and examining their previous work history. Similarly to Company A, at times Company C is unable to apply stringent criteria to potential employees. Further, even if a driver has a poor safety record, based on the references obtained from past employees, Company C may give them a 'second chance'.

*Like when they come here I have an interview with them and I've got, I think I have a fairly good grasp of people and we just have a bit of a chat. The first question I ask is can they take orders from a woman? If they go oh..oh..yes I know full well they can't so they usually don't get to base two. Because I do all of that, if they can't deal with me well this is not the job for them. And then we sort of more have a discussion than anything else. I look up what they've done in the past, I talk to past employers and see how they are and how they deal with umm with safety and whether they're able to take to instruction, all those kinds of things that you ask an ex-employer of your umm supposed new one. (Company C Manager)*

*It's like every industry sometimes you can't pick and choose. You don't particularly hire people that are downright drug-fucked, dangerous or bad records or whatever. Like we wouldn't do that. But there's got to be a middle ground somewhere. To give them a chance yeah. Like even though someone might have had a big bad drug record or something previous but he's sworn to be good, well you can't treat him as a criminal because you know I mean you've got to give them a go. We've always been prepared to give people a go. (Company C Driver/Manager)*

Despite taking this more lenient approach, due to the close nature of the livestock transport industry the managers of Company C can contact other transport companies that have had contact with the driver. Thus, they can typically determine whether or not a driver is suitable for employment based on the attitude and behaviour they have demonstrated in their previous employment. Thus, whilst Company C sometimes is pressured to hire less suitable staff, they take considerable effort to determine if a driver is sufficiently safe to employ.

*And the industry is quite, they all know each other. So if there's somebody you can sort of put out your feelers to someone else, oh have you heard of so and so the driver for the job. And they go shit stay away from him he rolled four or whatever... the livestock transport association is like a family. (Company C Driver/Manager)*

#### 7.3.1.4. Summary of recruitment by Company A, B and C

The above discussion outlined the recruitment approaches used by each of the case study organisations. Each of the studied companies takes a slightly different approach to recruitment. Whilst both Company A and C indicated an occasional inability to choose safe drivers and being forced to hire sub-standard drivers, Company B indicated they will only employ safe and competent staff regardless of demand and vehicle use. The primary difference between companies A and C lie in that Company C reliance on information from companies they have a relationship with, yet Company A relied on references. Finally, only Company A indicated a use of recruiting agencies, despite recognising an increased risk.

#### 7.3.2. Probationary period

It is common practice within many industries for new employees to be subject to a probationary employment period, during which they may be dismissed if a manager does not feel the employee 'fits in'. Whilst each company use a probationary period, Company B and C also incorporate on-the-job training during this period. The following discussion outlines these approaches taken by Company C and B. Again the purpose of this discussion is not to make inferences regarding the culture of the industry or organisations but to detail the specific practices used by the organisation.

### 7.3.2.1. Company C probationary period

After recruitment, a new Company C employee is required to accompany an existing driver on the road. The stated purpose of this trip was to ‘get a feel’ for the driver, and determine if they fit with the company. This is followed by a standard three-month probationary period.

*Okay I guess training from us in the last 34 years is pretty well on the job... And basically just get a bit of a feel, send them with the boys, send them with (name) let him get a feel for who they are. Give them a three-months trial, if they're no good in the first three months obviously they're not here and you usually know within the first week or so whether they're worth having or whether they're not. Or whether they're worth keeping to try, to try them out and see how they go. (Company C Manager)*

### 7.3.2.2. Company B probationary period

Company B appeared to place higher emphasis on determining if a driver is safe during the probationary period. Following the inductions (see section 7.3.3) a new driver begins their probationary period with Company B. During this time, an experienced driver, or a trainer in one depot, will teach the new employee and assess their fitness for continued employment based upon their driving and working skills and knowledge, and the attitude they demonstrate during this work. During one observation, a driver discussed his experience accompanying a new driver, stating that the new employee “*won't last long because of his driving habits*”, an opinion that was first given to the relevant manager. Whilst driving ability was assessed as part of the recruitment process, this probationary period was suggested to also assess the attitude of the driver. Thus, this assessment determines whether the new driver will act safely in the absence of a manager.

*I think if they've got a good attitude and they're willing to learn, they're willing to take advice not just from me but from all the experienced drivers we've got out there... we've got two experienced drivers out there, and if they say to me, 'oh that guy is a bit of a dickhead, where did you get him from?' or 'Christ he's going to need some training otherwise he's not going to get through it.' So you ask them, 'alright what's he not doing safely?' 'Well he doesn't wear his hat, he doesn't put his gloves on, he's always getting out without his gloves.' So you get him in and you say 'you've got to be a bit more aware of what you're doing because obviously I don't want you going home hurt, make sure you keep your PPE, make sure you've got your gloves on. Don't go handling things over twenty KG's' and that sort of thing. So you probably give him a week or two then you go back and ask the driver, or you go onsite yourself, you ask the driver who he is learning with, 'has he improved?' 'No he's not improved.' 'Well sorry we'll have to move you out of the depot, you'll have to find yourself another position.' (Company B Branch Manager Two)*

After the driver has been assessed through this probationary period, if the driver is believed to be safe they will then be employed within the company. Whilst the new employee may be provided with continued on-the-job training in order to enable them to work alone, the driver is now treated similarly to older drivers and given a regular position within the company. As highlighted by one manager, this process is similarly applied to drivers transferred within the company.

*...no matter where he's come from, how long he's worked with the company, if he comes into my area, he's my responsibility, it's my responsibility to look after his safety, I don't care if he's worked for us for heavy haulage for 10 years, seven years, once he comes into my area, he's into a different environment, he's not familiar with it so we train him up in every area... So anybody I have... he'll go with that area till he's actually happy he's –*

*– 100% comfortable, he can do all the runs and knows all the tricks. Might take a week, sometimes it takes two weeks. They never get pushed, it's always when they're happy. It's when the driver that they've gone with will sign off and say "yeah I'm happy with him, I can't show him anymore, he's good to go by himself". Then I'll bring the driver back in and say 'are you comfortable enough to do this work by yourself? The driver is taking holidays, he's going to take annual holidays, are you okay to cover this position?' If he says 'yeah I'm fine' then that's what I do... (Company B Branch Manager Two)*

#### 7.3.2.3. Summary of probationary periods

The above discussion outlined the approaches taken by Company C and B to probationary periods of employment. Company B places a much higher emphasis on this probationary period than Company C. Where Company C required the driver to be accompanied for one trip to determine suitability, Company B requires an extensive period during which an existing driver teaches the new employee important aspects of the job and simultaneously reports back to the organisation as to whether or not the driver is suitable.

#### 7.3.3. Initial training and inductions

Each organisation also offered some form of initial training and inductions. As the form and content of these inductions differed between companies, each company's approach is discussed below. In both Company A and B the researcher was exposed to a shortened form of these inductions. The following discussion again seeks to detail the specific approaches used by each company to describe the context surrounding the driver culture.

##### 7.3.3.1. Company A initial training and inductions

Company A provides drivers with a driver's manual detailing the company's policies and procedures, and requires drivers to undergo both training and inductions. The inductions cover the primary policies and procedures utilised by the company, including safety



procedures within the company depot, the use of pre-trip driver declarations and vehicle inspections, and policies regarding issues such as fatigue management and the use of drugs and alcohol. In order to use extended BFM (basic fatigue management) work hours, the driver must also receive BFM training.

*We put all of our blokes through basic fatigue management courses. If they don't have that accreditation when they come here we put them through that and give them medicals all that sort of stuff. (Company A Manager One)*

#### 7.3.3.2. Company B initial training and inductions.

Company B provides significant inductions, consisting of a number of presentations covering the basic policies and practices of Company B, alongside site maps containing important safety features (fire extinguishers, evacuation points etc.). Following the presentations, employees are given a questionnaire relating to the content covered, and a tour of the depot, in order to reinforce the content learned in its natural context.

For a new driver, skill competency training and assessment is also required. Whilst the competencies required for each job within Company B vary, there are some generic competencies, such as load restraint, which every driver must complete. Additionally, every driver is provided with COR (chain of responsibility) training. Finally, Company B also conducts induction training which is required by customers for drivers who deliver their goods.

*And the inductions cover off all the safety requirements for our customer sites and if they're you know having to use some particular type of equipment which can injure you well obviously then there's a training procedure for that when they come into the business. (Company B Region Manager One)*

Following the inductions, new drivers are also supplied with an operations manual. The operations manual contains information regarding the policies and procedures used by Company B and safety information relevant to all drivers, along with specific information related to the company branch the driver will work in. This branch-specific section includes customer policies and practices and information regarding the handling of goods. It was noted by one manager that staff cannot be expected to always remember their training, and thus, the manual allows easy access to safety information and policy statements.

*...if I told them you know to go and do ... to learn the procedures and policies off the top of their head they probably, they wouldn't know. So what we've done is we've actually done up a driver operation manuals so it's referral back to it. So if the driver feels like that if something is unsafe, he's got something to refer back to. Because we don't expect, we're all human we're not going to sit there and say you need to you know rule 101 or whatever it may be. We just try to refer back to it and the drivers have got it there for their reference. So it's not a book that's hidden away up in my office, it's there with them and it's something that they can, some drivers may not even open it. (Company B Branch Manager Five)*

#### 7.3.3.3. Company C initial training and inductions

Whilst Companies A and B utilised a number of formal classroom-style inductions, Company C predominantly relied upon the provision of a driver's manual. According to the Company C manager, this manual gives drivers *"all that they need to know about who we are"*. After reading the manual (or if illiterate, having the manual read to them), a driver has the option to discuss any questions they have with the manager. When asked about formal training, the manager stated that generally they aim to *"identify issues early in the piece and*

*if things come up sort of later on we counsel them*". Thus, within Company C, training is conducted in an informal and relational manner.

#### 7.3.3.4. Summary of initial training and inductions

The above discussion outlined the specific approaches taken by each company to initial training and inductions. Despite similarities between the inductions of Company A and B, Company B offered significantly more comprehensive training. Company C on the other hand, appeared to rely on a combination of their driver's manual and an 'honesty' system where the drivers are expected to ask questions if unsure. Thus, whilst drivers in all companies are, in theory, adequately informed of rules, only Company B provided significant training and testing to ensure drivers are able to comply.

#### 7.3.4. Ongoing training.

Each of the studied organisations also placed a different emphasis on ongoing training. The type of training utilised by each company and their attitudes towards training are discussed below. Whilst there is some discussion of attitudes regarding training the purpose of discussing these is to gain insight into the emphasis placed on training and the content which forms training. Again the primary purpose of this chapter is to detail the specific organisational context surrounding the driver culture. Whilst it is possible to make inferences about the culture of drivers or even managers from the below discussion, this is not the purpose of the current discussion. Further, without a deliberate treatment of the culture of drivers any inferences made at this stage could be misinterpreted. The type and content of ongoing training becomes particularly relevant to safety given the beliefs drivers hold about truth and reality.

#### 7.3.4.1. Company A ongoing training.

Within Company A, it was stated that getting drivers to attend training is arduous and takes significant time. Drivers are reportedly quick to attempt to avoid training and, while they will eventually be ‘forced’ into training, they can be unreceptive. This led one organisational staff member to suggest that they are happy so long as the minimal training and induction has been completed. Thus, at a minimum the initial training and inductions are conducted by all drivers, yet further training has not been effectively implemented in Company A.

*Right because their log books right, we can't teach them seven hours before they go out and that's when they're most receptive. When we're teaching them is when they come in and they're tired, grumpy and shitty and they're not receptive. Alright? But how else do you do it? Now unless these guys are making miles, they're not making dollars, we will teach...we will pay them for being in here but then it interferes with their fatigue time so it interferes with their trips and that interferes with their big dollars. So when they first come in here we give them you know about I don't know, an hour and a half, two hours' worth of training and I think that's probably about as much as they can take on board on the first day. Then over a period of time we'll get them in for more training but I'm actually going to change the way we do the training because I've found with that online thing you did. I found that to be easy and cost effective to do and I'm finding that you know because it's easy and cost effective to do we can get everybody through it. But with all the other courses you know that we do here they all say oh no I'm too tired, oh I'm this or I've got bloody my wife out in the car. Oh it's me bloody day off. So nobody wants to be trained. Eventually they [will be forced to do the training]... Yeah well at the moment since I've set up the online induction right, provided they've done that and the [major customers induction] I'm fairly happy with that. (Company A Health and Safety Officer)*

Regarding the attitudes of manager to training, it was evident that training often centred on behavioural consequences, ranging from legal repercussions to the likelihood of an incident. This form of training was evident through the inductions and reports of conversations with staff. Additionally, it was evident that managers perceived training was unnecessary for behaviours that could be reasonably expected. Thus, some aspects of safe behaviour were not given significant emphasis.

*I believe tailgating is in the induction stuff. Seat belts, that's a good question I mean I suppose, I could be wrong here, it may be in there, I don't recall it, but I suppose you probably wouldn't have to, I mean you don't tell them to breathe when they get in the truck, why would you need to tell them to put a seat belt on although you know most blokes don't because they think it's safer without it, and quite often it is in a truck. (Company A Manager One)*

#### 7.3.4.2. Company B ongoing training.

Company B offers significant training to both new and continuing staff throughout their employment. This ensures adequate skills and knowledge to safely perform the job and maintains high awareness and commitment to safety. As reported by one manager, Company B prefers to ensure its drivers are conscious of safety and risks rather than to condition behaviour through punishment. Thus the general attitude of Company B organisational staff members toward training was that it is necessary and beneficial.

*We don't like to sort of come across as the big brother slap you across the wrist. They work for us, we pay them. So what we do is we try to give them foundation. As you know you talked to (trainer's name) this morning, (trainer's name) basically preps the driver for the conditions that he works in. So they're well aware that safety is a high priority for (Company B) and for us you know as individuals. (Company B Branch Manager Five)*

Whilst training within Company B consists primarily of formal training sessions and toolbox meetings, drivers may be subjected to either generic or targeted training. Training was said to be either organised on the basis of a driver's individual need, or aimed at keeping all drivers' skills up to date. When conducted on a needs basis, training is generally the result of either an incident, leading to retraining, or when a trend of unsafe behaviour is noticed.

*The moment the incident has happened then we all start talking about these procedures and policies that are in the manual, and if the driver doesn't know about it we refresh them. And that's why we go through a refreshing training every 12 months. And we'll pick, even if we have an incident here on site where we see that there's a bit of a trend, we try to put training or refresher courses around those incidents as such or those policies, those procedures. Whether that's through a PowerPoint presentation, and it may only be two or three minutes of just slides, we try to do more visuals with the drivers and then less you know in a book type of deal because they, we get I've found in my time, is that you get more out of a driver from a visual sense. (Company B Branch Manager Five)*

Whilst targeted training can occur to ensure a driver is up to standard, the aim is often to equip a driver for more advanced work. For example, one manager stated that they will train drivers for larger vehicles when transferring from driving a body truck to a semi-trailer. Similarly, training can be conducted to equip a driver for over-dimension work.

*When you employ people, you have to look at their skill sets and then from there it's a case of training them up into more advanced skills like doing over-dimensional work and the likes of that. Because there's a lot of things that when you've done it for a long time, it just becomes something natural to you. But if you haven't done it before, you don't think of the little things that make your job so much easier or prevent you from damaging the product or damaging the vehicles or whatever, and there are also a lot of rules and regulations –*

*– from the point of view of travel times with over-dimensional loads so you have to know all that sort of side of the business too. (Company B Operational Manager)*

Group training sessions, however, typically serve a preventative role rather than a response to behaviour. One manager indicated that, due to the prevalence of manual handling throughout the company, they conduct regular manual handling refresher training courses.

*You've got to make (safety) everybody's problem. You know we're drumming into the guys all the time about safety. We do training sessions. We've just gone through a week of it now, we've just put them all through a safety fork lifting training as well as safety at work. The B-double drivers, we put them through a rollover training course... it's a DVD plus a questionnaire they were talking about, we got some engineers and explained how do rollover's happen. But they should know how that happens or any things, but yes the training they're always doing training of some sort. We do a manual handling training every six to 12 months. We bring in a guy from outside. He has a full training program that he's put together. He is an occupational therapist so he's actually come and done an actual site-specific training. He's now done the training with us I think, this will be the fourth year now he's been doing it. So every year he just takes it that little bit further and adjusts it to what we're doing in the workplace and so yeah, he's really good. (Company B Branch Manager Three)*

Each branch of Company B also conducts toolbox meetings on a monthly basis. Toolbox meetings typically occur prior to the beginning of a day's shift. A number of managers indicated that they choose a safety issue to focus on during each toolbox meeting. The researcher attended one such toolbox meeting, during which general discussion was made regarding minor upcoming business changes, the manner in which speeding infringements are managed, and driving at a safe speed in the depot. Drivers were also able to discuss these issues and ask questions about the topics covered.

Another common practice in these meetings is the discussion of serious occurrence reports (SORs), also sometimes called serious safety occurrences (SSOs). SORs detail incidents that have occurred in related industries, other branches of the company or at a customer site. The purpose of discussing these incidents is to raise awareness of safety issues and educate drivers about safety procedures. Drivers who participated in observations indicated that the use of SORs was effective in raising awareness and beneficial in helping them to learn about their job. One Company B driver stated that the use of these reports “*makes you more aware*” and that “*you are always learning, you can learn from incidents whether they happen at the workplace or elsewhere*”. This driver indicated that it was because of SORs that “*toolbox meetings are good, you hear of things and you think we’re lucky we follow the policies*”.

*We have a toolbox meeting once a month religiously, it’s on all of our umm calendars at the end of the month and we go through those SSOs, if there’s none, there’s none, if there is, there is, and we try to incorporate it into our day-to-days. A lot of the SSOs that have come through may not be relevant to our type of business here on site. But we do try to give them examples of you know this is you know this is how you get off the truck properly, you know the right way and all that type of stuff. And so the drivers yeah they do take it on board because I do have a lot of drivers come into me and say you know like that guy was lucky and there’s a bit of talk about it amongst the ranks. So I do believe that it’s a good tool, especially when you hear the stuff from Melbourne, Sydney because (steel customer) are quite good, they filter the stuff through quite regularly. So because it’s happening all the time it’s always good just to talk about it and refresh it. And ... it all comes down to like, and I don’t mean to harp on it, but all about influencing, I always said that. We’re trying to influence drivers to do the right thing. (Company B Branch Manager Five)*



#### 7.3.4.3. Company C ongoing training.

As noted in section 7.3.2.1, at Company C training is predominantly conducted on the job, rather than in a classroom-type setting. Due to shifts in accreditation and regulatory bodies, however, Company C is now required to take a more stringent approach to training. Training was, however, generally viewed as unnecessary and one staff member indicated a desire to avoid appearing overzealous or to repeat themselves. Thus, training borders on being apologetic in the way it is conveyed. This may be influenced by the inability to easily hire new staff and be an attempt to avoid offending current staff.

*Yeah and you'll never, you'll never make it 100% safe although you'd be stupid to think you could. Because like even now we've got to say to our drivers you know don't do this, don't stand there, don't do that. Because you know if you don't, you know the story, if we don't tell them the risk we're liable. But I'm not going to go there to the shed every morning and tell them the same old thing... (compared to construction industry) yeah every day, every day they've got to tell them. You know have a bloody toolbox meeting or whatever they talk about and you can't do this and you can't do that. Well I mean surely to Christ you've only got to tell them once. You can remind them every now and again but you don't have to tell them again. And we're not a big company like. The blokes that are here now are pretty...pretty good. (Company C Driver/Manager)*

The recent emphasis placed on training means that Company C is currently developing a new approach to training. Company C's recently appointed compliance officer was, at the time of investigation, determining the best approaches to use in training. Additionally, the compliance officer was still learning the legal requirements of training. Due to the perceived difficulty of getting all employees together at any given point in time the compliance officer typically approached individuals one-on-one to inform them of new requirements.

*And getting all the staff in the same place at the same time, all the same thing is like it hasn't happened. I've been trying to get that to happen for months and it just hasn't happened because it's impossible, it's virtually impossible... Getting everyone in the same place at the same time to tell them exactly how things need to be is difficult because then I lose track of what I've told one person because we're still getting our heads around how the ..I'm still trying to get my head around how it's going to work. So and then I'll tell a driver one thing and then I'll forget what I've, that that's what I've said to him and tell a different driver something else and then they start squabbling, the drivers start squabbling with the maintenance guys and it's just, it's a pain in the arse to be honest. But it's got to be done. (Company C Compliance Officer)*

Similarly to Company B, some training was reported to be in response to inappropriate behaviour. Due to legal changes, some previously accepted behaviours, now against regulation, were the typical focus of training. Thus, training is conducted as problems arise.

*Only because they're bringing in new procedures with new paperwork and all that sort of stuff that we have to have. Sometimes I have to go and tell them they're doing it wrong or tell them how to do it. But it's all pretty simple stuff, but it's just in the new system. (Company C Compliance Officer)*

#### 7.3.4.4. Summary of ongoing training.

The above discussion outlined the approaches taken to ongoing training by each of the case study organisations. A number of differences between each of the companies and the way they handle ongoing training were identified. Company A appeared to view training as somewhat unnecessary. Due to a lack of interest in training held by drivers, the company generally was content with the initial inductions. Similarly, Company C has traditionally only trained drivers in response to problems, typically in the form of informal discussions at the

workplace. Conversely, Company B places a high priority on training and conducts regular toolbox meetings alongside periodical formal training sessions.

### 7.3.5. Rostering

Though considered an employee management strategy, rostering has a major impact upon fatigue and fatigue management. Despite some similarities, each company handled rostering differently. The following discussion details the specific rostering approaches used by each company.

#### 7.3.5.1. Company A rostering

Company A has a fairly consistent workload with many regular trips. Generally, rostering is conducted to ensure that the roster meets the legal requirements for each driver. Thus, if a driver cannot legally complete a journey they are not rostered to take that load.

*What we've done in previous, we have looked back. A lot of, some of the guys, some of the older guys think oh yeah we're back in the old school where you keep going. And then we look back at what he's done for the whole week and we say no you're due for your 24-hour logbook break. We've got to look at that as well where the driver thinks he's still right to go and I'll say no if I send you out now you're not going to have, you're going to get half way down the road and you're going to have to have a 24-hour break somewhere. And it's no good. I'd rather give the load to someone else and then make sure that you're right for the following day. (Company A Operations Staff Member)*

Prior to departure, Company A assesses the driver's fitness for duty. Fitness for duty checks add a layer of flexibility to rostering. Fitness-for-duty assessment is an ongoing process, starting with up-to-date medical examinations and a brief daily assessment, typically consisting of operation and management staff observing the behaviour and appearance of the driver to determine if the driver appears fatigued or influenced by substances. Drivers are

also required to declare themselves fit to drive prior to departure. For drivers on long-distance journeys, this process is conducted over the phone.

*So we train our schedulers, because they do their scheduler's course on how to look for symptoms of fitness for duty. So are they tired? Do they look like they might be on something or whatever? So we go through slurring or red eyes and smells but we also train them you know to be careful that they're not diabetic and you know all that sort of stuff too. And how to handle it because we don't want to be seen to be discriminatory or unfair or anything like that. And it's got a lot, it is linked in with our drug and alcohol testing too because we test based on suspicion as well. So yeah so and that's why we make our drivers phone in for their drivers' dec, they don't just fill it out themselves. So that even if they're not at the depot the schedulers can listen for the symptoms and the signs. But if they're not fit then the options at that point are, you know, they don't do the trip. They need to stop and rest if they're in the middle of a trip or whatever. If there is suspicion then we organise drug testing. (Company A Manager Two)*

If deemed unfit for duty, a driver will be sent home or asked to rest until a later load becomes available. This is assisted by use of air-conditioned bedrooms, showers and kitchen facilities at the Company A depot, enabling adequate rest without losing commuting time.

*If they come in late and I see that they're not fit to go out or we haven't got a load to suit them to go out they get put at the end of the list and they don't go out. Or we put them on a very late one... like say for instance a drive comes in at two o'clock in the afternoon you know darn well he doesn't want to go out again. But I might have something for him that is not urgent to get into the other state til the following day and he can leave at midnight and he's still getting time to go home, do whatever he wants to do and still get six or seven hours sleep before he actually has to go out again. (Company A Operations staff Member)*

#### 7.3.5.2. Company B rostering.

Company B also rosters according to the needs of the job and the abilities of drivers. As put by one manager, it is important to determine “*who’s the best truck and driver and trailer for each job*”. Company B typically rosters their drivers for shorter shifts than the legal maximum. When discussing being stranded due to insufficient driving hours, one manager stated this problem was rare as “*it’s load planned anyway, so you wouldn’t probably do more than 10 hours at the furthest part*”. Echoing this, another manager indicated that the company ensures that, given fatigue management requirements, drivers always have extra days to spare, reducing the likelihood of problems arising from work pressures.

*Drivers on a 14-hour day, which is all basic fatigue management, they have to follow a logbook every day. They have to hand one page of that logbook in every day. So the company monitors, someone goes over that page every day and checks to make sure they’re not making mistakes, they’re not exceeding their driving hours and that’s all monitored and recorded through the office. And then when it comes to drivers being away for a long time, you’ve then got to talk to them and see how many hours they’ve worked each day to make sure they don’t exceed their 84 hours without a 24-hour break, and 145 hours in any 14-day period. I try and have it so that every driver has either a Saturday or a Sunday off. That way if they have a day off every weekend, you don’t have any troubles extending fatigue management. (Company B Operational Manager)*

As an added check, drivers are required to sign a fitness for duty declaration and are assessed for their fitness for duty. Thus, similar to Company A, the roster is flexible to the fitness of drivers. Further, drivers are required to undergo regular health checks and random drug and alcohol testing.

*Well yeah they do a...got to ensure that even before they start they have a fitness-for-duty to acknowledge. So if they come to work and they've had a bad night, they're fatigued because they haven't slept because they've had the flu, because they're taking a medication that may affect their driving, their responsiveness, they have an undertaking to put their hand up and say I'm just not coming to work, I'm not well. We've had instances where we've had drivers come in and they've had some family issues at home, they've been visibly upset. We've said no, no not in a truck today mate, you call it quits and head off home, get on top of things and then come back. We've done that for guys that are sick for a day, we've done it for one or two, we've sent them off and given them extended leave for a couple of weeks because they've had issues, so that's even before they start at work. They've got to be fit and able to do so and that follows on with our regular safety, our regular medical checks for them. We do random drug testing, drug and alcohol testing of a morning at a site. No one knows till they get to work and oh got a minute? Test. So it's ensuring, trying to ensure that even before the guys sort of like get in the truck, first of all they're fit and healthy to drive and that's along with our regular medicals. (Company B Region Manager One)*

#### 7.3.5.3. Company C rostering

Unlike companies A and B, rostering is very difficult at Company C. Whilst it will be further discussed in section 8.5, livestock transport is conducted on a needs basis, typically resulting from a sale. Thus, work can be gained at short notice and rostering is difficult or impossible.

*It's impossible, it's impossible. Even this morning we had a phone call this morning you know we've got eight decks in the (location name) sale, got to go to (location name)... you know this afternoon or tomorrow. So you can't plan in advance (Company C Manager)*

Whilst Company C tries to ensure drivers are available on sale days, it is difficult to predict driver demand. Despite trying to book in advance, agents and graziers may call at the last minute and change the number of trucks and trailers they need.

*With sale days even worse, Wednesday is sale day, you organise around having trucks waiting to see what comes out of the sales... then he rings up and says oh no I've only got three decks to go in and I go or he rings up and says you know those three trucks I booked? I now need five. So it's really difficult. There's no scheduling. You can't actually schedule anything in advance. It's difficult even to schedule around having the men have a day off a week because they can be away... The graziers are getting better in that they'll book in advance. There are some times when you simply they can't do that. (Company C Manager)*

Due to the size of the company, it is impossible to regularly have spare drivers ready for a last minute job. Whilst drivers typically get time off between loads, Company C does not truly have drivers to spare.

*... how many drivers we've got. Well when there's not something happening, we've got two blokes working the shed. You would have seen that I suppose. So when they come home if they're definitely not going anywhere for the next day or so they do much of their own greasing simply because if it's not greased properly and they drop a tail shaft they're the one going to get yelled at... But basically they can drive it in here and say this is my list of problems. The boys in the shed fix that and do brakes and all those kinds of things. So that gives them the time off to go and rest until something else comes up. And we can't have spare drivers, no such thing as spare drivers in this industry. You're flat out having enough to drive what we've got. (Company C Manager)*

#### 7.3.5.4. Summary of rostering

The above discussion outlined the specific rostering approaches used by each company. Both Company A and B are able to utilise a full rostering system due to relatively consistent workloads. For this reason, these companies can plan when they will use each driver in order to ensure that they do not exceed their work hours. Company A uses its drivers more heavily than Company B, and has to be more aware of legal restrictions. Conversely, Company B rosters its drivers well below their legal limits, both for daily and weekly restrictions, thus ensuring availability of drivers for additional workloads. Company C, however, is unable to roster their drivers effectively due to the nature of livestock transport and the number of drivers employed.

#### 7.3.6. Payment of drivers

The method of payment and, therefore, form of employment, can significantly influence safety. Members of Companies A and B discussed the way in which drivers are paid for their work, but members of Company C did not. Nonetheless, information regarding driver payment was gleaned from the driver's manual. The following discussion outlined specific payment methods for each company. This information becomes particularly important when discussing attitudes towards money and time in Chapter 9.

##### 7.3.6.1. Company A payment of drivers

Company A drivers are typically employed on a permanent basis. Unlike permanent employment in other industries, drivers of Company A are either paid a minimum salary, or in cents per kilometre. If the number of kilometres travelled does not result in a pay above the minimum salary, the driver will still be paid the minimum amount. It was suggested to be rare for drivers to work below the minimum number of kilometres. Additionally, however, due to the permanent status of drivers in Company A, they receive sick leave and vacation payment



(typically the minimum salary plus loadings). Thus, whilst drivers are employed on a permanent basis, they are typically paid by the kilometre travelled. This form of payment can serve as a significant motivation for unsafe driving, particularly through increased speed, which increases the average payment per time period. Local drivers within Company A are, however, paid an hourly rate.

*And umm when we are employing drivers yeah we put them on a permanent rate, which it obviously looks less because it's not casual loading but we pay their sick days, annual leave days all that sort of stuff, which is great around Christmas time. We get an influx of drivers at Christmas time because you get all the public holidays and they get paid for that whereas when they're casual working for someone else they don't get it. So we're finding when the Christmas period is over they head off back to their casual rate of pay and so we've been talking about do we need to look at casual because all they care about is that rate of cents per kilometre or what they're getting per hour. They don't care, seem to care about security of employment or yeah, you know getting their sick leave and annual leave pay loading. They just want more money now. And that would be the majority of feedback that we get, they just want that casual rate of pay... So we've been talking about do we do that? But isn't job security and having a permanent employee more important? I know legislation has changed so that if casuals have been here more than 12 months we need to legally offer them a permanent position in writing and they have the option to choose. But I mean you can deal with that as it happened. So yeah because really we've been looking at the calculations and it is slightly more expensive to use a casual rate of pay rather than permanent but if it's going to help us to attract and retain more drivers. I mean do we do that when everyone else is saying permanent. It's better to have permanent employees but that's not what they're wanting. (Company A Manager Two)*

### 7.3.6.2. Company B payment of drivers

A number of drivers indicated that Company B “*look after you pretty well*”, particularly because they pay drivers by the hour. Managers indicated that by paying drivers by the hour, there is no incentive to drive faster. Company B drivers shared this perspective, often making statements such as “*why bother rushing when you are paid by the hour?*” and “*they pay you by the hour so you are not really rushed*”. Contrary to distance-based payment, a number of drivers suggested that being paid by the hour may even contribute to a lazy, time-taking attitude in some drivers. Whilst this may be negative in itself, time-based payment clearly does not encourage speed-related risk taking.

*And the thing about (Company B) where the drivers don't have to push the limit is our drivers that go away are paid by the hour. Whereas a lot of companies pay by the trip or by the kilometre or others, whereas (Company B) it's by the hour. So the driver doesn't have to force himself to do the trip a little bit quicker so his pay packet looks a little bit better. And that's a lot of the problem with our industry. (Company B Region Manager Two)*

*Yeah I guess one of the advantages that (Company B) have from the point of view of not having the drivers want to exceed their hours is that our guys are paid an hourly rate regardless of whether they're working around town or whether they're going away on a trip. So they get paid, if they work 14 hours, they get paid for 14 hours. Not like the guys who are on a trip rate where they get paid \$350 to drive to Sydney so they try and drive it there as fast as they can so they can turn around and come home again. We do nothing like that, its straight hourly rates. If a guy works fifteen hours a day, he gets paid for fourteen, so there's no incentive for someone to go and work extra hours a day because he's not going to get paid for it. (Company B Operational Manager)*

#### 7.3.6.3. Company C payment of drivers.

No members of Company C spontaneously raised the manner in which drivers are paid. Further, whilst many prompts were used regarding the factors associated with behaviour, no specific attempt was made to elicit information regarding payment. Thus, the following information was drawn from the driver's manual. Drivers employed by Company C are paid a daily rate, and do not accrue holiday or sick leave. Further, drivers are expected to be at the depot from 8am to 5pm unless otherwise discussed, and will not be paid additional hours if they could have completed their load within a typical work day. Thus, driver employment could be described as casual, yet full-time. Similarly to Company B, as drivers are not paid by the kilometre there is less incentive to speed or skip required rest breaks. However, the potential not to receive additional pay for longer days may encourage speeding to reduce unpaid work.

#### 7.3.6.4. Summary of payment of drivers

The above discussion outlined the specific payment methods of each company. The form of payment used by each company was unique. Company A employs staff on a permanent basis, yet, the manner in which drivers are paid is based upon the number of kilometres travelled. Conversely, Company B pays their drivers by the hour, and Company C pays per day worked. Whilst the time period which companies B and C utilise is different, the fact that each pays based on the amount of time worked rather than by the kilometre means that these drivers are less likely to be motivated to drive in an unsafe manner to achieve a better pay.

#### 7.3.7. Promotion opportunity within Company B

Unique to Company B is the ability to promote drivers within the company. Due to the wide range of vehicles used and work conducted within Company B, drivers can advance

through different types of transport. This was particularly discussed by one Company B driver, who indicated an excitement that “*they are going to get [him his] B-double licence*”. Whilst this was not evidently linked to any specific safety behaviours, it may be possible that this opportunity leads to a greater commitment to the organisation, and thus better compliance, in order to receive such promotion.

*If they're a good driver and they want to change then we'll try to move them to somewhere what they want to do. Or if they want to improve their skills, if they've only got a heavy rigid licence and they want to go to a semi licence then we'll try and open some doors for them as long as they've been a good driver. So we'll try and reward them that way to keep their skills up. I've moved two or three now from different departments to get their skill levels up which obviously passes on a more positive attitude. They don't feel like they're trapped and stuck in that one job and one position. They can say look there's movements out there, whichever way they want to go. So that's what I try and do. (Company B Branch Manager Two)*

#### 7.4. SAFETY MANAGEMENT

In addition to the employee management strategies used by each company, a number of safety management practices within the organisation were identified within Study Three. These practices included communication, technological and material safety and the monitoring and enforcement of safety policies. Finally, Company B participants also indicated that the company deliberately attempts to shape the culture of their organisation. Each of these safety management strategies are discussed below for the purpose of detailing the context surrounding the culture of drivers. Again, whilst inferences could be made regarding the culture of drivers or managers, this is not the purpose of the current chapter. Thus, this section is descriptive in nature, outlining the specific organisational context.

#### 7.4.1. Communication

Communication between the organisation and their drivers is crucial to managing the problem of driver autonomy. Whilst some forms of communication were common to each company, the following discussion highlights increases in communication between companies.

Each company uses communication to monitor the location and progress of drivers. Starting with Company C, drivers reported a requirement to “*ring in for every load so that (the manager) knows where we are*”. Additionally, the manager will call drivers who have failed to check in at the expected time. As stated by one driver, “*if we should have reached the next spot, she knows*”, and it was stated that the manager will “*wait a while and then try to call (the driver) to see where (they) are*”.

Company A utilises the same processes. However, they will also call a driver who is detected pulling up at an unexpected time, through satellite tracking, to check if the driver is in need of rest or experiencing mechanical problems. Further, if a Company A driver is fatigued and needs to nap, the driver will contact the company to request a wakeup call.

*And that's, that's about the only way you can actually combat anything like that and with the satellite yeah like you've got to constant, we've got a guy in there, well put it this way. The office is manned 24/7. We consistently watch that satellite, we make numerous phone calls during the night to the drivers to ensure that they're okay. If they pull up for an unscheduled pit stop we want to know why. Is he okay? Has he got a problem? Has he got a mechanical problem, a fatigue problem, things like that. And that's our procedures inside...in the operations. (Company A Operations Staff Member)*

Lastly, Company B utilises the approaches detailed above and additionally uses an internal two-way radio system that serves as the first point of call. This system is often used to remind drivers about specific hazards.

*I usually get a phone call from (The Director) saying 'hey have you told the boys just to be careful?' You know like it's in there, the back of their mind, they lived through it like you know I suppose luckily enough I wasn't here at that time... So yeah so as soon as it starts to rain or you know there's that rush period, the company does, you know, you can tell it and you know even when we're talking in that management meetings you know the conversation will come up. (Company B Branch Manager Five)*

Additionally, Company B also will regularly contact their drivers simply to check that they are well, providing a supportive environment where drivers feel respected and able to discuss issues. Similarly, when the driver is absent from a depot for a prolonged period of time they will either check on the driver or require them to regularly phone in.

*... if I can see the driver is out of the truck because he's got his ignition turned off on the Navman and I need for some reason to contact him urgently I may try and ring his own personal mobile. But I find that can be a distraction to people when they're doing their work onsite so I try and avoid that as much as I can but yes, there are times when you have to make phone calls. But generally we also have mobiles in the trucks so I prefer to ring the truck's phone and leave a message on the mobile in the truck so when he gets back into his cab he sees it, sees the message there. But initially when they're driving down the road, the two-way is the main source of contact. (Company B Operational Manager)*

*We also have communication systems that people can use so we've got two way systems, we've got the mobile phones as well and we've got a Navman tracking system to be able to track where the drivers are so that we know if someone's pulled over for a longer period of time than expected we can do a call and find out if everything is okay. But often those things won't work so the Navman system won't work in all areas of Australia so in more remote areas they drop off but for the most part they do. We have a plan in place when –*

*– people are away, going on long trips. They either go in convoys or they will have a regular call-in point. (Company B Director)*

#### 7.4.2. Technological and material safety.

To provide a safe work environment, technological and material safety interventions are often required, ranging from PPE (personal protective equipment) to more advanced technologies. Additionally, vehicle design and maintenance can play a pivotal role in safety. Though vehicle maintenance is discussed as a specific safety concern in section 10.2.6, a brief note will be made here regarding speed limiting technology. The following discussion outlines the specific technological and material safety interventions used within each company in order to provide adequate detail of the organisational context surrounding drivers. As each organisation makes use of different materials and technologies for safety they will be discussed separately.

##### 7.4.2.1. Company A technological and material safety.

The forms of materials and technology utilised in Company A generally include PPE, sleeping facilities, and in-vehicle speed limiters. Additionally, the company tries to maintain a high quality of vehicle maintenance.

Company A has a limited PPE policy for drivers, mainly consisting of enclosed footwear in large portions of their depot and steel-capped shoes in the workshop. Thus, very little reference was made to the use of PPE. Despite the lack of in-depth PPE policies at Company A, their major customer requires enclosed footwear and high visibility vests.

Company A's bedroom facilities have already been discussed. Additionally, however, each Company A truck is fitted with built-in bunks for sleeping on the road. Due to difficulties sleeping in a truck during the day, the trucks are also fitted with 'bunk coolers'

(an air conditioning unit which operates when the vehicle is stopped). However, Company A drivers stated that bunk coolers are insufficient for the summer heat.

*The bunk coolers are shit, they just don't work with the heat, they use water to cool the air, but the water itself isn't cool... Always try to sleep when it's still dark and cool... Even guys who have been doing it for a while struggle to sleep... Some suggest putting ice in the water, but it's too much effort to make the ice fit. (Company A Driver Six)*

One approach to reduce speeding in the industry is the mandatory use of speed limiters in trucks. Speed limiters prevent the truck from accelerating beyond a given speed (legally maximum = 100km/h). Members of Company A indicated that limited trucks can still exceed this speed when going down hills.

*100km/h yeah. They're...the road speed is gutted at 100km/h they will go faster than that off a hill because they're not gear bound at 100km/h but I think they'll top out at just over 120 or something like that, 130. Yeah. (Company A Manager One)*

Due to the ease with which speed limiters can be tampered, satellite tracking is an important tool within the organisation. One Company A driver stated that “*tampering with speed limiters is easy, you just put a wire or a box over it, but you can't do it without being caught*”. Through notifying the company when a vehicle exceeds 100km/h, and the duration for which this has occurred, the company can detect speed limiter tampering. As noted by one driver, though a truck can briefly exceed 100km/h downhill, if the truck does so for an extended period of time it is clear that the speed limiter has been tampered with.

*And the workshop, that's the workshop's job as well and if we notice any abnormality we let senior management know that they may have a wire on it or some way to make it go quicker. And then it gets pulled into the workshop and the workshop goes right through it. –*



*– It gets sent around, gets put on the dyno, covers have a look at it and see if it's been tampered with, so everything is above board. (Company A Operations Staff Member)*

#### 7.4.2.2. Company B technological and material safety.

Company B places priority on providing safe worksites and equipment for drivers. A number of managers and drivers indicated that the owners of Company B are seeking to set an equipment benchmark for other companies.

*The owners of the company have very high standards in their equipment and their people and obviously that comes at a cost and that's how they want to run the business and that's really good from that point of view. They want to have their company as a standout company compared to other people. (Company B Operational Manager)*

This goal was evident in a number of ways. Company B provides mandatory high visibility clothing and other PPE for their drivers. This was particularly noted by the researcher who, prior to attending the first site visit, was informed of the PPE required for each site. Though such requirements are common to other industries, only Company B placed such requirements on the researcher (with exception to Company A stating that a high visibility vest would be required at one customer site). In addition to PPE, Company B also provides easily accessible first aid kits for every truck.

*We have first aid kits in the vehicles. We place them in the passenger side of the vehicle at the bottom of it, sort of at the foot well. So that way if someone needed to access the first aid kit, they don't have to climb up into the truck to access it. They can open the door on the passenger side of the vehicle which is off the roadside and get to a first aid kit fairly quickly. So just a few things like that. And we're moving in a way of our PPE at the moment is that we won't issue any shorts anymore. We used to issue some shorts as a combination of a uniform but as we're evolving as a company, moving in the direction of –*

*– no shorts will be issued, regardless of what you do. It'll just be long policy all the way. Yeah so a few things like that. (Company B Director)*

A number of Company B drivers, however, criticised the lack of some technologies and materials. For instance, some drivers indicated that the lack of bunks in Company B trucks prevented napping when fatigued. Whilst Company B provides hotel accommodation for all overnight trips, drivers insisted that the ability to nap during a trip was important. Similarly, one driver indicated that, despite a goal for no drivers to have to climb the trailer, some jobs are impossible to complete without climbing. It was suggested that, due to this goal, Company B did not provide safe methods of climbing the trailer for those jobs where it was necessary. Thus, it was suggested that, until it is possible to complete all jobs without climbing the trailer, drivers are forced to climb the trailer in an unsafe manner. One manager from Company B, however, indicated that despite searching, the company has been unable to identify a safe means to climb the trailer.

*We've tried to look at a way of having a ladder that you can make portable and move it around. Now there are some ladders that fit into the combing rail sockets but they're very narrow and the drivers generally don't like using them because they feel very narrow, they feel very flimsy and our drivers are quite big so they don't like that feeling, they want something sturdier. But to find something that will universally fit all trailers and can be off the ground so it doesn't need to be based on the ground, because we can work in all sort of ground heights. It can be uneven; it can be on a roadside. You want to be able to gain access to your truck or your trailer without needing a stable base. So you need to be able to create a stable base off the air, it needs the support from underneath the trailer to get a leverage point to keep it supported. I can't do that. All the trailers are built differently underneath so they don't work generically. So we investigate it, we investigated all of that and we ended up with a step we called a 'Shaw step' ... It's very similar to the steps that –*

*– you get in an office environment to step up onto something just a little bit higher... But the difficulty with those steps is where do we place them? They become a lethal weapon themselves if you don't restrain them properly. And if your space is taken up with paying load, what space do you allocate to a Shaw step? Where do you put that? So some vehicles, we've definitely got a way that we can do that and others don't, just don't. So it makes it difficult. (Company B Director)*

Despite these complaints, Company B does provide a number of safe materials for drivers and actively investigates new approaches to reduce risks. In addition to the simple materials discussed above, Company B has also purchased electric pallet jacks to prevent drivers from strains during unloading, and banned the use of 'lever dogs' (a chain tightening device prone to causing injuries) as a means to restrain loads, opting for the safer ratchet-mechanism 'EV cams'. Additionally, one manager indicated that Company B had purchased a device designed to lift the top layers off pallets, thus, reducing physical injuries.

*It's been superseded by a number of other types of equipment fully in (steel customer), fully in (building supplies customer), we no longer buy the lever dogs. We buy a replacement piece of equipment so I suppose also involved in the type of equipment we use. The design of some trailers specific to our customer's requirements, there's an involvement in safety there... If there is a safety incident or injury we'll review that incident, undertake an investigation of that incident, try and look at what the root causes are. Once again, if it's a piece of equipment that's been ill-used obviously we'll review our training procedures. If the equipment is not suitable we'll review the suitability and change the equipment. (Company B Region Manager One)*

Company B also places importance on the maintenance of vehicles. Whilst this includes general maintenance to ensure safety, Company B must also maintain and monitor speed limiters. Due to the age of many Company B trucks, however, some are unable to be speed

limited. For this reason, speed in Company B is typically controlled through policies, satellite tracking (see section 7.4.3.1.2) and enforcement, rather than technology.

*We have a 95 K speed limit on our vehicles, that's a policy limit. Some vehicles have been able to be speed limited because of the type of engine they have but some vehicles are older and their engines don't have limiting functionality like that. So it's a policy limit and we monitor to the policy based on our Navman. (Company B Director)*

#### 7.4.2.3. Company C technological and material safety

Company C differs significantly from companies A and B in their use of technological and material safety. As indicated by the manager of Company C, cattle react poorly to high visibility clothing and, as drivers are required to climb crates (livestock carrying trailers), steel capped boots make this climbing dangerous. Thus, it was argued to be common practice for livestock transporters is to avoid using PPE. However, Company C do utilise speed limiters.

The manager-driver of Company C stated that drivers “*can't speed because they're limited*”. Due to the potential for tampering with speed limiters, the manager-driver of Company C regular inspects each vehicle.

*...yeah and I look, not that I know what I'm looking for but....if I look at a truck and it looks like there might have been something done to it or whatever, you know. (Company C Driver/Manager)*

#### 7.4.2.4. Summary of technological and material safety.

The above discussion highlighted specific technological and material safety items used within each company. The companies used different degrees of technological and material safety. The limited or non-existent PPE policies in Company A and C contrast with Company B's extensive non-negotiable PPE policy. All three companies used speed limiters although

some Company B vehicles were unable to be limited, making Company B rely predominantly upon policy enforcement to manage speed. Company A provides sleeping facilities, while Company B does not have such facilities, but pays for accommodation for overnight drivers. Lastly, Company B also used a number of unique pieces of equipment, to avoid injuries likely to occur when restraining a load or loading goods.

#### 7.4.3. Policies and procedures

While the effects that specific organisational policies on safety-related behaviours will be discussed in Chapter 10, the general policy enforcement approach is worth noting. Each company had a number of policies, typically enforced through some form of punishment. However, in order to use such punishment, it is important to first detect policy breaches. Thus, the following discussion outlines the specific monitoring and enforcement approaches used by each company. Again the purpose of this discussion is not to make inferences regarding the culture, but to detail the specific organisational context surrounding drivers which may interact with their culture. The information below becomes particularly relevant when considering driver attitudes towards rules and regulations in Chapter 9.

##### 7.4.3.1. Monitoring

As previously noted (section 7.2) many policy breaches are difficult for companies to detect. Nonetheless, a number of monitoring techniques, common to each company, were identified, including feedback from external sources, satellite tracking, and paperwork auditing. The following discussion outlines specific monitoring approaches in each company.

##### 7.4.3.1.1. Feedback

Transport companies can receive a significant amount of feedback from their customers regarding the behaviour of drivers, though typically only when the behaviour results in damage to non-organisational people and property, or sufficient risk to warrant a formal

complaint. Due to the post-event nature of such feedback, this serves to provide information for future prevention. Members of Company A, however, noted that occasionally car drivers will also phone the organisation to lodge a complaint about drivers.

*If someone rings up and says your truck is tailgating me the first thing we do is work out which truck it is with satellite tracking and ring him up and say 'pull your fucking head in we had someone make a complaint about you'. (Company A Manager One)*

Company B also utilises an incident reporting system in which drivers are required to report on every incident, therefore providing self-feedback. Though drivers may provide false or misleading information, or fail to report minor incidents, Company B encourages drivers not to do so as the report is for information purposes, not to assign blame.

*You know we also try to talk to drivers one on one. Like if we do see something unsafe we try to umm encourage the drivers to report incidents, even if it's their own fault because there's learning in behind that. We don't come over with a big ruler and say "that's it, you're sacked, you're fired, you're gone". What we try to do is that "tell us, we'd rather find out about it today than a customer ringing us up and saying 'hey like did your driver tell you about this?'" So we try to work through that with the drivers, and put some, you know, procedures back in place... if it's required and just try to help the driver through it. Because in some cases you know if it's a driver error, in a lot of cases the incidents when they do occur, like if it's driver related you know it is driver error. And we work through the drivers with that, so we try again to influence that safety aspect. You know like you know "why did you do it?", "You shouldn't have done it. You know these are the rules" and we just sort of, we keep on back and forth you know. We always try to revert back to what our procedures and policies are and try to influence them in that way mate. (Company B Branch Manager Five)*

#### 7.4.3.1.2. Satellite tracking

As noted above, satellite tracking is a common monitoring method used in the heavy vehicle industry. Tracking provides the companies with information regarding the current location, heading and speed of a vehicle. Satellite tracking was used by each company to monitor speed breaches in all vehicles detecting speeds higher than the speed limiter, thereby detecting speed limiter tampering and running off hills.

*And then like I said the trucks are road speed limited to a hundred but they're gear bound at more than that so of course they run it off a hill. You can't stop anyone from doing that, although we frown upon it and that's one of the reasons we have satellite tracking to try and keep control of it a bit better. (Company A Manager One)*

As satellite tracking does not automatically provide information about the local speed limit, Company A primarily uses it to monitor truck location and breaches of speed limiters. Conversely, Company C uses satellite tracking to monitor speeds which exceed a safe level for the size and configuration of specific trucks and current weather conditions.

*Oh somebody has got a speeding issue here, not speeding as in over the limit but speeding in what you should be doing with the combination that you're carrying and each one of them goes it's not me. And when you print out their little and you put it in front of them, and they're all...the ones that are doing the wrong thing go very quiet. It's there, it's there. I find it a really good tool that Navman, really good tool. (Company C Manager)*

*I mean we destroyed a quad which is two B-doubles put together. One of my drivers destroyed the truck, the trailers everything, not because he was going too fast because my satellite tracking shows me he was only going 50km/h, but it was in the fog and in the dusk and there was another truck coming the other way. He should have been doing 30km/h. –*

*– So from a management point of view if I'm there and I see he's going too fast for the conditions as soon as it comes back into the range it's a slap on the wrist, and "I'll be watching you" again. (Company C Manager)*

Company B also primarily uses satellite tracking to monitor maximum speed limits. However, the system used within the company can also be programmed with location-specific speed limits. This approach is used near one depot to ensure that drivers do not exceed the local speed limit.

*But if there's a speed, it can only tell you from point A to point B. During that time, at some period, he went over a hundred K's or you can set it to wherever you want, you can set it at 50 K's, you can set it at 60 K's, it's up to you what you set it up. So I just have mine at a hundred K's so anything over a hundred K's it gives me a blip on it. If you're on like a, say you're on a designated road in a rural area say for instance and your guys are speeding down this road and you had a customer complaint, then you could set that road to whatever, 50 or 60 then you get the same readout that down this road during some point at some time, the truck was speeding. (Company B Branch Manager Two)*

Additionally, Company B uses satellite tracking to monitor driving hours and breaks, due to the short lengths between satellite 'snap-shots'. Thus, it is possible to detect, within approximately five to 10 minutes of accuracy, how long a truck has travelled without a break. Whilst driving hours and breaks are not consistently watched, it was stated that satellite tracking serves to confirm log book data on a semi-regular basis.

*We've had instances in the past where we've gone back through the Navman and checked on what drivers have put on their timesheet and their log book. Just to make sure that they're not cheating the hours, make sure they're taking their half-hour breaks when –*



*– they're due them. Because they can only work a maximum of six hours and they have to have a half hour break, we can use that... If a guy has had his engine turned on for 10 hours straight and he's driving well you know he hasn't had his half-hour break.*  
(Company B Operational Manager)

#### 7.4.3.1.3. Paperwork audit

The final form of monitoring used in each company was paperwork auditing. Drivers in each company complete regular paperwork, including log books and pre-trip inspections. Short distance drivers within Company A, must also complete a daily run sheet. Similarly, Company B drivers have additional forms for certain customers, such as declarations of fitness for duty. Each company regularly audits driver paperwork, and one Company A manager specifically stated that “*every week I go through 15% of work diaries, 100% of pre-trip inspections and I go through mass as well*”.

*So...umm you know with the drivers, do everything as far as like the driving hours and all that, all by the law, by the book and we audit that... When the drivers fill in their audit checklist, we've got (staff member name) down the front there, he'll actually go through and make sure all the numbers are checked, the dates are correct, the driving hours correct. Breaks have been taken, is the fitness for duty checked? So there's a process in place that we do the following morning. So whatever happens today all happens yeah tomorrow... So a lot of the stuff that if a driver is actually doing something unsafe it's probably something that they're going against a procedure or policy, not so much umm I think it's probably more just to cut corners. You know like it's five o'clock in the afternoon, I've still got two deliveries, you know the mindset gets onto home time. So that's why I talk about the influencing of the behaviours because we tell them that we're going to audit –*

*– them the next day. So we'll find out what ...where they've gone wrong if they've gone away from the procedures through our auditing process. (Company B Branch Manager Five)*

Through checking paper work, it is possible to identify unintentional non-compliance. Thus this serves as a useful tool in identifying a lack of understanding held by a driver. However, due to the ability to falsify paperwork, audits cannot easily detect deliberate breaches.

#### 7.4.3.2. Enforcement

When a driver is found to breach organisational policies and procedures, they may be subjected to penalties. Despite the severity of punishment depending on the breach, the same general process was followed by managers of each company. This section details the specific approach taken to enforcement within the studied companies for the purpose of detailing the organisational context surrounding drivers.

Typically, if a minor breach of policy or moderately risky behaviour is detected, the driver will be counselled. This serves to alert the driver to the fact they have been detected, and reminds them about correct behaviour and how to behave differently in future.

*I can think of one guy that we sat down with a couple of years ago and straightened him out and there hasn't been an issue with him since then...That one came about from just watching the guy on Navman and realising that he was up to his five hours and then his five and a half and then six hours and he still hadn't stopped for a break so I just kept watching him and he exceeded the amount of time he was allowed to work without having a break, you could see that on Navman. And that's just simply what alerted me to him was watching him from that point of view. (Company B Operational Manager)*

In Companies A and C, non-conformance slips are used to inform the driver of the correct behaviour. Essentially, a non-conformance slip is a warning stating the incorrect behaviour, the punishment to be received, and the organisation's expectations for future behaviour.

*And the non-conformance itself has on it, similar thing again, is it maintenance, fatigue, what is the short-term fix, what is the long-term fix and the drivers have to sign off on the short-term and the long-term fix. And then there's an area on there that if they don't agree with a non-conformance or if there was extenuating circumstances they can fill that in and then it gives either (OH&S officer), myself or the general manager the ability to withdraw the non-conformance from the system and that has happened. (Company A Manager Two)*

Non-conformance slips serve a number of purposes. First, non-conformance slips notify the driver that their behaviour has been detected. Second, it reminds the driver that this behaviour is not accepted by their organisation. Third, it offers a form of retraining simply by indicating what should be done in future. Additionally, however, receiving a non-conformance slip provides the individual and the organisation a chance to discuss the issue in question, which may lead to retraining.

*Yeah not taking proper breaks is different again because that's a little bit more serious. So the short-term fix for that would be they receive the non-conformance and ops will talk them through that and we ask them if they want further training around that area. The long-term fix is that if it happens again they don't have the option, we will retrain them, so yeah that's an example of that. (Company A Manager Two)*

*Well before backing OH&S we just occasionally mention to them like watch your speed and then if the OH&S person or senior manager wants to take it further then they pass it on to me and you know formally warn them in the way of a written letter or a non-conformance. We're pretty big on non-conformances just to let them know that they've done wrong and counsel them if need to be counselled. Like continuously running off of hills. You know they've got to be pulled back into line and say hey no, you can't do that. (Company A Operations Staff Member)*

Company C have only recently introduced a non-conformance system. It was noted that non-conformances serve as a reminder to the staff member of the behaviour they are required to complete and an indication that they have in some way failed to meet their requirements. Thus, their systems aligns with that of Company A and B. However, according to the company's compliance officer, at the time of investigation they had yet to issue a non-conformance to any drivers.

In the event of a more serious offence, or a repeat offence, a driver may receive a written warning. This warning again will indicate the policy or procedure breached, the expected future behaviour, and that further breaches in the policy may result in termination of employment.

*It's the only way I'm going to be able to do it because then if it's there in writing they initial the bottom of every page and sign the back, that's my arse covered. And it means I can go down and say to them, you understand this, you signed this piece of paper that says you understand this, why aren't you doing it? And give them a non-compliance. (Company C Compliance Officer)*

*Main thing would be if we get ...finding out about that. If a customer rings or severity there of it. So we'd certainly be, we would have a sit down chat with him, we'd always make sure that there's at least two of the supervisors in the discussion. Then mainly the supervisor that they have, if it's day shift or night shift. They'd be cautioned with it and we'd take a note of that, basically if we saw that happen again then they would be given a written letter or warning and depending on the severity of whatever that safety situation might be we may pursue that. You know we would go down the road of a termination. (Company B Branch Manager Three)*

Finally, if the behaviour is deemed to be extremely dangerous, or a written warning has already been issued, the individual may be recommended for immediate dismissal.

*Well it depends on what it was for right? Say for argument's sake I saw you jumping off the truck incorrectly right. I'd say look explain to you why you didn't have to do it right. But then if I saw you doing it another time I'd probably remind you and say for argument's sake if I saw you doing it a third time I'd put it in writing and just say you know this is what I saw you do. This is what's going to happen and then if I see you do it again we'll escalate it to a first and final warning letter. So that's like getting three warnings before you get fired. Now say for argument's sake I saw a bloke standing on top of a truck right? He'd be told to get down straight away, he would get a first warning letter straight away because you know the situation is so much more dangerous and I'd say for argument's sake he'd have been you know really silly up there I'd go and see the boss and I'd recommend termination. Yeah. So that's the... you know of course at the end of the day we're serious about safety. (Company A Health and Safety Officer)*

*I suppose the worst or one of the most extreme situations is if we've had a driver that will not follow our safety procedures, they'll be counselled, if their performance doesn't improve the worse thing is they'll be dismissed. We've done that on a couple of occasions where drivers have repeatedly broken our safety requirements, and it's got to be a significant incident or incidents before we take those extreme measures but we will if we think ongoing, the guy has got you know...some drivers I suppose you know I've always done it this way, she'll be right mate, that style of thing. We don't condone that you know if it's...if they're under.... involved in any issues that could involve safety of the public or themselves. Certainly discussion, counselling, if all else fails dismissal. So yeah safety is probably at the forefront of what we do. (Company B Region Manager One)*

#### 7.4.3.2.1. Summary: Policy monitoring and enforcement

The above discussion outlined the specific approaches taken towards policy monitoring and enforcement within each company. For company policies to influence behaviour it is necessary for breaches to be detected and punished. Not all breaches can easily be detected by transport organisations. Nonetheless, each studied company uses a number of monitoring approaches including feedback, satellite tracking, and paperwork auditing. Minor breaches in policies and procedures are typically used to train the individual. More serious incidents, however, may have employment consequences, thus deterring repeated behaviour.

#### 7.4.3.3. Company B specific: Culture shaping

Uniquely, Company B managers regularly indicated that they deliberately attempt to shape the culture of the organisation and groups with whom the drivers of Company B interact. Whilst this discussion is inherently about culture, the relevance of this information to the current research relates to the specific actions taken by management and not the reasons or rationale behind these actions. The following discussion highlights specific practices used

by Company B managers which form an important component of the organisational context surrounding drivers.

Managers often stated that they try to ‘shape the culture’, though typically this phrase was somewhat interchangeable with influencing a certain behaviour, as culture appeared to be described as patterns of behaviour. The primary means to shape culture used within Company B were ensuring a high level of homogeneity within the company, creating habitual behaviour patterns, setting examples of positive behaviour, raising awareness of safety, and reducing the sense of invulnerability to incidents. Managers appeared to believe that cultural shaping was dynamic and requires constant maintenance, as people will resort to old patterns of behaviour and thinking. Thus their concept of shaping culture aligned with the literature which suggests that culture can be difficult to change, or that true change may not be possible.

*Needs to be driven though still by the management. If you back off a bit the guys start to probably get back into the old routine. So you constantly need to be reviewing what they're doing. If they're not doing something right you know you broach that with them. We had a toolbox meeting with a group of them, pulling the guys aside off our driver trainer, might see someone they're probably not doing it the best way. Well then (name) allocates them time and do refresher training with them. (Company B Region Manager One)*

Managers of Company B highlighted homogeneity within the organisation as a key for maintaining a good culture, again typically meaning patterns of positive safety behaviour. In the past, some branches of Company B reportedly exhibited significant variance to the remainder of the company, leading to a higher risk of incidents and injury. Managers perceived that unless there is consistency across Company B, upper management cannot accurately assess safety and reduce incidents. In order to solve this problem, Company B

promoted a driver trainer from serving one depot to oversee the training needs of the entire company and examine safety across the company.

*He got promoted down to there and he's now sort of implementing what we've got here into other centres. Whether or not we're better or worse off than other sites really couldn't answer it because I've never really gone to those sites, but I do feel that I know when I talk to the drivers now that that gap has closed up to where the standards are a bit more gelled I suppose. Like before it used to be like I used to get a driver to come up from here and mate it was sort of like eyes wide opened like "holy shit... I didn't know I had to wear high viz" or "I didn't know I had to do this", you know. And it's just because they're used to being away from a site that's so heavily focussed on safety. Now it's not a problem... It took a while to implement and I think the link was (name), you know like they needed somebody like (name) in that role to bring it all together. It was all there on paper, it just needed somebody to be saying hey that doesn't look right or it just needed that fine tuning... Like it wasn't just somebody come in for two days and said this is now what we've got to make changes to. He understood the business as a driver, as a manager, he looked at it from, like similar to what you're doing now, you know going through the managers, go through the drivers and getting that right balance I think mate. (Company B Branch Manager Five)*

Company B managers also often indicated the need to set positive examples. Thus, like the common phrase of safety culture as 'the way we do things around here', Company B seeks to show drivers the correct way to act through constant training and reminders.

*I think generally everyone that works in (Company B) is pretty intelligent and is all striving for the right thing. You know there's the old guys that have been here for 20 to 30 years and who are taught how to do things for yourself because in those days there was no communication if you broke down in the middle of the highway somewhere, you didn't –*



*– have a mobile phone. You couldn't ring up someone and say come and fix me, you had to do it yourself. Whereas the newer breed of guys don't have that training because they're used to modern technology. Some guys don't allow drivers to change a flat tyre. So that's the sort of breed of person you're getting coming through. But it's always a case of just teaching them the (Company B) way and not the way they've come in with bad habits. And I think people come to realise from the way we run our business is that we don't do things illegally and people appreciate that. (Company B Operational Manager)*

*I think another hazard is the mentality of people, of the drivers when they're out of the depot is they revert back to old ways. So they'll take off all their high vis, they'll walk around in thongs, they'll put on their stubbies, they'll smoke, they'll eat and drive, do all of those things where we've got very clear procedures, but how do you monitor that? Really hard to monitor, because you're not sitting out the back of woop woop watching them. So some of the ways that we reduce those risks is a lot in the culture. So a new focus is a cultural behavioural shift, is people just behaving in a way that is safety related so that it becomes a behaviour, that it will be done regardless of whether you're being seen or not being seen. (Company B Director)*

To further facilitate this approach, the company newsletter often provides stories of correct behaviour to be modelled. For example, one driver made a poor decision resulting in damage to company property, however, they then went to great lengths to rectify the problem and this behaviour was included in the organisation's newsletter.

*I've got a driver recently, he parked his truck and went in for a break at a service station and he parked it just outside the service station on (road name). When he came back, he didn't notice the damage but he noticed a car off to the side. He drove back to the yard and then when he got to the yard he noticed his vehicle had been damaged. And he came back –*

– up, he actually parked it and went “well this is wrong”, took photos of that and went back up to the scene and found the car and found that it’d been like, someone had stolen a car and careered off the road and hit our truck, they took it off then took the plates and ran... the police were called, he made sure he called the office and he got (the Director), he came and looked and took all the pictures... So a couple of good things about that which I asked the driver could he write a story about it so we could publish it in the newsletter... this is the sort of behaviour I would like other drivers to hear about... He went above and beyond by, fair enough he didn’t see the damage at the time but he made the effort to come back. He knew where it was, he knew where it happened and he came back. He took pictures and he called somebody... I guess the not so good thing about his behaviour was he didn’t need to stop there for a break... He stopped because apparently a mate was there and he was going to go and see him, so he went to see his mate. So he did that, rather than take the truck the 15 minutes back to the depot... So he’s put a \$250,000 piece of machinery at risk because of convenience to meet a friend, and that mentality isn’t a good thing to

Finally, Company B management seek to shape culture through constantly raising awareness of safety and increasing the perceived risks of incidents. As discussed in section 7.3.4.2, Company B uses SORs to maintain safety consciousness. Though this was discussed as an aspect of toolbox training, at its core this is an attempt to maintain awareness and shape culture.

SORs mightn’t have anything to do with the transport industry but we still bring that up at the meeting. You know there’s the man that fell off that building in Ipswich a couple of weeks ago, that will be brought up. It’s more to sort of try and keep them focussed on safety. As I keep telling them I want to go home the same way I come to work except dirtier.  
(Company B Region Manager Two)

*I think we've been able to develop a culture in a couple of those sites where the guys actually now think all the time about safety because we've been able to show them what happens if they don't through our customer sends us anything that they get nationally, any significant safety occurrences. We'll then feed it back to our guys, look what happened in Victoria, look what happened in NSW, beware of this when you're doing it. So I suppose it's constant communication, referring back to the safety. The drivers see us working on our load restraint or umm trailer design or vehicle design and training safety training. With that event you know you start to develop that safety consciousness because you're always talking about it. (Company B Region Manager One)*

Additionally, one Company B depot uses trailer placards aimed at raising awareness of safety in drivers, customers and members of the general public. These placards included simple messages reminding unloaders to be aware of the location of the driver and broader statements such as that the driver is also a father. Whilst it was recognised that the placards could seem 'silly', it was argued that even the act of reading and criticising the placard can result in discussion which may be effective in shaping attitudes.

*It's all about how people perceive the truck driver. What we're trying to get out of it, especially on the road, that everyone sees a truck driver as a maniac, you know, he's going to cut me off and all that. In some cases drivers are saying they cut somebody off because they wanted to cut somebody off, they've got a family as well is what we're trying to promote. We've also got over there is 'where is the driver standing?' so can you see the driver? We've had quite a few near misses across the business, not saying directly through (Company B) but through (steel customer) when forklift unloading and, you know, the packs have fallen off. So we try to put magnets up on the side of the truck without us standing beside them and saying you know can you see the driver, we've got these –*

*– magnets up so they can read it. And it sort of, and some customers take it as a bit of a joke, but even while they're taking it as a joke they're still reading it and they're still talking about it. So that interaction is still happening. So we're influencing that type of behaviour. I think I talked to you before about you know what we try to do as far as safety, ear plugs and all that. We try to get all our guys, super, advisors, managers, whoever comes here on site, to be dressed ready to, you know, we don't try to cut any corners with safety. So if I'm seen to be wearing the right gear, like don't necessarily need to be wearing high vis all the time but I do because I want my drivers to see that well if he's wearing it then I should wear it. So they're the type of things that we really try to influence with the behaviour. (Company B Branch Manager Five)*

The belief that incidents 'won't happen to me' poses a significant safety risk and managers indicated that they also try to change this belief. This is particularly relevant for drivers who have worked for a long time without having an incident. Drivers were argued to need to believe that the job they are doing can lead to injury (see also section 9.3.1).

*But no, no I suppose it's just a matter of talking to the drivers to get, you know, their beliefs in safety. That's, I think, that's the underlying fact that the driver has got to have a sincere belief that whatever they do when they're at work can result in them hurting themselves. So consequently they need to have that safety focus at all times. But also at the same time they've got to balance that with getting the product delivered and ensuring the customer is happy and ensuring our customer is also satisfied they've done their job properly. (Company B Region Manager One)*

Company B seeks to develop a sense of vulnerability to injury and incidents through training and general conversations. Thus, they aim to produce a culture which is constantly seeking to reduce the risk of injury.

*It's an aging industry too ... and I've found in my time is that the older ones, and we touched on it before, is I've been doing it for 30 years. That umm is something that I try to change very quickly whenever I've become a manager in a certain contract or whatever it may be. Because those type of guys, they're the risks to me, you know, those ones have never had the incidents and never done this and do everything right, they're still a risk... So that's where I suppose my involvement is as we try and give that feedback to the drivers or influence those behaviours to keep them focussed on the point mate, which is come home safe. (Company B Branch Manager Five)*

## 7.5. SUMMARY OF THE INFLUENCE OF THE ORGANISATION ON SAFETY

The purpose of this chapter was to detail the organisational context within which drivers operate. There were a number of similarities between each of the studied organisations. Each organisation used a number of employee management strategies which provide the foundation for the work which is conducted by drivers. These strategies included recruitment, probationary periods, initial training and inductions, ongoing training, rostering, and payment. Whilst the companies differed in the exact use of these strategies, these strategies essentially determine who is permitted to drive a heavy vehicle, how much education they receive, when they are permitted to drive and what monetary incentive they receive. Similarly, each organisation used specific safety management strategies including regular communication with drivers, providing a safe working environment with technological or material safety, and the monitoring and enforcement of policies and procedure.

In terms of the current safety culture framework, these organisational strategies serve as significant contextual factors which, together with broader contextual factors (see Chapter 8) and cultural factors (see Chapter 9), shape safety-related behaviours (see Chapter 10) and therefore outcomes. It is worth noting, however, that this information could also be

interpreted through the normative conceptualisation of safety culture. The normative conceptualisation typically examines organisational structures and systems, comparing them to a predetermined set of best practices. Given the lack of previous safety culture research on the heavy vehicle industry, it is unclear what these best practices may be. Nonetheless, Company B appeared to have a stronger safety standard than companies A and C. Thus, it would appear that Company B could serve as an exemplar organisation for other transport companies to model. The next chapter details the broader contextual factors identified in Study Three.



## Chapter 8: Study Three Results Part II – Contextual Influences on Safety

### 8.1. CONTEXTUAL INFLUENCES ON SAFETY

Study Three consisted of a series of three case studies with transport organisations.

During these case studies, observations of drivers and interviews with organisational staff and drivers were conducted. In addition to the factors related to the organisation (see Chapter 7), a number of other contextual factors on safety were identified throughout the case studies.

These factors were categorised according to their source, ranging from abstract concepts such as the influence of national and global climate, to more concrete concepts such as government enforcement. Whilst the effects of each factor at times differed for drivers from each company, the factors were fairly consistent across organisations. The following chapter discusses the following contextual influences which were identified in the case studies: (1) the influence of national and global climate; (2) government departments and enforcement; (3) the general public; (4) the customer; (5) accreditation schemes; (6) the broader industry; and (7) environmental and situational factors.

As with Chapter 7, the purpose of this chapter is to detail specific contextual factors surrounding drivers. As stated in section 2.3.5, the synthesised conceptualisation holds that safety outcomes are the result of behaviours which are influenced by both culture and specific contextual factors. Thus, in order to address the aim of explaining how culture and context influence behaviour, it is necessary to provide a detailed account of the context surrounding

the driver and organisation. This context interacts with the culture of drivers (described in Chapter 9) to influence safety-related behaviours (see Chapter 10 for a discussion of how these factors influence behaviour). Whilst many of the themes regarding contextual factors are naturally influenced by the culture and individual attitudes of respondents, this chapter seeks to outline the specific structures and systems present within and around the industry. Thus, though inferences regarding the culture of drivers or managers could be made from many participant comments seen in this chapter, this is not the purpose of the current chapter.

## 8.2. THE INFLUENCE OF NATIONAL AND GLOBAL CLIMATE

The majority of factors identified within the case studies have a specific and direct effect on safety, through either the drivers or organisation. There were, however, a number of broader influences on safety, originating at a national or global level, which had a more indirect impact on safety. These included the effect of the 2007-2008 global financial crisis (GFC), the heavy vehicle industry driver shortage, and the effect of national cultural influences. Due to the abstract manner in which these factors were said to influence safety, they were more likely to be identified by upper management. Thus, there was a deficit in the depth and quantity of information obtained. Nonetheless, it is important to be aware of the effect of these factors on safety. Each of these contextual factors is outlined below.

### 8.2.1. The Global Financial Crisis

The GFC received significant public attention and had widespread impacts. The heavy vehicle industry was significantly affected by the GFC, through increased financial pressure on trucking companies, due to decreased spending by the general population, fewer goods to transport and increased competition. This financial pressure resulted in an increased motivation to cut corners regarding the implementation of safety. Similarly, Company A and B were required to make financial decisions to reduce this pressure.



*Because of the global downturn the work has dropped a lot... it's the same amount of work but smaller loads... so they are cutting down with the business and a lot of drivers are scared that when it gets busy again we won't be able to make it. Just recently they got rid of two prime movers, two trailers and a body truck... they got rid of them on the Friday and needed them on the Tuesday. (Company B Driver One)*

*And we are looking at an idea of giving drivers say a thousand dollar bonus every year but it works backwards. Every time they get a non-conformance they lose \$10 or something off that bonus... but again yeah with the GFC and everything it's been tough so that hasn't been implemented but that's where we want to head. So hopefully things will pick up soon. (Company A Manager Two)*

When combined with other catalysts, such as the Queensland floods between December 2010 and January 2011, this increased financial pressure led many transport companies to close. Whilst this increased the available workload, many organisations still face difficulties with the additional driver shortage.

*Oh yeah, with the GFC there's less and less transport companies out there so the work is out there and continually we don't even have to look for work, we're getting phone calls all the time can you do this? Can you do this? And we've got the equipment sitting here and we can't get drivers. So it's hard yeah. (Company A Manager Two)*

### 8.2.2. The driver shortage

It is common place within the industry to hear of the “driver shortage” that has been experienced in recent years. As stated in section 7.3.1.1, the additional workload and shortage of drivers has led Company A to loosen previous recruitment standards. One influence said to contribute to the driver shortage is the mining boom. One Company A manager indicated that

even with the loss of many transport companies, the mining industry, through offering better pay, hires many of the transport workers who have lost their past employment.

*No the mines have made that so bad. So bad because I mean we've had some of our long-term drivers leave... one of them as an example, he earned probably take home about \$1200 a week for his work and he chose to not do five days but he's taking home over \$2000 a week and you just can't compete with that. And I think he said he's two weeks on two weeks off so he's only working six months of the year... (Company A Manager Two)*

Additionally, the lack of formal recognition and training for heavy vehicle driving as a skilled labour was argued to contribute to the driver shortage. In the past, drivers would often have children or offsidiers present with them as they worked, which served as an informal introduction to the industry. However, due to the effects of insurance agencies and workplace legislations, this practice no longer occurs. Additionally, many insurance companies either refuse to insure heavy vehicle drivers under 25 years of age, or require significantly increased premiums. Given the low profit margin of the industry, many transport companies are unwilling to employ younger drivers and by the time a potential driver reaches an age at which they will receive work they may have pursued a different career. Whilst this is an industry concern, it was suggested that, if external bodies could provide recognised training, the number of people entering the industry could increase and ultimately increase competence and safety.

*...if we start at the schools I think programs that the government has need to be tweaked a little bit more to have the task of driving be considered a trade. Not an occupation, it's a trade like a mechanic. To get to the class of heavy vehicle operator, you start at high school where people can do a trade or an apprenticeship on it, not a traineeship but an apprenticeship where they're being an offsider, they're getting their licences out of –*

*– school, as long as they're competent and driving the right class and insurances support that and all those things come into place that you'll have a 24 or 23-year-old that is going to be a competent HR, HC driver and we've got more people in the industry but we're going to get more people, the bigger the pool which means the higher the competence rates. If we've only got a very small pool, we've got, we're digging the dregs of the barrel and we're going to fight a losing battle to ever get a smarter operator out there that can replicate these behaviours. (Company B Director)*

### 8.2.3. The effect of national culture

In addition to the specific pressures exerted upon the industry, the national culture can influence safety. Though only discussed by a small selection of participants, it was indicated that safety beliefs and values originate long before entering the workforce. The primary sources of these values were alleged to be public media and early life experiences. Even seemingly harmless activities were argued to build a dangerous culture – for example, watching television entertainment programs portraying a lack of compliance to safety principles. Whilst the previous example may be extreme, it was suggested by members of Company A that teaching safety is not solely the responsibility of the organisation.

*The other thing that I think is very valid right? Have you ever watched ... renovation programs and so forth on TV? ... have you ever noticed that they all run through the warehouse? Right? Have you ever noticed that some of the times... they were working off ladders without three points of contact? ... sometimes their scaffolding isn't erected correctly? ... Why don't we talk to these people you know and with regards to attitude and mind set and everything else. (Company A Health and Safety Officer)*

#### 8.2.4. Summary: The influence of national and global climate

The above discussion outlined a number of contextual influences originating from a national or global level. The global and national climate can have a direct and indirect effect on safety in the heavy vehicle industry. Recent economic conditions have placed considerable financial pressure on organisations. Additionally, the shortage of workers available for the industry increases pressure to hire drivers who would otherwise be deemed unsafe. Finally, national cultural variables may shape the culture of the workforce. Despite being seemingly removed from the daily activities of truck drivers, these factors highlight that the heavy vehicle industry does not operate in isolation from this broader climate.

### 8.3. GOVERNMENT DEPARTMENTS AND ENFORCEMENT

There are a number of government bodies which have an influence on safety in the heavy vehicle industry. Though the manner in which safety is influenced differs between departments, they primarily exert influence through policy enforcement. Thus these bodies largely serve to deter unsafe behaviour. The specific bodies identified in Study Three were the Fair Work Ombudsman, workplace health and safety branches, WorkCover, transport departments, police, animal welfare and the RSPCA. Prior to discussing the role of each department, two general factors will be discussed. First, though specific policies and enforcement are discussed in relation to behaviour in Chapter 10, chain of responsibility legislation will be discussed here due to its influence over many types of behaviour. Second, it is worth noting that enforcement on organisations may lead to an effort to appear safe, rather than actually reduce safety outcomes. The discussion below outlines the specific factors which form the government context surrounding drivers and organisations.

### 8.3.1. Chain of responsibility legislation

In 2005, the New South Wales and Victorian governments implemented chain of responsibility (COR) legislation, followed closely by the remainder of Australia. COR legislation states that any member of the supply chain (schedulers, packers, loaders, drivers, operators, receivers and employers or managers) can be held accountable for any action, inaction or demand they make which contributes to breaches in road safety. COR legislation is widely thought to have significantly impacted the industry, due to greater potential for punishment.

*Oh just everybody realises what the repercussions could be. I think there's a lot more of a chase of it in the court system and you know a lot of the smaller transports and the way they went a lot of those have gone now because of that you know. There's nowhere near as many, I don't know I suppose you'd call them backyarders in the game these days you know... Just you know I suppose the repercussions are now that there is jail time too I suppose, whereas everybody got a slap on the wrist for it many years ago. I suppose now there's a bit more of a repercussion to it. (Company B Branch Manager Three)*

The effect of COR legislation has been predominantly seen through transport organisations. One Company A driver stated that *“if a driver says no, they can't make you do it under COR”* as *“if they make them the company goes down big time”*. Additionally, one Company A manager stated that, due to COR, the company now ensures drivers take the required rest breaks. Similarly, within Company B, one manager suggested COR has meant that he must make every effort to ensure that the correct processes and procedures are in place prior to sending a driver out on a job.

*We enforce everybody take their legally required breaks, if you don't you're fired... and like I said, force blokes to have required breaks. Once upon a time all companies never used to do stuff like that but we now dismiss people if they don't because it's just too much of a risk if something goes wrong. Yeah it's a lot of trouble coming. (Company A Manager One)*

COR was perceived to have had mixed results on customers. One Company A manager indicated that their major customer now require safety, as they are equally responsible under the law.

*We do a lot of work for them, we're very closely monitored and essentially they even do their own audit on us every... every six or 12 months they audit us themselves. To make sure we're not breaking the law because under chain of responsibility these days they're in as much shit as we are because as the customer they're seen to push us to do the job. So you know they watch us just as closely as anyone else watching us. (Company A Manager One)*

Despite the positive impact of COR on some customers, it was often suggested that COR has failed to influence some customer behaviours, particularly delays which can contribute to fatigue and driving over hours. One Company B manager argued that the reason customers have been insufficiently effected by COR was a lack of education, although others suggested that some customers simply “*look the other way*”. Similarly, the manager of Company C noted that many livestock agents do not understand their obligations and in the past has contacted the local transport department who sent a representative to explain COR to an agent.

*Yeah so basically that's the story for us. Agents, to be honest with you agents are the biggest problem. They expect more and think they're exempt from lots of things. Like chain of responsibility etc you know we need you to be, or they'll ring at eight o'clock tonight and want you somewhere that's quite impossible at six o'clock in the morning and not get their head around the fact that there are other issues. We've had boys working in the shed here all day. They can't just get in the truck and be there tomorrow morning, that's just not how it works. So convincing them of their responsibilities is very difficult. Some of them are fine and some of them have respect for who we are and what we do because they're, when we started they were in nappies. So there's that oh okay well we expect that some of them are not...some of them will never be... Yeah so we did get them in... my understanding is that they... and this is quite some time ago, had a bit of a talk to the agents and the graziers. But I think at the end of the day there's got to be more education of those people and it's not all about the truck driver. You can't just put them on and say to the driver you need to be somewhere, they've got to take responsibility. And until somebody gets prosecuted and umm and convicted nothing is going to change because why would it?*

(Company C Manager)

Whilst COR has significantly influenced safety within the industry, this influence has yet to extend throughout the supply chain. This may be due to the number of customers and stakeholders within the industry. Thus, the industry is often required to educate their customers about COR.

### 8.3.2. The paperwork trail

A number of case study participants indicated that enforcement targeted at organisations typically lead to a paperwork trail, rather than organisational changes. Whilst this theme is inherently influenced by the culture and individual attitudes of respondents, as

the current research focuses on the culture of drivers, rather than organisational staff, it is important to recognise the manner in which government policies influence the organisation and are presented to drivers. Drivers often noted that organisational policies are put in place primarily to “*cover their arses*”. Whilst organisational staff at Company A did not use this wording, they did indicate that some policies were aimed at reducing the risk of punishment despite no perceived safety benefit. For example, it was stated that whilst the methods of training and policies have not changed an additional paperwork trail is needed as evidence in case an incident occurs.

*And one bloke climbed up and fell and because we didn't give him a letter to say hey don't climb up the fucking trailer it cost us a lot of money and a lot of trouble... we had gone through the whole don't do it, don't do it, don't do it. So we got in the least amount of trouble but we still got in a lot of fucking trouble for it. (Company A Manager One)*

*Yeah when it goes wrong that's when you've got to have a bit of paper. You know I just don't get it; I don't get the whole shooting match. (Company A Health and Safety Officer)*

As stated by the compliance officer of Company C, whilst the company complies with the laws to the best of their ability, his role was “*just proving that we're doing the right thing, and that the men are doing the right thing and that's all, all the Is are dotted and the Ts are crossed*”. It was argued that the sole purpose of this was to ensure that “*when that auditor comes in, or when the department comes in and has a look at the paperwork it's all there, [the drivers] don't get fined, nobody loses points*”. Thus, rather than organisations using policies to improve safety, they are often simply an effort to provide evidence of already occurring behaviour.



### 8.3.3. The Fair Work Ombudsman.

The Fair Work Ombudsman is a regulatory body put in place to ensure that organisations comply with commonwealth workplace laws, investigating issues such as payment of employees, unfair dismissal and mistreatment of employees. Thus the ombudsman acts as a check to ensure that individuals are not forced to comply with unreasonable demands by the organisation. As this body was only discussed by members of Company A it is unlikely that they play a major role in safety within the industry. Nonetheless, due to the existence of pressures within the industry, the Fair Work Ombudsman gives truck drivers an option if they feel pressured into unsafe working conditions. Thus, it is important to recognise the Fair Work Ombudsman as another contextual influence surrounding the industry. Organisational staff members from Company A indicated that the Fair Work Ombudsman has investigated their organisation on a number of occasions.

*It's a really interesting thing because we put, and even when we were audited, we got audited by the workplace ombudsman and we do on a regular basis, as people leave and they're not happy or whatever. And they've never found anything but they cannot believe that we put our drivers on permanently because they said the majority of transport companies have their drivers as casuals not permanents. (Company A Manager Two)*

Additionally, one Company A driver indicated previous experience with unfair dismissals, stating that a previous employer had tried to force them to drive a vehicle with bald tyres. After refusing to drive the truck the driver was fired. The driver then stated that “*if they sack you for not doing something you can't do you can get them for unfair dismissal*”.

#### 8.3.4. Workplace Health and Safety and WorkCover

Workplace Health and Safety branches play a major role in policy making and enforcement within the industry. Members of the case study organisations did not discuss the role of workplace health and safety branches directly, however, they did emphasise the role of workers compensation, or WorkCover. Given the close relationship between WorkCover and workplace health and safety branches, and that compensation claims may lead to workplace health and safety department involvement, the influence of these two bodies overlap. The majority of information regarding these departments was drawn from a select few organisational staff members. However, this information source bias may reflect the role of these individuals, rather than discredit the information obtained. As the enforcement aspects of these bodies are exerted at an organisational level, managers and health and safety personnel are more likely to see them as relevant to safety within the industry. Additionally, a number of the provided quotes were drawn from a single manager who was very passionate and vocal about the issue. However, the same sentiments were expressed, albeit to a lesser extent, by many managers. Whilst the attitudes of respondents can be clearly seen to influence the themes identified, it is important to recognise that the purpose of this section is to detail the influence of WorkCover. This discussion does not seek to explain the culture of drivers, nor the attitudes of specific respondents.

Similarly to insurance bodies, WorkCover requires organisations to pay a premium based upon a number of general factors, such as the size of the organisation and the average claim rate of the industry, in addition to an organisational safety record loading.

*Well when I first came here I thought we had heaps of accidents. When I looked at our insurance you know like annual reports and things it was like oh my God. Like seriously there are so many accidents. But then over time as I sit in on the meetings every time they come around to renew our insurances and stuff, this company is doing so well in –*

*– comparison to most. And our premiums should actually be a lot lower but you know how they use industry premiums? (Company A Manager Two)*

In addition to regular premiums, in the event of an incident claim, the organisation is required to pay an excess, calculated upon factors including the usual salary the individual receives and the duration of lost work time. Further, if the organisation is found negligent, they may be at risk of fines or further payments. Thus, WorkCover serves to deter organisations from failing to provide a safe workplace, leading to changes in perceptions of acceptable behaviours.

*And not only is it less safe than it was, it's not less safe or anything it's just the amount of trouble you get into stuff like that now closes your business down. You know just to take someone to hospital and give them some worker's comp for a few weeks you know get tens or hundreds of thousands of dollars' worth of fines and shit. (Company A Manager One)*

In addition to fines and punishments, an injured employee may choose to make a common law claim against the organisation. These claims provide further incentive to manage safety in the workplace.

*And we had one WorkCover common law claim, like common law, which was just ridiculous and it cost this company, we paid \$45,000 in our policy premiums though to this individual in lost salaries and things, well continuing their wages and that. When we in our minds thought this is not a genuine common law claim but what do you do? And yeah they threw it out and said you shouldn't have even got \$45,000 at common law yet WorkCover continued paying. And that was one incident and we've got another and it's ongoing at the moment where yeah this guy again is claiming he's like claiming a million dollars. (Company A Manager Two)*

Due to these significant costs, Company A members indicated that they work closely with WorkCover to encourage rehabilitation of injured employees. Thus, whilst WorkCover primarily serves to deter injuries from occurring, they also assist in reducing the severity and duration of injuries.

*We try and work really closely with WorkCover to rehabilitate as quickly as possible not only for our financial gain... but paying some dude to do nothing for three weeks while we're paying another dude to do his job. (Company A Manager One)*

Despite the benefits of WorkCover and workplace health and safety branches, there were concerns raised by case study participants. First, it was often indicated that some individuals abuse the compensation system for monetary payouts.

*Depends on the person. You can generally pick them. I had one person who fell off the truck, the trailer and fractured his hip. Fifty per cent overall permanent impairment, can't drive a truck today, has never gone common law. Could have gone to state claim and common law no worries, never gone common law because he felt supported through the process. He has a job that he still works around the heavy vehicle injury but he just said, I'm not that type of person. I don't believe in that sort of system. I've got a payout that has been sufficient for me to do what I need to do for ongoing surgery because he needed a hip replacement in the end and that came out of a stat payment. He did all that, he's happy. I've got somebody who has a small tear that was based on a pre-existing tear but they did it, the straw that broke the camel's back was here. It'll be in common law, no worries. They've already got their lawyers involved. That's the first person they call after their injury is a lawyer and it's flagged all over WorkCover. You see it coming a mile away because they just know they can get some money and they're only after the money. I've got some people who we go through the whole process, they're all wanting to get back to –*

– work and everything like that, all happy to then they know the system well enough to go can you give me a permanent impairment assessment and offer me a payout? And they'll take that as well, they'll go oh I'll just take an extra fifteen, sixteen grand from this. That's going to help me pay off my next car. I've got some people that use the system because they know they've got money and they're not really going to need it going forward but they know they can get it. Got other people who don't believe that they should milk the system like that then we have other injuries where people haven't even, they don't even think about it... They've focussed on the job rather than the injury. (Company B Director)

Specific examples of working this system included claiming injuries which occurred at home as work injuries, and trying to achieve maximum payouts from minor injuries.

You know we had a bloke the other day went to the doctor and got I've got a pain in my groin. Oh it's a hernia. Is it a work injury? 'Yeah I done it at work' (tone of voice used to indicate otherwise). All that dude has ever done since he's worked here he gets in his truck goes to [customer depot], hooks up his trailers goes to Sydney unhooks them and goes to bed... All of a sudden you know we've caused his hernia. Turns out, we sent him to our doctor yesterday he doesn't have a hernia he's got a strained stomach muscle. That could happen from taking a crap mate; you know how does he put that down to being a work injury? The hardest thing he does is climb in his truck which is probably no taller than his front steps at home anyway. Unfortunately everyone knows now that you can get lots for a work injury... You know we had a bloke here who couldn't come to work for a week and was having time off because he hurt his shoulder lifting a gate. That was awesome except the week before that he fell off a chair changing a light globe at home. Same injury. So he was just told to go to work or fuck off and work somewhere else. I'm not going to say people don't hurt themselves and then they deserve time off work. But if a bloke falls off a –

– chair changing a light globe at home and then comes to work the next day or the next week oh I hurt my shoulder lifting the gate. You know you want to belt their fucking head in because number one they're lying straight to your face. You're good enough to give them a job in the beginning. He's lying to your face and he expects to get money for it that he doesn't deserve. That's fraud mate. But these blokes, you know, if I went to the bank and said my name's [researcher's name] I want to withdraw a thousand bucks I'd go to fucking jail for that. But yet these blokes can make a false claim for injury and receive money for it and it's just like yeah go back to work you're not getting any more so they go back to work. What's the difference? (Company A Manager One)

Whilst this may not directly influence safety within the industry, it may inflate injury statistics and results in increased premiums.

It's another bloke that's probably going to try and settle for a shitload of money because he's just a fucking liar. Essentially he's a liar but WorkCover's no fault claim system means they just keep paying him anyway. And it just jacks up all of our policies in the long run. (Company A Manager One)

Second, it was argued the organisation for which an individual works at a given point in time may receive increased payments for injuries which result from cumulative strain over a number of years.

We had a bloke working here for a few months, he only had one arm, he was diagnosed with carpal tunnel and had to have an operation so that goes on our WorkCover. You know that's a lifetime of using one arm to do everything but he was working here when it happened and it cost us tens of thousands of dollars. (Company A Manager One)

Finally, it was suggested that, due to the no fault system utilised by WorkCover, workers are encouraged to take little or no responsibility for their actions. This was suggested

to lead to financial punishment on organisations even when an individual has shown blatant disregard for safety.

*It's a no fault injury system right, so no one is ever at fault so therefore everyone is going to pay. And I think that's widely spread throughout the whole issue. We're in right across the board it doesn't matter what industry you're talking about is that there's no blame placed on the individual. So it doesn't matter if I train you today right and you are ...I train you tomorrow and on the third day you had an injury and I wasn't there physically holding your hand, we are at fault. You need to place fault with the individual... people need to be accountable for their own actions (Company A Health and Safety Officer)*

Despite much of the information regarding WorkCover being presented negatively by members of Company A, it was noted that WorkCover can positively impact attitudes regarding safety. Due to the current level of premiums paid by Company A, improvements in safety can lead to a reduction in costs. Given safety is often seen as a cost, typically borne for moral reasons, the financial penalty for incidents can lead to viewing safety as having financial benefit.

*So there's been a big shift in that focus and since we've done that even WorkCover have commented on you know how well things are travelling in terms of the way we're managing our WorkCover so it's been really good. And it's also worked to influence management because our director can now see it is worth sending someone to the doctor for five hundred bucks to get specialist reports and whatever. In comparison to having you know hundreds of thousands of dollars of WorkCover premiums and stuff. So he can really see the benefit already and I think that's pretty good for a, you know, maybe we've been doing it for about 12 months. (Company A Manager Two)*

### 8.3.5. Police and transport departments

Due to the vast amount of time heavy vehicle drivers spend on the road, enforcement of road laws by police and transport inspectors play a significant role in safety. There are a number of Australian government departments responsible for the enforcement of road laws, including police, the Department of Transport and Main Roads Queensland and the Roads and Traffic Authority in New South Wales. On road enforcement was seen by members of the case study organisations as strict. One Company A driver stated that *“the authorities are pretty tight these days so you can’t do much”*. Similarly, the manager-driver of Company C stated that *“everything we do is done legitimately, as close as you can to being perfect because you’ve got to be”* as *“if you don’t get in the shit today you’ll get in the shit tomorrow”*. However, it was often noted that there is insufficient police enforcement on the roads. As stated by one Company C driver, *“there’s not enough police on the roads, when I was a young fellow you couldn’t do anything without being pulled over”*. Specific reference was made by case study participants regarding licensing, and fixed and mobile enforcement. Whilst the impact of specific laws and enforcement strategies is discussed in Chapter 10, a brief discussion of these common factors is provided below for the purpose of outlining the specific structures and systems related to police and transport inspectors, and the manner in which they influence the industry. Again the purpose of this section is not to interpret cultural factors or individual attitudes.

#### 8.3.5.1. Licensing

Government departments responsible for the provision of licences are the first influence on road safety. Similarly to organisational recruitment, the licensing process determines who is allowed to become a heavy vehicle driver. Despite the benefits of licensing, a number of concerns were raised by members of Company B and C. Members of Company B indicated that the level of skill required for different heavy vehicle licences were insufficient. First, it



was indicated that driving tests are conducted in unrealistic conditions, particularly as the vehicle used is empty. As asked by one Company B driver, “*what’s the use in going in an empty truck?*”

Second, members of Company B suggested that the current licensing brackets were too broad and easy to acquire. It was often argued that different vehicle types and loads require significantly different abilities. A driver may be competent for one type of vehicle, but hold licences for vehicle types they cannot safely operate. Similarly, drivers are not required to demonstrate advanced competency with existing licences prior to receiving a more advanced licence. Drivers are, therefore, permitted to shift to more dangerous vehicles without sufficient experience and ability.

*I have a lot of problems with people coming down with B-double licences and all this and they can't drive a single trailer with steel. You know 25 tonne of steel on is a little bit different to handle on a trailer than 22 tonne of Weet-bix, do you know what I mean? It's a whole different aspect you know. Especially when they're about 20 metres and all that, because they're long and they get trailers out 20 metres and they're 3.2 wide, sometimes 3.3...it's a whole different ball game. Like we've had a lot of drivers come here with B-double licences and couldn't drive a body truck you know. I believe that goes back to the government. You can hold a HR (heavy rigid) licence in Queensland, go and pay \$3000 to Major or whoever does B-double national, or whoever does that, of a weekend and come out a B-double driver. And yet you've never driven a trailer. Why's that? So I believe if you're going to become a B-double driver in Queensland... you know it used to be in NSW, when I got my artic ('articulated') licence, you had to drive for years, as a 21-year-old, say I think it was three years before you could actually step up and go for your thing like that. And I believe you should have to drive a single trailer before you can sit for your –*

– *B-double. Say two years, let's say that...you can go from a HR pushing 12 to 14 tonne around to pushing 86... Friday afternoon you stop the truck and you're pushing 12 tonne of steel. Monday morning you're in a truck pushing 86 tonne of steel. What's the go? Where's the experience?* (Company B Trainer One)

Drivers from Company C also raised concerns about the licensing process. First, it was suggested that the difficulty of obtaining a licence was partly responsible for the shortage of drivers. Second, the absence of a requirement for knowledge about maintenance, despite requiring the same knowledge for a forklift ticket, was indicated to be dangerous due to the amount of time a truck driver may be alone on the road.

#### 8.3.5.2. On-road enforcement

Once licensed and employed within the industry, drivers must adhere to road rules and laws. To enforce these policies, transport inspectors and police may fine drivers or even demerit their licence. As stated by one Company A driver, “*when your whole career depends on your licence you don't want to jeopardise it*”.

*Seat belt... mainly for the fines to be honest... if you get booked not wearing one you can't bitch about it. I don't wear it for safety coz I don't believe it will help you, in a head on you're stuffed anyway. You just leave it on 'til they see it if you get pulled over. Even the safest things, you can have an argument about if they are safe, I just find it's easier just to put the bastard on.* (Company B Driver Three)

A number of weaknesses regarding enforcement were exposed by members of the participating organisations. Drivers often suggested that they have had little interaction with law enforcement on the road. One Company B driver even said that after years within the industry he had only been pulled over once by police and never at a weighbridge. Thus, the uncertainty of punishment may reduce the deterrence effect of road laws. This uncertainty is

further increased by communication between drivers over UHF radio. Drivers typically inform one another of the location of enforcement, enabling adjusted behaviour in the presence of enforcement. For this reason, detection of speeding was seen as unlucky.

*I have had two speeding tickets from running off hills in the past seven months... just my bad luck that when I did it there was a cop down the bottom, plus I was on the wrong radio station so I didn't hear about them. (Company A Driver Six)*

Nonetheless, the threat of fines and punishments is a significant deterrent for many drivers. Additionally, this deterrence can extend to organisational punishment, as fixed enforcement fines are typically sent to the organisation. Within Company B one driver reported that the company owner has stated that *“if you got a speeding fine he takes it as an offence against the company”*. Thus, through the combined efforts of organisations and enforcement, there is significant motivation for compliance. The two primary forms of on-road enforcement are fixed enforcement sites and mobile or random enforcement.

Drivers tend to know the location of each fixed enforcement site passed on regular journeys. Drivers regularly pointed out and discussed specific camera sites, including heavy vehicle access enforcement cameras, red light cameras and speed cameras. Thus, drivers are unlikely to be caught by fixed enforcement. Conversely, mobile enforcement has the benefit of detecting drivers at any location. It was often suggested that fatigue management and seatbelt non-compliance could result in fines if pulled over by police. Similarly, one Company B driver stated that *“if you do take drugs you're going to get caught, you see blitzes on the highway and now they've got the drug swabs”*. Therefore, mobile enforcement has a greater deterrence effect on long-term behavioural patterns than merely controlling behaviour in set locations.

Though conducted in specific locations, weighbridges serve as a form of random enforcement due to their irregular opening. A number of drivers for Company B said that

they had never been pulled over at a weighbridge, yet that they ensured adequate load restraint because of the risk of being pulled over. Weighbridges primarily serve to check that vehicles have not been overloaded and that their load is adequately restrained. However, when a driver is pulled into a weighbridge it is typical for their work diary to also be checked to ensure the driver has adhered to fatigue management legislation. As both load restraint and fatigue management must be handled correctly from the onset of a journey, the effect of weighbridges is more similar to that of mobile enforcement in that the driver must be conducting the correct behaviour for the entirety of a journey to reduce risk of punishment.

#### 8.3.6. Animal welfare and the RSPCA

The involvement of animal welfare and the RSPCA was specific to Company C. As Company C transports livestock, they must adhere to specific policies and laws governing the treatment of animals. Prior to discussing the influence of these groups on safety, it is important to note that Company C views such policies as requiring standards that the organisation already meets. For example, the manager-driver of Company C stated that *“it’s straight forward mate, it’s what we do anyway”*.

Similarly to other government departments, the primary method through which these bodies influence safety is the enforcement of punishments for breaches of laws. Whilst the primary purpose of these rules is animal welfare, some policies such as those regarding the amount of time which an animal is allowed to stay on the truck also influence safety. It was stated by one Company C driver that *“you can only have them on your deck for 36 hours”*. This is further discussed in Chapter 10 (section 10.2.1), however, it is important to note that animal welfare issues appeared to take precedence over fatigue management laws, as the organisation is more likely to be punished for failing to abide by animal welfare issues.

*I mean I think chain of responsibility for animal welfare and chain of responsibility for driving hours umm it's easier for me to justify allowing them to go another half an hour or an hour. And I don't mean 24 hours a day, I just mean extra time to do what needs to be done. It's easier for me to justify that from a driving hours point of view than it will be if we have a disaster and we've got cattle down and dead, simply because they couldn't drive that extra hour to get them off. (Company C Manager)*

### 8.3.7. Unique factors relating to government enforcement in Company B

A number of differences regarding the influence of enforcement were identified between companies. Company B appeared to place a lower emphasis on government branches and their involvement in safety. This appeared to stem from a greater reliance on their own policies and procedures in managing safety. Whilst the differential effect of government enforcement on Company B is influenced by the attitudes of managers, it is important to recognise that the purpose of providing this discussion is to understand the influence of government enforcement on drivers. Thus, again this section will not seek to explain individual attitudes or culture.

When discussing government policies, a number of organisational staff members suggested that Company B holds drivers to a higher standard than legally required. For example, Company B requires its drivers to restrain loads more securely than current legislation requires.

*I think the law is 80% restrain your load, but we do it 100% here. You know we go, we got 20 tonne on, it's five four tonne chains, simple as that. Whereas, elsewhere the law says you've only got to restrain 80%, so you can put four chains on, Okay? Restrain 16 tonne of it. (Company B Trainer One)*

Similarly, despite legally being able to work for up to 12 hours, Company B typically rosters drivers for 10-hour shifts. Additionally, rather than allowing delays to leave a driver stranded on the side of the road, Company B will send another vehicle with a spare driver to bring the stranded driver and vehicle home. Finally, Company B has a heavy haulage branch which carries many loads that require permits and pilot vehicles or police escorts. In the case of police-escorted vehicles, the immediate presence of police for the duration of the journey will significantly influence behaviour.

*If they go somewhere and get held up and they're only allowed to drive 12 hours\* or something like that and they've driven the 12 hours they have to stop. They call here, our night loader (name) organises a driver to go there and pick that truck up and drive home. We don't let them drive over the designated hours that are allowed. So he's done his 14 hours\* coming back from (location Name), you know he's been up there, he got bogged or something, you know, whatever. And hasn't had a rest, but soon as his hours are up he has to stop on the side of the road and ring (name) the night loader and then he organises a driver to go out and get that vehicle. (Company B Trainer One)*

**\*discrepancy in hours due to differences between BFM and standard hours**

#### 8.3.8. Summary: Government departments and enforcement

The above discussion outlined the specific contextual factors relating to government departments that influence members of the studied organisations. There are a number of government departments which have an influence on safety in the heavy vehicle industry. These departments focus on a variety of different safety issues ranging from fair work conditions to safe driving. These departments typically serve a deterrent effect through punishments of breaches. Additionally, COR legislation increases the risk of punishment for organisations and customers, thus increasing the attention they give to safety. Despite the

benefits of enforcement, a number of weaknesses were identified, including organisations complying with policies in order to ‘cover their arse’ rather than improve safety, individuals falsely claiming on WorkCover and on-road enforcement being easily avoided by drivers.

#### 8.4. THE GENERAL PUBLIC

Whilst driving a truck on Australian roads, drivers share the roads with members of the general public driving other vehicles. The following discussion outlines the specific impact of members of the general public on truck drivers. Again, this discussion does not seek to explain the culture of drivers, nor the attitudes of individual respondents.

When asked what the major hazards faced by truck drivers are, the vast majority of members of all three companies indicated *other vehicles* as the primary concern. Managers and drivers consistently discussed the hazards related to members of the general public. First and foremost, other vehicles were stated to drive dangerously and could directly cause crashes which are unavoidable for the truck driver. Secondly, other vehicles can cause significant delays for truck drivers, which may lead to increased stress, frustration and fatigue. Ultimately, truck drivers are limited in their ability to control the hazards presented by other vehicles, however, they typically stressed the importance of maintaining a high level of awareness.

*“Other drivers are our biggest fear... You never know what they are going to do... You always have to be aware of what they could do.”*

(Company A Driver Three)

*“Our biggest problem is what cars are doing. Some of them have no fucking idea... My main concern is cars.”*

(Company B Driver Two)

*“Main hazards? ... cars mainly... people cutting across you, push bikes too you get them in town and along some of the highways and there is no room.”*

(Company B Driver Three)

*“Just cars really.”*

(Company B Driver Eight)

*“Other vehicles.”*

(Company C Manager)

*“Just other vehicles.”*

(Company C Manager/Driver)

#### 8.4.1. Dangerous behaviours of other vehicles

It was regularly indicated that the manner in which cars drive around trucks was dangerous and led to an increased risk of crashes. Despite this danger being commonly recognised by members of the industry, it was suggested that many regulatory officials neither believe members of the industry, nor recognise the severity of the problem. One Company C driver even suggested that he *“would love to bring police on the road with [him] to show them”*.

Other vehicles were reported to drive dangerously fast, conduct illegal overtaking manoeuvres and jump in front of trucks within their stopping distance. As phrased by one Company B driver, you often *“see vehicles that make you feel like you’re standing still”*. During the observations in each case study, on multiple occasions car drivers were observed speeding around low visibility corners where trucks enter or exit depots. The truck drivers being observed in such instances showed significant concern, as they often were required to



begin manoeuvres in fear of a vehicle driving too fast to be able to stop without crashing into them.

Drivers also often discussed patterns of weaving between lanes and overtaking trucks during turning or similar manoeuvres. One Company B driver stated that when reversing into depots, cars will often speed around the truck, whether due to impatience or a belief that they could pass the truck without posing a significant risk to safety.

*When you're reversing one of these you can't see much... you don't need cars jumping around you... even when pulling into a driveway and your cab's gonna swing around pretty far cars jump in front. (Company B Driver Two)*

The risks posed by cars are amplified by the limited visibility within trucks. One Company B driver highlighted his limited driver visibility, stating that as soon as *“there's a gap there they pull in front of you, you just look for antennas all the time coz you never know what they'll do”*. During one observation, a car driver deliberately accelerated when two lanes were merging despite the truck being significantly further ahead. The driver made the following comment:

*Like this idiot she has seen my indicator but she still tried to run up inside of me... it just makes you so fucking angry coz if anything happens you're at fault... she not even behind us now but she was willing to jeopardise us and everyone around us for a short gain. (Company B Driver Three)*

#### 8.4.2. Need for better awareness

A number of participants suggested that there is a need to provide better education to car drivers. Whilst some risky behaviour may have been caused by impatience, it was suggested that much of this behaviour stemmed from a lack of understanding about the limitations of trucks. One Company A driver specifically stated that *“they need more*

*awareness of trucks; it should be part of getting a licence*". The main topics indicated to require education were the turning circles, blind spots and typical stopping distance of trucks.

*I mean the little bubble car stops pretty quickly, they're pretty nimble, they zip in and out everywhere and unfortunately drive whether it's a bubble car or a big Falcon or whatever it might be, people drive that thing every day. That's what they're accustomed to, they see another car just like theirs it does exactly the same thing. They see the bigger car, it probably just goes faster, they see the truck, it's old, slow you know. They don't see that it takes an extra 30 metres to stop. They don't see that, you know, go down the left hand side of a truck you can't see, a truck can't see you, you just disappear from view. I was driving years ago and I remember on Parramatta Road in Sydney you could see aerals, you'd look for aerals, that's all you could frigging see. So yeah car drivers, probably not deliberately, more so because they just don't know any better, are an issue. You've got to, it's like riding a motorbike, you can blame the bike riders all you like, sorry the car drivers, for knocking the bike riders off but it's the bike rider's fault. He shouldn't have been there. You don't ride a motorcycle when you can't see the driver in the mirror or in the eye, you move away. Yeah it's education with the car drivers. (Company B Branch Manager Four)*

It was often suggested that cars will enter small gaps in front of trucks, creating a risk of a collision in the event of heavy braking, and that then they will often brake strongly when it is not always necessary. As put by one Company B driver, *"cars don't give you space, when you try to manoeuvre they zip around you, and they slam on the brakes when a light goes yellow... they don't realise I can't stop that quick"*.

*People don't realise that when you try to stop a truck you have 60-80 tonnes that keeps pushing you... that's why jack-knives happen, you stop the PM (prime mover) but the –*

*– trailer keeps pushing and has to go either left or right... That why you always try to leave four car spaces in front. (Company A Driver One)*

*The biggest issue is traffic and motorists and a lack of awareness and education about trucks... We can't pull up as quick as cars... They should start looking at their mirrors before stopping. They see a gap and jump in, they don't realise that we left that gap because we need it for stopping distances... every day you have near misses with cars overtaking you. (Company C Driver Three)*

A number of participants also indicated that car drivers do not understand the blind spots of trucks. Thus, other vehicles regularly position themselves in a blind spot and are at risk of being involved in a crash.

*So the behaviour of motorists and the behaviour and the understanding of other drivers who just simply drive cars, they have no understanding of what it means to drive a heavy vehicle. But them sitting at a certain point on the truck or behind the truck, next to the truck is anything like a car view. The truck won't see them! Then they go 'this truck just launched itself in front of me'. Well no, you're driving a very, very small car in the blind spot. Do you even know where the blind spot is? Do you have any understanding that you're right in the blind spot? He wasn't actually trying to hurt you, he just thought he was clear to drive. (Company B Branch Manager One)*

*...they don't quite understand all the other aspects that go to it because it's not included in any exams for your licence. Nothing like that. The education campaign is not about how to make you driving around a heavy vehicle safer, it's how do you get rid of your trucks or how do these trucks not do, should they just drive at night? Well god how many people in –*

*– the transport industry and how many of them have kids? Do they really want to be driving at night? That's the prime time, is it? Not. (Company B Director)*

Due to the lack of understanding regarding trucks, it was commonly suggested that better public education was required. Ultimately, it was indicated by one participant that without public education car drivers will simply receive incorrect information about trucks through public media.

*You know some people are scared of driving or they're scared of big trucks or whatever. So there's they get paranoid about it... you see the crap on A Current Affair every couple of months about bad arse truck drivers and unfortunately there's bad arse truck drivers and I was going to say there's not ..there's bad arse car drivers too. But you know everyone sees that crap they don't have a story oh yeah this bloke's a top driver he's done 40 million kilometres in his lifetime and hasn't had a crash or whatever. You know so people are going to think oh most of them are good, there's some dickheads around, they just think everyone is a dickhead. (Company A Manager One)*

#### 8.4.3. Cause delays, stress, frustration and fatigue

Car drivers were indicated to often contribute to stress and frustration for truck drivers. This stress can contribute to fatigue and reduced alertness, increasing the risk of a crash. One primary situation in which cars contribute to stress is through overtaking. As was stated by one Company B driver, “*cars always speed up when you're overtaking, coz they don't want to be overtaken by a truck*”. It was often stated that despite being happy to drive at low speeds when in single lane highway, the moment there is a lane enabling the truck to overtake them they will drive faster. When combined with speed limiters, truck drivers are often unable to pass slower vehicles, causing longer trip times and frustration, in addition to the potential for near misses or crashes at the end of overtaking lanes.

*Unfortunately though... you know you seem to me like a pretty cool, calm, collected sort of dude but I'm sure you get the shits driving your car every now and then. Everyone does. And the problem with it is man is if you're sitting in your car for 12 hours you're probably going to get the shits on more and more. Especially like these blokes are in a speed limited truck that's timed, you know you've got a time to get to here to there whatever. And then grandpa in his caravan, not even necessarily an old dude, just anyone doesn't want to, you know, they're too scared to do a hundred kilometres an hour. That's going to cause you dramas. And then the problem, and it happens every day mate, you know you get two set of dual lanes so you want to go round them so they'll speed up because then they don't want to be behind a truck because they're scared of it or they don't want the truck overtaking them because they're scared of it. (Company A Manager One)*

#### 8.4.4. What can drivers do?

Truck drivers can be powerless to avoid the risks posed by other vehicles. As said by the manager of Company C, *“there's not a lot they can do about it, it's just grit your teeth and back off and see what happens”*. Cars pose a heightened risk of crashes which may be beyond the control of truck drivers. The account of one crash between a car and truck is provided over the page.

In some cases, avoiding a crash may be possible but may hold risks for the truck driver. The driver may be faced with the option of swerving to avoid the car, risking a single vehicle crash by running off the road, or hold their current heading and hope the car moves. In this situation, the driver is effectively forced to choose between potentially killing the car driver and risking their own life. Whilst some drivers suggested that instinctual reaction would most likely be to swerve, others indicated that they would hold their line.

*When someone drifts over you need to hold your line and hope they wake up... If you crash without them it's your fault... If you go into their lane to avoid them then they wake up and swing back to their lane it's your fault. (Company A Driver Two)*

Despite the difficulty of avoiding some crashes with cars, drivers must still take steps to minimise this hazard. First, it was regularly stated that truck drivers must be constantly aware of other vehicles in order to adjust their own driving behaviours. As said by the driver-manager of Company C, you have to “*drive your vehicle plus everybody else's*”. The danger of other vehicles also requires truck drivers to make constant adjustments in response to hazards ahead. As stated by one Company C Driver, “*you gotta be driving ahead and you gotta be planning your fucking stopping distance way ahead*”.

*I'm driving for everyone else on the road, I'm doing it all anyway, keeping mirrors to see who's coming coz you never know who's there and when you're gonna have to take evasive action... There's not much more you can do. (Company C Driver Three)*

A number of drivers suggested that they try to maintain a significant distance between themselves and other vehicles. One Company B driver stated that he tries “*to leave a couple of hundred meters, but through town you'll be lucky to get 100m*”, due to the tendency of cars to fill these gaps. Thus, it is not always possible to maintain a safe distance. However, as stated by one Company B driver, “*if another vehicle pulls in front of me I slow down a bit, once again, it's about safety, I want to go home to my family*”.

Despite most truck drivers taking specific care when travelling near cars, others are not so careful. As was discussed by one manager from Company B, some truck drivers want to get away from cars as quickly as possible. Thus, when cars get in their way they may forcefully encourage the car to get out of their way. One Company B driver stated that his

### Company A Driver One's Story

As the driver was driving along the freeway a drunk driver swerved into his lane and crashed into the lower driver's side of the truck. It was stated that the collision "*ripped the truck up*" from the front through to the fuel tank on the driver's side (fuel tanks are located towards the rear of a prime mover on either side). This impact destroyed the steer tyre and caused fuel to leak onto the road. Further, the first few trailer tyres on that side were pushed backwards. Due to the loss of the steer tyre the driver was unable to control the vehicle well and was heading towards the edge of the road in the direction of a river. As the driver feared the possibility of drowning in the river, he pulled the steering wheel as hard as possible to the right. This evasive action led the truck into the path of an oncoming B-double. The driver stated that at this point he closed his eyes thinking that the collision would not be avoided and that he was likely to die as a result. After a short moment without a collision the driver re-opened his eyes to see that the approaching B-double had avoided the collision.

Due to the collision the drunken car driver was admitted to hospital and placed on life support. Whilst the truck driver is unaware whether the car driver ever made it out of hospital he stated that this was "*as good as dead*". The truck driver stated that this outcome was and remains to this day very difficult to cope with, and that he has to keep reminding himself that it was "*the other guy's fault*". The truck driver took a long time to drive again. Whilst his managers were pressing him to return to work he said he would drive when he was "*good and ready*". Despite surviving the crash and returning to work the driver still appeared quite emotional when sharing the story and repeatedly said that he hopes "*the guy didn't have a family*" as he "*wouldn't want to kill a father*". Then the driver continued to remind himself that it was not his fault by using phrases such as "*but I didn't (kill him), he did*".

partner often suggests that trucks should have their own road, to which he responds “*they do, you’re on it*”. He explained this further by stating that “*sometimes with cars you have to flex your muscles, you gotta make space, they’ll get out of your way*”. Therefore, it is clear that some truck drivers are not afraid to take risks in order to achieve right of way on the roads.

#### 8.4.5. Summary: The general public

The above discussion outlined the specific influence of members of the general public on truck drivers, for the purpose of providing a detailed account of the context surrounding drivers. Unlike Study Two, the information gained regarding the general public in Study Three centred around the role of cars on the road. Members of the general public on the road serve as a significant hazard for truck drivers to navigate. Whilst in many cases crashes with other vehicles may be unavoidable for the truck driver, there are many situations in which the truck driver can manage their own behaviour in order to reduce the risk of incidents. Thus, it is important to note that there may be interactions between the culture of truck drivers and the behaviour of car drivers.

### 8.5. THE CUSTOMER

As the customer is the source of income for all transport companies, the desires of customers can have a large impact on the industry. Customers may make significant demands of transport companies, demanding either a high level of safety or the cheapest and quickest service, and they have the ability to follow up these demands with financial reward or punishment. The following section outlines the specific approaches used by customers of the studied organisations, as they are perceived by respondents. Whilst some of the themes which emerged are influenced by the attitudes of respondents, the purpose of this section is to detail



the customer-related context surrounding safety. Prior to exploring the influence of customers it is necessary to note the relationship between each company and their customers.

#### 8.5.1. The customer-company relationship

Company A has a single customer accounting for approximately 70% of their workload. Thus, Company A is susceptible to the requirements and demands made by this customer. Conversely, Company B has a number of long-term major customers supplying a steady workload, along with a number of smaller and short-term customers. Each of these customers has an influence over safety within Company B. Additionally, Company B regularly transports to their customers' customers; thus, Company B must provide a quality service to these additional organisations. Due to a lower influence of each individual customer, and the fact that Company B does not struggle to find sufficient work, members of Company B often suggested that the company is not easily swayed by customer pressures and demands. One manager suggested that during the global financial crisis Company B had to carefully consider each quote to ensure maximum competitiveness. However, more recently this is not the case. Finally, as was stated by one manager, Company B likes to service a niche market and aims for quality and reliability over the lowest price, thus resisting some common pressures.

*We want to be specialised. So we're not going to go and fight with these major transport carriers that cart containers off the wharf and have depots at Fisherman's Island and work 24 hours a day, seven days a week. We're not going to fight with those guys. But we are going to provide a service to the customer at a higher price but a lot of the time people want service... It's not just a case of fighting the wars with everyone that wants to cut the rates, let them go I say. Let them go and fight their wars and cut their rates because in the end they'll all go broke. (Company B Operational Manager)*

The livestock transport industry, however, operates differently to other sectors of the transport industry. When compared to other transport types, livestock transport could be defined as informal at best, or disorganised at worst. This is not to criticise the transport industry, but rather that in many ways it is based upon relationships and simply getting the job done. As described by a number of members of Company C, the relationship between graziers and transport companies is like a family.

*You spend 70% of your time on the dirt roads around farms with no other vehicles around, and when you arrive the graziers all chat with you and offer you food and drinks... it's like a family... Even when we used to load boats at the end of the day they would give you beer and food as well as paying you. (Company C Driving Manager)*

As discussed in section 7.3.5, within livestock transport it is difficult to know what work will be conducted in advance, thus, limiting the ability of Company C to schedule drivers to be available for the workload. Additionally, as indicated in section 8.3.1, cattle agents appear to have a limited understanding of their requirements under COR and, therefore, may request transport which is impossible with the fatigue management requirements of drivers.

*Agents, to be honest with you agents are the biggest problem. They expect more and think they're exempt from lots of things. Like chain of responsibility etc you know we need you to be, or they'll ring at eight o'clock tonight and want you somewhere that's quite impossible at six o'clock in the morning and not get their head around the fact that there are other issues. We've had boys working in the shed here all day. They can't just get in the truck and be there tomorrow morning, that's just not how it works. So convincing them of their responsibilities is very difficult. (Company C Manager)*

Within the case study of Company C, it was evident that due to a focus on sales and quick transport there were minimal, if any, formal systems utilised by livestock customers to improve safety. Thus, many of the factors such as customer requirements, policies and inductions, that were identified in companies A and B were absent within Company C.

#### 8.5.2. The influence of customers

During the case studies a number of key themes emerged regarding the influence of customers on safety. These included the standards placed on the transport company, communication regarding standards and procedures between the customer and transport company, policy and procedure enforcement, and pressures placed on members of the company. Each of these aspects is discussed below for the purpose of providing a detailed description of the context surrounding drivers.

##### 8.5.2.1. Customer standards.

Each customer has a certain standard regarding safety. Some customers are very strict regarding safety, requiring all their business to be conducted safely, and others are more interested in reducing cost and time. Thus, customers may influence safety in different ways. While it is common to hear about unsafe customers, customers can also require high safety standards from transport companies. For example, Company A's principal customer requires them to have NHVAS (National Heavy Vehicle Accreditation Scheme) accreditation and up-to-date information on all of the drivers who are used to transport their goods.

*Our employment application and our induction says that you're supposed to notify us of any speeding fines whether they be in your car or our truck because we need to keep a record if you've got a licence still or not. And we also have to supply that information to one of our customers; they require that of us. (Company A Manager One)*

In regards to the standards of customers, one Company B manager stated that the company prefers to work with safe customers, due to previous experience with customers that have lower safety standards. It was indicated that working with customers without high safety standards can lead to poor safety outcomes caused both directly by the customer and through pressure placed on drivers.

*Yeah. I much prefer to work in, work with customers who have those requirements on us than those who don't. Because those that don't have unsafe environments for us to work in. We've had, where we were loading a flat rack, it's like a container but you could see through the sides onto a side loader... So we got told something was 10 tonne. Ten tonne, three pieces, you look at it okay 10 tonne, three pieces, heavier this end, that end but it's only 10 tonne, my crane ... can hold nine on each arm so it's 18 tonne overall... The people who filled out all the paperwork were filling it out to get the cheapest possible rates they could through the wharf. The product was over 20 tonne and our swing lifter rolled. So we got all this damage to our side loader or our swing lifter and the product was damaged. No people were damaged or hurt because we had set up the exclusion zones, we had the remote controls so you could stand away from it as it was happening so no one was hurt. So Workplace Health and Safety Queensland weren't interested in it but it was still damaged to us and evidence found was that it was grossly under-weighted. It was just over. We would have been over mass had we gone on the road with it .... But those people, their behaviour and their whatever, "I'm just going to try and do this cheaply" were going to try and lie and have us wear the consequences... So I'd much prefer to deal with somebody who is willing to meet legislation and expect that of me as well because they have standards. If I've got someone who's operating to my standards as a customer then we're going to be in a more harmonious relationship. (Company B Director)*

Low safety standards can be evident through unsafe demands and pressures and through shortcuts made by the customer. Conversely, customers with high safety standards can demand adherence with certain policies and procedures, require drivers to have completed inductions and be medically cleared, and can even provide information and guidelines to the transport company.

#### 8.5.2.2. Auditing

Both at the start of a contract, and at regular intervals following, some customers will conduct audits of transport companies. For example, the principal customer of Company A conducts its own regular audits of Company A in order to ensure that it are meeting those requirements.

*We do a lot of work for them, we're very closely monitored and essentially they even do their own audit on us every... Every six or 12 months they audit us themselves to make sure we're not breaking the law because under chain of responsibility these days they're in as much shit as we are because as the customer they're seen to push us to do the job. So you know they watch us just as closely as anyone else watching us. (Company A Manager One)*

#### 8.5.2.3. Communication

In order for the requirements of customers to be fulfilled, adequate communication is necessary. Such communication within the studied organisations included driver inductions, feedback provided to the organisation and, in the case of Company B, the provision of serious occurrence reports.

##### 8.5.2.3.1. Inductions

The first approach used by many customers to ensure compliance with their standards is the use of inductions. Inductions serve to educate drivers regarding the risks and management

strategies for hazards encountered when working for the customer. Sometimes, due to the provision of an induction or pass card, they also provide a means of enforcement.

Company A's principal customer uses an online induction required to be completed by all drivers. Similarly, Company B conducts inductions for their drivers as a necessary component of working at depots which serve particular customers. Additionally, some customer sites (particularly temporary sites such as construction sites) may require drivers to complete a site induction prior to delivering goods. During one Company B observation, both the driver and researcher were required to complete an induction upon arriving at a building site. A number of forms were required to be completed and the site supervisor provided instruction regarding general safety procedures on site. After leaving the site the driver stated that *"it's quite rare to have to sign into a site, these guys were overboard but good, the only sites I've had to do inductions on are the air force base and military barracks"*.

Whilst the driver above indicated that inductions were rare, other Company B drivers suggested they were very common. There was some frustration expressed regarding such inductions. At the core of this frustration, is the time lost to inductions coupled with the perception that most of the inductions are common sense. One Company B driver suggested that inductions could be summarised as *"use the walkways, follow instructions, wear the correct PPE"*. Many drivers from Company A and B indicated that the content of these inductions is relatively simple and *"all boils down to common sense"*.

*... it's a pain in the arse. I did four hours doing an induction yesterday for one container, but a lot don't do it as well. I don't remember much of it, I did five hours for one the other week and hardly any of it was about trucks... Inductions give me the shits. Everywhere you go they give you an induction. I understand that their shithouses are in different places and their offices are in different places but surely there could be a proper one we should have to do. I switch off in a lot of them. (Company B Driver Three)*

Despite this frustration, many of the drivers accepted the importance of inductions. As worded by one Company B driver, “*they’re pretty full on, there’s a lot of it, but it’s for safety so it’s all good*”. Whilst inductions primarily serve an educational purpose, a number of larger sites will provide an induction card to the driver which the driver must be in possession of to enter the site. In the event of a breach of policy, the driver may have this card revoked and, therefore, be banned entry until re-inducted or permitted to re-enter the site. Thus, inductions can also provide an enforcement benefit.

*There’s not too many safety issues really... I need to abide by site rules... If I breach the rules they can breach me and then the truck will need to be picked up by another driver... I won’t be permitted to work on their site* (Company A Driver Five)

#### 8.5.2.3.2. Feedback

Customers often serve as the primary source of feedback for the company. Whilst incidents and fines provide post-event feedback, customers are able to provide information regarding risky behaviour which did not result in an incident.

*So look to be honest I hope not but whenever there is an issue where, whether or not a driver has done something on site unsafe, we usually get that reported through to (steel customer) and we correct, do some corrective actions. Like we’d either do an interim report on it depending on how severe the incident is, we’d obviously report it through and put it probably a new...well not so much a new policy or procedure in place, we would just direct them back to what’s probably already in place there that they’ve actually gone away from.* (Company B Branch Manager Five)

Through this communication, one Company B manager indicated that they have developed a feedback loop with the customer, enabling open discussion of safety concerns.

Further, due to the longstanding relationship between the customer and Company B, both are quick to amend problems to ensure a continued safe working environment.

*Yeah absolutely they've given us very clear grounds to work on, where if we deem it unsafe, we filter that information through. Now that's if we deem it unsafe we will then do an interim report. If we're reporting it through like from a customer, we do an incident report up. We'd give it to (steel customer), review it because there's a bit of, there's sensitive information as far as like this customer might be you know \$500,000 a month. They don't want to come down too heavily hard and say you know we're not going to deliver here no more, they try and find other arrangements. Now whether or not that's go and deliver to another business, you know, where they're incorporated with like other business that buy in with them. But no (steel customer) are very much about our beliefs, they see safety at a high level as we do. In some cases we exceed their expectations. (Company B Branch Manager Five)*

#### 8.5.2.3.3. Serious occurrence reports

As discussed in section 7.3.4, one of Company B's larger customers provides serious occurrence reports (SORs), also sometimes called serious safety occurrences (SSOs) detailing incidents not involving Company B. As this has already been discussed no further discussion is provided here.

#### 8.5.2.4. Customer policies and enforcement

Depending on the emphasis that customers place on safety, they may have a number of different policies. It was often indicated by members of Company B that many of their customers have different policies and procedures. One Company B driver stated that it is often not until the driver arrives on site that they will know what policies a new customer has.



*On this site today there may be a driver exclusion zone, there will be required PPE (personal protective equipment), you may be able to help, you may have to unload it yourself or they may not let you help at all. You find this all out when you drive on site.*  
(Company B Driver Four)

The vast majority of customer policies discussed throughout the case studies centred on loading and unloading practices and the use of PPE. While the impact of policies and procedures on specific behaviours is discussed in Chapter 10, it is important to note that the presence or absence of such policies presents a significant influence on safety.

*No a lot of customers just don't have, you know, safe procedures. I suppose if you draw, you know, if you go into a Woolworths shopping centre it's all, it's well laid out, you know what you want to buy, you know where it is, it's clearly marked, you know the procedure to follow. Or if you go in, you know, pull up in a little country shop out in the back of nowhere and you walk through and there's stuff all over the place and you're not really sure...it's very similar to some of our customers that we deliver. Some sites are very good, well placarded, signed, go to this point, contact this person. When the vehicle has been unloaded you've got to stand in designated areas so one can see where you are so you're not likely to be hit with the vehicle or products. That's the ideal situation, the driver has got to wear PPE, that's part of our, the unloading site's policy. That's a good one. There's the other extreme. You drive into a dingy old shed that's ill-lit you know 'oh she'll be right mate' and 'can you get up and just help us with this?' And the forklift is not well maintained, the operator probably hasn't got the appropriate licences, you know, they're bashing into the truck because the brakes don't work that well on the fork lift, all that style of thing. So yeah that's probably where our biggest exposure lies.* (Company B Region Manager One)

A number of customers, particularly those with higher safety standards, also utilise checklists and declaration forms which drivers are required to complete. Many Company B drivers were observed completing such forms, which generally focussed on correct loading and restraint and whether the drivers were fit to drive and legally capable of completing the journey. Whilst these forms do not prevent unsafe behaviour, they do remind drivers of their requirements and protect the customer from legal repercussions from incidents.

Without adequate enforcement, however, policies will not influence safety. Some customer depots are extremely strict on their policies. For example, one customer of Company B prohibits drivers from climbing onto the back of the truck. One manager at the depot servicing this customer stated that this policy is enforced both on and off site and that the customer is adamant that this risk be avoided at all times. Conversely, some depots, even within otherwise strict customers, may insufficiently enforce policies. Company A drivers noted that the enforcement of rules is inconsistent within depots of their primary customer. One Company A driver was observed to not use a high visibility vest at a smaller depot, but wear it upon reaching the main depot. Similarly, another Company A driver wore thongs for the majority of his shift, stating that he would only put work boots on at the larger depot. Despite enforcement inconsistencies, it was clear that when policies were enforced there was a high level of compliance.

*It's looked after by us. I'd be very, very confident that if (building customer) thought something untoward was happening between their site and their customer's premises they'd be all over it like a rash. Yeah they are big on safety. So I guess as an example to that, they're not allowed to get on the back of a semi trailer here or any truck right? So what, 1.8 metres, you can't get up there, so they've implemented ways and means to manage that on site here. Some of our guys go 'well I can get around that, I will just take –*

*– the truck out on the street right? So we'll take the truck out on the street or we'll pack the truck up on the street before we bring it in to (building customer). That way we don't break their rules'... (Building customer) is like 'no sorry you're not doing that. You're not doing what you're not allowed to here on the street'. (Company B Branch Manager Four)*

#### 8.5.2.5. Pressures and delays

It was often noted throughout the case studies that customers can also pressure companies and drivers to act in unsafe manner. These pressures can be formal, such as the use of delivery timeslots, or informal, through direct demands on drivers to commit an unsafe act at a site. Within Company A, there is also an implicit pressure which comes as a result of transporting express delivery loads. Company A drivers indicated that the moment a load is accepted and carried there is significant pressure to get the job done. One driver specifically noted that *“express is time critical; if the customer doesn't get it the next day they get it free, so once you get in that seat you have to go”*. Lastly, customers can also cause significant delays for drivers, leading to fatigue.

##### 8.5.2.5.1. Timeslots

The use of timeslots is common within larger customer sites that experience large numbers of deliveries. One Company A driver stated that when a load is carried from interstate there is enough time to reach the destination city and have a one-hour nap. Though presented positively, as the delivery window only left one hour longer than the travel time, the driver may be pressured to continue driving when fatigued and in need of a longer break, or drive faster to make up for longer break times. As one driver stated, *“sometimes you got held up but you need to be there by a certain time so the truck is available for the next run, so you have to speed”*.

Whilst timeslots can lead to unsafe pressures, some timeslots were seen to improve safety by drivers and managers. For example, one Company A driver stated that, due to the use of timeslots, “*you don’t need to rush*”. In these cases, timeslots are typically allocated as a minimum amount of time before the driver is allowed to arrive. Thus, dependant on the strictness of timeslots, and how well they are allocated to allow for safe travel times, timeslots can either help or hinder safety.

#### 8.5.2.5.2. Informal demands

Informal customer demands are difficult to summarise. This form of demand was often discussed using specific case examples that revealed few patterns. Nonetheless, a brief discussion of the nature of such pressures is necessary. When arriving at a new site, drivers may be unaware of safety policies and procedures and the customer will inform them of their requirements. In some cases, the requests made by the customer can be unsafe or require the driver to break a company policy. In such situations, the driver either must comply with these requests or refuse to service the customer.

*So the driver will go ‘well I’m supposed to do all this stuff, I’m supposed to get you to do a commission into property’ or ‘I’m not supposed to lift product over a fence and put it on the ground because I can’t see what’s on the other side of the fence, I’m not supposed to. But you’re yelling at me, this is my last drop of the day, you just say it’s so hard, you can’t leave it there’, blah, blah, blah, pressure. ‘Will do’. And then if their fence is damaged, guess who gets rung up? (Company B Director)*

#### 8.5.2.5.3. Delays

Despite commonly requiring drivers to adhere to strict timeslots, customers do not always place the same pressure on their own loaders and unloaders to quickly process the vehicle. It was noted by a number of managers long loading delays are common. Many of

Company A drivers noted that time spent waiting at customer depots was boring and draining, leading to fatigue. Though drivers suggested that they often nap during these waiting times, others indicated that truck movements from loading can prevent sleep. One Company A driver suggested that, at a smaller depot, he would “*help to unload the truck*” as it “*takes too long otherwise*”, despite organisational policies preventing him from providing such aid. Unfortunately however, involvement in loading and unloading can serve to increase fatigue.

*Safety concerns in terms of breaks are definitely with clients, lots of hold ups in queues and there are people who are known to do it more so than others. So that’s a really big issue in this industry. (Company A Manager Two)*

*Some of the other customers, you know (customer name), you can get held up, (customer name) you can get held up, it’s just three or four trucks in front of you, (customer name), and that’s it. It’s not like everyone drops everything because a (steel customer) truck comes in. You know, but yeah, just in the normal delivery sequence so to speak you can get held up, yeah. (Company B Trainer One)*

### 8.5.3. Summary: The customer

The above discussion outlined the specific approaches used by customers to influence the organisations and drivers. Customers play a pivotal role in safety within the industry. Customers can require high standards of transport organisations and drivers through a number of policies and requirements. These requirements are enforced by the customer’s ability to provide or retain work from the organisation, and their ability to ban drivers from entering their sites. Thus, the effects of the customer can be similar to that of government departments. Additionally, customers can provide significant education for drivers through inductions and provide significant feedback to organisations. Conversely, customers can also place

significant demands and delays upon drivers and organisations, resulting in unsafe behaviours.

## 8.6. ACCREDITATION SCHEMES

Another major influence on safety in the heavy vehicle industry is accreditation schemes. One of the most prominent accreditation schemes in the industry is the National Heavy Vehicle Accreditation Scheme (NHVAS). The NHVAS has a number of specific schemes providing direct benefits to the organisation. These include: (a) mass management, allowing companies to utilise their own weighbridges and carry a higher mass of goods; (b) maintenance management, permitting companies to conduct their own maintenance; and (c) fatigue management, allowing the use of BFM (basic fatigue management). Another major accreditation system, Trucksafe, is a voluntary ‘industry standard’ accreditation scheme. A number of other accreditation schemes were noted by members of Company B, though insufficient detail was provided with which to discuss their effects. The accreditations held by each company that was studied are identified in Table 8.1.

### 8.6.1. Benefits of accreditation

In addition to the direct benefits attained from NHVAS, accreditation can provide a competitive advantage to the organisation by attracting business.

*I'm always saying in training if you have any ideas let us know because without NHVAS we can't work for (customer name), they're our biggest client, so none of us have jobs.*  
(Company A Manager Two)

Unfortunately, however, it was recognised that many accreditation schemes which are highly respected within the industry have failed to achieve a high enough public profile.

Table 8.1: Accreditation schemes held by each case study organisation

Accreditation Scheme	Comp. A	Comp. B	Comp. C
NHVAS			
Mass Management	✓	✓	
Maintenance Management	✓	✓	✓
Fatigue Management	✓		
TruckSafe	✓	✓	✓
Industry Recognised Standards		✓	
Quality Assurance		✓	
Western Australian Heavy Vehicle Accreditation		✓	

*We've got industry accreditation standards and we've got the TruckSafe logo and the TruckSafe branding and that's all for quality. I just don't think it's gone to a level of the general public to look at it and go that means that person has a higher standard of operation than the next person. (Company B Director)*

It was also indicated that accreditation schemes can be used as an excuse to ensure driver compliance. For example, during the Company B toolbox meeting attended by the researcher the use of satellite tracking of speed was discussed. One Company B driver questioned whether government authorities require satellite tracking and why the company does not remove satellite tracking. Rather than explain the safety benefits of satellite tracking and the risks of speeding, the manager simply stated that one of their accreditation schemes required satellite tracking. In a later observation, another Company B driver raised the toolbox discussion and stated that the question was “*just stupidity, it's there for a reason*”. Pointing to an accreditation sticker, the driver then said “*see this? They require us to do*

*certain things for safety*”. The same tactic for increasing driver compliance was evident in each company.

*But there's been a big cultural change within this organisation in the last three years around training. Well that's when we've gotten into NHVAS and it's been a huge change for everybody. (Company A Manager Two)*

#### 8.6.2. Gaining and maintaining accreditation

In order to gain and maintain accreditation, there are a number of standards which must be met. Once a company has proven that they meet these standards, they are audited or reviewed on a regular basis to ensure ongoing compliance.

*I have to do all the safety assessments for all our sites, all our depots. I need to maintain the TruckSafe quality system and any code of conduct that we're part of, like the retail logistics supply chain code of conduct, NHVAS... every two years TruckSafe and NHVAS get reviewed and re-entered into. (Company B Director)*

*We get audited regularly for all of our different accreditations and they audit us, they see that we've got those speeding fines and whatever...it's the same if blokes don't fill out their required paperwork of pre-trip checks they get a non-conformance for that as well because as a company we have to ensure that they're doing that stuff for our accreditation. So if the auditor says well from this day this bloke didn't fill his log book out right or didn't fill his pre-trip check sheet out right, you know what have you done to curb that? So we say well he got this non-conformance. Obviously it worked coz he hasn't done it again. (Company A Manager One)*

During the study of Company C the researcher was able to observe a TruckSafe accreditation audit. It was stated by the auditor that TruckSafe generally governs four areas:



(1) training; (2) management standards; (3) maintenance (also covering the NHVAS maintenance management accreditation); and (4) occupational health and safety.

Additionally, though it will not be discussed in detail, the TruckSafe auditor also examined animal welfare related issues.

Whilst the auditor was assessing whether or not Company C adhered to the required standards, they also utilised the audit to teach the company management strategies and how to prove their compliance. It was noted that if a company fails the audit, they are provided with a list of changes to make, rather than simply losing accreditation, and a subsequent audit will be conducted shortly afterward. Thus, the TruckSafe auditor appeared more concerned with assisting the organisation than punishing failure.

Regarding training, it was noted by the auditor that accreditation requirements are based upon “*how the department checks the standards*”. It was also noted by the auditor that the company must demonstrate not that training has occurred, but that training needs have been assessed and met.

For management standards, the auditor checked the adequacy of company policy statements and compliance rates. It was noted that if the company’s own policies and procedures exceed that of the standards, the company must demonstrate adherence to their own policies. Thus, the manner in which policies are written was deemed important. To assist the company in this process, two questions were suggested. First, do company practices meet the standards? Second, are company policies being met? If policies do not meet the standards they need to be changed. Conversely, if the policies exceed the standards but are not being met, it was argued to be better to simplify the policies to the standards’ level.

Regarding maintenance, there were a number of components that the auditor checked within Company C. The auditor checked that pre-trip vehicle inspections and maintenance were being conducted, and that staff members who completed maintenance had the required

competencies. The auditor stated that service records needed to demonstrate that problems were identified and remedied, rather than simply that everything was fine with the vehicle.

Lastly, regarding occupational health and safety, the auditor checked that staff had the required medical examinations and licences. The auditor also assessed whether or not any incidents had occurred, including if they required any rehabilitation that was conducted. Records and management strategies for a number of specific safety hazards were also examined.

#### 8.6.3. Summary: Accreditation schemes

Accreditation schemes have a number of benefits to the organisation, such as the ability to utilise more advanced forms of fatigue management – enabling a company to conduct their own maintenance and mass management – and the ability to gain work from customers which may require accreditation. Accreditation schemes also hold benefits to safety due to the requirement for high safety standards to gain accreditation. Additionally, it was noted that companies can utilise the requirements of accreditation to gain driver compliance with procedures. Due to the fact that many of the noted accreditation schemes are common between the studied companies, it may be difficult to adequately detect how accreditation interacts with organisations and drivers to influence behaviour.

### 8.7. THE BROADER HEAVY VEHICLE INDUSTRY

The broader industry may also have a number of impacts on safety in a given company. Throughout the case studies a number of comments were made regarding the broader industry. Members of Company B indicated that there may be an industry culture which is at odds with their own. Further, other transport companies can either improve safety by offering support and assistance, or negatively influence safety through financial competition. Lastly,

other truck drivers on the road interact with drivers, particularly through the use of UHF radio.

Each of the studied organisations placed different emphasis on the broader industry. In the case of Company C the influence of the broader industry appeared minimal, potentially due to the location of Company C limiting interaction with other transport companies. Additionally, Company C drivers spend much of their time within private properties and access roads, and thus are isolated from interactions with the broader industry. Conversely, members of Company A typically travel on common highways increasing their interaction with other trucks and organisations. Lastly, only Company B members made reference to the culture of the wider industry, potentially due to the self-perceived uniqueness of the company (see section 9.2.1) resulting in viewing this culture from an ‘external’ perspective. Despite the varied manner in which this information appeared, a number of similarities were evident. Thus, these influences will be discussed collectively.

#### 8.7.1. The industrial culture

Members of Company B regularly discussed the culture and practices of the wider industry. Interestingly, many of the comments made about the wider industry were presented negatively. For instance, when discussing participant confidentiality with one driver and that the case study was for the purpose of understanding, rather than evaluation leading to punitive outcomes, the driver responded that “*someone should be checking up on the industry*”.

Many references to unsafe and illegal activities in other organisations were made. Of particular note, many drivers suggested that other members of the industry accept and support speeding behaviours. One Company B driver suggested that this was caused by distance-based payment methods, arguing that such payment provides a “*good incentive to driver fast hey?*”. Most of the drivers at Company B appeared unaffected by this tendency to speed.

However, one driver suggested that when the company considered limiting their vehicles to 90km/h, many drivers objected, partly because “*interstaters would be grief, they’d run us off the roads*”. Thus, at least to some extent, drivers are influenced by how they perceive other members of the industry would react to them.

#### 8.7.2. Organisational assistance

Members of the industry may also offer assistance to one another which serves to improve safety. Assistance offered between organisations differed for each company. As discussed in section 7.3.1, Company C interacts with other livestock transporters to investigate potential new employees. Additionally, it was noted by the manager of Company C that they have previously assisted other livestock transport companies by supplying them with their driver’s manual. The manager stated that a number of other companies have also used the manual in the design of their own driver’s manuals.

*I think we’ve covered pretty well all the safety aspects in that little book and that just comes from our experience. I’ve actually handed that to around any livestock transport association members that want to see it as well and they’ve modified it to suit themselves. Many of them have that or something similar to it. (Company C Manager)*

Members of Companies A and B also indicated that they work cooperatively with other transport companies. In some instances, Company A will contact other organisations to arrange to swap trailers, allowing a fatigued driver to rest and take a less urgent load.

*If they’re tired and they need to sleep longer than their legal break which is going to put them behind their delivery time we swap trailers. We have another truck pull up and swap trailers so if that’s a less urgent delivery doesn’t matter. Old mate who’s not tired can take the super urgent stuff in and we work with other companies as well. If they’ve got a truck –*

*– in the area that's got something that's not important they'll take our trailers and we'll take their trailers when old mate is fit enough to drive his truck again. (Company A Manager One)*

Similarly, Company B has previously engaged other transport companies to learn how to achieve novel tasks. One Company B manager stated that, to prepare for an upcoming job, drivers have been sent to observe similar loads being carried by another company.

### 8.7.3. Competition

The broader industry may also negatively influence safety through competition. It was often suggested that the level of competition within the industry leads many transport companies to cut corners in order to make sufficient money.

*Everybody does it cheap because they have this mentality that their trucks have to do so many round trips a week. Out at Melbourne is a classic one, they want to do two round trips a week in six days. They want to get to Brisbane on say a Wednesday morning, they want to leave Brisbane on Wednesday afternoon and they'll just pretty much take anything. They'll just take a load, as long as it pays for their fuel to get home, that's what they're worried about and that's the mentality of some of the companies and how they work. (Company B Operational Manager)*

As could be expected, members of the studied companies appeared to indicate that this was not a problem for them. It was however, noted by a number of participants that this level of competition can reduce industry-wide safety by enabling customers to seek cheaper organisations, rather than organisations with higher levels of safety.

*The economy runs the industry, safety all comes back to level rates... you level the rates and you'll get the job based on your morals and the way you work... but at the moment it's about who can offer the cheapest rate. (Company C Driver Two)*

Despite the studied companies claiming to be unswayed by this competition, it is worth understanding this competition given the relevance it holds for the wider industry. The tendency for transport companies to compete on prices leads to minimal profit margins and, therefore, less emphasis placed on safety. This is particularly relevant for long-distance travel, where travelling from Brisbane to Sydney is considered ‘back-loading’ and therefore receives a lower average payment.

#### 8.7.4. Interactions with other drivers

Whilst on the road, drivers may have a number of interactions with other truck drivers. Whilst these interactions can be negative in nature, drivers may also rely heavily on other drivers. In past years, this would include other drivers offering assistance if a truck broke down or needed to swap a tyre. However, there is concern that such assistance is less common now due to driving hours’ constraints.

*There used to be a lot of courtesies... People would help you with a tyre... with driving hours you can't afford to pull up to help anymore... it takes 20mins to even just pull up and drive right off. (Company A Driver Three)*

*People used to pull over and help you, now they will run you over... it's just a new breed of drivers coming through. (Company C Driver Two)*

While stopping to assist other drivers is becoming less common, drivers assist one another using other means. For example, whenever a truck overtakes another truck, the rearward vehicle typically flashes their lights to indicate that it is now safe to merge back across. Similarly, when following another truck, the forward vehicle will use indicators to communicate the need to veer slightly to one side to avoid an upcoming hazard. In this sense, drivers are able to avoid risks they were unaware of through the assistance of other drivers.

Additionally, drivers also use UHF radio to offer assistance to each other. During one observation, a Company B driver indicated that the UHF is particularly useful along certain stretches of highway. For example, it was stated that in the past Company B did not fit their vehicles with UHF radios. The driver recounted a near-miss in which he was driving past a dangerous on-ramp, which is relatively short and has limited visibility. The dangers of this on-ramp are further compounded by the fact that the on-ramp is located beside a low bridge, requiring some heavy vehicles to exit the highway and re-enter through the on-ramp. As the driver passed this intersection, driving side-by-side with another truck, he was unaware of a third truck entering from the ramp, resulting in the three trucks driving three abreast on a two lane stretch of highway. It was stated that the incident was used to convince management to install UHF radios, as drivers use UHF to warn that they are entering the highway.

Drivers will also regularly warn and advise others. It was stated by a number of drivers, that if you are following another slower truck, the forward driver will use the call *“all dark up here”* to indicate it is safe to overtake. Similarly, the radio is often used to warn about bad drivers on the road and of police enforcement. One Company A driver provided a detailed description of the phrases used to describe different types of enforcement (see Table 8.2).

Warnings regarding enforcement may undermine attempts to enforce road rules, as the possibility of being pulled over unexpectedly is decreased. However, a number of drivers indicated that the radio is also used to correct unsafe drivers. For example, one Company C driver, who was being tailgated by another truck, used the radio to tell them to back off.

*I had a B-double tailgating me so I asked if the guy wanted me to pull over and open the crate. “Are you being a smartass?” “No I just don’t like someone on my arse”. (Company C Driver Two)*

Table 8.2: Radio phrases for different types of enforcement

Radio Phrase	Description
Candy Car	Coloured highway patrol vehicles (red, green, blue, etc)
Double-Double	Traditional police vehicle
Flash for Cash	Mobile speed camera enforcement
Angry Lights	Siren and flashing lights (e.g. <i>“candy car coming at pace with their angry lights on”</i> )
Dog Box	Police vehicle with sealed compartment at the back for transporting criminals
Evil Knieval	Police motorbike

Similarly, one Company A driver recalled a radio conversation between two drivers in which one vehicle was *“wandering all over the road”*. The other driver asked him if he was alright and the first driver stated he was getting something out of his glove box. The driver berated him, asking if he had been doing so for the last 20 minutes, before finishing with the statement *“Get off the fucking road!”* Thus, drivers will commonly use the radio to correct people they deem to be unsafe.

#### 8.7.5. Summary: The broader industry

The broader industry is another contextual variable which may impact upon safety. The broader industry culture may have a negative influence on safety. Additionally, the level of competition within the industry leads some organisations to cut corners, thereby offering lower prices and reducing available work for higher-charging organisations. Drivers are known to regularly warn one another of upcoming enforcement, reducing the deterrence of government enforcement on unsafe behaviours. Conversely, however, organisations and drivers may offer assistance to one another which serves to improve safety. This includes



taking urgent loads to allow fatigued drivers to rest, helping determine if drivers are fit to employ, and sharing knowledge and experience, particularly regarding novel tasks.

## 8.8. ENVIRONMENTAL AND SITUATIONAL FACTORS

Study Three also identified a number of environmental and situational factors that influence safety. These could be broadly categorised as road design and conditions, truck design, and environmental conditions. Additionally, a number of factors related to the load carried were identified by members of Companies B and C. In many cases these factors can present a direct hazard or risk to the driver, which must be managed through correct behaviour. Additionally, these factors can shape the choice of action made by the driver when responding to another hazard.

### 8.8.1. Road design and conditions

The road is one of the most immediate and prevailing contextual factors influencing heavy vehicle safety. It was stated by one driver from Company C that “*the government goes on about safety but three-quarters of safety is the state of the road*”. Regardless of any other contextual factors which vary between drivers, all drivers who travel the same roads are exposed to certain road-related risk factors. Whilst many road-related factors are relatively consistent and predictable, it is important to note that there may be any number of more random occurrences which the driver must also be aware of.

*You have to be aware of your surroundings, you just never know. You can get a kangaroo jump out and they can rip up under the truck. (Company B Driver Six)*

#### 8.8.1.1. Road design

There were a number of concerns raised about the condition of the roads on which the drivers work. Participants generally indicated that the Australian road infrastructure is poor, due to flaws in road design and a lack of adequate roads for the amount of traffic. One

organisational staff member from Company A said that there are a number of insufficiencies in Australian road design, ranging from inconsistencies between similar roads and intersections to poorly-signed hazards and dangerous use of adverse camber. These issues can either present an immediate hazard to the driver or can contribute to issues such as speeding and fatigue.

As discussed in section 8.7.4, one Company B driver provided an account of a near miss caused by a combination of poor on-ramp design and a lack of UHF radio within the truck. Similarly, one organisational staff member from Company A indicated that the extensive use of single carriageways on major Australian highways presents a direct safety risk. It was noted that two trucks can pass within inches at high speeds, due to the design of these highways, increasing the risk of a collision and its likely severity.

*Number one, the general condition of Australia's highways is shit. That's a massive safety problem. The fact that you can still drive just about anywhere in this country and you're mostly on dual carriage (sic, referring to single carriage) highway. This is Australia's national highway system and you're within inches of a truck going in the opposite direction at a hundred odd km/h. That's a massive impact if you happen to clip them. You know there's a lot of good highway now but there's still way more terrible, terrible to be on.*  
(Company A Manager One)

Within Company B a number of specific road design issues were raised, including locations where it is impossible to pull over and the design of road access to depots. Whilst not specifically a road design issue it was also noted by a number of drivers that it can be very difficult to find locations to pull over.

During one observation a driver needed to pull over to check his load was still adequately restrained. Due to the absence of major stopping locations, the driver had to resort to pulling into an emergency stopping bay. In addition to the need to stop to check load

restraint, drivers often need to stop for their log book breaks, to purchase food, or to take a nap. It was noted by a number of drivers that there are few locations along the highways where such stops are possible. One driver noted that when travelling from southern Brisbane to the Sunshine Coast, north of Brisbane, the earliest it is possible to pull over is approximately 30 minutes outside of the Brisbane boundary. The lack of sufficient stopping locations restricts the ability of truck drivers to eat healthily and to rest when fatigued. Further, a number of drivers noted the high level of traffic and the lack of clean amenities at many truck stops make it difficult to find a suitable location to sleep.

*It's not too bad sleeping in the bunk... if you pull up on the side of the road you get cars and trucks passing you all night... road houses generally aren't good because you'll get trucks pulling up all night. (Company B Driver Three)*

Due to the size and manoeuvrability of trucks it can also be difficult to navigate narrow or difficult access points. As discussed in section 8.4.1, when coupled with interactions with other vehicles, this can increase the risk of incidents. In many cases the access point to a customer depot can be poorly designed or located, relative to the surroundings. In addition to the placement of depot entrances, the design of access roads can also present a risk. During one observation a driver was required to reverse approximately 100m down a very narrow driveway. Whilst the driver handled this manoeuvres with ease, the driver noted how difficult it was to initially line up the truck with the driveway due to road width. Additionally, when combined with limited visibility from trucks, it was noted that the driver must estimate the correct place to begin the turn and was unable to determine if they were accurate until they had made a significant portion of the turn. A number of other drivers were also observed struggling to enter depots and warehouses.

*Wheel placement is everything, just getting it off the road is the hardest... little guesswork at first til you can see where you're going... The worst part of the job is little shit holes like this. (Company B Driver Two)*

The design and conditions of access points present a direct hazard which driver must manage on a regular basis. Whilst it was noted that drivers become familiar with the sites they visit on a regular basis, differences in the behaviour of car drivers and position of parked vehicles can increase the risk of collision.

*No, no not really because we teach our blokes just to be that little bit patient and, as I say, well I just say, talking about setting yourself up early. You know, you know if you're going to have block-off both lanes and get in this bloke's driveway and that's the only way you can get in there, or even just turn left or right of this bloke. Right is not too bad because oncoming traffic and you've got that turn to swing, it's left. Sometimes because a car might be parked right up against the edge of the driveway, so you have to bring your truck, your prime mover out on the wrong side of the road to get your trailer around to get in... They'll stop 50m up the road, you know indicate left, put the hazards on, let the cars get around you it's all clear, then do your left turn in. We don't have a lot of incidents like that because ... this job is repetitious. After three months you get to know all the places and they don't change customers every day. They don't say I've got a new customer. You're always going to (Customer X) or you're always going to (Customer Y) or you're always going here you know what I mean? So you get to know the customer after a while. You get to know the limitations of your truck and all that, you get to know who's building your truck and your ability. So yeah it's...in that sense I suppose you get too complacent sometimes. You can be you know 'oh yeah (Customer Y) I do this, then I do this'. And this bloke will have his –*

– car parked there, about three inches more than he normally does. We don't have a lot of accidents like that. We have a lot of umm near misses to gates, hitting gate poles or something like that. As I say you've got to try and have 15 sets of eyes. You might be watching something else and it might be real tight this side and he's just nicked the gate with a bed pin that side. Customer doesn't worry about it too much as long as you don't push it right over like ninety degrees, he's not worried, he realises it's tight. But that's...our accident rate I think here is good for some of the places they've got to actually put the vehicle. (Company B Trainer One)

#### 8.8.1.2. Road conditions

In addition to the design of roads, a number of other issues were identified regarding road conditions. It was indicated by drivers that there are many distractions on the road, including roadside billboards, and that many roads are rough, leading to vibration-related back problems. Additionally one Company B driver specifically stated that whilst “*people think trucks wouldn't feel much, you can run over a rat and feel it*”.

*Road conditions are bad, it's disgraceful some of our roads... just the general condition of the road... they're narrow, they're rough, they're broken up a lot of times, they're not wide enough... In a car it's fine but this truck is heavy haulage so has hard suspension.*  
(Company B Driver Three)

In addition to general road conditions, a number of drivers also discussed the effect that roadworks may have on safety. Due to the transient nature of roadworks, they have been grouped with road conditions rather than design. Roadworks can cause significant delays along the roads, leading to issues with fatigue management. One Company C driver indicated that “*you can lose 15 minutes just sitting there, and you can't take them off the time*”. Additionally, one Company B driver noted that on many occasions the overall width of the

road is altered for the duration of the roadworks however, rather than close lanes, roadwork sites often narrow one or more of the lanes to reduce slowing traffic. This can provide a significant risk for tucks, which often utilise much of the lane they are travelling in.

*Roadworks sometimes give you no warning, sometimes give you 3kms... The roadworks have narrowed the left lane on the Gateway... there's no warning you just suddenly have no room. (Company B Driver Eight)*

#### 8.8.1.3. Specific issues related to dirt roads gleaned from Company C

In Company C specific reference was made to the hazards and risks associated with travelling along dirt roads. It was indicated by one member of Company C that over 70% of their driving time is spent on dirt roads. Due to the required lower speeds that must be travelled on dirt roads, it can take many hours to travel short distances. This was indicated to pose difficulties when combined with fatigue management, as it can take a full working day to travel only 300kms.

*It's 143km takes you five hours on some of those roads. So there's a fatigue management issue before you even start. You get back to the bitumen and then you've already wasted 10 hours of your day virtually, getting there and getting out. Unless you go in the afternoon before and that's an issue. We had umm I can't even think of his name now, was Chairman of the NTC, (name) went with (driver/manager name) up the (road name) and it's a similar way to where you went ... the other day only probably worse and he was all full of you know 'everybody is the same, there is no difference'. Once you get into those roads and understand number one there's no traffic, number two how long it takes you to do what you've got to do and a lot of that, there was an understanding then oh this is different. So I think that's important. (Company C Manager)*

*No I think in our industry in our industry where we probably do hours-wise, not kilometre-wise, hours-wise we probably do 70% of our driving time would be spent on unsealed roads where the speed probably you could average a speed on unsealed roads probably about maximum 50km/h down to 30km/h. (Company C Driver/Manager)*

It was also noted by a number of members of Company C that rough surface of dirt roads can lead an increased risk of rolling the trailer. It was indicated that when driving on these roads it is necessary to find the “*right pace*” as if you drive “*too slow and the bumps are worse*” and “*too fast and they are worse*”.

#### 8.8.2. Truck design

The design and size of trucks were also regularly discussed by a number of drivers. Whilst drivers from some companies gave different emphasis to specific aspects of vehicle design, these factors are common throughout the industry and thus will be discussed collectively. The specific aspects which were discussed by drivers included the turning circle of trucks, their stopping distance, visibility, and a number of issues related to trailer and cab design. As the impact of these design factors will be discussed in Chapter 10, only a brief discussion of the nature of these factors is provided here.

##### 8.8.2.1. Turning

Due to the length of trucks their ability to turn and manoeuvre is significantly different to that of a car. For this reason truck drivers are often required to take wide corners and may be unable to enter locations in the usual manner. The limitations of truck manoeuvrability can pose a direct hazard if the driver underestimates the space required, and can act as a stimulus for other drivers to behave in an unsafe manner by trying to rush past a truck.

*He's looking ahead, he's thinking of all these other things that he's got to think as well as a slosh factor in his liquid tank and all these things and his speed and you know, where he needs to be turning because he's got a very long vehicle and if he's got to turn right at some time, he is going to make sure he's in the right lane well before he needs to turn right, not just do it at the last minute because he needs 25m to do that. All these things he's thinking about and somebody is just going, you're not going to the speed of a normal car, well he's not a normal car. (Company B Director)*

Even between trucks there can be significant differences in manoeuvrability. One Company B driver indicated the difficulties associated with access point and turning circles by stating *“it's fun getting one of these (B-doubles) in the doorway”*. Conversely, however, another Company B driver indicated that manoeuvrability is not an issue when driving smaller trucks, as they *“can go anywhere, it just doesn't have the power and speed of a car”*.

#### 8.8.2.2. Stopping distance

Another common limitation associated with trucks is their stopping distance. One Company A driver specifically discussed the nature of stopping a truck weighing 60 to 80 tonnes, stating that when you try to stop the truck this weight *“keeps pushing you; that's why jack-knives happen, you stop the prime mover but the trailer keeps pushing and has to go either left or right”*. For this reason truck drivers need to leave significantly longer times to stop, and have a reduced ability to avoid an impact if another vehicle crosses their path.

*Yeah I mean the little bubble car stops pretty quickly, they're pretty nimble, they zip in and out everywhere and unfortunately drive whether it's a bubble car or a big Falcon or whatever it might be, people drive that thing every day. That's what they're accustomed to, they see another car just like theirs it does exactly the same thing. They see the bigger –*



*– car, it probably just goes faster, they see the truck it's old, slow you know. They don't see that it takes an extra 30m to stop. (Company B Branch Manager Four)*

#### 8.8.2.3. Visibility and Blind spots

The last general limitation of trucks is associated with visibility from behind the wheel. Due in part to the length of the vehicle, the lack of rear vision in the presence of a trailer, and the design of the cab, truck drivers have significantly decreased side and rear visibility. Paradoxically, the increased elevation of trucks enables further forward vision than other vehicles, increasing truck driver ability to prepare for increased stopping distances, yet reduces ability to see lower height vehicles at closer distances.

*They don't see that you know go down the left hand side of a truck you can't see...a truck can't see you, you just disappear from view. I was driving years ago and I remember on Parramatta Road in Sydney you could see aerals, you'd look for aerals, that's all you could frigging see. So yeah car drivers, probably not deliberately, more so because they just don't know any better are an issue. You've got to, it's like riding a motorbike, you can blame the car drivers all you like for knocking the bike riders off, but it's the bike rider's fault. He shouldn't have been there. You don't ride a motorcycle when you can't see the driver in the mirror or in the eye, you move away. (Company B Branch Manager Four)*

Whilst most people are aware that trucks have large blind spots, it is difficult to truly appreciate this fact without having sat in a truck. During one observation, when the truck was stopped, two pedestrians walked past the front of the vehicle at a reasonable distance, completely disappearing from view. After this occurrence, the observed driver discussed the difficulties in visibility, indicating that bonneted trucks have a 12-meter blind spot directly in front of the vehicle.

*Bonneted trucks have a 12m blind spot directly in front. The sloped bonnets are easier to see in front of you though. There's also a blind spot behind your side mirrors, on roundabouts you have to look around them... That window [passenger side foot level window] helps you see anyone hiding down there. (Company A Driver Three)*

One Company A driver even recounted a collision in which a motorbike had moved in front of the truck at a set of traffic lights without the driver seeing them. As the motorbike intended to turn, when the lights when green they did not accelerate, and the truck drove into them. The driver stated that truck drivers just have to drive and hope that nothing is there.

#### 8.8.2.4. Trailer design

In addition to the aforementioned issues of manoeuvrability, stopping distance and visibility, the design of trailers can pose a risk to the truck driver. Whilst the risk associated with climbing onto the back of trucks was briefly discussed in section 7.4.2, there are a number of other factors worth noting. First, when driving a taut-liner (a trailer with canvas sides) the use of metal gates is required along the side of the trailer to support the load. These gates are heavy and can be difficult to correctly insert and remove, leading to a risk of muscular injuries. However, on one Company B observation, rather than the use of metal gates the canvas sides had Kevlar inserts removing the risks associated with metal gates and reducing the requirement to strap each item. The lack of a requirement to strap each item reduces the repetitive strain of throwing straps over loads and entirely removes the requirement to climb the trailer to dislodge straps which become caught.

Second, during one observation a driver discussed the technology present in some of the extendable trailers used by Company B to transport long loads. Long loads are typically very difficult to safely navigate on some roads. Further, there is a significant level of skill required to safely handle these trailers. Company B possessed two specialised trailers which

were fitted with additional steering assists absent from standard trailers. The first of these ‘self steers’ in response to the steering movements made by the driver, permitting the trailer to better follow the path of the prime mover. The second trailer could be steered by a pilot following the truck in a second vehicle. In these two examples it can be seen that the use of new technology can reduce the hazards associated with trailer design.

#### 8.8.2.4.1. Company C specific: Livestock crates

When transporting livestock it is necessary to use a specific form of trailer referred to as a ‘crate’. The crates used by Company C are two-level trailers, which consist of a number of subsections or ‘pens’. These crates are designed to allow sufficient air movement for cattle and are open-sided with fence-like walls. It was noted by members of Company C that it is necessary to enter the crate, during unloading and loading, in order to close or open pens and guide livestock between pens. It was for this reason that one Company C driver indicated that “*the cattle game is hard for bringing safety in*”. Whilst inside the crate there is a risk of being kicked by cattle or being struck by kicked gates. However, some recent design changes have significantly reduced the risks associated with crates.

*So they can't really get at you. They can get at you but they can't hurt you. But that's why the crates are made and that's where manufacturing and industry and itself .... most crates are designed out of people like us, or whatever, who come up with these little ideas. And then the manufacturers take them on board and they refine them and....it's all come from industry. It hasn't come from manufacturers... Oh L pens and just chains around gates, they all got slam-shuts now so you just slam the gate and it shuts. Like before you had to go and push the gate and put your chain around it. Yeah. And anyone that's been carting cows for 30-odd years will have some sort of a mark on his face or his teeth or somewhere where he's been kicked in the head with a gate. It's true. But in the last 20 years it's come a –*

*– long way. To the safety side of it which probably has taken the common sense thing out of it. You know what I mean? (Company C Driver/Manager)*

Additionally, in order to get to cattle on the higher level of the crate, it is often a requirement to climb to the top of the crate via a ladder at the back, leading to a risk of falling from heights. It was noted that health and safety departments have sought to identify safer means by which working from these heights can be achieved, however, it has generally been recognised that this is a necessary risk for transporting livestock.

*Yeah in the actual industry I think Work Health and Safety has been pretty good. They don't really like we've had them look at putting handrails on crates and safety harnesses and all this and it just don't work in this industry. They look at it, and they see what we do and they come away with it, you know they put issues on there. They put stipulations on that we've done anyway. But they had to be in writing, another little chapter that you can't climb up the side of the crate, you must use the ladders, you must do this.. which is common sense. But they had to put their little bit in there make it look like they were doing something... Like you can climb on the top of the crate even though it's four-and-a-half metres off the ground, when you're on the catwalk you can only fall one-and-a-half metres into the crate. Because you're not walking along the little bar on the side, four-and-a-half metres above the ground, you're walking along a catwalk. And if you fall in there you're going to get hurt. Because there's 40 other things in there with four legs. So you don't fall in there. Do you know what I mean? (Company C Driver/Manager)*

#### 8.8.2.5. Cab design

Cab design can also influence driver safety. As noted in section 7.4.2, many Company B trucks do not possess bunks and drivers may be unable to receive adequate rest on the road. Despite providing accommodation for over-night drivers, it is difficult for drivers to pull over

to sleep during a journey. Other design issues associated with truck cabs included the access points and the quality of seats within trucks. In regards to Kenworth cab-overs, one Company B driver stated that *“if you’re not careful you bash your head getting in and bash your head getting out of them”*. Whilst this seems a minor issue, the requirement to focus on avoiding hitting your head, draws attention away from safe exiting and entering of the vehicle. Finally, it was indicated by one Company B driver that *“if you are not comfortable you are not able to concentrate”* and thus the quality of seats can present difficulties for drivers.

### 8.8.3. Environmental conditions

Regarding environmental conditions, a number of participants noted the influence of weather and the time of day in safety. The time of day was specifically discussed by members of Company A, as the majority of their work was conducted during the night. Driving at night carries an increased fatigue risks and specific reference was made to the perceived heightened risk of driving during dawn and dusk.

Weather was also discussed by a number of participants, particularly with regards to reduced visibility and slipperiness. In Company C specific reference was made to the need to drive slower in foggy conditions, as it was noted that one Company C truck was involved in a significant incident due to decreased visibility. Additionally, a significant amount of focus was placed on the effect of rain on the roads. As this effect is common to all vehicle types, little discussion is required here. One Company A manager raised two incidents where a truck had a crash in wet weather conditions.

*He had to loose in the wet because he’s fucking retarded. He was driving to Sydney with empty trailers on, he went through the main street of a town, 60km/h and lose in the wet.*  
(Company A Manager One)

*We have a bloke in I think it was [Year of crash] jack knifed a B-double out [Name of town where incident occurred] in the rain Friday night. All he had to do when he left here on Friday night was get to Sydney before 4am Monday morning. The front trailer was written off, the back trailer was almost written off and the truck was pretty fucked but they repaired it. (Company A Manager One)*

Additionally, it is worth noting that due to a previous crash involving Company B and wet weather, in the event of rain they will remind their drivers to take extra care.

*Obviously when it rains yes obviously we get on the two-way and say you know it's more, it's probably highlighted because you know the risk is actually there, it's real like the wet roads. But you know we don't get on the two-way and say hey, you know, like don't be speeding. (Company B Branch Manager Five)*

#### 8.8.4. The load

The final environmental and situational factors highlighted in Company B and C related to the load being carried. Each load type can present specific hazards for drivers. In Company B a number of risks were associated with transporting steel goods, sharp products, over-dimension loads, and craned loads. Additionally, in Company C a number of factors were identified as relating to the transporting of livestock.

##### 8.8.4.1. Steel

Steel can be a difficult product to correctly restrain, is especially heavy, and can be a difficult product to work around on a trailer. As stated by one Company B manager, *“it's a whole different aspect carrying steel to carrying Kleenex tissues or dog food or something like that you know, there's a whole new ball game carrying steel”*. Steel naturally has little friction and steel loads can shift significantly if incorrectly restrained. One Company B driver stated that *“if you restrain it properly it won't move, the main thing is taking the time to look*

*at it and restrain it properly*”. In order to minimise the risks associated with transporting steel, it is therefore necessary to have adequately skilled and educated drivers.

*You can't just come out and say I've been driving tippers for 10 years and walk in here and do the same with steel. You just have to change your driving attitude a little bit yeah.*  
(Company B Trainer One)

Due to this level of friction, it is necessary to ensure that there are limited gaps between steel products. One method of reducing these gaps is to ‘belly wrap’ the product. Belly wrapping is conducted by running a chain from either side of the trailer, wrapping it around a load, or part thereof, and pulling it tight on the far side. This reduces the distance the load can shift along the length of the trailer, as the chain pulls tight when the goods shift.

Even after adequate restraint, steel has a tendency to ‘settle’. Within a few kilometres of leaving the depot it is possible for this load to no longer be safely restrained. Observed drivers were often witnessed regularly keeping an eye on their load when driving and stopping at intervals to check if the load was still restrained.

*After a couple of months they realise, like you go out of here, turn right, go a kilometre down the road and all your chains will be loose, because steels come together and all that. So you've got to get out and tighten it all up again. Steel moves a lot more than most products.* (Company B Trainer One)

Unfortunately, regardless of how well a load of steel is restrained, rough driving can still lead to significant problems. It was regularly noted by Company B managers that, under heavy breaking or jerky movements, steel can shift dramatically and put both the truck driver and other road users at significant risk. Heavy braking is likely to put greater force on the load than the acceleration capabilities of the truck and thus the heavy vehicle driver is at significant risk because steel products can leave the trailer and pierce the cab. Due to this

risk, the trailers used by the steel transporting branch of Company B use an engineered headboard. The engineered headboard is a panel at the front of the trailer which is designed to prevent the goods from sliding forward into the cab of the truck. However, even with an engineered headboard the load can only be slowed and heavy braking can still pose a risk for the driver.

*If you have a look out there you'll see our headboards are thicker, they're big RHS (rectangular hollow sections of steel) ...it's what they call an engineered head board. The normal trucks you see carrying around freight just have a pipe headboard, so to speak, and a pipe tailgate and that's why we have an engineered headboard, it just stops it a little bit. Won't stop it completely, no way it will still come through. You only have, you wouldn't have a metre between that and the back of your cab so to speak and...once a big bit of pipe or a heavy bit of RHS or flap or whatever it is gets going, and you lock, once you brake trying to stop from 100 to nothing and try and do it, it's going to be a good spear comes in the back of your head. So you've got to drive a bit more defensively or so yeah. (Company B Trainer One)*

The final difficulty associated with carrying steel was the slipperiness of steel when walking on top of it. Whilst Company B has rules preventing drivers from climbing onto the trailer, this behaviour still occurs. One driver stated that when they are required to cover a steel load with a tarp, or on some occasions during belly wrapping, it becomes necessary to climb onto the trailer. Steel loads often have irregular surfaces and, when accompanied by the slipperiness of steel, it is dangerous for drivers to walk on.

*It's deadly, you just need one foot in the wrong place and you'll go off the side... I know one bloke who fell off... he didn't die but he got a lot of internal injuries. (Company B Driver Two)*



#### 8.8.4.2. Sharp goods

When carrying building and steel products, there is often a risk of cut injuries from sharp edges. One Company B driver, who works transporting building materials, indicated that his major safety concern was “cuts, it’s a sharp product, you gotta wear gloves, long sleeves and trousers to make sure you don’t slice yourself”. It was noted that the sharpness of products is a hazard for drivers when handling and restraining goods and when walking on the trailer. Thus, there are specific PPE requirements when working with such products.

*And we...funnily enough (building material customer), I believe, have a few cut issues, we don't generally get them, our guys wear their PPE, they wear their gloves. You don't see too many, I'm trying to think when I saw one last. But basic things, if you get, I guess if you get a razor blade which a piece of tin can be, when the...a bit of 1.5 mil sheet just laid on the guillotine and it chops it. It leaves a burr underneath and you can't see it but it's there, this end is smooth, that end is not, it's like a razor blade. If it's on a rainy day you have a piece of bent tin on the back of your truck, you're talking to your mate, you've got the paperwork, do you want this one? Yeah. You grab it, oh it's stuck, you give it a pull, it's wet, it slips...goes straight through your gloves and it cuts all your fingers. It's happened so many times. The glove itself has improved, you only use gloves with certain ratings and cut resistance and so on and so forth. I guess we're lucky here because Company B is one thing, they have 35-year employees, you know guys who have been here, long service is incredible in Company B. At (building material customer) here again I think there's only two drivers that have been here less than two years, you know, so longevity in the business, the guys learned. All your skills factors and your safety improves the longer the people stay. So with experience you know it helps us out. (Company B Branch Manager Four)*

#### 8.8.4.3. Over dimension

Over-dimension products can pose significant risks in the form of wide loads requiring extra width to travel, long loads being incapable of taking certain corners, and heavy goods placing extra load on the vehicle and restraints. As discussed in section 8.8.2.4, Company B has a number of specialised trailers which are designed to improve the manoeuvrability of long loads. Similarly, in order to carry heavy loads Company B is legally required to have trailers designed for the extra weight.

The use of police escorts for heavy haulage was already discussed in section 8.3.7. Due to the requirement for police escorts, a significant amount of planning is put into the transport of over-dimension freight, helping to reduce the risk of incidents. Additionally, the presence of police escorts makes it much less likely for the driver to engage in illegal behaviour.

*When you are transporting the gear on the road we transport up to 42m so you need police escorts, pilot escorts, your lights to be switched on in your head and then you have to trust that all the other people on the road have a little bit of courtesy and respect. (Company B Branch Manager Four)*

Over-dimension freight also requires a certain level of skill and knowledge for drivers. These drivers must be aware of the limitations of the load they are carrying to ensure that they do not cause an incident. Examples of this can include cornering at the wrong speed or simply colliding with an object due to forgetting the size of the goods.

*But when you get into the over-dimensional freight where it's wider than what the trailer is or if it's super high load you've got to take into consideration of are you going to hit anything through the course of the journey. And the same for the width, you've got to be considerate of who you put on there, it's got to be a person that's experienced in that sort –*

*– of work that knows the hazards to look for and knows that driving around corners you've got to take a wider sweep to get around corners and that sort of thing. (Company B Operational Manager)*

Finally, with heavier products there is an increased potential for harm resulting from freight falling off of the trailer. Further, in the event of this occurring, the time taken to remove a fallen object from the road is increased by the need for specialised equipment. Thus, ensuring that the load is adequately restrained becomes even more important. However, due to the weight of the product, adequate restraint is made more difficult as vibrations along the road can cause a loss of tension. It is therefore necessary for drivers to regularly check their restraints.

*Yeah throughout the drive, particularly if you're carrying whatever you're carrying, you have to stop at points throughout the drive to check your load restraints, check they haven't come loose. If you're carrying a large piece of mining equipment, that tension can come loose with the vibration of the road, vibration of the vehicle so you'd have to pull over every few hours to check them. (Company B Director)*

#### 8.8.4.4. Craned loads

There are two types of craned loads commonly used by company B. The first are those which can be loaded and unloaded by a trailer mounted crane and the second are those that are unloaded by a crane operated by a customer. Regardless of the type of crane required, there are a number of risks faced by the driver. A driver is typically required to climb onto the back of the trailer in order to attach the crane cable/chain around the goods, increasing the risk of falls. Additionally, the driver must be sufficiently clear of the load in case the goods fall from the crane. When unloading goods with a trailer mounted crane, drivers must also be aware of powerlines. Whilst drivers are encouraged by Company B to refuse the work if they

believe it is dangerous, one driver suggested that many drivers believe themselves to be capable of working safely in dangerous conditions.

*The powerlines are often lower than they are meant to be so sometimes we are touching them... Most of the guys have been here long enough that they know how to work around powerlines... but some of the newer guys refuse the work ... we're not working in dangerous conditions... you just gotta be safe. (Company B Driver One)*

#### 8.8.4.5. Livestock

Whilst the risks associated with utilising livestock crates and the limitations working with livestock places on driving hours and the use of PPE were already discussed, a number of additional issues were raised by members of Company C. First, when transporting livestock the potential to damage the 'goods' is increased and can have significant costs to the transporting company and their customers. It was noted that bruising of cattle during transport may cost the grazier significantly, as the animal is less suitable for use as meat. Further, cattle which fall over are at risk of being crushed or trampled and may die. In the event that an animal is harmed or killed, the transport company may be at risk of punishment from animal welfare agencies and may need to pay damages to the grazier. Additionally, as cattle may move around within the crate, there is an increased risk of rolling the truck if it is poorly loaded. It was indicated that it is, therefore, necessary to drive more carefully and to ensure that the load is heavier on the lower level of the crate. Lastly, it was noted that it is necessary for drivers to understand that cattle are animals with their own personality and transporters are required to have a level of empathy with their load.

*My men actually form little relationships. That sounds really crazy, that sounds really stupid but they'll ring me up and say oh the old girl she's got her head out here, she's looking at me and you know what I mean, all of this little baby is in the corner there how –*

*– cute is that? And so they form this, because they do have a personality and every cow is a little bit different you know. Some that you know are going to eat you when you look at them and some that and you would have seen that. You would have seen the other day when you loaded them up and I think got their head out, what's going on today? (Company C Manager)*

#### 8.8.5. Summary: Environmental and situational factors

In addition to interpersonal contextual factors, there are a number of inanimate contextual factors which may influence safety in the heavy vehicle industry. These included factors related to road design and conditions, truck designs, environmental conditions and the load being carried. These factors influence safety by providing the immediate contextual setting in which behaviours occur. Whilst many of the previously discussed contextual influences, such as government departments, exert their influence through modifying the decisions of drivers, environmental and situational factors appear to exert their primary influence through presenting hazards and scenarios which require action. Some of the identified factors pose a direct hazard to the driver, for example slippery or rough road surfaces. Additionally, however, they can also serve to increase the risks associated with other hazards. For instance, crashes with other vehicles may be more likely due to truck blind spots and stopping distance.

#### 8.9. SUMMARY: CONTEXTUAL FACTORS WHICH INFLUENCE SAFETY

The purpose of this chapter was to outline and detail the contextual influences on safety which may interact with the culture of the industry to shape driver behaviours. Whilst the role of the organisation was detailed in the previous chapter, the current chapter explored the influence of: (1) national and global climate; (2) government departments and enforcement; (3) the general public; (4) the customer; (5) accreditation schemes; (6) the broader industry;

and (7) environmental and situational Factors. At a broad level, these influences can be categorised under either: (a) the external context surrounding the industry; (b) the industrial context; or (c) the environmental context. This categorisation is used in Figure 8.1 below. Whilst each of these factors holds relevance to the current safety culture framework, they would not receive attention within traditional views of safety culture. Whilst some of the above factors are relevant in many industries, many hold specific relevance for the heavy vehicle industry. The wide variety of factors present makes the heavy vehicle industry a particularly complicated example of safety culture. The next chapter examines cultural factors present within the studied organisations.

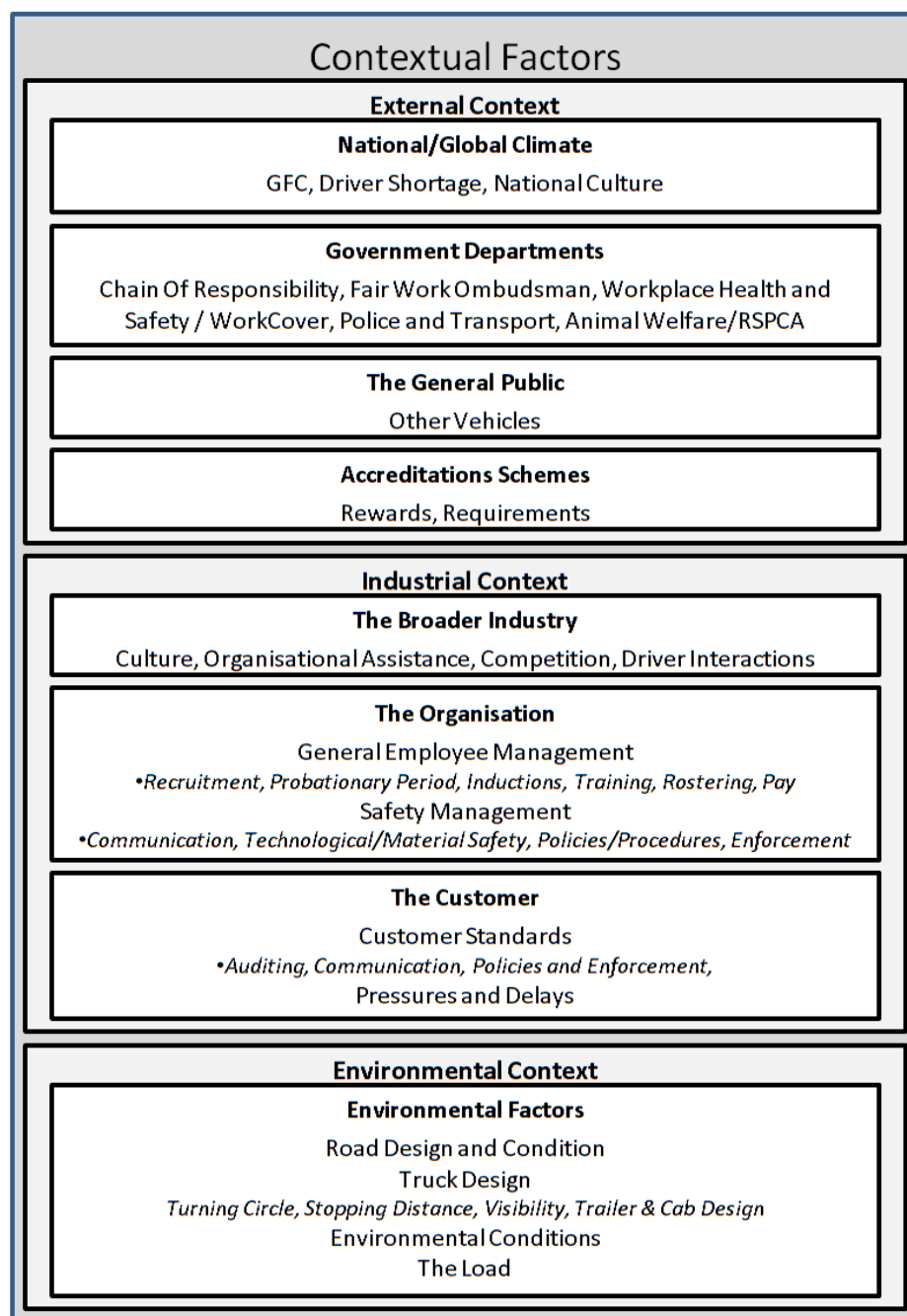
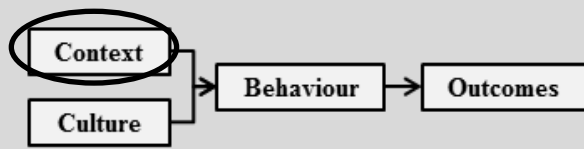
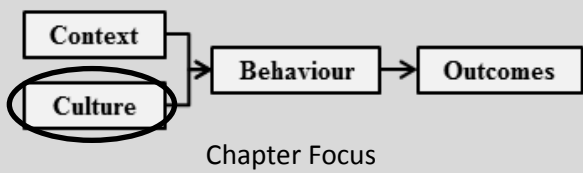


Figure 8.1: Contextual influences on safety identified within the Study Three







## Chapter 9: Study Three Results Part III – Cultural Influences on Safety

### 9.1. INTRODUCTION

Study Three consisted of a series of three case studies with transport organisations. During these case studies, observations of drivers and interviews with organisational staff and drivers were conducted. The synthesised conceptualisation of safety culture, which forms the theoretical framework for the current research, emphasises safety outcomes that are the result of behaviours influenced by culture and specific contextual factors. The purpose of Study Three was to examine how cultural and contextual factors affect safety-related behaviours through the use of case studies. Chapters 7 and 8 reported on the specific context surrounding drivers. The next component of the current framework which should be explored is the culture held by drivers. Study Three identified a number of cultural syndromes or dimensions, referred to throughout this chapter as cultural traits. Prior to exploring these traits, it is important to note that due to the use of qualitative research methods, the identified factors could still be viewed as potential cultural traits, as the extent to which they are shared is yet to be demonstrated. Nonetheless, the ethnographic methodology which was used in Study Three is the standard method used to explore cultures and it is evident that these traits were shared to at least some extent within each of the studied organisations.

Each of the discussed cultural traits was held by drivers. There are a number of reasons for focussing on the culture of drivers rather than managers and organisational staff. First, a

significant proportion of safety-related behaviours within the industry are performed by individual drivers. Whilst organisational staff member (managers and administrative personnel) behaviour influences the context surrounding the driver, it is ultimately the driver's behaviour that causes an incident (with exception to crashes caused by other vehicles). Second, though culture may influence decisions of organisational staff, it is often suggested within the literature that a leader should aim to develop or create a 'positive' or 'good' safety culture (e.g. Choudhry et al., 2007; M. Cooper, D., 2000; Crum & Morrow, 2002; International Nuclear Safety Advisory Group, 1991, 1992; Sully, 2001). Schein (1992) even suggests that creating a good organisational culture is the ultimate responsibility of a leader. While the ability to change or shape culture is debated within the literature, if an organisation's leadership is truly interested in influencing safety they must be able to step outside of their culture to seek improved safety. On this basis, the culture of organisational leadership is not relevant for an organisation seeking to improve safety, as their leaders will lay aside their beliefs and values to make decisions which will improve safety. This chapter focuses on cultural traits held but drivers, but also indicates where it was evident that these cultural traits also applied to organisational staff members. A number of quotes from managers have been used to illustrate the traits identified. Due to the fact that recording was not possible during observations, it was difficult to gain accurate quotes from drivers. Wherever possible, quotes from drivers have been used, however, at times managers and organisational staff accurately described the identified traits in a more fluent manner than drivers. In these cases the quotes have been used to provide thicker description and to better convey the nature of the traits identified.

#### 9.1.1. The format of the current chapter

Study Three used an ethnographic, grounded theory approach to examining the culture of the industry through a selection of three organisations, somewhat representative of the

broader industry. As such, the identified cultural traits were identified from data, with only the definitional condition that they be shared (within a single organisation) beliefs, attitudes and values which appeared to influence safety. Despite taking a grounded approach, there was a significant overlap between the identified traits and a series of example cultural dimensions identified by Schein (1990, 1992). The overlapping dimensions appeared to form the underlying core group of cultural traits identified within the case studies and, as such, are discussed in the first half of this chapter (section 9.2). Though the traits were identified inductively, through the use of grounded theory, the dimensions identified by Schein have been overlayed upon these underlying traits to provide an organising structure enabling easier reading and understanding. Additionally, whilst the current research is based upon the synthesised conceptualisation of safety culture, in this conceptualisation cultural traits include any shared beliefs, attitudes and values which impact upon safety. Thus, the use of Schein's cultural dimensions does not conflict with, or replace, the current framework, but serves to provide internal structure to the existing framework.

Study Three also identified a number of traits which appeared to be specific applications of these underlying traits, or the result of a combination of cultural and contextual factors. As these traits appeared to be a result or application of underlying traits, they formed a somewhat tiered structure and have been labelled as second and third order traits to highlight this structure. These traits are discussed in the second half of the current chapter (section 9.3).

It was stated in section 2.3.5 that culture does not lead directly to behaviour, but rather interacts with specific contextual factors. However, in some cases it was seen that culture could directly shape behaviour without requiring interactions with contextual factors. In these cases, the direct behavioural outcomes of cultural traits will be discussed; however, for the

vast majority of cultural traits, the effect they have on behaviour will be discussed in Chapter 10.

Prior to presenting the identified traits, however, it is important to note that many sources were used to identify multiple cultural traits. Thus, the discussion of some traits can be seen to overlap. Whilst related, or even apparently conflicting, cultural traits may be evident within the discussion of a given trait, the current chapter focusses on individual traits to enable in depth discussion, rather than shallow discussion of multiple traits simultaneously.

Additionally, many of the cultural beliefs, attitudes and values could be seen to be at odds with safe behaviours. Further, at times the beliefs held by drivers do not align with objective truth or with what research has shown to be true (for example, some drivers suggested that they could drive for 10 hours straight without being fatigued despite significant evidence to the contrary). However, as discussed in section 2.3.1, there is significant debate within the literature as to the extent to which it is possible to change culture. Thus, there is little benefit to critiquing the validity of cultural beliefs and values. Conversely, by understanding the culture held by drivers it is possible to understand their behaviour and thus identify changes that could be made to the structures and systems which surround them in order to shape behaviour in the presence of problematic beliefs. Thus, the current chapter seeks to understand the culture of drivers and gain insight on their perspective of safety, rather than to identify faults within their beliefs. Whilst it is occasionally noted where beliefs are incorrect, this is not typically pertinent to the current discussion.

## 9.2. UNDERLYING CULTURAL TRAITS

Schein (1990, 1992) identified a number of cultural dimensions which overlap considerably with the cultural traits identified within Study Three. These dimensions were: (1) the organisations relationship to its environment; (2) the nature of human activity; (3) the nature of reality and truth; (4) the nature of time; (5) the nature of human nature; (6) the

nature of human relationships; and (7) homogeneity versus diversity. Only the final dimension, homogeneity versus diversity, was not present within Study Three.

It was stated by Schein (1990) that these dimensions were drawn from “*anthropological typologies of universal issues faced by all societies*” (p.112). Thus, it is not surprising that there was some degree of overlap between these dimensions and the cultural traits identified in this study. In fact, the noted overlap could be argued to show support for these traits as likely dimensions present to differing degrees throughout the broader industry. These dimensions were used to categorise a number of more specific traits identified within the study.

#### 9.2.1. The industry and organisations relationship to its environment

Schein’s (1990) first typological dimension was the organisation’s relationship to its environment. Schein (p.114) suggested that a central question to this dimension was “*does the organisation perceive itself to be dominant, submissive, harmonising, searching out a niche?*” In the context of the present study, it is important to understand how each company views itself relative to its broader context. Whilst the target environment differed between each company, it was apparent that they each perceived themselves to be unique, aligning somewhat with the concept of ‘searching out a niche’.

##### 9.2.1.1. The uniqueness of the industry/organisation

Each of the studied organisations viewed themselves to be unique. In Company A this uniqueness was extended to the industry as a whole, in Company C this it extended to the livestock transporting industry, and in Company B it was specific to the organisation. Each organisation is discussed separately below.

*Company A.* Members of Company A expressed a belief that the industry is different to other industries and vocations. This uniqueness is based upon the nature and requirements of

their work, the challenges the industry faces and the individuals who are part of the industry. This perceived uniqueness has two major effects on safety. First, members of Company A regularly indicated that the individuals who write policies for the industry have never driven a truck. It was believed that individuals outside of the industry, while well meaning, do not understand the industry and, therefore, make incorrect policy decisions. This contributes to a perception that policies are typically impractical or simply wrong. As discussed in section 9.3.3, this perception can influence compliance rates. This perceived uniqueness of the industry can result in a resistance to policies.

*The industry is so different to anything else... Drivers are a breed of their own... the industry attracts a certain type of person and shapes them too... To be a good driver you've gotta have it in your blood, or at least understand it. (Company A Driver Three)*

Secondly, because of this uniqueness, safety aims such as zero harm may not be believed to apply to the industry. Members of Company A suggested that due to the nature of the task, there is little more that can be done about safety within the industry. One staff member indicated that due to the long history of the industry, it is already quite controlled and has been made as safe as is possible at this time. Therefore, perceived uniqueness also may reduce self-efficacy regarding the ability to improve safety.

*The industry has improved heaps since I started... But it comes a time when it can't get any better... It's as good as it will get... It's the nature of the task. (Company A Driver Three)*

*Company C.* Similarly to Company A, Company C appeared to believe that livestock transporters should be exempt from many industry legislations. It was stated by the driver/manager of Company C that “every time there is a story on the news about truck drivers being bad they hit us all with more legislations”, but “the livestock transport industry is so much different to the rest”. This was particularly relevant to fatigue management laws,

which were considered to be unsuited to the livestock transport industry. Whilst the belief that fatigue management laws do not suit the industry was largely based on contextual variations between livestock transport and other transporters, the perception that livestock transport is unique appeared may provide an internal justification for non-compliance.

So as far as the laws go I'd like to see all that rural side of driving exempt from logbooks on unsealed roads because you can't do 800 k in five hours. Some days it takes you a hundred, to do 150k, might take you four hours. So by the time you get to the sealed road you can't go anywhere. Which makes it hard... and while you're driving on those unsealed roads at a slow speed there's no other traffic, there's only you and the road. There's nobody to worry about, you haven't got to worry about trucks coming at you or cars coming at you or cars overtaking you or anything like that. It's just you and the environment if you want to call it that. I don't know what the word is. So once you do get over that then you got to your sealed sections of your road it's like starting a new day. Does that make sense?... plus with our industry we're also stopping a lot anyway when you do stop and check your cattle and have a walk about, you check cows, you kick your tyres, that sort of stuff, that's all a part of it...it's the only industry it's part of. You don't have to stop and check your bananas or your pallets of god knows what. (Company C Driver/Manager)

*Company B.* Whilst Companies A and C viewed the industry, or their section thereof, as unique resulting in legislations not suiting them, this pattern was not evident in Company B. Nonetheless, members of Company B considered their organisation to be unique compared to the broader industry. This uniqueness was a source of pride, linked with positive practices. Relative to other organisations, one Company B manager indicated that “*Company B is probably one of the ones that is most focussed on safety that I've been with*”. Similarly, one Company B driver stated that “*other truck companies I've worked for seemed a bit shifty but*

*Company B are good”, arguing that “it’s all above board, nice and simple, pays well and I get to spend a lot of time with my family”.*

This positive form of uniqueness was often present in discussions of the role of government and customers. Company B often exceeds legal requirements, particularly for fatigue and load restraint, and avoids competition by servicing a niche market. The direct impact of this trait on safety was unclear, however, drivers may go to greater lengths to uphold the perceived unique safety focus.

*I think the fines affect the business but you’ve met (Director). I don't know your opinion there but they’re a family organisation. They’re a family, they give a shit about their people you know I was involved in the passing of one of our employees and the effort that Company B went to in that regard. They didn’t have to, financially umm let’s not put it morally, it’s financially and supportive, in a supportive manner they were there for the family you know. They didn’t have to, there was no rule or regulation that said here we need to give you some money oh we need to ring up and make sure you’re okay. We need to offer you assistance through guidance counselling. They don't have to do that, they choose to do that you know. (Company B Branch Manager Four)*

#### 9.2.1.2. The industry and organisations’ relationships to its environment:

##### Summary

Each company believe themselves to be unique. This uniqueness applied to either the broader industry, a subsection of the industry, or their organisation alone. Perceptions regarding broader uniqueness appeared to result in a belief that external governance was inappropriate, particularly as ‘only members of the industry could understand how the industry works’. This has the potential to justify unsafe acts. Conversely, however, within



Company B the perceived uniqueness of the company was used to explain why the company exceeds the standards of others and may set a high benchmark for drivers to strive toward.

### 9.2.2. The nature of human activity

The second dimension highlighted by Schein (1990) was entitled the nature of human activity. The central question to this dimension was said to be “*is the “correct” way for humans to behave to be dominant/pro-active, harmonizing, or passive/fatalistic?*” (p.114). A number of work expectation-related traits were identified in Study Three. Whilst Schein’s question suggested ‘correctness’ to be important, which is common within his writing, within the studies these traits generally centred around the way a driver would act, not necessarily whether this was correct. The expectations, beliefs, attitudes and values which were identified in this category included: (1) hard work; (2) fairness; (3) ‘hold your line’; and (4) safety.

#### 9.2.2.1. Hard work

Many members of the industry have a strong work ethic and place high expectations on one another. Drivers feel a sense of achievement from a well-executed, hard day’s work.

*Like when you get, when you load them and when you get to where you deliver them there’s no better feeling than to have all your stock walk off all good and you’ve achieved something. I mean there’s a big sense of achievement in delivering your freight, call it freight, all in good order. So you don’t want to be stopping hard and throwing them down and causing them to stress and giving you a headache. So you just do what you do. And it’s like mowing the grass, you mow the grass and you look back and you think geez I’ve done a good job today. (Company C Manager)*

Further, many members of the studied organisations had a low tolerance for laziness. One Company A driver stated that “*there’s no reason the guys can’t do what they are asked*

to do... they are just lazy and whingers”. Similarly, the Company C manager indicated that they are angered by workers who oversleep out of laziness.

*I sent him to do a job to (location), he cross loaded onto somebody else's because we don't do any more long distance as into Brisbane anymore because of the driving hours issue. Sent him there, cross loaded onto (company name) at six o'clock that night. Was meant to be somewhere else within plenty of time the next day, he rang me at 8:30 in the morning and he was 400 kilometres away from where he had to be and...and....like it's 14 hours later. I did ring him up and wanted to know where he was, he actually rang me and said 'I'm still at the hundred mile ha, ha'. Now I don't care that he was still there except that it's 14 hours later. It's not, you know I'm not pushing him to say, you know, you've only had four hours sleep and that's all you need, you better go. There's a need from my perspective and you know 34 years in business reliability is what we actually, it's our motto, reliability backed on experience that's what we do. Backed by..and he knows that, he's been with us for quite a while. I was angry with him. Not because he had a sleep because of course you're allowed to have a sleep and not because he slept in but 14 hours after you've had two days off for me was just too much. And too much, look I could sleep 24 hours a day too if you let me. But if you've got a commitment and you had plenty of sleep it's not a big deal to set the alarm to get up. (Company C Manager)*

Due to this 'hard work' ethic, drivers may feel pressure to work beyond their ability. For example, one Company A driver stated that “*other guys just get to a loading point and just nap in the bunk when they should be offering help*”, suggesting that fatigued drivers should not rest. Pressure from this trait was less evident in Company B drivers, however, it was still evident that drivers had a high work ethic.

Despite the absence of correctness from some of the traits in this category, managers indicated that hard work was the correct behaviour for drivers. It was indicated by one Company B manager that drivers should have a mentality of doing whatever is required for their employer.

*You know you need a union to back you up, why? If you do the right thing, if you get employed; I'm employed between the hours of eight and six, if you don't want me to kill anybody or do anything wrong, I'll do whatever you like. Want me to wear a dress to work I don't care. If that's what my employment involves right? I've agreed to work for the company, yes I've got a piece of paper that says I'll do all these things but I do more than that, some days I do less. But you know ultimately do you want to work for a company?*  
(Company B Branch Manager Four)

This hard work trait also directly relates to safety through shaping expectations surrounding an injury. Organisational staff members within Company A had a low tolerance for lost time injuries. One Company A manager discussed his own experience with rehabilitation and insurance claims after a serious car crash, stating that whilst he was able to return to work after a couple of weeks, a specialist suggested that they would prescribe five years off work. The manager found this to be ridiculous, stating that there was no need for such an extensive recovery period, as he could return to work after two weeks.

*You get other blokes here that you know you could chop their arm off and it's like 'oh fuck I've got to go to work, but fuck, my arm, you know; it's not even there but it's still sore'. And then there's just stupid shit, the blokes just need a month off work because they pulled a muscle.* (Company A Manager One)

The expectation that individuals should be able to work through pain and return to work may be unreasonable. Nonetheless, it was common to hear organisational staff members and

drivers suggest that certain individuals, who could work withstanding significant pain, were better workers than others.

*I don't really, you know, we had a bloke I think it was earlier this year that broke his ankle. He broke his ankle at Wyong, that's just out of Sydney, fell off the back of the truck and broke his ankle. He drove it to Kempsey before he said I can't go any further. That's a fucking good bloke. (Company A Manager One)*

Whilst this aspect was also less evident in company B, it was clear that one of the company directors had a high level of respect for individuals who aimed to return to work with minimal compensation after an injury.

*I had one person who fell off the truck, the trailer and fractured his hip. Fifty per cent overall permanent impairment, can't drive a truck today, has never gone common law. Could have gone to state claim and common law no worries, never gone common law because he felt supported through the process. He has a job that he still works around the heavy vehicle injury but he just said, I'm not that type of person. I don't believe in that sort of system. I've got a payout that has been sufficient for me to do what I need to do for ongoing surgery because he needed a hip replacement in the end and that came out of a stat payment. He did all that, he's happy... I've got some people that use the system because they know they've got money and they're not really going to need it going forward but they know they can get it. Got other people who don't believe that they should milk the system like that then we have other injuries where people haven't even, they don't even think about it. They just focus on, I'm going to get back to work and it's a small part and it's then back on the job. (Company B Director)*

#### 9.2.2.2. Fairness

Drivers within the studied organisations also placed a large focus on ‘fairness’. Many rules and regulations were considered to be unfair, whether due to sole application to the heavy vehicle industry or simply the nature of the regulation. Further, a number of drivers made reference to the work diaries fines resulting from spelling errors, though as stated by one Company A driver, if “*if the RTA make a mistake though it is different*”. Similarly, one Company C driver stated that the design of work diaries placed unfair restrictions on truck drivers that are not required of other workers. The driver compared truck drivers to police officers and doctors, indicating that doctors who work long hours then drive home are highly respected, yet that if a truck driver works 16 hours they are considered ‘a criminal’.

*Police that book you they work eight hours but then they go home and you can be sure they don't go to bed, they play with their families and it makes it a 16-hour day, what's the difference? Even doctors, there's a huge doctor shortage, but the intern that does a double shift, he's a hero, but if I work 16 hours I'm a criminal. Fatigue is fatigue, if you work a long day then drive 20 minutes it's the same as driving all day and I've been doing it for 20 years, I know the signs of fatigue but they are doing it because of circumstance that bought it up. (Company C Driver 3)*

Within company B, it was suggested that the company owners place unfair expectations on drivers which they do not place on themselves. For example, one driver indicated that the owners believe that small accidents were not possible for good drivers, yet, when the owners have made a mistake they simply get someone else to fix it. Whilst it may appear this way to a driver, it is important to note that the owners would likely be equally disappointed with their own mistakes as the mistakes of others, viewing their financial loss as significant self-punishment. Nonetheless, the perception of a lack of fairness highlights this trait in drivers.

*Accidents can't happen as far as they are concerned, not major ones but small ones. But if the owner makes a mistake he can just tell someone to fix it. (Company B Driver Three)*

There to be two primary means by which safety may be influenced by the fairness trait. Firstly, as indicated by one Company A manager, rather than accepting responsibility and punishments for speeding infringements, some drivers will “*get the shits and finish up because they think it's unfair*”. These drivers may then seek employment within less safe organisations which they view as fair. Further, companies may be restricted in their use of enforcement out of fear of losing workers. Second, though never observed, the perception that regulations and policies are unfair may serve as a catalyst for non-compliance. However, one manager highlighted that despite viewing specific heavy vehicle fatigue and licensing regulations as unfair, many believe that they should apply to other drivers, not that the policies are wrong. Thus unfairness cannot be confused with disagreement with the principle of policies.

*Little Johnnie can drive his little bubble car alright? You can drive that, let's just say you live at Brown's Plains and you work here, takes you 10 minutes every day for 30 years, then you retire and you go and buy a monstrous big frigging F250 and a 36-foot caravan and off you go. You don't need another licence, you can do that, but a truck driver can't. The bloke who drives a 12-tonne rigid with no trailer licence he can't do that, yet he can go home and tow a trailer. He has more experience than the average Joe Blow driving a trailer yet the truck driver is, again what is it, because of their potential to cause harm or death? They are regulated so highly. And I don't disagree with it, I'm not saying they shouldn't be, I think the regulation is great, I just think there should be more of it lower down. There should be more of it down where we start. You know we put kids in charge of frigging missiles, no regulation. (Company B Branch Manager Four)*

#### 9.2.2.3. ‘Hold your line’

Another key work expectation highlighted within Study Three was that as a driver, you should ‘hold your line’. In essence, holding your line means to maintain your current course as much as is possible. Whilst it was indicated by one Company A driver that many truck drivers dislike a certain company who use lower speed limits, resulting in holding up other drivers, the driver stated that *‘if they are holding their line, they’re not doing anything wrong’*.

This trait bears immediate relevance to the interactions between trucks and other vehicles on the road. Three specific scenarios were identified as posing as issue potentially requiring drivers to hold their line. These were overtaking, when a car brakes heavily in front of a truck, and when another vehicle drifts into oncoming traffic. As put by one Company A driver, when a truck tries to overtake a car and the car speeds up *“there’s not much you can do, you’ve gotta hold your line”*. Due to the shortness of many overtaking lanes, there is a heightened risk of a crash, rather than suggest the truck driver slow down to avoid a collision the driver simply said *“if they want to play games with a truck they shouldn’t be on the road”*.

One Company B driver also gave significant discussion to cars that brake heavily in front of a truck. The driver noted that they have been instructed, due to the risks associated with steel transport (section 8.8.4.1), not to brake suddenly under any circumstances. Due to the potential for truck driver injury from shifting loads, it was seen to be better to run into the back of a car than brake to avoid a crash.

*With steel if a car stops in front, (trainer name) said don’t slam the brakes, hit them. The steel will go through the cab. It’s not about fault or anything it’s just not safe. (Company B Driver Two)*

Similarly, when a car drifts into oncoming traffic risking a collision with a truck, a number of drivers suggested that the truck driver has to hold their line due to the potential outcomes associated with different actions. If the car driver is able to recover in time and return to their own lane, a crash will be averted by the truck driver holding their line. Alternatively, if the truck driver swerves they risk a potentially fatal single vehicle crash or an at-fault crash with another vehicle in the opposite lane. Additionally, if they swerve into the opposite lane and the car driver recovers, they will be deemed at fault for the crash, due to being on the wrong side of the road. Unfortunately, however, if the car driver does not recover, the decision to hold their line may result in the car driver's death. Thus, no matter what course of action is taken, there is a risk of a fatality crash. However, the truck driver is at greater risk of personal injury, death and legal repercussions if they swerve. Many such discussions occurred, yet they were typically hypothetical in nature and none of the drivers could guarantee how they would instinctively react in this situation. As argued by one Company B driver *"instinct will stop you from ploughing through a car; plus there could be a family in there. I think I'd run off the road, even though we'd probably die"*. Nonetheless, in these hypothetical scenarios the majority of drivers suggested they would hold their line.

*When someone drifts over you need to hold your line... If you crash without them it's your fault and if you go into their lane to avoid them then they wake up and swing back to their lane it's your fault for being in their lane. (Company A Driver Two)*

This trait was absent from Company C. The expectation for drivers to hold their line generally emerged when discussing interactions other vehicles. The higher proportion of time spent on dirt roads away from other traffic may explain the absence of this trait within Company C.



#### 9.2.2.4. Safety

Central to the effect of culture on safety are the drivers' attitudes towards safety.

Generally speaking, drivers were willing to go to great lengths for safety. Drivers often indicated a high priority on safety and were willing to ignore infringements on other cultural traits in the name of safety. The value placed on safety often appeared to override a number of other cultural traits.

*These guys leave you alone, but you're never really alone, they track you, but they are checking up on you for your own wellbeing so it's ok... If you took it wrong you could get angry about it but it's for your safety. (Company C Driver Two)*

As said by one driver from Company B, "*safety is absolutely paramount*". Another Company B driver simply stated "*safety is safety*". One Company A driver even suggested that despite public opinion holding that truck drivers do not care about car drivers, "*at the end of the day it's about our safety too, I want to go home and see my partner*". Thus, within the studied organisations, drivers often stated that safety was a key behavioural motivator.

*I try to keep a safe distance, if another vehicle pulls in front of me I slow down a bit... once again it's about safety, I want to go home to my family. (Company B Driver Four)*

It was often noted that drivers need to be motivated by safety to adhere to policies and practices. For reasons explained in section 9.3.1, members of Company B were more likely to see the safety benefit of given actions and are over-represented within the following discussion. Nonetheless, this trait was clearly present within each company. As stated by one Company B Driver, "*I don't take chances, we just do everything in accordance with what we're supposed to do at (Company B)*". Similarly, another Company B driver stated that "*at the end of the day you just want to go home, so if you follow the policies and procedures everything should happen*". If drivers believe that a given policy has safety benefits they are

highly likely to comply. As stated by one Company B manager, *“people have got to want to be safe”*.

*If you drive to the conditions, drive to the speed limits, make sure you do everything safe and follow the policies and procedures you’ll be ok... You probably look at me and think I’m a company man, yeah if you do everything right you’ll be alright.* (Company B Driver four)

In regards to seatbelt use, a number of Company B drivers specifically cited safety as their motivation for compliance. Even when acknowledging other motivations, one Company B driver stated that *“there’s a fine too but I don’t wanna die in a crash”*.

Similarly, one Company C driver indicated that, despite having exceeded fatigue regulations on many occasions in the past and utilised substances to assist in driving long hours, increased traffic in recent years means he no longer considers this type of behaviour to be safe and now adheres to the policies.

*I’ve been around long enough to talk about the old days. I’ve done days on end with only an hours sleep here and there and taken what was needed to stay awake, but there so much more traffic these days it’s not safe, I wouldn’t do it now, self preservation is a pretty good motivation.* (Company C Driver Three)

Further, whilst there are many pressures and demands within the industry which may lead to some drivers conducting unsafe behaviours, if a driver perceives the requested course of action to be unsafe they will typically resist this pressure. For example, one Company C driver said *“I don’t care who I work for, I’m not taking drugs to stay awake, it’s my life at risk not theirs”*. Drivers within Company A also commonly suggested that, when pressured by organisations and customers, it’s *“better late than sorry”*. This was particularly prevalent to fatigue, with one Company A driver stating that *“if I need a sleep I do it, it doesn’t matter what they say”*.

Additionally, drivers will conduct activities they are not required to do in order to ensure their safety and the safety of others. For example, one Company B driver stated that he chooses to always drive with two hands on the steering wheel, *“reason being you have better control”*. This general approach to safety was also highlighted by one Company A driver who stated that even when ridiculed for cleaning the ‘long vehicle’ signs on a trailer, he continued to clean it because *“that is safety, people need to be able to read those signs”*. Similarly, one Company B driver indicated that whilst he was not required to do so, he always checks his load restraint on journeys exceeding 30 minutes as *“it only takes two minutes to make sure”*.

For drivers to be motivated by safety, they must believe that a given behaviour has the potential to reduce harm. This underlying requirement was noted by one Company B manager who stated that drivers must have *‘a sincere belief’* that their *‘work can result in them hurting themselves’*.

*That’s I think that’s the underlying fact that the driver has got to have a sincere belief that whatever they do when they’re at work can result in them hurting themselves. So consequently they need to have that safety focus at all times.* (Company B Region Manager One)

Company C drivers indicated that some risks associated with livestock transport are easily evident and that they understand the importance of behaving in a safe manner around cattle.

*Carrying cattle you gotta make sure you don’t get injured by a beast, where you put your arms and where you stand, you can quite easily get hurt by getting kicked by the cattle.* (Company C Driver Three)

Similarly, the belief that harm can occur led one Company B driver to indicate that, whilst he may sound like a ‘do-gooder’, he actually just wants to avoid harming himself or others. There were many similar examples within Company B. Rather than discuss each example, however, a selection of such cases is present within excerpts over the page.

*How would you be if you lost a load on a family... fuck dying yourself, that would be worse. I might sound like a do-gooder. I’m fucking not I tell you but I just don’t want to get in strife... I wanna drag this life out as long as I can. (Company B Driver Three)*

Despite placing significant value on safety, drivers do not always see the safety benefit associated with behaviours. If a driver is expected to complete a ‘safety’ task which they do not believe will improve safety, they may not comply. Further, if a legislated behaviour is actually believed to increase risk, drivers may choose not to comply. This was common for seatbelts. As stated by one manager, “most blokes don’t wear it because they think it’s safer without it, and quite often it is in a truck”.

*It’s a safe job if you keep your mind to it, but it can be very unsafe if you don’t know what you’re doing. (Company B Driver One)*

*Always have worn a seatbelt... just habit... in an abrupt stop you’ve got more chance of surviving if you stay in the truck rather than through the windscreen. (Company B Driver Seven)*

*You do the speed limits for a reason... the signs are on the road for a reason, they’re there for safety... you go through roadworks that are 40km/h and some go through at 80km/h... if you lose a tyre all sort of things can happen to someone working on the side of the road. (Company B Driver Four)*

*These guys have their own safety \*pointing to an exclusion zone\*... some have nothing, you gotta use your common sense ... they'll let you stand right next to a forklift... but if you don't want to die... This job's pretty dangerous if you're not careful... some loads are 12m long but the forks of a forklift might only be a metre apart... pretty hard to balance ... you can get hit 8m away... Some depots have pissy little forklifts for two tonnes of metal... you gotta stand back... depends on the driver of the forklift, some are good but some have no idea. (Company B Driver Two)*

*In the old days I used to jump off the trailer, but now I'm trying to be safer... you'll hurt yourself and bugger your knees... I don't know if its coz the industry has gotten more aware about it or because I have gotten older and more conscious of looking after myself... The last company I was with works blokes hard and were working illegal hours. I'm old now; I own my house and if I die my wife can sell my bike to pay off the credit card... but I'm not risking that for a company. (Company B Driver Three)*

Similarly, however, if drivers perceive that they can be safe without compliance, they are less likely to invest effort to comply. It was noted by one Company B driver that despite a legal clearance around power lines, truck crane operators will often breach this legislation as they believe they are “*not working in dangerous conditions; you just gotta be safe*”. As an additional example, one Company C driver stated that, when changing a tyre, “*if you know what you're doing, it might not look safe but it is*”. Thus, due to a lack of safety benefit, many safety regulations are considered a waste of time. As stated by one of the directors of company B, ultimately this may come down to a narrow view of what safety is.

*We have lots of paperwork and it is, we need to cover our arse to prove that we are behaving in a safe manner but that's my view of looking at it. The other view is by having the drivers fill out job safety analysis, it is making them think about safety before they do it. The guys won't see that perspective, they'll just see it as I have to provide a piece of paper, I have to fill out this paperwork about it. So I think in their view if they thought it was safer, yeah they'll go do it. But I don't think they quite understand all the aspects of why it is safer. They don't see this, if I do this here it will avoid something that I never have had happen to me before so therefore it mustn't be really relevant to my safety. If I climb up and down from this trailer, it's not actually safer because I've got to take more steps and I have more risk of falling off it. Jumping down might actually be safer to me because I've done it a lot, I've never had it happen, I don't know what they're talking about, not relevant. So it's their perspective that they have. I can totally see that statement being true just by the fact that they're saying it as ... in so many ways because it's a narrow-minded view of how they define what safe is and what isn't. (Company B Director)*

Due to the potential to not recognise the safety benefit behind certain policies, it is important to identify how to adequately communicate the safety benefits of policies and practices to drivers. It was argued by one Company B manager that “*if they are communicated with properly, they understand*”. Thus the means by which drivers identify reality and truth, which is discussed in the next section, is of critical importance.

*Safety can be frustrating. If you I guess if you look at doing the job that we're doing now, 20 years ago we could do it quicker, cheaper, yes we'd have less fingers. But what people don't realise is when companies are trying to implement safety they're not doing it to fuck you around, they're doing it to save your fingers, toes, life you know. And what they don't –*

*– realise there is a massive cost right? The drivers think oh this is frigging...and I do it, the points I do it...I go this is frigging stupid, this is ridiculous, safety is out of control. People aren't throwing money at safety because they don't want the money, they're throwing money at safety because they don't want the injuries and the accidents you know. And it's all, it's education I guess, everybody is going there, some faster than others. But if the guys I guess if the guys are communicated with properly they understand and yeah we have a few negative people at the bottom niggling away. We just have to have, put more in than they do you know. (Company B Branch Manager Four)*

### 9.2.3. The nature of reality and truth

The third dimension noted by Schein (1990) was entitled the nature of reality and truth.

The central questions relating to this dimension (see p.114) was said to be:

*“How do we define what is true and what is not true; and how is truth ultimately determined both in the physical and social world? By pragmatic test, reliance on wisdom, or social consensus?”*

Within the studied organisations, drivers were found to learn through experience and stories rather than relayed facts. Given the relative low frequency of incidents, the industry is prone to normalisation of deviance. Additionally, many drivers also place a high value on ‘common sense’. Each of these issues is discussed below.

#### 9.2.3.1. Experiential and narrative learning

In almost every discussion regarding a safety matter, drivers would resort to either their own experience or stories of other drivers. Whilst it is easy to find statistics which reveal the risk associated with given behaviours, drivers do not view behaviour as unsafe if their own experience and stories of others suggest otherwise. This emphasis on experience and stories may relate to the fact that, until recently, there has been little focus on safety within the heavy

vehicle industry. It was stated by one Company B manager, that due to the lack of emphasis on safety in past years, drivers would typically only learn about safety from the advice of friends. The value placed on stories and experience may, therefore, be an artefact of this being the only source of advice in past years.

A number of drivers suggested that their own behaviour was motivated by past experience or stories of others. For example, one Company A driver indicated that as a result of a collision with a drunk car driver, he would never again drink and drive. Within company A, this learning style was particularly important for the use of seatbelts, as every driver had stories of people who ‘would have died if they were wearing a seatbelt’. However, a small number of drivers cited their own experience with punishments as the motivation for seatbelt use.

*It wouldn't even be the last 20 years where there's been a big focus on safety and I'm not saying it's wrong I totally agree with it. But before that, like when I was driving... your mate might come along to you and say oh just be careful tying that down it might slip and that sort of thing but there's no real focus on safety. (Company B Region Manager Two)*

Interestingly, within Company B, many stories and the behaviours they influence fell outside of typical safety concerns within the industry. For example, one driver cited their own experience of heart surgery as the reason he needs to watch his health. Similarly, another driver related a story of a friend who suffered sciatic nerve damage and was “*told never to drive with his wallet in his pocket*”. The driver said that upon hearing the doctor’s recommendation to his friend, “*I thought ‘well I’ll practice that’*”.

In Company C these stories and experiences typically related to injuries sustained around cattle. For example, the driver/manager of Company C provided a number of stories of his own injuries and the injuries of others to explain how to correctly work within a crate.



*When the thing kicked me in the face, I knew, I knew soon as I pushed the gate that it was going to hurt. You know what I'm saying? Like it's oh shit. Because the cow's bum was there, I was here, I had the gate, when I touched her with the gate. I knew like you know that split second you think oh shit. And when my old mate fell in the crate he was closing the gate with his foot. Instead of going down and shutting the gate with his hands he put his foot on the gate and pushed the gate. Cow kicked the gate and threw his leg back there. He won't tell you that but that's a fact. And that would be the worst injury we've had.*  
(Company C Driver/Manager)

Additionally, one Company C driver also cited his own experience as the reason why he always wears thongs. The driver argued that he is safer when wearing thongs, as he is not used to the size of the sole of enclosed footwear and is more likely to trip wearing enclosed shoes.

*I'm not really one for safety, I always wear thongs, never my boots. I've got them with me but I never wear them. I even used to work in steel but got out of that when they got all safety focussed. I'm less safe in boots. I have worked with thongs for years and never crushed a toe but when I wear boots I trip on everything coz I'm not used to the extra depth.* (Company C Driver Two)

Non-safety related consequences were also seen to motivate behaviour. One Company A driver stated that his own experience of punishment leads him to wear a seatbelt even though he has “*had a few friends crash without a seatbelt and said that if they were wearing it they would be dead; I just hope I never have to find out*”. Whilst this can be seen as a simple example of specific deterrence, it demonstrates that many outcomes may be relevant in teaching drivers the correct behaviour.

Experiential learning is by nature retrospective. As stated by one Company B manager that “*it's not until an incident happens that a driver goes oh shit and they start to see the*

*bigger picture of it*”. Nonetheless, major incidents are not required to learn from experience. Near misses and close calls can also be significant source of learning. For example, a number of drivers suggested that close calls have taught them how to judge and manage fatigue.

*Have had a few near misses when tired... never a fatal though... a fair bit of that is luck. It's not that I'm a better driver than others, just lucky to pull out of the near miss... then you think 'Fuck I gotta sleep'... Those experiences help you judge your fatigue... For me, it is speed. If I start slowing down and can't keep it at 100km that's my first sign. (Company A Driver Six)*

Further, even when an incident occurs there is a need for a lesson to be present in the experience (i.e. the driver must be able to make a causal attribution which could be used to shape future behaviour) in order for learning to occur. For example, one driver discussed a fatigue-related incident in which he awoke with the truck in a highway-side gutter. In this case, the driver was unable to take any lesson from the experience as, as far as he knew, he had received adequate rest and was prepared for the journey.

*Woke up with the truck in a gutter beside the road and the trailer coming up beside me coz it had broke off. Don't know why it happened or how to avoid it. My friend told me that whenever it gets to sunrise or sunset, take a one-hour break, something about the changing light conditions puts people to sleep. (Company A Driver One)*

Experiential and narrative learning was seen as a frustration by many managers. When warning drivers that a given behaviour would result in injury, it was common for managers to state that drivers would argue that they have been doing things ‘this way since before you were born’ and never had a problem. Despite the potential for false or inaccurate stories, drivers often adhere to them.

The finding that drivers primarily learn through personal experience and stories coincides well with past research. The tendency to place personal experience over rules or

reported truths was also observed within both the truck safety literature (Snyder, 2012) and the safety culture literature (Håvold, 2010; Hopkins, 1999) reviewed in Chapters 4 and 2 respectively. Additionally, Baumeister et al. (2004) found that gossip can be used to teach the rules of a culture by highlighting heroic behaviour or revealing how an individual has breached certain unspoken rules, serving as an extension of observational learning.

Because of the importance placed on stories and experience, the use of stories may serve as a vital path by which to improve safety within the industry. However, due to the perceived uniqueness of the industry, non-truck drivers may be viewed as insufficiently knowledgeable to be able to relate stories which are considered believable. For this reason future research must explore the perceived legitimacy of stories from various sources to confirm the validity of this approach.

#### 9.2.3.1.1. Normalisation of deviance

‘Normalisation of deviance’ was a phrase first used to describe a process evident in the challenger space shuttle disaster. Vaughan (1996) argued that after successive disaster-free flights involving shuttles with the same flaws present in the Challenger shuttle, members of NASA began to believe the flaws were acceptable. This process of past experiences justifying unsafe acts was referred to as normalisation of deviance (NOD).

In the heavy vehicle industry, NOD occurs when an unsafe act has regularly occurred without severe consequences, leading to the assumption that the behaviour is safe. This process was described by one Company B manager who stated that the consequences of behaviour are often unknown until it is too late.

*And it's usually, and I've always said to them, it's the stuff you find out after the incidents happen right? Because the drivers will drive around for 30 years and say: I've never had an incident, never happen to me. You don't know what can happen after the fact. (Company B Branch Manager Five)*

Similarly, the driver/manager of Company C shared an incident involving a driver who broke their leg climbing a ladder. It was stated that whilst it could be argued that the incident was always likely to occur, “*it hadn’t happened*”. Thus, due to a lack of past incidents the injured driver was performing a task typically deemed safe.

*There was another one, a bloke, but this was at the sale yard on a very dewy wet morning, a cover up job. He went to climb the ladder to go up to the top ramp, it had no hand rails on the ladder, just a ladder, just a ladder. He put his foot on the ladder and grabbed the ladder because there was no rails and he’d been doing it for 50 years, the same old ladder had been there, but it was just one of those things. You could say it was an accident going somewhere to happen but it hadn’t happened. And when he grabbed the rail the ..the runners of the ladder it was slippery from the dew, his hand slipped, his foot went through the rungs and he fell back and broke his leg off there. (Company C Driver/Manager)*

NOD was evident within the industry for a number of safety issues. As discussed in section 9.2.2.4, drivers will often work beside powerlines, believing themselves to be sufficiently safe. One specific Company B driver even stated that it was safe to operate a crane whilst touching powerlines. In this case, due to previous instances in which no incident had occurred, the driver did not recognise the dangers associated with this activity. Similarly, one Company B manager indicated that many drivers view jumping from a vehicle as safe due to a lack of incidents, yet that the impact of each jump can cause repetitive strain injuries.

*They don’t climb down, just like a trailer, they will jump from the trailer rather than climb down the points. Because my experience is that people seem to do things that are quicker, they’ll take shortcuts to do things. So they think they’re young, they’ve done this a hundred times before, it’s not that far, the calculated risk they’ll take. But the amount of times they’ve done that, there’s just going to be one time they jump and then they go, my knee –*

*– hurts from that one jump. No it's not from the one jump, it's from the 200 jumps you've done prior because you've just taken it as, 'this is okay'. (Company B Director)*

Minor injuries can also be viewed as acceptable in the absence of serious injuries. For example, when the driver/manager of Company C was discussing being struck by a kicked gate, it was stated that being “*kicked in the head with a gate*” is “*normal in the livestock industry*”.

NOD appeared to be the cause of resistance to instruction within Company A. However this was not solely a driver issue. It was evident that NOD also occurs at the organisational level. For example, one Company A manager stated that speeding was common and that the organisation has few speed-related incidents. Due to the lack of incidents, speeding was not viewed as sufficiently dangerous to warrant significant attention.

*But you know everyone does it, it's not a purposeful thing; it just happens you know. We have very, very few speed-related crashes. They're normally road condition-related or stupidity-related or fatigue-related. (Organisational Staff Member)*

NOD may be somewhat unavoidable within the industry. Crashes and incidents are relatively rare, even in the presence of unsafe behaviour, due to fact that many factors must align to produce an incident. Many unsafe behaviours may increase risk, yet do not guarantee an incident. Thus, unsafe behaviour can be conducted many times before other circumstances occur which cumulate in an incident. Additionally, when multiple risk factors align, it is common for incidents to be attributed to the most novel factor. For example, if a driver is speeding and a car cuts across his path resulting in a crash, it is most likely that the car driver will be blamed for the incident, even if the incident would have been avoided at lower speeds. This is both a cause and effect of normalisation of deviance, in that false attributions contribute to a belief that behaviour is safe and a belief that behaviour is safe reduces the likelihood of the behaviour being labelled as the cause of the incident.

Lastly, due to the reliance on stories and experience, drivers may not learn from fatal incidents. Whilst many drivers held stories of individuals who ‘would have died’ if they weren’t wearing a seatbelt, it is impossible to determine the accuracy of such claims. Conversely, drivers who die in an incident cannot share their story. Thus, all first-person accounts are drawn from individuals who survived an incident.

#### 9.2.3.2. Common sense

Common sense appeared to be viewed as the second most reliable source of truth about safety within the studied organisations. It was common throughout the case studies for drivers to state that safety is essentially a matter of common sense. The driver/manager from Company C even stated that “*it’s all common sense*”.

*It’s common sense, you just need to use common sense ... It all comes down to common sense, if you drive sensibly and do everything smooth and neat you shouldn’t have any problems ... It all comes back to common sense dunnit ... Safety videos we look at all them, it’s just common sense ... Just coz you’re a truck driver doesn’t mean you have to compromise your common sense and be stupid. (Company B Driver Seven)*

When discussing customer safety precautions one Company B driver stated that “*some have nothing, you gotta use your common sense*”. Thus, the cultural emphasis on common sense may have originally stemmed from the autonomy (section 9.2.6.1) and responsibility (section 9.3.2) of drivers and regularly changing work environments. As it is difficult for organisations and government personnel to compile a complete list of policies and procedures for safety in every situation, drivers often must rely on their own ability to recognise danger. However, it was often indicated that not all drivers possess significant common sense.

*A lot of safety and all that is just common sense... but a lot of them don’t have all that. (Company B Driver Six)*

*It's common sense is the issue, and common sense is not so common here. (Company A Health and Safety Officer)*

Due to a past reliance on common sense, many rules and regulations are viewed as negative. Further, due to the belief that safety is common sense, many incidents are blamed on stupidity. As stated by one Company A driver, “*most accidents are from stupidity and impatience*”. Similarly, even when asked if Company C has experienced many incidents when working around crates, the driver/manager simply responded “*no; had stupid things like common sense things*”. Blaming an incident on stupidity typically indicated a deviation from ‘common sense’. For example, when discussing injuries resulting from standing close to a forklift, one Company B driver said “*what did you think would happen if you stand that close?*” Thus, rather than suggesting better policies and procedures are required, the individual is typically blamed for being ‘stupid’.

*We are breeding idiots these days with the safety... people don't take responsibility... like they'll get hurt standing next to a forklift... what did you think would happen if you stand that close? (Company B Driver Five)*

*...the guy shouldn't have been there. What part of stupid don't you understand? You know umm it's just, as I said to you at the beginning of this, it's common sense, you know, stand back where the motor is going to be. (Company A Health and Safety Officer)*

Blaming an incident on stupidity appeared to also be linked with a desire to distance the individual from the organisation. For example, in every discussion of drivers making common law claims against the company, one Company A manager attributed the incidents to stupidity.

*...now he's too scared to drive a truck. He had to lose it in the wet because he's fucking retarded, he was driving to Sydney with empty trailers on, he went through the main street of a town, 60km/h and lose it in the wet, crashed into the front of a house. (Company A Manager One)*

When an incident is attributed to stupidity, it is unnecessary for the organisation or drivers to make changes to prevent recurrence.

*Apart from that just I guess not so much safety but stupidity is the problem rather than... people not acting safely or not working safely is just people working stupidly... You can't fix stupidity. Most injuries are just stupidity, blokes doing the wrong thing you know. (Company A Manager One)*

#### 9.2.3.3. Summary: The nature of reality and truth

There were two key traits identified within Study Three which related to the nature of reality and truth. First, drivers learn from experience and stories and may, therefore, be resistant to the instruction of others. Due to the relatively low incidence of injuries and crashes, however, this trait lends itself towards normalisation of deviance, where unsafe acts begin to be viewed as safe and acceptable. Second, potentially due to the autonomous and varied nature of the industry, drivers rely more upon common sense than on policies and procedures. Due to this reliance on common sense injuries are often blamed on individual stupidity rather than procedural flaws.

#### 9.2.4. The nature of time

Schein's (1990) fourth dimension was labelled as the nature of time, within which the central question was: *"What is our basic orientation in terms of past, present, and future, and what kinds of time units are most relevant for the conduct of daily affairs?"*. Drivers from each company placed a different value on time, resulting in a somewhat bi-polar cultural



dimension. Unlike many other cultural traits, contextual factors, particularly the payment method of drivers, appear to dictate at which end of the dimension a company's culture sat. Thus each organisation will be discussed separately.

*Company A.* Company A drivers see time as a precious commodity and do not like to be delayed. As discussed in section 7.3.6.1, drivers from Company A are employed on a permanent basis, yet are typically paid a distance-based rate, unless conducting local work, which incurs an hourly rate. One Company A driver stated that *“on local, time doesn't matter coz you're paid by the hour; line-haul you want to get finished and get to bed to have your long break”*. Due to the manner in which drivers are paid, there is an increased incentive to attempt to reduce non-driving time or to maximise the distance travelled in a given period of time.

The desire to save time specifically influences speeding. It was often suggested that drivers will speed to make up time lost to delays. Whilst typically occurring when running off hills, alarmingly, drivers reportedly may also hold higher speeds through small towns.

*So they get to an 80 km/h zone or a 70 or a 60 and they just keep on going. They come into an 80 K zone and say keep doing a hundred. And I'm sure you're guilty of doing it... you know you go down the road and it drops back to 80 for a section or whatever and you just keep it at whatever was the cruise control was set at. And it's the same as truck drivers that have been stuffed around for the last hour by someone so they just hold it flat through a village to make up that time... So you know speeding not so much you know a lot of the highway is a hundred but through the towns and that it is somewhat of an issue because blokes like to make up time so of course they speed through towns. (Company A Manager One)*

Additionally, a number of drivers noted that they will not accurately complete pre-trip vehicle inspection as they take too long. Finally, this desire to save time was evident even

when there was no benefit to faster work. On one observation, a Company A driver stated that they would assist in the unloading because *“it takes too long otherwise”*. After giving significant assistance to the unloaders, the driver and researcher waited approximately four hours for the return-journey goods to arrive at the customer depot and be loaded. In this case, the driver opted to make significant effort to ‘speed up’ the unloading, despite acknowledging that the long wait after unloading was expected and occurred every time the same run is conducted.

*Company B.* All of Company B’s drivers are paid by the hour. Thus, as could be expected, Company B drivers placed a lower priority on time. Two drivers particularly emphasised this, one stating that *“they pay by the hour so you’re not really rushed”* and the other, *“why bother rushing when you are paid by the hour?”*

*And the thing about (Company B) where the drivers don't have to push the limit is our drivers that go away are paid by the hour. Whereas a lot of companies pay by the trip or by the kilometre or others, whereas (Company B) it's by the hour. So the driver doesn't have to force himself to do the trip a little bit quicker so his pay packet looks a little bit better. And that's a lot of the problem with our industry. (Company B Region Manager Two)*

Despite being paid an hourly rate, some drivers still placed significant value on time. This may be the result of a history driving under different payment methods. However, it was indicated by two drivers that some individuals simply want to spend as little time working as possible to get home sooner. Thus, even within Company B there still appears to be a subgroup that places a high value on working quickly.

*We are paid overtime so there's no use rushing. I know some of the drivers will work during their breaks to get home. I tell them they're mad; it's just giving the company money. (Company B Driver One)*

*Some other drivers just wanna have a whinge. Sometimes you drive around all day and the last drop is just near the depot. Some whinge about time. So what? I get some overtime. Some just want their hours and to go home. (Company B Driver Two)*

*Company C.* Drivers from Company C are paid a daily rate. Thus, similarly to Company B, it could be suggested that there is no financial incentive to save time. However, the lack of additional pay for trips that go over time may increase the value placed on time. Company C drivers, however, indicated that fatigue management work diaries create significant time constraints. Given the industry wide use of work diaries, this likely applies to drivers from all companies. Whilst the purpose of work diaries is to limit fatigue through limiting maximum working hours, work diaries can motivate drivers to maximise the use of these hours. As stated by one Company C driver logbooks might ‘look good on paper’ but the limits placed on drivers, lead to pressure to ‘go hard’.

*You are restricted by the logbooks, you can work all day and have a sleep for eight hours then you have to wait three hours to drive again. The way the books are once you put a mark in the book you gotta go, it might look good on paper, but you gotta go hard, if I had 1000km to go, if left to my own devices it might take me 15 hours but I’ve gotta cover it in 12. (Company C Driver Three)*

The time spent traversing dirt roads, and the restrictions of animal welfare issues, may explain why work diaries were only linked with the value placed on time in Company C. Due to these addition pressures, drivers from Company C appeared to place significant emphasis on time and desired to avoid delays.

*So as far as the laws go I’d like to see all that rural side of driving exempt from logbooks on unsealed roads because you can’t do 800km in five hours. Some days it takes you 100, –*

– *to do 150km might take you four hours. So by the time you get to the sealed road you can't go anywhere. Which makes it hard.* (Company C Driver/Manager)

#### 9.2.4.1. Summary: The nature of time

As can be seen from the above discussion it is evident that the value placed on time can differ between organisations. Whilst all drivers placed some value on time, being paid a distance-based rate was linked with an increased value on time and a desire to make up lost time. Conversely, being paid an hourly rate appeared to reduce the value placed on time. Additionally, due to work diary constraints, some driver may feel an increased pressure which is exerted through a higher priority on time. Thus, it was evident that despite a general value placed on time within each company, contextual values appeared to shape the extent to which time was prioritised.

#### 9.2.5. The nature of human nature

The fifth dimension outlined by Schein (1990) was entitled 'the nature of human nature', with the central question being "*are humans basically good, neutral, or evil, and is human nature perfectible or fixed?*" (p.114). Study Three identified a number of cultural traits which related to this key theme. Generally, members of each organisation believed that drivers are good, expressed through traits which indicated that unsafe behaviour is unintentional and that drivers are just like everyone else. Occasionally, individual drivers or groups of drivers were viewed negatively, however, in these instances they are categorised as 'rebels', 'rogues', or 'cowboys'. Lastly, though drivers were typically viewed positively, many drivers were indicated to be motivated by a desire for money and other gains. Whilst each of these traits is different, they centred on the nature and character of drivers.

#### 9.2.5.1. Unintentional

Members of Company A and B commonly excused the responsibility of unsafe acts by indicating that the behaviour was unintentional. Thus, drivers are viewed as good people who make mistakes. Within Company A, this was even evident in discussions of speeding, with one manager stating that “*everyone does it, it’s not a purposeful thing*”.

Failure to wear a seatbelt was also attributed to unintentionality within both Company A and B. A number of drivers suggested that despite regular use of seatbelts they sometimes forget. Similarly, one Company B manager indicated that drivers may forget to wear the correct PPE, but that even he has done this on occasion.

*A lot of effort goes into it, you’d be surprised the number of times you will pick up, even myself, walked out of a meeting this morning at the room here, on the phone and I try not to walk around while I’m on the phone, just try to stand still so I stood still. Good me, seen some drivers down the back and started walking down to them. And I thought hang on I haven’t got me vest on so I had to come back in and get me vest. (Company B Regional Manager Two)*

Within Company A, the ‘unintentional’ excuse appeared to, at times, be applied too broadly, resulting in diffused responsibility. In an extreme example, it was argued that some truck drivers will tailgate cars in an attempt to make them speed up, yet that sometimes it was unintentional and just a habit. Whilst this trait can be seen as a means to reduce responsibility, it was evident within Company B that the use of this excuse was actually just an explanation of the fact that sometimes drivers and managers will ‘slip up’.

#### 9.2.5.2. ‘Just like everyone else’

Unique to Company A, willingly committed unsafe acts were sometimes justified, with the behaviour being viewed as ‘just the same as everyone else’. The range of behaviours that

this justification applied to include a number of serious safety breaches. One such behaviour was incomplete overtaking, leading to another vehicle being forced to heavily brake or run off the road. Due to the limited speed of trucks, it is common for attempts to overtake cars to be unsuccessful if the car speeds up. Whilst this is a frustrating and regular occurrence, it can lead to a significant risk of crashes when the truck chooses to continue attempting to overtake the vehicle. Nonetheless, such behaviour was suggested to be no different to asking a loud office visitor to leave.

*Come the end of [the overtaking lane] if you're only most of the way past, well you're not going to stop, so the car has to slow down or run off the road. So then that automatically makes the truck driver a cowboy even though he's just trying to get round because you're holding him up from doing his job. You know if you're obviously paid to do this research is that right... If I come to your office and screw you around talking shit all day, someone will eventually get the shits and tell me to get out of the office so you can get on with your work right? It's no different than your grandpa and grandma in their caravan doing 85km/h down the highway. And my truck has got to sit behind them for an hour or two because there's no overtaking area or no dual, you know, no four-lane highway for him to get round it. (Company A Manager One)*

Similarly, failure to reduce speed after changes in the posted speed limit was argued to be something everyone is guilty of. Additionally, a number of workplace hazards were also justified in this manner. For example, one Company A manager stated that some drivers will fail to wear the required enclosed footwear in the depot. The manager equated this with the desire to remove shoes upon arriving home, stating “*I'm sure when you get home from work the first thing you do is kick your shoes off*”. Whilst this justification was unique to Company A, it further demonstrates the general belief in the ‘goodness’ of drivers.

#### 9.2.5.3. Rebels, rogues and cowboys

Common to each company was the discussion of a ‘rogue element’ within the industry. A select minority of the industry, identified as ‘rogues’, ‘cowboys’ or ‘rebels’, were commonly suggested to refuse to operate in a safe and legal manner. As stated by one Company A driver, *“you may hear that we are over-regulated, in some ways we are, but in other ways we’re not regulated enough; there’s still too many cowboys”*.

Among other behaviours, rogues are often attributed with excessive speed violations. Rogues were suggested to tamper with speed limiters, leading to the suggestion by one Company A driver that if the speed limit was increased *“it would probably remove a lot of cowboys from the industry”*. Whilst this may not be an accurate prediction, this demonstrates the perceived link between speeding and rogues.

Members of Company A appeared to blame the majority of industry safety incidents upon the rogue element. The accuracy of such claims, however, was unclear. Whilst it is possible that there are a select few companies and individuals responsible for a large proportion of incidents, the concept of a rogue element may also be a mechanism used to justify the greater industry, or distance the organisation from negative industry events. This is a distinct possibility given the findings of previous research which suggested heavy vehicle drivers view others as less safe than themselves (see section 4.2.4.1.2). If the rogue element is a scapegoat to excuse the wider industry, it may reduce responsibility of organisations to assess their own actions. Ultimately, the designation of a rebel or rogue company may simply be a matter of perspective and only targeted investigation will reveal the extent of the rogue element within the industry.

*They get paranoid about it, you know... you see the crap on A Current Affair every couple of months about bad arse truck drivers and unfortunately there's bad arse truck drivers and I'm not going to say there's not ... there's bad arse car drivers too. But you know everyone sees that crap, they don't have a story 'oh yeah this bloke's a top driver he's done 40 million kilometres in his lifetime and hasn't had a crash or whatever'. You know so people aren't going to think 'oh most of them are good, there's some dick heads – around', they just think everyone is a dick head. And then because my trucks want to go round them because they're holding them up "they're obviously a rogue company because this dude is trying to run me off the road". (Company A Manager One)*

The rogue element was only referred to once during the study of Company B.

Regarding the decision to avoid competition through offering a niche service, one manager stated that they would not compete with the *"cowboys that do everything illegally"*. The lack of this cultural trait within Company B may relate to the perceived organisational uniqueness (section 9.2.1). Rather than attributing negative characteristics to other companies, Company B may focus on the positive characteristics of its own company. Similarly, in Company C rogues were only once referred to by name, though it was evident that many members of Company C perceived there to be a rogue element within the industry.

***Excerpt from a two participant interview within Company C***

*Driver/Manager:* Yeah it's like a family like if I went to someone from Toowoomba and said you were here at our place the other day he'd say I know him. He was at our place. But if you went to Joe Blow in Huendon who's probably running amuck and that, Huendon is just a name, but he's running amuck and probably giving some of the industry a bad name, he would never have heard of you because they...like they're the rogues. There's always a...



*Compliance officer:* In anything there's always the people who are flaunting the system.

*Driver/Manager:* Yeah, yeah. The fiddlers, who fiddle with their, you know them, you know them they fiddle with the truck and they fiddle with the book and they fiddle with their life and other people's lives and...

*Compliance officer:* And all you have to do is sit around in a road house for an hour and you hear about these people.

#### 9.2.5.4. Money and other gains

Drivers were commonly suggested to be significantly motivated by gains and losses. As money is the main gain or loss that can be achieved whilst working, many comments were made about the motivating effect of money on drivers. Typically, however, comments regarding the motivating effect of money attributed this problem to 'other drivers'. As stated by one Company A driver, *"some people push it for an extra run to get money"*. This was particularly relevant for fatigue management. One Company A driver stated that an organisation can *"ask a driver if they are fit for duty and they will say they are right just because they want the money, but then they might make a wrong decision because they are tired."* Similarly, one Company B driver stated that, whilst it is commonly said that you shouldn't *"do anything that will need drugs"* to stay awake, drivers may use drugs if they've *"got a family and house payments wanting you to make a mile"*. As with the value placed on time (section 9.2.4), this may be less of a problem for drivers paid by the hour.

Money can significantly motivate organisational behaviours. The Driver/Manager of Company C noted that whilst you try to be as safe as possible, *'we're trying to make a living'*. However, the motivation of money can also drive safe behaviours. It was noted that maintenance of vehicles can actually significantly reduce costs associated with breakdowns.

*But we do it, everything we do is done within the, legitimately, as close as you can to being perfect because you've got to be. Oh, well if you don't get in the shit today you'll get in the shit tomorrow. Like if you do shonky things with your maintenance it might keep you going for a week or two weeks but it will break down out there on the road. You know so your maintenance, you don't do shonky with your maintenance, your maintenance is important to get there. Because well for the other thing is... it's your livelihood but you've got a live thing and it's somebody's livelihood, somebody else's livelihood. (Company C Driver/Manager)*

It was also stated that money can drive safe behaviours in drivers. One organisational staff member at Company A stated that “*unless you hit people in the hip pocket they don't respond*”. Similarly, a Company B trainer highlighted the importance of money by stating that “*incidents cost a lot of money to the individual and the company*”. Thus, financial punishments associated with safety breaches are particularly effective at reducing unsafe behaviour.

It was suggested that a lack of financial wisdom contributes to the strength of money as a motivator for drivers, due to the costs associated with life on the road. When a driver is financially struggling, the severity of perceived punishments is further increased.

*Because a lot of blokes that drive trucks live week to week. I suppose that's got a bit to do with the fact they spend so much money buying food up and down the road all the time. It's quite an expensive thing to do. You know you can imagine yourself if you eat out every night of the week it will cost you a lot of money and a lot of blokes aren't smart enough to pack dinner the night before they leave so they buy tucker up and down the road. Anyway you know if you give them a week's suspension without pay it kills them mate. Really hurts them because like I said they live week to week. So it's normally once is enough. (Company A Manager One)*

Whilst the motivational power of money is commonly recognised, drivers are also motivated by other gains and losses. This can include time, as discussed in section 9.2.4, but also includes other gains such as comfort. Drivers can be seen to be significantly personal-outcome oriented, which can influence whether or not they choose to adhere to safety policies at any given time. As was stated by one Company A manager, *“it’s the same as these blokes that work here mate you know they’re still going to disrespect the equipment and run it off the hill at 120 if they feel like doing it”*. Similarly, one Company B manager stated that drivers will adhere to policies *“if it suits them”*.

*But yeah there is some, some drivers, not a lot, but there’s, and depends on what sort of mindset they’re in too. Like if they’re in a rush to go home all of a sudden all the policies and procedures go out the door. But if it’s to suit them all the policies and procedures come in, you know what I mean? So sort of like they want to use them when they want to use them but we really push to try and make sure that the drivers are following the procedures and policies 100% mate. (Company B Branch Manager Five)*

A number of drivers suggested that certain safety requirements result in a lack of comfort. For example, one Company A driver suggested that, despite the safety benefits, he did not wear seatbelts as they were too tight and irritated his shoulder and neck. Conversely, another Company A driver stated that, in one of the newer trucks, you’ve *“got to wear the seatbelt on this one or it beeps”*, indicating that his seatbelt use was to avoid an annoying noise. Similarly, another Company A driver stated that he would not wear enclosed footwear until reaching the customer depot, as boots and even socks, make his feet sweat too much when driving.

The effect of gains and losses, like those discussed above, are common even outside of the industry. These gains could be argued to be the result of external motivation from contextual influences. Nonetheless, the extent to which drivers would prioritise money and

other gains, even above personal safety and legislation on occasions, could be seen to be pathological. That is, whilst money is a significant motivation for many people, even outside of the industry, it was apparent that many drivers value money to an extreme level leading to excessive risk taking. Safety initiatives which have negative consequences associated with them may be some resisted by drivers.

#### 9.2.5.5. Summary: The nature of human nature

In terms of the ‘nature of human nature’, it was evident that members of the industry generally view drivers in a positive light. Drivers were viewed as good people who sometimes make unintentional mistakes. Within Company A, however, even intentional breaches were at times viewed as normal and equated with standard worker behaviours from other industries. Additionally, however, significantly unsafe behaviours were commonly attributed to rebels, rogues and cowboys, distancing these individuals from the majority of ‘good’ members of the industry. Lastly, it was often noted that drivers can be driven by a desire for money or other gains and that, as such, they sometimes do as they please.

#### 9.2.6. The nature of human relationships

The last of Schein’s dimensions which was evident in Study Three was ‘the nature of human relationships’. According to Schein (1990) the central questions for this dimension were:

*“What is the "correct" way for people to relate to each other, to distribute power and affection? Is life competitive or cooperative? Is the best way to organize society on the basis of individualism or groupism? Is the best authority system autocratic/parentalistic or collegial/participative?” (p.114).*

Study Three identified one key cultural trait related to this dimension, which was autonomy. Additionally, however, within Company A, a trait emerged regarding keeping up the correct image.

#### 9.2.6.1. Autonomy

*There's no clock guard in a truck, there's no headmaster watching. If you start at six o'clock in the morning you can drive for five hours. No one says you have to have your break at five to one or ten past nine. You have it when best suits you I guess. You look at the job you've got to do, the places you've got to go, you know, and then take all that into consideration with how you feel. (Company B Branch Manager Four)*

Drivers have a high level of autonomy from their organisation and customers. As stated in section 7.2, this autonomy places limitations on the supervision of drivers. Drivers also appear to significantly desire and place a high value on autonomy. Thus, drivers may be resistant to organisational monitoring and supervision.

*I can't do a job where you're bound to an office or a factory... but out here you're your own boss... you return the truck at the end of the day in one piece and they're happy... out here I'm my own boss... so long as you use common sense... But you know I couldn't work with (Director) looking over my shoulder... I couldn't do it. (Company B Driver Two)*

*There are some very smart people, but most of the time these are people who haven't been successful at school, who have just floated through life and have just wound up going well I can drive a truck because I can drive a car or I like driving, I like being away from people, I like being my own person and just doing my stuff, no one tells me what to do. It's a little bit of that thought process, they're generally older generation. (Company B Director)*

It was indicated by members of each company that drivers are resistant to monitoring techniques, such as satellite tracking, due to its impact upon autonomy. As said by one

Company B manager, many drivers view satellite tracking as “*a big brother approach, you know, like you’re being arseholes and all that type of stuff*”. Similarly, the manager of Company C has on many occasions, when asking a driver where they are, received negative comments regarding the fact that she knows where they are due to satellite tracking.

*And it’s only satellite tracking. I don’t have the little thing that says you go here, I don’t have any of that and they don’t have to umm interact with that whatsoever. But there’ll be little snide remarks like you know I ring them up and say where are you? And sometimes if the Navman’s down and it is down at the moment, it’s very frustrating for me. I hate it. They’ll go: You know exactly where I am, you know why are you asking me? Why do we, you know, just look at your tracking? Well...and I don’t think it’s resentment of the tracking but they’ve just spent so many years of their lives just doing what they do and now all of a sudden I’m watching. (Company C Manager)*

As put by one Company A organisational staff member, the desire for autonomy can pose difficulties when trying to determine if a driver is still fit for duty. When members of the operations team of Company A notice a driver is stopped earlier than anticipated they may attempt to call the driver and drivers may view this as a violation of autonomy.

*You know they’ll switch their phones off so they don’t have to get spoken to and just things like that. But we’re not there to harass them, we’re there to try and help them. You know if they pull up for an extra five or 10 minutes past their logbook break we want to know why. Do you need more time for a rest? Is there a problem or, you know, are you sick? You know we try and sort of pick the eyes out of it and try and work out with them and find out what the problem is. And some of them are a bit scared. They think, you know, we’re harassing them or ... but in actual fact we’re trying to help them. (Company A Operations Staff Member)*

In addition to this resistance, some drivers show resistance to audits, training and pre-trip checks based upon autonomy. It was argued that some drivers will leave organisations rather than allow the organisation to monitor or manage them.

*We have had drivers leaving us on a regular basis because they refused to do training. They don't like getting non-conformances, they don't like the whole process of having a formalised audit process, they just want to get in a truck and drive. They don't want to have to do pre-trip checks or training or whatever. (Company A Manager Two)*

*Like and some of them won't if you hand them a non-conformance they get all angry, if they get too many non-conformances because they're not doing the right thing, they feel like they've been scolded children. That's what makes it hard. I'm supposed to do this and I can't just do it and file it away. They have to sign it to say that I've told them that they've done, not the wrong thing, but they just haven't met the requirements... if you go to three pages of non-conformances they're going to go, coz they're truck drivers and they throw tantrums... they do and they will walk. (Company C Compliance officer)*

#### 9.2.6.2. Keeping up the trucking image

Drivers in Company A were also seen to place a significant value on keeping up a tough and carefree appearance. At a novel level this even included not wanting to be seen driving a Volvo truck.

*Driving a Volvo is like getting a blowjob from a poofteer. Feels good while it's happening but you don't want to get caught. (Company A Driver)*

Whilst this novel concern appears innocent, being too safety conscious was essentially considered 'uncool' by drivers and some organisational staff. This was clearly evident when the occupational health and safety officer of Company A was repeatedly referred to by a manager as 'the safety nerd'. Drivers also want to avoid looking too safety conscious. In

Company A the ‘uncoolness’ of being too safety conscious was found to restrict efforts to reward and acknowledge safe behaviour. Company A has previously implemented a system whereby drivers who did not receive non-conformances were recognised on the noticeboard and provided a personal note from the manager. However, these drivers were unhappy with others being aware of their safe behaviour.

*Like that is an excellent achievement so we used to put names up on noticeboards and do memos in their pay slips and stuff. Like the general manager used to give them a note and everything. And there was good feedback about the notes but they weren't happy about names being on the board because yeah that whole sort of like peer pressure. (Company A Manager Two)*

It was unclear whether this desire to not look too safety conscious directly influences behaviours. Whilst drivers may not want to complete certain tasks in order to ensure they maintain their appearance, it is possible that drivers may maintain safe behaviour but attempt to avoid being seen to do so. Further, why this trait was found solely within Company A was not clear. Of the studied organisations, Company A alone conducts the majority of their work through long distance highway journeys. Thus, drivers may be more exposed to the broader industry, and, therefore, more motivated to conform to the industry image.

### 9.3. SECOND AND THIRD ORDER CULTURAL TRAITS

As stated at the onset of this chapter, there were a number of additional cultural traits identified throughout the case studies which were better viewed as a specific application of an underlying trait or result of interactions between multiple traits. The second order cultural traits identified within the studied organisations included: (1) luck and the likelihood of incidents; (2) responsibility; and (3) attitudes towards rules and regulations. These second order traits also appeared to influence further traits, here referred to as third order traits. The



third order traits identified included: (1a) limitations; (3a) punishment avoidance; and (3b) the ‘go’ mentality.

### 9.3.1. Luck and the likelihood of incidents

The combination of the underlying traits of ‘experiential and narrative learning’ and ‘safety’, along with organisational training approaches, leads drivers within each company to have different views on the likelihood of incidents.

Whilst drivers highly value safety, they have a tendency to learn through experience and stories. Thus due to the relatively low incidence of crashes and injuries, there is a tendency for many drivers to experience normalisation of deviance. Further, as discussed in Chapter 7, each of the studied organisations utilised different approaches to training and communication. Of particular relevance was the use of SORs within Company B (see section 7.3.4.2.). SORs (serious occurrence reports) are stories of incidents which have occurred within similar industries or organisations. Thus, due to experiential and narrative learning, drivers from Company B were much more likely to perceive safety benefits associated with behaviour and adhere to policies. This was further evident through general perceptions held by drivers regarding the likelihood of incidents. Generally, members of Company A viewed many incidents as caused, or avoided, by luck. Conversely, Company B drivers and managers perceived industry members to be vulnerable to incidents unless they behaved safely.

*Luck.* In Company A, the presence or absence of incidents is often attributed to luck. For example, rather than recognise the efforts of Company a managers, one Company A driver stated that the company “*has a good record, a lot of it is luck*”. Similarly, when discussing fatigue, one Company A driver indicated that he had never had a fatality crash, saying that “*a fair bit of that is luck, it’s not that I’m a better driver than others, just lucky to pull out of the near miss*”.

This tendency to explain incidents through luck also extended to the occurrence of injuries and being booked by police. One Company A driver discussed his own injuries and the injuries of a number of friends. These incidents included one individual ‘stepping off’ (falling from) the back of the trailer, rolling an ankle on a drain lip, slipping on diesel near the fuel tank, and being pinned under an object which fell off a trailer during forklift-assisted unloading. Each of these incidents was attributed to bad luck through simply being in the wrong place at the wrong time. The attribution of the unloading incident to luck is particularly concerning as it is common knowledge that objects can fall during unloading. It is for this reason that many companies require driver exclusion zones. Rather than state that the driver should have been further away from the vehicle, it was simply stated that it was unlucky. As stated in section 9.2.3.1, a lesson needs to be present in experience and stories for drivers to believe that behaviour is dangerous. Thus, when luck is seen as the responsible factor, drivers do not need to re-assess their own behaviour.

*Vulnerability.* Members of Company B never attributed an incident to bad luck. In fact, luck was only ever cited as relevant to avoiding an incident when conducting unsafe behaviour.

*You don't know what can happen after the fact. So you know like we talk about load restraint, you know like oh I tie my loads down that way all the time or, you know, driver rushes at the end, I've been doing it for 30 years, you don't tell me how to drive. We sort of try to push them in the right direction and say look we understand, you've just been lucky and that's how we put it down to. Drivers have just been unlucky, sorry been lucky that they haven't had an incident with that mindset and we try to change that. (Company B Branch Manager Five)*

Company B drivers indicated that incidents were a likely result of unsafe behaviour. One Company B driver even stated that the industry “*can be very unsafe if you don't know*

*what you're doing*". Similarly, one Company B manager suggested that he was so convinced of the likelihood of incidents that he did not believe in zero harm.

*Oh I think everyone's role is with safety, it's directly involved because we're all responsible for it. Don't get me wrong I support this zero harm concept everyone has got but I don't believe it. Not that I don't believe in it, but I don't believe when you've got a person, a human being working, that you can have zero harm. You can strive towards it and that's what we all should be doing. But I don't believe we'll ever have zero harm while we've got people working with anything... I don't, my personal belief is I don't believe an accident happens. Something causes it. It's either human content of it or there's a failure in a machine or something is not done properly at some...because it's not an accident. Well I don't believe in accidents, it's a personal opinion I don't believe in accidents... But yeah I just don't believe while you've got persons working, whether it's using the biro, you know, it's in the hand or something it will happen. So you can't have, well I don't believe you can have zero harm. Let's all strive towards it but yeah. (Company B Region Manager Two)*

Company B's use of SORs (or SSOs) was highly connected to the perceived likelihood of incidents. As stated by one manager, many drivers are influenced by SORs, and comment on the incidents, suggesting that the injured drivers were lucky to have not been more seriously injured.

*We have a toolbox meeting once a month religiously. It's on all of our umm calendars at the end of the month and we go through those SSOs. If there's none, there's none, if there is others. And we try to incorporate it into our day to days. Because a lot of the SSOs that have come through may not be relevant to our type of business here on site. But we do try to give them examples of, you know, this is you know this is how you get off the truck properly, you know the right way and all that type of stuff. And so the drivers yeah they –*

– *do take it on board because I do have a lot of drivers come into me and say you know like that guy was lucky and there's a bit of talk about it amongst the ranks.* (Company B Branch Manager Five)

Whilst the majority of drivers attributed incidents to driver behaviour, it is important to note that some incidents are beyond the control of the driver. For example, as discussed in section 8.4, some crashes are the sole fault of other vehicles. Whilst Company B drivers recognised this hazard they did indicate a need for additional care when working around uncontrollable hazards.

*Company C.* Due to a lack of sufficient attention given to these matters by members of Company C, it was unclear whether this organisation aligned better with Company A or B. However, there was some evidence of both ends of this spectrum within Company C. One driver stated that *“accidents can happen but the way you drive can make it more avoidable”*. This view appeared to recognise the impact of driver behaviour, whilst still believing that incidents can occur regardless of behaviour. Conversely, the driver/manager of Company C stated, regarding one particular incident involving a driver falling on a ladder, that *“there's nothing you could have done; it was just one of those things that happened”*. Thus, similarly to Company A, it appears that incidents were also attributed to luck.

#### 9.3.1.1. Summary: Luck and the likelihood of incidents

Whilst members of each company perceived incidents were likely, it was evident that there were differences in the attributed cause of incidents. Members of Company A and C appeared to perceive an element of luck behind incidents. Conversely, however, members of Company B tended to assign behavioural causes to incidents. The use of SORs in Company B, through ‘experiential and narrative learning’, increase drivers’ belief in the likelihood of an incident under unsafe behavioural conditions. These perceptions may have significant

impacts upon behaviour conducted by drivers and organisation members. Where an incident is perceived to be the result of luck, it is unlikely that further precautionary actions will be taken. Conversely, where incidents are attributed to a cause, drivers are more likely to change their behaviour.

#### 9.3.1.2. Limitations

A number of limitations in the role of the organisation were highlighted in section 7.2. Whilst members of Company B viewed these limitations as challenges which could be overcome, members of Companies A and C appeared to hold that these limitations precluded an ability to manage certain aspects of safety. Whilst the attribution of incidents to luck was seen to exclude the need to take additional precautions, these cultural belief of limitations was associated with an inability to improve safety. The lower level traits which appeared to result in a belief of limitation were autonomy, common sense/stupidity and luck and the likelihood of incidents.

Generally speaking, organisational staff members of Companies A and C believe that they can do little to control the behaviour of their drivers. This was particularly relevant to speeding resulting from running off a hill. It was often stated that *“you can’t stop anyone from doing that”* or *“there’s nothing we can do as a company to stop someone doing that”*.

*Unfortunately though you can’t, as soon as someone is out the gate and round that corner, you can’t see the truck anymore, you can’t make them do anything. You can’t tell them not to... you know you could tell them all you want not to tailgate that doesn’t mean they’re going to do it. Same as seatbelts. All trucks are fitted with seatbelts, doesn’t mean they’re going to wear them. (Company A Manager One)*

It was also evident that organisational staff members viewed incidents as inevitable. For example, one Company A manager stated that *“given the kilometres you know I think they’re always going to happen unfortunately no matter how much you train people and do the right*

*thing, accidents happen*". Similarly, the compliance officer of Company C stated that *"you can't completely make everything safe"*.

*All you can do is minimise the dangerous things. Like you can't completely take danger out of it, you can't completely make everything safe because you just can't. ...Each person is an individual and has their own brain. Each cow is an individual and has its own brain so you can't completely take out the danger factor but you can minimise it. And that's all we can really hope to do, I think. (Company C Compliance Officer)*

This general sense of limitation also extended to the drivers of Companies A and C. One Company A driver even stated that whilst *"the industry has improved heaps since I started; it comes a time when it can't get any better"*. Similarly, drivers from Company C often suggested that *"accidents happen"*. This perceived inability to prevent incidents was also linked to the role of other vehicle in non-fault crashes and the influence of road condition factors.

### 9.3.2. Responsibility

Common within each company is the belief that it is the driver's own responsibility to ensure their safety. Even during the Company B induction it was stated that *"drivers are expected to be responsible for their own health and safety and the safety of others"*.

Similarly, when discussing pre-trip inspections, the driver/manager from Company C stated that drivers are responsible for their own safety.

*There's only one thing between you and a post is your steer tyres and your brakes. And drivers are happy with that, you know drivers are, because they have daily checks and all that they're responsible for their own safety to make sure that it's within spec. (Company C Driver/Manager)*

This was also evident in the number of occasions on which incidents were attributed to the driver. One Company A driver stated that *“accidents often operator error, there’s so many rules you can’t get hurt, it’s drivers choosing to break rules”*. This typified the responses of many participants. On occasions, managers placed fault directly on the individual for incidents which were the result of multiple factors.

*He had to lose in the wet because he’s fucking retarded. He was driving to Sydney with empty trailers on, he went through the main street of a town, sixty 60km/h and lose in the wet, crashed into the front of a house and now we’re still paying him to do nothing.*  
(Company A Manager One)

A number of laws and regulations were seen to take responsibility away from drivers. One Company C driver stated that *“as far as workplace health and safety, from my point of view it’s getting carried away, no one’s responsible anymore”*. It was indicated that due to this reduction in responsibility, these regulations are typically disliked. Thus, in addition to believing drivers are responsible for safety, this was typically believed to be ‘correct’.

Similarly, a number of participants felt that they should be able to manage their own fatigue rather than rely on fatigue management legislation.

*Like I’m not sure about fatigue mate. I think as a driver I control me own fatigue. That fair enough? When I feel like I’m tired I pull up and have a sleep. Or I pull up and do something else yeah.* (Company C Driver/Manager)

This belief was further emphasised by one manager who stated that many of the rules and regulations in Company B exist to protect drivers who ‘don’t take responsibility’. Thus, incidents are seen to be a failure of individuals to fulfil their responsibility.

*So if you’re in a hurry, if you take short cuts, yes, you’ll get the opinion from time to time that it’s a load of crap. If you’re a safe person yeah I guess to a lot of extents it is a load –*

*– of crap because YOU'RE a safe person. We're trying to protect the safe people but more so we're trying to protect the people who don't take responsibility for their actions. There's people, I read the other day, I think it's a town not a country a town has banned texting whilst walking, because people are falling over too often. Right? So it's been banned, no texting while walking. You know. (Company B Branch Manager Four)*

The effects of this responsibility appeared to extend to resisting pressures that encourage unsafe acts. Despite pressures exerted by customers and organisations, drivers are expected to take responsibility over determining if an action is safe. As noted by one Company B manager, he “*can't physically always go out and check a particular site and make sure the site is safe, that's sort of up to the driver when he gets there to make that judgment*”. In the event a behaviour is unsafe to conduct, it is seen as the driver's responsibility to refuse to conduct the activity.

*It's very clear to the drivers, if you've got to do it unsafe you don't do it. The product comes back, I'd rather it would be not delivered yes it inconveniences the customer, but we've done it safe. If there's something wrong with the load, if there's something wrong with the unloading conditions, the customer or whatever it is, we tell the drivers if you believe it's unsafe bring it back. We'll assess it for whatever it's worth and whether that's a risk assessment done on the site, risk, you know, load audit on the load, whatever it may be we'll assess it and make our own call on it. (Company B Branch Manager Five)*

*We have had that yeah. But we also let our drivers know that they've got the full backing of management. If they say no to a customer for a safety reason or for any reason, we back them. You know they might be wrong, we might have to talk to them later and say well you know if you had of done it this way or you had of done it that way, but once a customer is on site and he says no I won't do it because it's near powerlines with his crane or trucks–*



– on a slope or something like that, well we back him. And we, if the customer refuses to listen to the driver we ask the driver to be very nice, pack his gear up, move off site and ask the customer to ring us, or he rings us and then we ring the customer. [Interviewer: Has that had to happen a couple of times?] I've had it happen yeah. I've had it happen where I had to go out to site and explain to the customer that the reason we couldn't do it was because it was on a slope and we can't use our cranes on a slope because they'll you know run away from the driver sort of thing ... But most drivers we've got now they understand if they don't think it's safe or they don't think they can get in, don't do it. Yeah don't take any, and some customers can be very aggressive towards the driver because he won't do what they want him to do. (Company B Region Manager Two)

Due to the responsibility of drivers, it was indicated by one Company B manager that a driver who gives in to pressure is 'not standing up for themselves', and 'letting' people 'walk over' them. This tendency to assign responsibility to the driver may serve to encourage customers and organisations to simply press the driver until they say no. Despite the expectation that drivers will say no to pressures to complete unsafe acts, at times they will break their organisation's policies in order to avoid disappointing customers.

Further, due to the significant responsibility placed on drivers, drivers and organisations may seek to avoid blame that is likely to be placed upon them after an incident. It was noted by one driver from Company A that "*people always blame the road too; sometimes the road is fine, but the drivers aren't blamed for speeding*". Similarly, it was noted by a driver from Company B that some drivers "*don't want to do anything but then they blame the company if they get hurt*". Whilst motivations leading to unsafe acts vary between situations, drivers are quick to divert responsibility to other causes. Whilst blame-shifting may appear to be in direct contrast to the responsibility of drivers, it was noted by one Company B manager that drivers may be afraid of the assignment of blame. Out of this fear, some drivers are hesitant

to even complete an incident report “*because they are worried about blame*”. Thus, blame-shifting may be a result of the responsibility placed on drivers.

*So they'll accept unsafe behaviours based on a pre-existing set of rules that was done a hundred years ago. It's just, that's just how you do things and that's the risk you take when you do them, suck it up. When something happens, how did you let me do that? It's your fault that you let me do that. (Company B Director)*

### 9.3.3. Rules and regulations

There are a number of rules and regulations, implemented by organisations, customers and government departments, aimed at improving safety within the industry. One Company A driver even stated that “*there's so many rules you can't get hurt*”. When these rules and regulations are combined with the traits of autonomy, safety, experiential and narrative learning, luck and the likelihood of incidents, and responsibility, drivers may form a number of attitudes towards these regulations.

Drivers from Companies A and C have a strong distaste for many rules and regulations. Conversely, Company B drivers exhibited mixed attitudes. When discussing inductions at one customer site, one Company B drivers stated that “*these guys were overboard but good*”. This driver effectively summarised these mixed attitudes, as it was evident that whilst many Company B drivers saw the value of rules and regulations, many also viewed them as somewhat ‘over-the-top’. Similarly, one Company B manager indicated that whilst some drivers value rules and regulations, there are others who think ‘it’s all bullshit’.

*There's some drivers that believe that yes. hand on your heart, the drivers are getting looked after by Company B because we've got all these policies and procedures behind us. Some drivers will say oh it's all bullshit and you know like it's just as you say it's like a paperwork trail. (Company B Branch Manager Five)*

The inability to see the safety benefits of many regulations was at the core of many drivers' dislike of rules and regulations. When discussing the use of non-conformances by Company A one driver stated that *“you get them if you don't fill out your paper work perfect and don't tick every box, or if you don't write the weight properly; a lot of it goes beyond safety, silly things you know”*. This was seen to also extend to managers, particularly evident regarding speed limiters. One Company A manager stated that that speed limiting was *“one of the most ridiculous laws that's ever been invented in the country”*, and that speed limiting below the posted speed limit actually presented a safety hazard.

Similarly, when discussing supervision of reversing at customer depots, one Company B driver said *“bloody hell, we're truck drivers; I'm sure we can reverse”*. Additionally, another Company B driver argued that fatigue management legislation assumes *“we are all the same”*, but that *“we're not all robots”*. The driver further indicated the ineffectiveness of fatigue management on the basis that *“just because someone stops the truck doesn't mean they are resting”*.

*But what people don't realise is when companies are trying to implement safety they're not doing it to fuck you around, they're doing it to save your fingers, toes, life you know. And what they don't realise there is a massive cost right? The drivers think oh this is frigging...and I do it, the points I do it...I go this is frigging stupid, this is ridiculous safety is out of control. People aren't throwing money at safety because they don't want the money. They're throwing money at safety because they don't want the injuries and the accidents you know. (Company B Branch Manager Four)*

Within Company C the lack of perceived safety benefits was particularly relevant for maintenance laws. It was indicated that after completing a thorough pre-trip inspection a driver is required to *“get in his truck for an hour in the morning and tick the box or mark the square”*.

*We've been doing it for years anyway except it's just not written down and it becomes a pain in the arse because there's things on that that are silly things. Like you've got brakes and you've got tyres and you've got your steering and your king pins and your ring feeder are the main things. Things like 'one side light out' or, that that's not a safety issue. A kangaroo could have run into it going down the road do you know what I mean? You know like safety issues you know they can pin you for having a side light out and that's not a safety issue mate, that's, the rules are there's got to be five side lights on each trailer. Well if one's out there's still four you know. It's not as if they're all out. (Company C Driver/Manager)*

Whilst the disbelief regarding the safety benefits of regulations was often based on legitimate perceived flaws, at other times this disbelief occurred despite clear hazards. For example, one Company C driver expressed a view that fatigue management legislation does not have sufficient benefit as it assumes “*that when you've worked 12 hours you've gotta be tired*”. Whilst a driver may not feel tired, this driver failed to recognise the dangers of fatigue faced by driving long hours.

Even in the presence of recognised safety benefits, drivers can still have a strong dislike for rules. For example, despite all Company A drivers recognising the dangers of fatigue, one driver stated “*I don't need someone else to tell me I'm tired; you just know when you need a sleep*”. Thus, due to the desire for autonomy and the belief that drivers should have responsibility for their own safety, many drivers thought they could regulate themselves.

Conversely to Companies A and C, the vast majority of Company B drivers did see the safety value of rules and regulations and believed that adhering to rules and regulations reduces the likelihood of an incident. A number of Company B drivers indicated that speed cameras were an acceptable form of enforcement, due to the dangers of speeding. One

Company B even said *“I’ve got no problem, it’s like security cameras, people complain but if you’re doing the right thing you’ve got nothing to worry about”*.

*Yes they’re keeping people to the speed limit. Yes they can get you if you speed. If you’re a professional driver it’s your livelihood. A licence is a privilege not a right but people don’t treat it as such... You do the speed limits for a reason; the signs are on the road for a reason, they’re there for safety. You go through roadworks that are 40km/h and some go through at 80km/h. If you lose a tyre all sort of things can happen to someone working on the side of the road. (Company B Driver Four)*

Returning to the aforementioned cultural traits of ‘safety’ and ‘experiential and narrative learning’, the increased acceptance of rules and regulations within Company B appeared to be linked to the use of SORs and the perceived likelihood of an incident in the presence of unsafe behaviours. This explanation was also evident in a comment provided by one driver from Company B who argued that SORs make *“you think ‘we’re lucky we follow the policies’”*.

*Serious occurrence reports makes you more aware, you are always leaning; you can learn from incidents whether they happen at the workplace or elsewhere. That’s why the toolbox meetings are good, you hear of things and you think we’re lucky we follow the policies. (Company B Driver Four)*

When drivers are convinced that compliance with regulations reduces their chance of an incident, many are willing to comply with rules and regulations and view them positively. Conversely, when non-compliance is not seen to hold safety benefits, drivers disliked these rules and exhibited as decreased intrinsic motivation for compliance. In the event that rules are viewed negatively there were two identified resultant third order cultural traits, punishment avoidance and the ‘go!’ mentality.

#### 9.3.3.1. Punishment avoidance

As discussed above, when rules and regulations are seen to have little safety benefit they are disliked by drivers. However, as stated in section 9.2.5.4, drivers may be highly motivated by money and other gains. Thus, due to the manner in which breaches of safety regulations are punished, many drivers may disagree with regulations, yet want to avoid punishment. A driver may avoid punishment either through compliance or avoiding detection.

Due to the significant motivation of money within the industry, drivers will go to great lengths to avoid punishments. It was commonly stated that increased fines and punishments have led to a significant shift in the way the broader industry operates. For example, a number of Company A drivers suggested that the introduction of drug swabs significantly reduced drug use in the industry. Similarly, the introduction of chain of responsibility was argued by one Company B manager to have removed ‘backyarders’ (potentially another word for owner-operator rogues) within the industry.

*Oh just everybody realises what the repercussions could be. I think there's a lot more of a chase of it in the court system and you know a lot of the smaller transports and the way they went, a lot of those have gone now because of that, you know. There's no where near as many, I don't know I suppose you'd call them backyarders in the game these days, you know. (Company B Branch Manager Three)*

Due to the effects of greater enforcement, some organisations are now also taking greater care to ensure compliance within their organisation.

*And like I said, force blokes to have required breaks. Once upon a time all companies never used to do stuff like that but we now dismiss people if they don't because it's just too much of a risk if something goes wrong. (Company A Manager One)*

In addition to affecting the broader industry, many drivers indicated enforcement has a significant impact upon individual behaviour. One Company B driver indicated that, whilst he has never used drugs, *“if you do take drugs, you’re going to get caught”*. Additional examples of behaviour that were affected by enforcement were unlicensed driving, seatbelts and fatigue management. Additionally, one Company A driver suggested that whilst drivers used to modify or falsify their log books, it’s *“not worth trying to cheat it anymore; you need to write down your Speedo now, so you need to follow the book these days”*.

*Mainly for the fines to be honest, if you get booked not wearing (a seatbelt) you can’t bitch. I don’t wear it for safety coz I don’t believe it will help you, in a head on you’re stuffed. You just leave it on till they see it if you get pulled over. Even the safest things you can have an argument about if they are safe; I just find it’s easier just to put the bastard on*  
(Company B Driver Three)

Whilst the motivation caused by punishments is effective, a number of drivers take an alternative approach to avoiding punishment. Rather than comply with rules and regulations, they will seek to avoid detection of non-compliance. For example, one Company A driver stated that, as the company give non-conformance slips for failure to complete pre-trip vehicle inspections, *“I just tick it all off, if you know the truck you know how it will run, they are just covering their arses, so you just tick it all off”*. Similarly, drivers were indicated to wait before a point-to-point speed camera until they can legally pass, or willingly speed after experiencing delays.

*But you know everyone does it, it’s not a purposeful thing, it just happens you know. There’s blokes that have got stop watches in their truck that time themselves too, they’re not going to break those times. If they are they just pull up and wait before the camera and then drive –*

*– through it... Mate you go down the highway every night of the week and there's plenty of trucks that are just really quick trucks and they'll go blasting past you and you get to the next camera and they're all pulled up. Because they're too quick for the cameras so they wait, go through the camera, go blasting past you again and you find them another hour down the road just waiting. (Company A Manager One)*

*[Point-to-point speed cameras] don't stop you from speeding. There are hills between the cams so you lose speed up the hills and can go like hell down them... Out of Sydney you will get trucks that will pass you three to four times in the night... Fatigue is still managed well with the cams, but speed isn't... Going through towns slows you down so you go like stink on the highway (Company A Driver Six)*

This approach was also evident at an organisational level to a lesser degree. When receiving a point-to-point speed camera infringement notice at the office, one Company A manager stated that they advise their drivers to not run quicker than the camera times, rather than telling them to drive to the speed limit.

*Anyway back to the story, if you get a non conformance here for safety camera infringement it will say this is what you've done, this is what you should do to not do it again, which is just keep a track of your time, don't run quicker than the camera times. Whether that be like I said on the flat, through a village, running off hills whatever, just don't do it. (Company A Manager One)*

Whilst no Company B driver indicated that they avoid detection without compliance, a number of drivers gave accounts of other drivers who attempt to avoid satellite monitoring. For example, one driver stated that that when satellite tracking was first introduced “*drivers would disconnect it*” and that now some drivers suggest you “*just wrap it in foil*” as this was believed to block the GPS signal.



### 9.3.3.2. The “go!” mentality

Whilst somewhat related to the desire for autonomy, drivers also have a tendency to want to drive rather than complete other work tasks. This can present a problem in that certain tasks which are designed for safety purposes, such as pre-trip vehicle inspections, may be avoided by drivers due to a desire to get on the road. Interestingly, however, this trait was primarily only evident in Company A. In the case of Company B, the payment of drivers on an hourly rate reduces the financial losses associated with tasks that delay driving. In Company C, the necessity of regularly stopping to check on the cattle may deter drivers who want to simply drive from seeking employment in livestock transport.

The majority of Company A drivers who discussed this trait appeared uninfluenced by it. It was common for drivers to state that they didn't understand why “*a lot of people just want to go, go, go*”.

*Others say: Why do this or that with all the policies? Just get it done... Some guys just want to drive and not fulfil their duties... In my old company they wouldn't even throw a strap over a load unless they had to. (Company A Driver Five)*

Despite typically assigning this trait to other drivers, some Company A drivers did appear to adhere with this trait. It was argued that some drivers want to keep going at the fastest possible speed for as long as possible. Despite the risks of such behaviour, one Company A driver actually suggested that safety was the motivation for such behaviour. It was suggested that unless the driver continues moving and driving hard they run a higher risk of nodding off from fatigue.

*You can't relax and cruise... You have to keep it at the max, keeps you alert even just staying aware of the cops... When you relax it's game over, may as well go to bed coz you're going to go off the road. (Company A Driver Six)*

#### 9.4. DISCUSSION

Study Three identified a number of cultural traits within the studied organisations. On the basis of the synthesised conceptualisation of safety culture, which is the guiding framework for the current research, cultural traits are viewed as shared beliefs, attitudes and values which influence safety. Whilst the cultural traits were explored in a ‘grounded’ manner, with no more guidance than the definitions of culture provided in Chapter 2, there was a significant degree of overlap between the identified traits and the dimensions presented by Schein (1990). As such, Schein’s dimensions were used to categorise many underlying cultural traits identified within Study Three, providing an internal structure to the cultural component of the synthesised conceptualisation. The dimensions which were drawn from Schein and were present within the current research were: (1) the industry and organisation’s relationship to its environment; (2) the nature of human activity; (3) the nature of truth and reality; (4) the nature of time; (5) the nature of human nature; and (6) the nature of human relationships.

Regarding the industry and organisations relationship to its environment, members of each company perceived themselves to be unique. Traits categorised under the nature of human activity centred on the work expectations of industry members. Within all studied organisations there was a high value placed on hard work and fairness. Whilst it was not evident in company C, members of both Company A and B placed a high expectation on drivers to ‘hold their line’. Lastly, it was evident within each company that drivers place a high value on safety. Traits related to ‘the nature of truth and reality’ were also evident within each of the studied organisations. Drivers are heavily influenced by experience and stories, and were more likely to believe the experience of others over reported facts. They also placed a significant emphasis on common sense. Regarding the nature of time, though all drivers valued time to some extent, drivers who were paid a distance-based rate were much more

likely to prioritise the value of time. Traits relating to the nature of human nature centred on a key themes that drivers were good yet made unintentional mistake. Additionally, intentional safety breaches were either seen as behaviour that other people would do under the same circumstance or attributed to the actions of a select few rogues within the industry. However, it was recognised that many drivers are motivated by a desire for monetary and other gains. Finally, with regard to the nature of human relationships, it was evident that members of each company place a high value on autonomy and members of Company A exhibited a desire to conform with the ‘trucking image’.

In addition to these traits, there were a number of second and third order traits which were typically the result of multiple interacting cultural traits and the occasional contextual factor. These second and third order traits included perceptions regarding the likelihood of incidents, the limitations with which the industry can improve safety, the level of responsibility placed on drivers, the attitudes of drivers towards rules and regulations, punishment avoidance, and the ‘go!’ mentality.

Given that the purpose of the selection of case studies was to identify cultural traits that may be relevant to the broader industry, it is important to note that there was a significantly high degree of overlap between the identified cultural traits in each organisation (presented in Table 9.1). Whilst there was a small selection of traits which were only evident within one or two of the studied organisations, the majority of traits were in common. It is, however, important to note that some of the identified traits evidenced a dimension-like property, in which whilst the theme was common, drivers from different companies fell at opposite ends of the spectrum (e.g. time highly valued or little valued). Due to the high congruence between cases, each of these traits present potential industry-wide cultural factors, that should be considered when exploring safety culture in the heavy vehicle industry (see Figure 9.1 for a graphical summary of the findings of this chapter).

Table 9.1: The extent to which cultural traits were shared between case studies

Underlying Cultural Traits	Organisation/s
<hr/> The Industry/Organisations Relationship to its Environment	
- Uniqueness of the Industry/Organisation	All
The Nature of Human Activity	
- Hard Work	All
- Fairness	All
- Hold Your Line	A & B*
- Safety	All
The Nature of Truth and Reality	
- Experiential and Narrative Learning	All
- Common Sense	All
The Nature of Time	
- The Nature of Time	All**
The Nature of Human Nature	
- Unintentional	A & B
- Just Like Everyone Else	A Only
- Rebels, Rogues and Cowboys	All
- Money and Other Gains	All
The Nature of Human Relationships	
- Autonomy	All
- Keeping Up the Trucking Image	A Only*
<hr/> Second and Third Order Traits	
Organisation/s	
- Luck and the Likelihood of an Incident	All**

- Limitations	All**
- Responsibility	All
- Rules and Regulations	All**
- Punishment Avoidance	All*
- The ‘Go!’ Mentality	A Only*

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\* The absence or presence of trait may reflect contextual variations that changed the extent to which the trait was relevant.

\*\* The strength, valency or effect of this trait differed within organisations, yet was present in some form within all organisations.

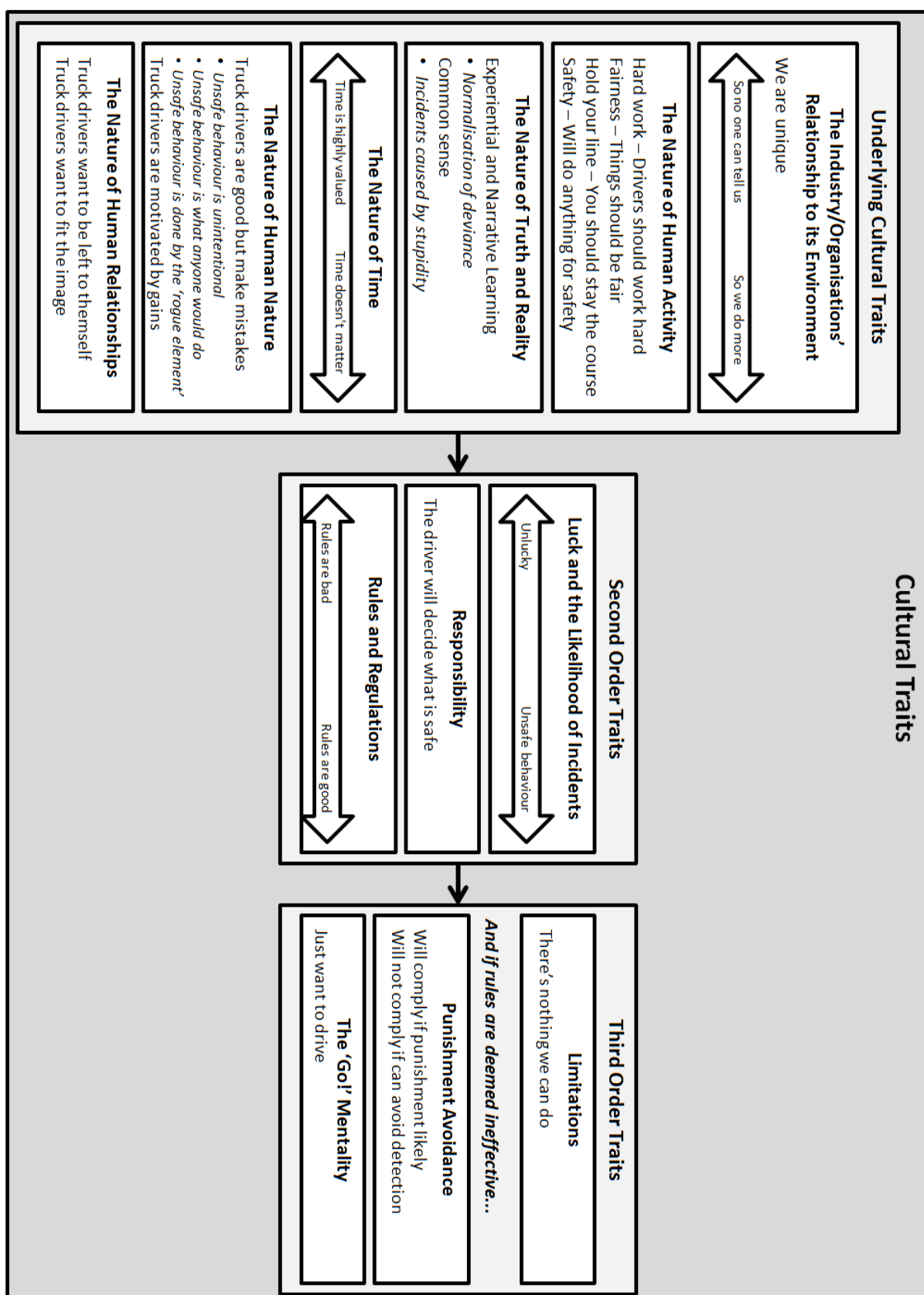
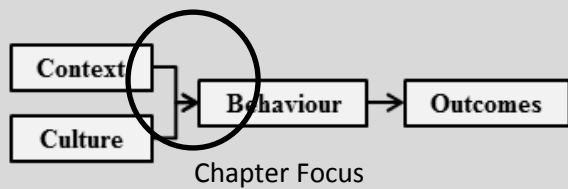


Figure 9.1: Cultural traits identified within the case studies



## Chapter 10: Study Three Results Part IV – Safety-Related Behaviours

### 10.1. INTRODUCTION

Study Three consisted of a series of three case studies with transport organisations. During these case studies, observations of drivers and interviews with organisational staff and drivers were conducted. The purpose of Study Three was specifically to examine how cultural and contextual factors influence safety-related behaviours. Within the synthesised conceptualisation of safety culture, safety outcomes are seen as the result of behaviours which are influenced by cultural and contextual factors (see section 2.3.5). Thus, within this framework, the contextual and cultural factors identified within Study Three are only relevant to safety culture if they influence behaviour. Similarly, safety-related behaviours are only deemed relevant to safety culture if they are influenced by cultural and contextual factors. Chapters 7 to 9 outlined the specific context surrounding drivers and the culture held by drivers. The final step to take to address the purpose of Study Three is to explore how the factors identified within Chapters 7 to 9 interact to produce specific safety related behaviours and, therefore, outcomes.

The current chapter presents each class of safety outcomes that were identified in Study Three (crash outcomes, non-driving injuries, and health outcomes), along with the factors which were found to influence the relevant behaviours within these outcomes. The broad classes of safety outcomes that were identified within Study Three were crash outcomes, non-

driving incidents and health outcomes. Whilst the decision to aggregate safety-related behaviours according to outcome types was somewhat arbitrary, in that each behaviour could have been discussed separately, this chapter uses the same categorisation of outcomes that were used within Study One and Two (Chapters 4 and 5). The chapter begins with the discussion of crash-related behaviours, non-driving-injury-related behaviours and health-related behaviours.

Prior to exploring these behaviours and the factors which influence them, it is important to make note again of the purpose of exploring safety culture within the current framework. As discussed in section 2.3.1, there is significant debate within the literature regarding the extent to which culture can be shaped. Thus it was argued that it is important to explore the culture of workers and the context surrounding them in order to understand the reasons behind behaviour. Through understanding these factors, it was suggested that practitioners and researchers could identify how the context surrounding workers could be shaped to influence behaviour in the desired manner so as to interact in a positive manner with the culture of workers (section 2.3.5). Thus, similarly to Chapter 9, whilst the beliefs and values to drivers may not be objectively accurate, critiquing the culture of drivers for the sake of identifying faulty beliefs is not beneficial to shaping behaviour. The current chapter seeks to understand safety-related behaviours from the perspective of drivers.

## 10.2. CRASH OUTCOMES

Both Study One (Chapter 4) and Study Two (Chapter 5) identified a number of behaviours relevant to crash outcomes, including driving whilst fatigued, substance use, speeding, seatbelt use, and general driving errors and violations. Whilst seatbelt use and general driving errors and violations were only identified in Company A and B, the remaining behaviours were identified within each case study organisation. In addition to these behaviours, a number of vehicle maintenance-related behaviours were identified within



each company, and load restraint behaviours uniquely within Company B. Each of these behaviours and the factors found to influence them will be discussed separately. First, however, a number of general points should be made with regards to factors that were associated with crashes but not related to specific truck driver behaviours. Following this discussion, the current section will focus on the role of cultural and contextual factors in influencing each of the behaviour categories listed above, namely: (1) driving whilst fatigued; (2) substance use; (3) speeding; (4) seatbelt use; (5) general driving errors and violations; (6) vehicle maintenance related behaviours; and (7) load restraint behaviours.

#### 10.2.1. General crash factors

Throughout the case studies a number of contextual factors were identified as having a direct influence on crash likelihood and were separate from truck driver behaviour. As direct effects were already discussed to some extent within Chapter 8, only a brief summary is presented here. First, a number of the identified environmental and situational factors (section 8.8) pose a direct risk for truck crashes. Road design and conditions factors can present hazardous scenarios for drivers who are otherwise driving safely. For example, as discussed in section 8.8.1.1, one Company B driver experienced a near miss caused by poor on-ramp design, despite driving at a safe speed and conducting no unsafe behaviour. Similarly, truck design and maintenance can pose a threat to safety; for instance, through brake failure or the lack of visibility in trucks.

Additionally, as noted in section 8.4, other vehicles may cause incidents independent of truck driver behaviour. Many incidents and near misses were suggested to stem from a lack of understanding of the design and abilities of heavy vehicles. Despite some such crashes not being caused by truck driver behaviour, the cultural trait ‘hold your line’ (section 9.2.2.3) was shown to increase the likelihood of a crash resulting from unsafe other-vehicle behaviour, and the perceived likelihood of an incident (section 9.3.1) may influence the extent to which a

driver maintains awareness of other vehicles. Further, environmental conditions such as wet weather (section 8.8.3) may further increase the likelihood of such incidents.

### 10.2.2. Fatigue

Driving whilst fatigued received the most attention of all safety-related behaviours within both Study One (section 4.2) and Study Two (section 5.2.1.1). The general perception of fatigue as one of the largest concerns was also evident within Study Three. One Company A staff member stated that fatigue is “*the cause of most crashes*” and is “*is the most important thing*”. Similarly, one Company A manager listed fatigue as one of three most common reasons for crashes. Thus, at least within Company A, fatigue is seen as high priority, and recognised to be a genuine safety hazard. Further, work diaries were also given significant attention within the case studies. Discussions surrounding fatigue centred on the themes of: (1) the causes of fatigue; (2) attitudes towards log books; (3) the difference between log books and fatigue; (4) driving out of hours; and (5) driving whilst fatigued. As such, the remainder of this section will discuss each of these themes.

#### 10.2.2.1. The causes of fatigue

In simplest terms, fatigue is the result of prolonged attention, physical work or wakefulness with insufficient rest. When exploring the effect of safety culture on fatigue there are a number of contextual factors which create additional cognitive or physical strain on the driver, or reduce the ability of the driver to attain sufficient rest. Whilst it was rare for any single factor to be identified as fatigue inducing, Study Three found that the key factors influencing fatigue were members of the general public (section 8.4), customers (8.5), and environmental factors (8.8). Further, a number of general lifestyle-related factors, which did not emerge as a key theme within the case studies but did appear in Study One (see section 4.2.3), were seen to influence fatigue.

#### 10.2.2.1.1. The general public and fatigue

One Company A driver suggested that cars are “*the biggest contributor to fatigue*” due to their tendency to “*jump in front of you and hit the brakes*”. The additional awareness and attention required when driving around other vehicles is a cognitive drain leading to fatigue. Additionally, it was indicated by multiple drivers that speed limiters prevent truck drivers from overtaking slower vehicles, leading to fatigue from frustration.

*Should increase speed limit especially with the roads these days. You run off to catch up lost time. Increasing it would probably remove a lot of cowboys from the industry. Nothing worse than trying to overtake and they speed up and you can't get past. Guys sit below the speed limit and when you go to pass they speed up and don't let you in. Having 110km/h at the pedal would help. Frustration builds up and you are constantly tired, stressed out, your mind is going 100mph; even 3km/h on a long drive makes a big difference. (Company A Driver Three)*

#### 10.2.2.1.2. Customers and fatigue

As discussed in section 8.5, customers can be a source of significant delays which contribute to fatigue. Though not evident within Company B and C, Company A drivers experienced regular long delays during the observations. Two specific examples are worth discussing. In the first, the researcher and driver arrived on time to a depot at which the driver assisted in unloading. After unloading, the researcher and driver waited approximately two and a half hours before the truck began to be loaded, resulting in a total waiting time of four hours before departure. It was suggested that heat, and the fact that the air conditioner within the truck was broken, prevented napping during such delays. Thus, when delays are combined with truck maintenance factors and environmental conditions, the driver is unable to use such time to sleep. The second incident (recorded from the researcher's perspective over the page) occurred during one change-over journey, when the observed driver was

required to sit on the side of the road for approximately four-and-a-half hours during the middle of the night, due to a combination of customer delays and a slower travel time. Whilst the driver used this opportunity to take a brief nap, the researcher was unable to do so and experienced significant fatigue as a result.

It was common for driver and manager to suggest that customers should be held more accountable for delays. For example, one Company A driver shared his experience of being required to wait six-and-a-half hours to be loaded. When combined with a three-hour loading process, the driver was delayed 9.5 hours despite arriving early to the customer site and expecting an early finish. The driver stated that “*some places just don’t care how long they hold you up*”. Whilst customers can be punished under chain of responsibility legislation, general perception is that they remain unpunished.

*Safety concerns in terms of breaks are definitely with clients, lots of holds up in queues and there are people who are known to do it more so than others. So that’s a really big issue in this industry. A lot of it’s been discussed when I was going to the National Heavy Regulator forums. Lots of discussion around you know you’re focusing on the operators, what about the other people in the chain. So we often have drivers who are held up for hours. So we tell them to go and rest but it’s really hard because they’re getting woken up again to move things and just move up the queue or whatever like crazy. So that’s a big safety issue.*

(Company A Manager Two)

#### 10.2.2.1.3. Environmental factors and fatigue

A number of environment factors were found to influence fatigue. These primarily included the time of day, road design and condition, truck design, and type of load carried.

***Observation Notes Excerpts: Researcher's Experience of Delay-Related Fatigue***

*Driving from Brisbane to halfway between Brisbane and Sydney, where we will swap trailers with a driver coming out of Sydney, then return to Brisbane.*

**6:30pm** – *Left Brisbane*

**9:30pm** – *The driver coming out of Sydney was delayed and has only just left*

**12:15am** – *Arrived at Macksville (halfway between Brisbane and Sydney). We had a brief break for coffee on the way. Now just chatting to the driver about work and family etc.*

**3am (approx.)** – *We had been chatting for a while but I'm getting pretty tired and am concerned the driver may need to sleep. I suggested multiple times that if he wanted to rest or sleep (whatever he would usually do) that he shouldn't let me stop him. I walked down the road to get something to eat and drink from the servo, but it may make him choose to rest if he wants to. When I got back to the truck he was in the bunk, apparently the other driver was a fair way off still and was going to call just before he got there. So the driver I am with is taking a nap. I decided to wait outside the truck to avoid disturbing the driver by moving around etc. Sitting beside the wheel arch (not sure if it is the wheel still hot, or warm air from the drain, but it's warmer here). Almost fell asleep sitting here. So tired.*

**4:30am (approx.)** – *Finally got the call that the other driver is about 20 minutes away. I hope the nap helped my driver, coz I'm exhausted.*

**Thoughts after** – *Got a coffee at Grafton, gave me about 30 minutes of being awake but I was falling asleep again after that. Tried sitting forward to not be comfortable, every time I leaned back I started to drift. He's right, you can't relax or you're gone. I think I had multiple micro sleeps, he didn't seem to realise because he would say something that I missed the start of without mentioning that I was falling asleep. I'm not sure if just the act of driving would help you stay awake.*

The time of day is particularly relevant to fatigue due to the human circadian rhythm which dictates levels of alertness on a regular basis relative to the time. Regarding this rhythm, one Company A manager simply stated *“the human body is not meant to function at night”*. Due to the proportion of night journeys conducted, this factor is more relevant to Company A drivers who regularly highlighted the times at which fatigue is the most difficult. The effect of time was typically attributed to light conditions, which also influence the body clock. For example, one Company A driver stated that *“fatigue is definitely harder an hour either side of sunrise and sunset”*, additionally stating that he finds there is *“also a lull at about 3 to 5pm”*.

*The human body is not meant to operate of a night time, we're not nocturnal. One of the biggest problems I always found when I was working the night shift... It's the change from daylight to dark or dark to daylight. Every single morning 4.30, 5 o'clock I'm getting crazy tired just because it's beginning to be light. Or when the birds wake up because you know it's about to change from dark to light. And if it was a full moon and birds are awake because it's so light you'll be tired most of the night because you've got your birds all the time and your body just thinks oh it's morning... Most of the night when we're running late if they're pulling up for their half hour break well they probably go to sleep, wake them up so they don't over sleep all that sort of stuff. A lot of blokes pull up 4, 5, 6am at the change of dark to light because that's just, I don't know, it's just something. Your brain goes fuck I'm tired now it's getting light. Because you know when it's dark it's just night-time but when it becomes light fuck it's the morning. (Company A Manager One)*

It was also suggested that road design and truck design factors can interact with this to further induce fatigue. For example, when discussing what time was the hardest to stay alert, one driver stated that it depends on the road, indicating that a lack of lights along the road

make it more difficult to stay awake. Similarly, one driver stated that it can be hard to stay alert at 2am due to the lack of attention required to drive an automatic truck.

Both road and truck design factors can also influence fatigue separate to the time of day. A number of drivers suggested that the inability to find adequate rest locations along the road, and a lack of clean rest facilities at truck stops prevents drivers from gaining sufficient rest. Thus, one Company A driver stated that the government should invest in more stopping bays. Additionally, one driver who had previously worked in another country stated that in Australia the roads are long and straight, leading to fatigue from monotony. Conversely, one organisational staff member from Company A suggested that drivers have too much to focus on, particularly related to speed, which further increase fatigue.

*We need to be thinking big picture. I don't think we are on our highways. And our drivers get huge log book fines and they're getting huge infringement fines for going 70 through something that looks like an 80 but is actually 60. So they're constantly looking at their speedo to make sure they keep their points. So all that adds to your driver fatigue right?*  
(Company A Health and Safety Officer)

A number of Company A drivers also suggested that the provided bunk coolers were insufficient for Australian heat, making it difficult to sleep on the side of the road. Similarly, the absence of bunks in many Company B trucks was suggested by drivers to prevent napping to reduce fatigue during a journey. For this reason, truck design factors, particularly related to technological safety choices made by organisations, can also influence fatigue levels.

The last environmental factor which was identified as influencing fatigue was the type of load being carried (section 8.8). When transporting livestock it is necessary to regularly exit the vehicle to check the cattle. Whilst this is still a form of work, the brief break from driving may assist the driver to stay alert. Conversely, one Company B manager stated that

carrying over-dimension loads results in a significant increase of time spent loading and unloading, which in itself may contribute to fatigue.

*Yeah it can be. You know like there's no doubt they do have big days, they're pretty much...when they do head out of town they pretty much do go right up on their hours. Heavy haulage is less physical driving than like a line-haul truck. Like you know if you're doing a Brisbane to Melbourne then you work 14 hours chances are you're driving 13 of those hours or whatever it might be you know. With heavy haulage there is a lot of time loading, unloading, on site all that kind of stuff. So technically speaking if a job is a 30-hour job you know the driving component of that might be 15 or 18, something like that. So a guy might work a lot of hours it doesn't necessarily mean he's been driving that whole time. You know just, it's still a fatigue issue and everything as well because they're not standing around they're usually you know doing physical labour as well. With chaining down and all that kind of stuff. But yeah definitely is like you know and it's the same like with police. If you go out of town with the police leaving at midnight the police are in the same boat. You know they've got fatigue management they've got to abide by as well.*

(Company B Branch Manager One)

#### 10.2.2.2. Log books

Significant attention was given to log books by members of the studied organisations. Log books are the primary means of fatigue management enforcement and monitoring. Due to the influence of a number of contextual and cultural factors, a number of attitudes towards log books emerged. Additionally, a number of general comments regarding the suitability of log books were made. First, it should be noted that every comment regarding log books was inherently influenced by government departments, due to the legislation governing their use.

Members of the industry commonly noted the influence of road factors on log books. Delays caused by roadworks, and even traffic lights, can significantly reduce remaining work



hours, thus reducing the distance a driver can travel. Whilst delays still contribute to fatigue, many drivers disliked log books as minor losses of time detract from the maximum trip distance. This was partly influenced by a combination of the value placed on time and money, and the inability to drive beyond the legal hours. Due to distance-based payment methods, log books limit the amount of money a driver can make in the presence of traffic delays.

We're paid by the kilometre. You can't cut hours any further coz you need to do 5000km to earn a decent wage. (Company A Driver Three)

Many participants also expressed that log books are unfair in that they are only applied to the heavy vehicle industry (see section 9.2.2). Further, a general lack of education, and in some cases, intelligence, made log books difficult for some drivers to comply with. For example, one Company B driver was visibly distressed when completing his work diary. The driver immediately stated that log books *"are bullshit"*, due to the ease of falsification. However, he immediately went on to say that he hated the log books *"coz I didn't go to uni and I'm not too bright with all these"*, indicating concern, as *"they book you for it if you don't get it all right"*. The driver concluded by saying *"fuck I don't know, I'm not real good at this shit as I say"*. The number of overlapping rules governing maximum consecutive work hours and maximum weekly hours can become rapidly confusing. This will be further discussed in the next section; however, it is important to note that many participants believed that log books were too complicated and difficult.

*They're trying to make it flexible but it's a bloody, you know, it's not flexible at all, or it's not flexible enough. We're talking about guys that, you know, probably don't even get past Grade 8, so we need to make things a bit easier for them out there.* (Company A Health and Safety Officer)

Finally, members of Company C believed that the livestock transport industry was unique when compared with other transport (section 9.2.1). Due to this uniqueness, one driver stated that *“log books just don’t suit the industry”*. The combination of regular use of dirt roads, and the associated inability to travel significant distances within regulated hours, alongside the requirement to regularly stop to check on the cattle, results in log books being seen as a hassle, rather than a benefit.

#### 10.2.2.2.1. Log books versus fatigue

Ultimately, as discussed in section 9.2.2, behaviour is significantly more likely where members of the industry believe that it will improve safety. Thus, it is important to consider whether or not fatigue management regulations are perceived to improve safety. Participants expressed mixed views regarding the benefits of fatigue management through log books.

Many participants did express a belief in the benefits of the log book system. As stated by one Company A driver, *“fatigue is not too bad if you follow the guidelines as they are meant to be done”*. Similarly, another Company A driver indicated that it was common for members of the broader industry to criticise drivers who are perceived to not comply with fatigue management, through radio comments such as *“if you’re not sure about your log book get off the road!”* Additionally, one Company B manager stated that drivers who incorrectly used the log book, may be making a ‘mistake’ which will one day *“cost his life”*. Some members of the industry clearly believe fatigue management compliance improves safety.

A number of participants, however, appeared to believe that log books do not improve safety. These beliefs appeared to be based upon perceived individual differences, the difference between ‘resting’ and gaining actual rest, the differences between standard and ‘basic’ fatigue management regulations, and the perception that log books force drivers to drive when fatigued.

They really get peeved when they get them. ... It's a good way of teaching, too right, especially the work diaries you know. If they haven't had their regular breaks and even though we find that out later on he might continually be making that mistake which could cost his life later on... So we, you know, found out more, you know, you're not taking your four breaks right, is that, you know, eventually you'll be found out and you know most of them say I didn't know I had to do it like that. (Company A Health and Safety Officer)

Perceived individual differences were commonly cited as being overlooked within fatigue management legislation. Within Company C, a number of individuals indicated that the maximum legal work hours assume that every driver will be tired after a given amount of work. For this reason, the driver/manager of Company C stated that log books are “*shit*”.

*No, no I said that. No, because the fatigue laws say you've got to drive for five hours and then you've got to have a break and then you've got to do something else and then you've got to have a break. Sometimes you don't want to go for five hours. Sometimes you might get weary after two hours. But the laws say you must, to get the amount of time in a day of driving you must break it up into those specific breaks. (Company C Driver/Manager)*

Participants placed significant value on individual responsibility and common sense (see sections 9.3.2 and 9.2.3.2). The lack of recognition of individual differences in the log book system was perceived by the driver/manager of Company C to have removed common sense out of fatigue management. Whilst the removal of individual responsibility and common sense is beneficial to safety, it is commonly disliked by industry members.

*It's like saying that after driving for five hours you must stop. Like they've taken the common sense out of that and said that after five hours no matter who you are –*

*– or what your background is or whether you're a robot or whatever, after five hours you're gonna be tired. That's where the common sense has gone. Whereas after four hours you might be tired but to get to where you've got to be in that 12-hour period you must drive for five. And then you must have a break. ... Realistically you could probably drive for 10 and then have your break. But the laws say that you can't go over five so... (Company C Driver/Manager)*

Many members of the industry expressed similar concerns yet still considered the rules as valid.

*I think the regulation is great on the hours. There's some people out there who can drive for 24 hours. I can drive my car for 24 hours, or I used to be able to. I could probably do the same in a truck the difference is the amount of people it will kill if it runs into a primary school I guess. You know the car will only kill the lady on the crossing the truck will take the gardener out as well. Yeah I don't know how you'd regulate, maybe it's just too big to regulate. (Company B Branch Manager Four)*

A second weakness identified in the log book system was the difference between what constitutes resting on a log book, and actual rest achieved. For example, one Company A driver suggested that the legal seven-hour break every day is actually insufficient when a driver is at their own home, due to the time taken to eat, shower and commute between work and home. Conversely, it was argued that on the side of the road drivers do not want longer than seven hours. Similarly, one Company B driver indicated that a thirty minute break does not leave time to actually rest as, between recording the break, going to the toilet and quickly eating something the driver is left with 10 to 20 minutes. Lastly, one Company A driver stated that even with longer breaks drivers must choose to rest and that many will waste time doing other tasks. In each of these cases, the respondents were indicating that compliance with the legal requirements of log books does not guarantee safety and thus the current log

book system, designed to improve safety, is insufficient if a driver does not want to gain sufficient rest.

Have heard rumours that some people don't sleep in their seven hours rest period; they go and do stuff instead. But it's gotta be a two-way street. They can't force you to drive when tired but you still need to do your part and get enough rest. You have to play by the rules but you can't be stupid about it coz it will stuff your next run out. (Company A Driver Six)

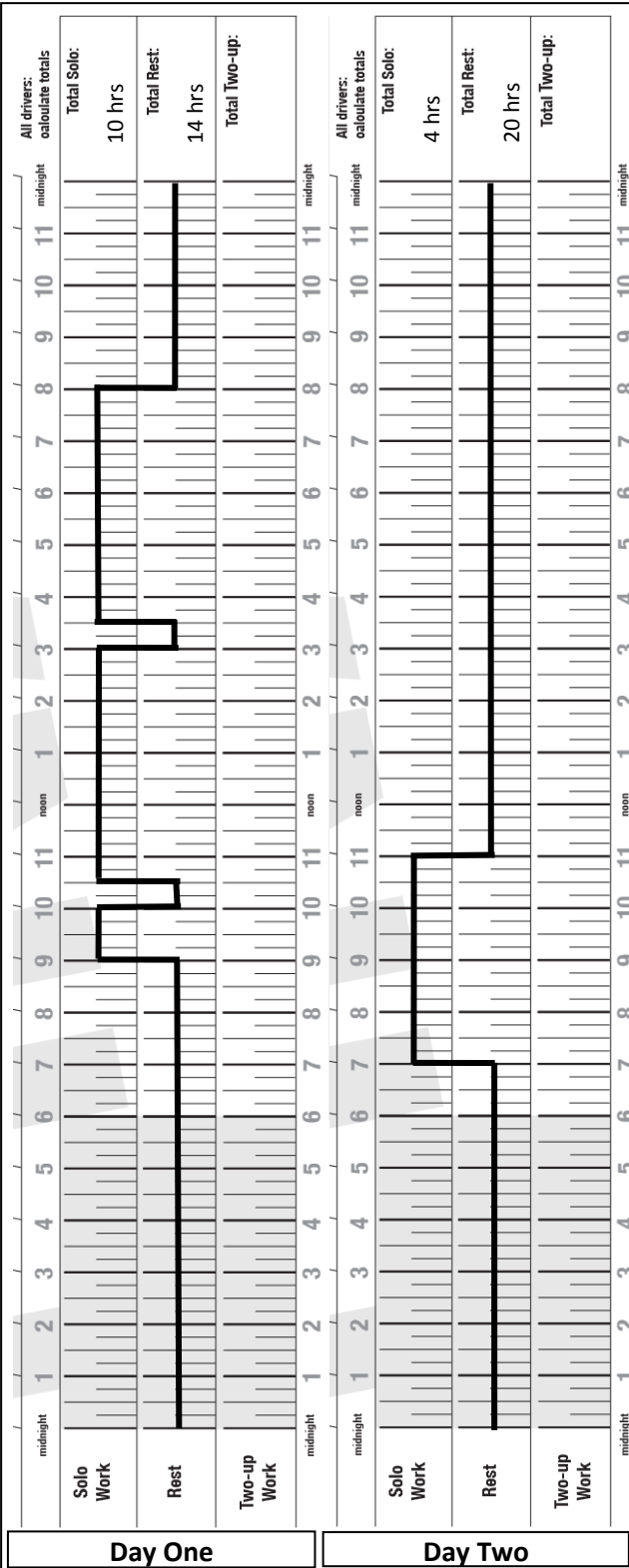
The three levels of fatigue management – standard, basic and advanced fatigue management – require users to gain the associated NHVAS accreditation and gradually allow longer daily hours with typically longer required break times between shifts. Additionally, basic fatigue management (BFM) places restrictions on the number of night-time hours driven. The differences between these levels were the focus of much criticism. For example, one Company A driver stated it is possible to drive every night between Brisbane and Sydney on standard hours, yet that due to restricted night time hours, the same trips are not possible under BFM. This restriction was deemed illogical given the extra training the individual has received. Similarly, in regards to the additional daily hours permitted by BFM, one Company A driver suggested that it should not be allowed as it *“only favours the company”* and *“no driver wants to do the extra hours”*. Thus, it was perceived that BFM allows what is considered to be dangerous single shifts whilst preventing normal shifts that other drivers are allowed.

The final issue raised with log book enforcement was the perception that log books force drivers to drive whilst fatigued. As stated by one Company A driver *“you gotta do a minimum amount of time and keep going so you can get home legally the next day”*. Similarly, one Company C driver suggested that despite wanting to take longer to conduct some journeys, log book restrictions mean that he has to drive hard.

The way the books are once you put a mark in the book you gotta go, it might look good on paper, but you gotta go hard, if I had 1000 km to go, if left to my own devices it might take me 15 hours but I've gotta cover it in 12. (Company C Driver Three)

Whilst the claim that log books encourage driving whilst fatigued initially seemed unlikely, further investigation revealed that weaknesses in the log book system encourage drivers to treat the log book as a restrictive run-sheet, rather than to ensure sufficient rest and reduced fatigue. The reliance on 24-hour periods means that no single day can be treated in isolation. Deviations on a single day to reduce fatigue can have significant implications for the remainder of a driver's week. Whilst safety should be given priority over productivity, drivers are also forced to rest earlier than required, but not when fatigued, in order to comply with legislation. During the observed TruckSafe audit, the auditor identified a fatigue management breach on a log book copy. A reproduction of this example is provided over the page to demonstrate the impact that fatigue-reducing choices made on one day have on the next day. Due to the effects that rests have on subsequent work, drivers feel pressured to drive to the maximum requirements of the work diary and follow it as a prescriptive roster, rather than a tool to ensure they receive sufficient rest. This was another perceived reason why the log book system does not align with perceptions of safety.

On some occasions, however, members of the industry may have been misinformed regarding fatigue management legislation. The driver/manager of Company C discussed curfews regarding heavy vehicle access to certain roads, noting that these curfews result in trips finishing after midnight. He believed that drivers were only allowed to work a total of six calendar days per week and finishing after 12am meant the driver had worked on the subsequent day and would be required to have a separate day off. In actuality, the regulations only require a consecutive 24-hour break and the driver is permitted to resume work 24 hours after finishing. Thus, some frustrations may be the result of misinformation.



In the illustrated case, a driver began his first day at 9am, working til 8pm with two half-hour breaks. On the second day the driver started at 7am and worked four hours straight, finishing at 11am. Neither day, in isolation, has breached fatigue management legislation.

Regulations state that a driver may not work more than 12 hours in a 24-hour period. Measuring from 9am on day one, the driver has only worked 12 hours and is thus within the law.

However, the law also states that this 24-hour period can be measured from the end of any break. If measured from the end of his first break on day one, this driver breaches fatigue management legislation by 30 minutes.

Due to taking a necessary rest too early on day one, he is over hours on day two.

Drivers are permitted to work identical 12-hour shifts every day, yet unless they take breaks at the same time every day they will be in breach of policy. Thus, drivers indicated that they feel pressured to take breaks for compliance, but unable to rest when fatigued.

It was evident that many participants did not perceive log books to be an effective strategy for reducing fatigue. Driving over hours and driving whilst fatigued are two separate behaviours in the minds of many industry members, and different factors were found to influence each behaviour.

#### 10.2.2.3. Driving over hours

There are a number of factors which determine whether or not drivers will comply with fatigue management legislation. The factors which were identified included a number of organisational practices, the role of the government, customer delays, pressures and standards, the role of accreditation schemes, and a number of cultural traits.

##### 10.2.2.3.1. The organisation and driving over hours

The organisation plays a significant role in influencing drivers' decisions regarding fatigue management compliance. Even the basic recruitment of drivers may influence compliance. As discussed in section 7.3.1.1, many recruitment agencies do not hold copies of driver work diary entries and the use of recruitment agency drivers by organisations may result in unintended breaches. Similarly, an organisation is unable to prove that a freshly-recruited driver is not exceeding legislated hours.

Anyway there's been an incident in the past where I've phoned an agency to obtain work diary sheets because the driver didn't hand any in to us and we didn't pay the agency because we didn't have all the paperwork. And the agency wasn't collecting work diaries and they're the employer... So how are they making sure in a chain of responsibility that the driver is doing the right thing and are they training them on how to fill them in? (Company A Manager Two)

It is the responsibility of the organisation, especially if accredited for BFM, to adequately train their staff on how to manage fatigue and comply with legislated work hours.



After training, the organisation also must roster drivers to suit fatigue legislation. As stated by one Company B manager, he must “*make sure (the driver is) within his driving hours for the day or week or whatever it might be*”.

*Obviously in my work you’ve got to be aware of fatigue management. They can only work so many hours a day, they have to have their statutory 10-hour break between finishing one day and starting the next day. Then if they’re away for a considerable period of time you’ve also got to be aware of the fact that they work so many hours in a seven day period and so many hours in a 14-day period. So it all comes back to managing their fatigue. So obviously when there’s fatigue involved, it heightens the risk factor of something happening on the road. (Company B Operational Manager)*

Communication between organisations and drivers during a shift may also influence compliance. This is particularly important when a driver is absent from the depot for a prolonged period of time. The operational manager of Company B discussed this communication, indicating that the organisation must determine how many breaks the driver has taken and when they occurred to ensure that the driver does not exceed their maximum weekly hours. However, even on shorter trips, the organisation may contact drivers to ensure that they can legally complete their journey.

*If they go somewhere and get held up and they’re only allowed to drive 12 hours or something like that and they’ve driven the 12 hours they have to stop. They call here, our night loader (name) organises a driver to go there and pick that truck up and drive home, we don’t let them driver over the designated hours that are allowed. (Company B Trainer One)*

Whilst communication is largely related to helping the driver, it is also a form of compliance monitoring, potentially resulting in organisational enforcement. However, the primary monitoring technique for fatigue compliance in each company was the checking of

log book sheets. It was noted by one Company A manager that they regularly check a significant proportion of log book sheets to ensure compliance, providing non-conformance notices for breaches.

*Drivers on a 14-hour day which is all basic fatigue management they have to follow a log book every day. They have to hand one page of that log book in every day. So the company monitors, someone goes over that page every day and checks to make sure they're not making mistakes, they're not exceeding their driving hours and that's all monitored and recorded through the office. (Company B Operational Manager)*

Additionally, many organisations utilise satellite tracking to monitor compliance. As stated by one Company B driver, “we’re satellite tracked so you don’t go over your hours”. Similarly, another Company B driver indicated that the length of time between satellite tracking “snap shots” enables monitoring of even short breaks. However, satellite tracking of fatigue compliance is generally through confirming log book accuracy.

*We’ve had instances in the past where we’ve gone back through the Navman and checked on what drivers have put on their timesheet and their log book just to make sure that they’re not cheating the hours, make sure they’re taking their half-hour breaks when they’re due them. Because they can only work a maximum of six hours and they have to have a half-hour break, we can use that. If a guy has had his engine turned on for 10 hours straight and he’s driving well you know he hasn’t had his half-hour break. (Company B Operational Manager)*

#### 10.2.2.3.2. Government departments and driving over hours

Compliance with fatigue management legislation is primarily enforced by government officials. Due to the perception that fatigue management legislation is insufficient at reducing fatigue, members of the industry appeared to take a punishment avoidance approach towards

log books. Thus, the primary motivation for compliance was drawn from a desire to avoid punishment. One Company A driver, who was observed completing a log book entry from a previous shift, stated that he was doing this *“so I don’t get booked”* as it was *“a fine we don’t need and points we don’t need to give away”*. The severity of punishment, combined with a belief that log books could not be ‘cheated’, appeared to motivate drivers to comply rather than seek to avoid detection. As stated by one Company A driver, *“you used to be able to cheat log books, but now it is not possible, you are forced to do it legally, it’s just not worth it”*. Due to the requirement of entering odometer readings on the work diary, one Company A driver stated that it was *“not worth trying to cheat it anymore, you need to write down your speedo now, so you need to follow the book these days”*.

Conversely, some drivers still believe it is possible to falsify log book entries without detection. One Company C driver simply stated *“I’m old school, we get the job done and don’t worry about log books, I’ll bodge it up later”*. Other subtler forms of non-compliance were also evident. Journeys which do not exceed 200km from the originating depot do not require work diary use. In these cases, it was indicated that drivers may conduct multiple runs, totalling work times in excess of 15 hours. Additionally, one Company A driver stated that a previous employee sent him on a short distance trip, then required him to start a log book from a second depot, resulting in a 19-hour shift.

#### 10.2.2.3.3. Customers and driving over hours

Customers may apply heavy standards upon drivers, thereby encouraging compliance. Whilst timeslots can be a major contributor to fatigue, it was noted by one Company B driver that the time slots used by one customer prevented a driver from entering the customer site before a designated time. In this case, there is less incentive to skip rest breaks or drive over hours as the driver will simply have to wait at the destination. Similarly, many customers require drivers to declare that they are legally capable of completing a job.

Conversely, customers may also place significant delays and pressures on drivers. For example, one Company A driver indicated that, despite warning a customer of limited remaining work hours upon arriving at a depot, the customer did not process his unloading in time and the driver was required to exit the depot and find a safe rest location whilst outside of hours. Similarly, as discussed in section 7.3.5.3, Company C is often pressured by agents to conduct loads which would require non-compliance with regulation.

#### 10.2.2.3.4. Accreditation and driving over hours

As was detailed in section 8.6, the NHVAS fatigue management scheme governs whether companies may use BFM. Thus, the requirements they place on organisations to train, monitor and enforce fatigue management compliance with their drivers has an indirect effect, through the organisation, on this compliance. Similarly, however, for companies which do not use BFM, TruckSafe accreditation places significant similar requirements on organisations. As these were discussed previously no further detail will be provided here.

#### 10.2.2.3.5. Cultural traits and driving over hours

A number of cultural traits, identified in Chapter 9, appeared to influence fatigue compliance. First, the value placed on money can contribute to a driver's decision to exceed regulated hours if they are paid a distance-based rate. Conversely, when paid an hourly-rate, one Company B driver stated that drivers who choose to work during breaks “*are idiots*”, as “*it's just giving the company money, you don't get paid for it*”.

*So they get paid, if they work 14 hours, they get paid for 14 hours. Not like the guys who are on a trip rate where they get paid \$350 to drive to Sydney so they try and drive it there as fast as they can so they can turn around and come home again. (Company B Operational Manager)*

The cultural traits of autonomy and responsibility were also suggested to play a role in driving outside of hours. Drivers are deemed solely responsible for choosing when to take breaks. Additionally, it is the driver's responsibility to take breaks when fatigued, and ensure they are not stranded in a location which they cannot rest resulting in non-compliance.

There's no clock guard in a truck, there's no headmaster watching. If you start at six o'clock in the morning you can drive for five hours. No one says you have to have your break at five to one or ten past nine. You have it when best suits you I guess. You look at the job you've got to do, the places you've got to go you know and then take all that into consideration with how you feel. There's no point going, oh I'll have my break right at the end, and then you find you're sitting in a frigging traffic jam and you can't have it. So then you're under pressure, you've just added that little bit of stress to your life, but now you're worried I'm not going to get my break, the RTA is going to get me you know. Doesn't have to have... people need to I guess manage their fatigue. (Company B Branch Manager Four)

The perceived likelihood of experiencing fatigue from breaching fatigue management legislation can shape drivers' attitudes and behaviours regarding fatigue management legislation. Thus, cultural traits of experiential and narrative learning, and the associated perceived likelihood of an incident, affect compliance decisions. For example, one driver stated that *"the moment the 14 hours is up I go home. It's the end of my day coz I've found that that's where a lot of truck accidents happen, at the end of a long day"*.

Within Company C the perceived likelihood of an incident resulting from driving over hours was low. Due to the constraints associated with holding cattle on a truck for extended time, and the potential for punishment under animal welfare legislations, it was suggested to be easier to justify driving hours breaches than animal welfare breaches. Whilst this is an interaction between two government legislations, it evidenced a belief that driving hours breaches would not result in a crash. Thus, it was believed that a driver could drive over

hours without incident if they did not perceive themselves to be fatigued.

*There's nothing more than we identify issues early in the piece and if things come up sort of later on we counsel them if that's the right word. But basically that's how it works. And they know it's made really clear to them early in the piece what's expected of them and what's not. The first thing that's expected of them, and we've had this discussion without the tape recorder going, is they've tired they sleep. I really don't care if your log book says you have sleep you sleep because you're tired. Umm you don't drive, unless there's animal welfare issues and I'm always honest and out there, if there's animal welfare issues and you have to drive past your ...certainly not into an unsafe environment, but past your five hours or you know a little while into your daily allowance, as long as you talk to me first, and explain to me what the issues are, if they're in range. I don't have a problem with that. I then mark it in my diary to say this is what's happening today and then I schedule around making sure it doesn't happen two days in a row or that sort of thing... Yeah we discuss it. And I think that's a call I have to make. Myself or (Driver/Manager's name) but usually it's me. I have to make. I mean I think chain of responsibility for animal welfare and chain of responsibility for driving hours umm it's easier for me to justify allowing them to go another half an hour or an hour. And I don't mean (researchers name), I don't mean 24 hours a day, I just mean extra time to do what needs to be done. Easier for me to justify that from a driving hours point of view, than it will be if we have a disaster and we've got cattle down and dead. (Company C Manager)*

#### 10.2.2.4. Driving whilst fatigued

There were a number of factors which influenced the likelihood of a driver choosing to drive whilst fatigued. These included organisational factors, the role of customers, the broader industry, environmental factors, and a number of cultural traits.

#### 10.2.2.4.1. The organisation and driving whilst fatigued

The organisation also plays a pivotal role in influencing drivers' decisions regarding driving whilst fatigued. Given the greater proportion of long distance trips, much of the following information was drawn from Company A. Many organisations appear to walk a fine line maximising safe productivity and encouraging dangerous behaviour. As stated of Company A by one driver, *“they don't send you off if you're tired, they will push you to your legal limit but if they are tired they won't force it”*. Thus, organisations must have a number of procedures in place to ensure drivers work in a safe manner. Ultimately, the organisation is somewhat limited in its ability to influence driving whilst fatigued.

*Yeah so you know it's a, it's a hell of a thing in a lot of respects. Yeah. So all we can give them are tools alright, it's up to them to tie up the nuts and bolts with those tools, that's all we can do.* (Company A Health and Safety Officer)

It is both a legislative and accreditation requirement for organisations to adequately train their drivers to identify and manage fatigue. As organisations cannot identify fatigue in their drivers, this training is essential.

It was commonly suggested that, in addition to compliance with fatigue management legislation, organisations will roster their drivers according to their perceived level of fatigue. Whilst a driver's level of fatigue cannot be predicted at the creation of a roster, organisations typically anticipate flexibility in their rosters. Whilst a driver may be rostered to complete a journey, if they are fatigued they are not required, or even permitted in some cases, to take the load. Within Company A it was suggested that drivers will be given a different load if they appear fatigued upon arriving at the depot.

*We've got to teach them to know, to look for the signs or symptoms of tiredness and we got to teach them as we went through our inductions to pull over if tired, ring ops. And we don't prevent them from doing that. You know certainly our stuff is time sensitive right but we're not preventing them you know. We expect them to be true night workers in other words sleep during the day and work through the night. But people need that, you know, that kip or you know... we'd rather the wheels on the ground than wheels up there. (Company A Health and Safety Officer)*

*Well we try and roster them on properly like to make sure, like, they will have their proper rest breaks. If they come in late and I see that they're not fit to go out or we haven't got a load to suit them to go out they get put at the end of the list and they don't go out. Or we put them on a very late one where they do have extra...like say for instance a drive comes in at two o'clock in the afternoon you know darn well he doesn't want to go out again. But I might have something for him that is not urgent to get into the other state till the following day and he can leave at midnight and he's still getting time to go home, do whatever he wants to do and still get six or seven hours sleep before he actually has to go out again. So we take that type of procedure here and we try and ensure that all our drivers are properly fatigue managed before they go out. (Company A Operations Staff Member)*

Organisations also use a number of specific safety-management strategies to ensure that drivers do not drive whilst fatigued. Within Company A, drivers are required to regularly inform the organisation if they are going to sleep during a rest break, which lets the organisation know that the driver is fatigued and enables it to assist the driver to avoid sleep inertia by waking him up after an agreed time.



*One of the main functions of the night crew is if someone is tired they ring up and say I'm going for bed whether it be for 15, 20, half hour for this their legal required break or they need longer than that. So we wake them up when they're due to get up whether it be for the time constraint or because they say I want to be in bed for 40 minutes or whatever.*  
(Company A Manager One)

Additionally, the organisation can recheck on the driver after their nap to try to assess fitness for duty. Similarly, the organisation will contact drivers on regular occasion to assess their level of fatigue, especially after receiving external feedback.

*Yeah well that's all you can do right? You know say for argument's sake somebody rings us up and says one of our semi-trailers is you know wavering all over the road. All we can do is phone them up talk to them and assess their speech – whether it's slurred, whether it's slow, whether it's coherent.* (Company A Health and Safety Officer)

If a driver is too fatigued, the organisation may also take measures to permit additional rest. One Company A manager suggested that when a driver is too fatigued, the organisation will organise another driver to take the load to the destination. Further, however, it was indicated that on occasions simply talking over the phone helps drivers to stay alert and thus communication in itself may assist in reducing fatigued driving.

#### 10.2.2.4.2. The customer and driving whilst fatigued

Customer pressures can pose a significant threat to driving whilst fatigued. Within Company A this is further amplified by the express nature of their major freight (see section 8.5). Whilst discussed in detail section 8.5.2.5.1, it is worth repeating that timeslots which are designed to allow a driver additional time to rest before arrival may reduce such pressures. However, one driver noted that there may be repercussions if a driver is regularly late.

#### 10.2.2.4.3. The broader industry and driving whilst fatigued

As indicated in section 8.7, the broader industry can affect safety-related behaviours in a number of ways. As was discussed, Company A has at times relied on drivers from other companies to exchange loads with a fatigued driver, allowing additional rest. Further, members of the general industry have on many occasions been reported to criticise drivers who appear to be driving whilst fatigued (see also 10.2.2.2.1).

#### 10.2.2.4.4. Environmental factors and driving whilst fatigued

In addition to contributing to a driver's level of fatigue, environmental factors may contribute to decisions to drive whilst fatigued. Specifically, it was indicated by a number of drivers that they may opt to continue driving in order to reach their final location whilst it is still dark, or cool, in order to be able to sleep more efficiently. Additionally, regarding load types, the requirement for cattle to be removed from the truck after a maximum of 36 hours may encourage drivers to continue driving even whilst fatigued.

#### 10.2.2.4.5. Cultural traits and driving whilst fatigued

A number of cultural traits identified in Chapter 9 appeared to influence drivers' decisions to drive whilst fatigued, including the uniqueness of the industry, hard work, money and other gains, rebels, rogues and cowboys, autonomy, responsibility and the perceived likelihood of an incident.

First, due to the perceived uniqueness of the industry, it was common for participants to suggest that you can drive a truck all day without experiencing fatigue, yet this is not possible for cars. It was also evident that the cultural trait of hard work may encourage drivers to continue whilst fatigued. A number of drivers, particularly within Company A, suggested that once you accept a job you have to complete it. Though this was sometimes linked to meeting

with another driver to exchange loads and customer demands, it was also suggested outright that if you accept a job you must complete it.

*But when you've started a job you have to finish. You've put your hand up for it so you've got to get it done.* (Company A Driver One)

A number of drivers also indicated that the value placed on money and other gains may lead to driving whilst fatigued. One Company A manager described a driver who had carefully worked out the maximum amount of kilometres, and therefore income, that can be legally achieved within a week of work. This driver then completes this maximum workload on a weekly basis. Further, it was also evident that many members of the industry perceived that driving whilst fatigued was common amongst those labelled as rogues.

The desire and value of autonomy and the responsibility of drivers were also evident in driving whilst fatigued. Unlike other identified traits, these cultural traits were seen to largely play a role in reducing driving whilst fatigued. Many drivers suggested that they will not succumb to pressure to drive whilst fatigued. This further applied to resting regardless of current log book requirements. As phrased by the driver/manager of Company C, *"I manage my own fatigue"*, continuing to say *"when I feel like I'm tired I pull up and have a sleep"*.

The last cultural trait which was seen to influence driving whilst fatigued was the perceived likelihood of an incident. This perceived likelihood is strongly related to a driver's past experience of driving whilst fatigued. However, this was further extended to relate to choices regarding substance use to manage fatigue.

#### 10.2.2.5. Summary: Fatigue

Fatigue is a complex safety issue with a number of involved behaviours. A number of factors were identified which influence drivers' levels of fatigue and their decisions to continue driving whilst either outside of legislated hours or experiencing fatigue. Every

organisational factor discussed in Chapter 7 was seen to have some influence over fatigue. Additionally, with exception to the effect of national and global climate, every category of contextual factors identified in Chapter 8 was also seen to influence fatigue. When considering that the discussed driver shortage (section 8.2.2) may encourage organisations like Company A to rely on recruitment agencies, it can be argued that there is an effect of national climate on fatigue. Lastly, the only cultural traits, discussed in Chapter 9, which were not seen to be evident within discussions of fatigue were the beliefs that unsafe acts are unintentional (section 9.2.5.3) or ‘just like everyone else’ (section 9.2.5.4), the tendency for drivers to conform to the ‘trucking image’ (section 9.2.6.4) and the ‘go!’ mentality (section 9.3.3.2).

With the exception of a few cultural sub-traits, it can be seen that every contextual and cultural factor identified within Study Three was relevant to fatigue. Thus, fatigue is a complex issue which cannot be understood using traditional approaches to safety culture, which focus solely on either organisational or cultural factors. Table 10.1 displays each of the factors which were identified to influence aspects of fatigue within the above discussion, along with the valence of their effect. These factors were identified to influence either experienced fatigue, attitudes towards log books, driving over hours or driving whilst fatigued. They are categorised according to their source (contextual or cultural) and as either leading to improved or decreased safety (e.g. greater or lesser experienced fatigue, positive or negative attitudes towards log books, and more or less likely to drive whilst over hours or fatigued).

Table 10.1: Factors which influence fatigue-related behaviours

Outcome	Factors which reduce safety	Factors which improve safety
Experienced fatigue	Contextual Factors: General public Customer delays Road design and condition Truck design and maintenance Environmental conditions Load type	Contextual Factors: Government COR legislation
	Cultural Factors: Hard work	Cultural Factors: -
Attitudes towards log books	Contextual factors: General public Road design and condition	Contextual factors: -
	Cultural Factors: Uniqueness Time Common sense Fairness Low perceived likelihood Rules	Cultural Factors: -
Driving over hours	Contextual Factors: Customer delays	Contextual Factors: Organisational management. Government monitoring and enforcement

		Customer standards Accreditation requirements
	Cultural Factors:  Low perceived likelihood  Punishment avoidance  Money  Time	Cultural Factors:  High perceived likelihood  Safety  Experiential and narrative learning  Autonomy  Responsibility
Driving whilst fatigued	Contextual Factors:  Customer pressures and delays  Environmental conditions  Load type	Contextual Factors:  Organisational management  Broader industry
	Cultural Factors:  Limitations  Uniqueness  Hard work  Money	Cultural Factors:  Experiential and narrative learning  Perceived likelihood  Safety  Autonomy  Responsibility

### 10.2.3. Substance use

As discussed in section 4.2, there is a relatively small body of literature regarding illicit drug use within the heavy vehicle industry. It was also seen in Study Two (section 5.2.1), that members expressed differing views regarding the extent of drug use within the industry. For this reason, and given the sensitivity of substance use, relatively little information was gained from Study Three regarding drug use whilst driving.

One Company B driver stated regarding drugs that *“a lot of people say stuff that they don’t know anything about”*. Thus, it was indicated that much of the information gained could be myths. Further, one Company A manager stated that *“there are two types of people who use drugs; those who use it to stay awake, and those who are just drug users who happen to drive a truck”*. Therefore, whilst there may be aspects of heavy vehicle driving which could encourage illicit substance use, drug use may simply be a continuation of use not related to the industry. Prior to sharing this information, however, the manager quietly signalled to stop recording the interview. Whilst a small amount of sensitive information was provided during the time that the recorder was turned off, it was evident that even simple comments regarding drug use were shared secretively. Thus, despite ensured confidentiality, there may have been barriers to sharing such information, and the data collected regarding substance use may be biased or incomplete. For this reason, more targeted investigation of drug use is required to draw accurate conclusions.

Potentially due to the above issues, all the information gained regarding drug use in Study Three was provided by individuals who, though they may have used substance in the past, do not currently use drugs. The factors which were identified as relating to illicit substance use included those drawn from organisational systems, government enforcement, customer standards and a few cultural traits.

#### 10.2.3.1. The organisation and substance use

The organisation may play a significant role in influencing illicit substance use. Even general organisational factors were seen to influence substance use. For example, one Company B driver stated that, whilst drugs are used by some drivers, it seems to be mostly related to interstate truck driving over longer distances.

There are a number of factors originating from the organisation which may be related to decisions to use illicit substances. First, high levels of organisational pressure may be linked with the decision to use substances to continue working.

*I know that for this company I don't need to take the drugs, I don't need to work long hours. I can pull over and sleep no matter what time of the day and they won't call you up and harass you. I pulled up once for five minutes and woke up four hours later. I didn't hear a word about it. (Company B Driver Three)*

In addition to not applying extreme pressures on drivers, there are a number of organisational approaches to reduce substance use. Essentially, however, they all revolve around the use of drug tests. The owners of Company A have a strong objection to any drug use whatsoever. Thus, Company A managers indicated that the company conducts regular random drug tests, typically testing random drivers alongside an individual who is suspected of drug use. Further, in the event of an incident, Company A requires drivers to be tested for illicit substances. Random drug tests are also common within Company B.

*The policy in place, which is in that manual right, is if you get injured you're going to go down to our people, you're going to get drug and alcohol tested right and you'll be put on light duties. (Company A Health and Safety Officer)*

*We're taking you to our doctor and every time you go to the doctor you're going to be drug tested... And it's got a lot, it is linked in with our drug and alcohol testing too because we test based on suspicion as well... They need to stop and rest if they're in the middle of a trip or whatever. If there is suspicion then we organise drug testing. (Company A Manager Two)*

*We do random drug testing, drug and alcohol testing of a morning at a site. No one knows till they get to work and oh got a minute? Test. (Company B Region Manager One)*



#### 10.2.3.2. Government departments and substance use

Police officers monitor and enforce illicit substance use in drivers along the road. The introduction of police drug tests was suggested to have significantly reduced drug use within the industry. The combination of the cultural traits related to money and other gains, as well as punishment avoidance, increase the deterrent effective of this enforcement on many drivers. For example, one Company B driver stated that *“if you do take drugs, you’re going to get caught, you see blitzes on the highway and now they’ve got the drug swabs”*. Similarly, one Company A driver stated that drugs were *“not worth it anymore”*, as *“when your whole career depends on your licence you don’t want to jeopardise it”*.

*Other than that drink 47 cans of Red Bull every night I suppose or take drugs and run the risk of getting the drug swab somewhere I suppose. Pay money, take your chances I guess. That’s just staying awake. (Comapny A Manager One)*

#### 10.2.3.3. Customers and substance use

Similarly to fatigue, the customer can influence substance use through enforcing high standards on drivers. Whilst many customers will simply require drivers to make declarations regarding drug use, some larger customers will also conduct random drug tests.

#### 10.2.3.4. Cultural traits and substance use

A number of cultural traits were identified as being relevant to substance use. Within the above discussion of contextual factors, it was evident that the traits regarding money and other gains and punishment avoidance may influence the effect of government enforcement on substance use. Additionally, autonomy and the responsibility of the driver were evident in discussion surrounding organisational pressures.

The perceived likelihood of an incident was regularly cited as the reason for avoiding substance use. A number of drivers indicated that there was a significant safety risk associated with drug use. As stated by one Company C driver, *“I don’t care who I’m working for, I’m not taking drugs to stay awake”* because *“it’s my life at risk not theirs”*. Similarly, one Company A driver stated that whilst some drivers do take drugs it *“will catch up on you anyway”*. This driver stated that he doesn’t use drugs as he *“wouldn’t want to be one of those drivers in the paper having killed someone”*.

However, it was clear that this perceived likelihood of an incident was linked to more than simply crash events and extended to health outcomes. For example, one Company A driver indicated that prolonged drug use leaves people with *“no life in them”*, and that after a while drivers experience a *“meltdown”*.

*Back then I would run off three hours sleep for days. That’s why drivers would resort to drugs. It kills you in the long run, tears your body apart. Drug’s in the industry has really died off. Fifty to 75% of drivers are dead set against it. It only really happened in the last four to five years. They just think stuff it, it’s not worth it, it’s about me now and our safety. The roadside tests changed people’s minds. It kills the body, people have no life in them. Some guys take so much it no longer affects them. After a while on drugs you have a meltdown, your body just stops. Some of them realise it doesn’t help anymore and get off it.*

(Company A Driver Three)

#### 10.2.3.5. Summary: substance use

Despite limitations in the collection of data relating to substance use, a number of factors were identified as having a role in decisions regarding the use of drugs. With exception to organisational pressure, each of identified factors was seen to have a protective

effect on the likelihood of using substances. In the same manner as for fatigue, these factors are presented in Table 10.2, along with the direction of the effect they have on substance use.

Table 10.2: Factors which influence substance use behaviours

Outcome	Factors which reduce safety	Factors which improve safety
Substance use	Contextual Factors:  Organisational pressure	Contextual Factors:  Organisational monitoring and enforcement  Government monitoring and enforcement  Customer standards
	Cultural Factors:  -	Cultural Factors:  Autonomy  Responsibility  Money  Punishment avoidance  Experiential and narrative learning  High perceived likelihood

#### 10.2.4. Speeding

As discussed when examining the results of Study Two (see section 5.2.1.3), dangerous behaviours relating to speeding include: (1) unsafe speed for the conditions; and (2) exceeding the posted speed limit. Heavy vehicles are legally required to be speed limited to prevent speeds exceeding 100km/h. As such, this limiting technology only reduces speeding on highways with a posted speed limit of 100km/h or greater. Thus, it was concerning that many participants tended to define speeding as exceeding 100km/h. When asked about speeding one Company B driver stated, due to the speed limiter, *“I can’t speed”*. Similarly,

the driver/manager of Company C said that their drivers “*can’t speed because they’re limited*”. Given that a driver could drive at 100km/h on a suburban road with a posted speed limit of 50km/h, this perception is incorrect. Throughout the case studies, the role of organisations, government departments, the general public, customers and truck design factors were identified as relevant to speeding. Additionally, a number of cultural traits were identified as relevant to decisions regarding speed selection.

#### 10.2.4.1. The organisation and speeding

The organisation’s primary roles in speeding come from the method in which they pay drivers, and the approaches used to monitor and enforce speed adherence. Starting with the payment of drivers, hourly rates were again shown to result in safer behaviour. As stated by one Company B driver, payment by the hour means that “*you’re not really rushed*”. Another Company B driver discussed a passing truck stating “*these guys get paid by the load*” and that this is a “*good incentive to driver fast hey!*”

*Basically the drivers over at (previous employer location), they’re getting paid a kilometre rate. So it’s in their own interest to go like gun it all the time and they do gun it all the time. They’re doing Sydney for 10, 11 hours so you’re moving... Over here they get paid on an hourly rate so they’re not actually achieving anything by speeding and obviously our trucks are regulated to down to 95km and theirs are still 105, 110km. (Company B Branch Manager Two)*

Each company relied on two primary means to monitor speed compliance – satellite tracking and speeding infringement notices from government departments. The satellite tracking methods of each company were capable of detecting speeds in excess of a set limit. When set higher than the trucks’ speed limiters, this typically indicates that the driver has run off a hill. Company B staff discussed the use of daily printed speed reports from satellite

tracking, which provided the maximum speed vehicles were driving within six minute intervals. Similar approaches were utilised within both Company A and C.

Enforcement of speeding in each company was largely through non-conformance notices. For first offences and minor breaches, non-conformances were typically used to inform the driver that they were detected and to remind them to comply with the upper speed limit. As stated by one Company B driver, “*you won’t get the sack*”. Within Company A, one driver suggested that individual offences go unpunished, and that driver will be reminded to slow down, yet repeated offences are followed by non-conformance notifications, and/or one week without work and payment. However, one Company A driver stated that he “*had this truck up to 120m/h downhill but it was never followed up*”.

*Yeah like the...well all our trucks are limited to 100kms okay. If they roll them off a hill or something like that they may exceed up to a 105 or 108. Yeah we normally ring up the driver and say: Oh what’s the problem how come you put your foot down or what happened there? And we try and monitor that as well... Of course then we sort of have to say: Right, you know you’re going to get chastised for it. You know you’re not in deep shit just keep it down, keep your speed back like don’t run it off the hills. On the flats you know you’d be flat out doing a 100, 101 would probably be about the best because they’re all speed limited. (Company A Operations staff Member)*

Satellite tracking is also a useful means of detecting if a driver has tampered with their speed limiter. Prolonged breaches of the upper speed limit, that would not be possible from just a brief run-off, are seen as a sign of tampering. When this is detected the truck is typically checked by the mechanical team resulting in punishment if the limiter has been tampered with. Due to the ease of detection through satellite tracking, one Company A driver stated that you will get caught for tampering. Tampering with the speed limiter is deemed a serious offence by each company and is always accompanied by immediate dismissal.

Tampering with speed limiters is easy, you just put a wire or a box over it but you can't do it without being caught. Satellite tracking shows vehicle over limited speed for an extended period of time and you know they have tampered. People are sacked immediately for it, has happened a few times. (Company A Driver Three)

Whilst satellite tracking is primarily only used to monitor speeds exceeding the speed limiter, they can be used for breaches of posted speed limits. One Company B manager stated that the organisation can place different speed restrictions on certain locations. However, as this must be conducted manually, it was not common. Additionally, within Company C the managers of the company occasionally visually check whether a driver exceeds the posted speed limit. Finally, the provision of infringement notices to the organisation by the relevant government department provides additional monitoring. This typically occurs for speed camera enforcement. Speed camera detection typically results in similar penalties for the driver.

None of these methods is capable of detecting safe speed for the conditions. Whilst members of Company B indicated that they will remind drivers to be careful during rain, only members of Company C indicated that they actually monitor speed relative to the conditions (see section 7.4.3.1.2).

#### 10.2.4.2. Government departments and speeding

Government departments play a significant role in monitoring and enforcing speed limits. As monitoring methods were discussed in section 8.3.5.2, they will not be repeated here. Additionally, as discussed in section 10.2.4.1, heavy vehicles are required by law, unless incompatible as in some older trucks, to be fitted with speed limiting technology. However, it is possible to exceed this limiter by running off of hills, meaning the legislation only holds trucks to a maximum speed and only whilst on flat roads.

*The road speed is gutted at 100km/h. They will go faster than that off a hill because they're not gear-bound at 100km/h but I think they'll top out at just over 120 or something like that, 130. (Company A Manager One)*

#### 10.2.4.3. The general public and speeding

Interactions with members of the general public on the road also have an influence on heavy vehicle drivers' speed selection. As was discussed in section 8.4.3, members of the general public often delay truck drivers, due to a trucks inability to overtake. The combination of speed limiters and car drivers who are unwilling to be overtaken can cause significant frustration for truck drivers and a dislike of speed limiters. Due to such delays and the cultural value placed on time, it is common for drivers to subsequently speed to catch up lost time.

*So they get to an 80km/h zone or a 70 or a 60 and they just keep on going. They come into an 80km/h zone and say keep doing 100. And I'm sure you're guilty of doing it... you know you go down the road and it drops back to 80 for a section or whatever and you just keep it at whatever was the cruise control was set at. And it's the same as truck drivers that have been stuffed around for the last hour by someone so they just hold it flat through a village to make up that time. (Company A Manager One)*

#### 10.2.4.4. The customer and speeding

Whilst customer pressures may encourage speeding, it was generally stated that customers seek to ensure driver speed compliance due to their COR (chain of responsibility) requirements. Thus, as indicated in section 8.5.2, customers ensure compliance through the use of company audits.

*We don't really have a speed issue because all our trucks are set to the speed limit. There's plenty of other mobs that don't adhere to that but we're closely monitored ... there's a lot of trucks here that are painted (colour with customer name) on the side. We do a lot of work for them. We're very closely monitored and essentially they even do their own audit on us every... six or 12 months they audit us themselves. To make sure we're not breaking the law because under chain of responsibility these days they're in as much shit as we are because, as the customer, they're seen to push us to do the job. So you know they watch us just as closely as anyone else watching us. (Company A Manager One)*

#### 10.2.4.5. Environmental and situational factors and speeding

Whilst driving too fast for the conditions received little attention within the case studies, inclement weather can significantly reduce the safe travelling speed. A number of past incidents within Company A and C were the result of unsafe speeds for the weather conditions. Additionally, the design and upkeep of trucks is relevant to speeding due to the legal requirement for speed limiters (see sections 10.2.4.1-2).

#### 10.2.4.6. Cultural traits and speeding

A number of the cultural traits identified in Chapter 9 were linked with speeding behaviours. With exception to cultural traits categorised as the relationship between the industry or organisation and its environment, every category of cultural traits was seen to influence speeding. Traits from each of these categories will be discussed in order of appearance.

The cultural value placed on fairness was evident within speeding. The sole requirement of trucks to be speed limited was often deemed unfair. It was not suggested that cars be speed limited to the same speeds as trucks. Rather, given the speed that trucks are



limited to, it was argued cars should not be designed to travel as fast as current designs permit. For this reason one Company B manager stated that truck drivers feel like ‘sitting ducks’.

*Point-to-point cameras have been around for years you know. From the truck driver's perspective I guess he feels like a bit of a sitting duck. you know. It is hard to control but...governed, trucks are governed to 90, cars can do 220. Why do they need to do 200? Why on earth do we have a car that does 220km/h and gets sold to a 17-year-old on his birthday? There's nowhere in Australia you can do 220km/h, doesn't need to go that fast.*  
(Company B Branch Manager Four)

As referenced when discussing experiential learning and NOD (normalisation of deviance), one Company A manager stated that the organisation had experienced very few speed-related crashes, as they were mostly related to other causes. This was immediately preceded with discussions regarding truck drivers choosing to speed through towns. The lack of experienced incidents that were attributed to speed led to a false confidence in the safety of speeding.

*A lot of the highway is 100 but through the towns and that it is somewhat of an issue because blokes like to make up time so of course they speed through towns. We have very, very few speed-related crashes. They're normally road condition-related or stupidity-related or fatigue-related.* (Company A Manager One)

The same manager indicated that one driver from the company had previously spun a truck on a highway at high speeds, yet attributed this not to speed but to the stupidity of the

driver. This manager mirrored many drivers' perspectives on speed and highlights how false causal attributions can shape beliefs regarding the dangers associated with speeding.

The cultural value placed on time was also seen as significant to speeding, as driving faster reduces travel time. As with other behaviours, the issue of time is less relevant for drivers paid an hourly rate. However, non-financial motivations for saving time may influence speeding. One Company A driver stated that it is beneficial to reach a destination sooner in order to sleep before the sun rises. Point-to-point speed cameras, through the use of 30-minute intervals between cameras, can reduce this effect, as speeding requires the driver to stop before each camera. Nonetheless, drivers may speed to catch up on lost time and these cameras are incapable of detecting speeding if a driver experiences delays. Thus, point-to-point speed cameras only limit the maximum time between cameras and not speed.

*And because those safety cam times are worked out in a car with the speed limit set on cruise control, you know it's pretty exact. So if you're cranking it up through every town and then, like I said, the trucks are road speed limited to 100 but they're gear-bound at more than that so of course they run it off a hill. You can't stop anyone from doing that, although we frown upon it and that's one of the reasons we have satellite tracking to try and keep control of it a bit better. When they run it down a hill they're at 110 or 120. That makes up time. Where that car has been tested at cruise control, if you're doing 10km/h quicker for 30 seconds you're going to break that time. (Company A Manager One)*

It was often suggested that speeding is unintentional. One Company A staff member stated that truck drivers may miss the posted speed limit and drive at the speed that 'feels' right for the road. Due to the potential for unintentional speeding, many drivers were suggested to time the trip between point-to-point speed cameras to avoid punishment. Whilst

this was indicated to be done to avoid unintentional speeding, one Company A manager suggested this was a deliberate punishment-avoidance strategy.

*But you know everyone does it, it's not a purposeful thing, it just happens you know. There's blokes that have got stop watches in their truck that time themselves so they're not going to break those times. If they are they just pull up and wait before the camera and then drive through it. Mate you go down the highway every night of the week and there's plenty of trucks that are just really quick trucks and they'll go blasting past you and you get to the next camera and they're all pulled up. Because they're too quick for the cameras so they wait, go through the camera, go blasting past you again and you find them another hour down the road just waiting. (Company A Manager One)*

The desire for money and other gains were also seen to be related to speeding. Some influences of gain were positive in nature, such as the desire not to shift a load by driving too fast around corners. However, within companies which pay a distance-based rate the desire for money is a significant motivation to speed.

The truck driver's desire to fit in with the 'trucking image' may also influence speeding. Whilst there were no instances of this occurring during the case studies, drivers indicated that companies which have lower set speed limiters were often disliked and criticised by members of the industry. Additionally, one Company B driver did indicate that many drivers complained when it was suggested that the company reduce their speed limit as "*interstaters would be grief, they'd run us off the roads*". Thus, it is clear that a desire to fit in with other truck drivers did influence perceptions regarding the upper speed limit.

There were a number of second and third order traits which also were evident in discussions surrounding speeding. First, drivers' beliefs about luck and the likelihood of incidents were often expressed when discussing speeding. Participants appeared to generally

believe that speeding was a hazardous behaviour. As stated by the driver/manager of Company C *“it’s dangerous to speed, shit yeah”*. Similarly one Company C driver stated that another driver involved in a crash *“was lucky he wasn’t going faster”*. More generally, one Company A driver said *“these things (trucks) are too dangerous (to speed) as far as I’m concerned”*. Conversely, a number of drivers did not hold these same views. For example, one Company A driver disregarded the effects of speed by suggesting that speed was irrelevant if someone cuts in front of you. As this driver believed that most incidents were caused by other vehicles, speeding was not considered dangerous. Similarly, one Company A driver stated that he was unlucky to have been caught for speeding, indicating that he anticipated being able to speed without detection.

The issue of detection relates directly to beliefs regarding rules and regulations. Within the case studies there were mixed views regarding methods of speed monitoring and enforcement. As already stated, many drivers dislike speed limiters due to interactions with cars. It was also evident from one observed toolbox meeting that some drivers do not like satellite tracking (see section 8.6.1). Nonetheless, the combination of satellite tracking and speed limiters was seen as positive by some drivers. For example, one Company B driver stated that the required speed limit used within their company protected them from incidents and fines.

Regarding government legislation and rules, a number of Company B drivers also suggested that speed limit compliance held significant safety benefits. One driver in particular stated that *“you do the speed limits for a reason, the signs are on the road for a reason, they’re there for safety”*. This belief in the dangers of speeding extended to many drivers’ attitudes towards monitoring and enforcement.

Unfortunately, however, many drivers find ways to speed within point-to-point speed cameras without detection. It was often stated that drivers would speed when going down

hills thus catching up lost time between cameras. One Company A driver also suggested that timing trips between cameras could be difficult when driving less heavily loaded vehicles which lose less speed going up hills. The driver stated that he will often stop prior to speed camera locations if he suspects he may have caught up too much lost time. Such strategies clearly bypass the intentions of these cameras, as rather than comply with speed limits drivers may choose to speed and then take a brief break before the camera.

The familiarity drivers have with the roads they travel may contribute to this problem. One Company A driver pointed at a series of upcoming speed cameras, describing in detail the coloured lights which were on them, even indicating that he was unsure what device was responsible for a specific colour. This case demonstrated that drivers know the location of most fixed enforcement. Thus drivers can avoid detection in these locations.

*SAFE-T Cams don't stop you from speeding. There are hills between the cams so you lose speed up the hills and can go like hell down them. Out of Sydney you will get trucks that will pass you three to four times in the night. Fatigue is still managed well with the cams, but speed isn't. Going through towns slows you down so you go like stink on the highway and at daytime you hit traffic lights which can add five minutes to your time. If they were closer together it would help. It would be easier just to download the data from the trucks computers. Engine computers can't lie. (Company A Driver Six)*

#### 10.2.4.7. Summary: Speeding

A number of contextual and cultural factors interact to shape drivers' attitudes towards speeding and speed regulations, and their behaviour. Speeding was only moderately influenced by the organisation, their customers and government departments. Both organisational and government monitoring and enforcement possessed a number of weaknesses, resulting in speeding being able to occur without detection. Thus, speeding is

predominantly a cultural issue. Whilst many cultural traits were seen to influence speeding, these traits appeared to be either activated or dormant depending on the driver's view of the likelihood of an incident resulting from speeding. Increasing the perception that speeding is dangerous, particularly through the use of narratives, appears the most beneficial route to improving speed compliance. As with each of the previous behaviours, the factors identified throughout the case studies as being relevant to speeding are displayed in Table 10.3.

Table 10.3: Factors which influence speed-related behaviours

Outcome	Factors which reduce Safety	Factors Which improve safety
Speeding	Contextual Factors:  General public,  Environmental conditions,	Contextual Factors:  Organisational payment, monitoring and enforcement  Government monitoring and enforcement  Customer standards  Truck design and maintenance
	Cultural Factors:  Normalisation of deviance  Low perceived likelihood  Unfair  Time  Unintentional  Money  Keeping up the trucking image  Rules  Punishment avoidance	Cultural Factors:  Experiential and narrative learning  High perceived likelihood  Safety

### 10.2.5. Seatbelt use

Seatbelt use was a significant issue within the studied organisations. Drivers from Company A and C rarely wear seatbelts. However, a small selection of drivers did wear seatbelts the majority of the time (typically not on short trips), including two Company A drivers who specifically assisted the researcher to locate his seatbelt. Conversely, every observed Company B driver wore seatbelts. Whilst there was the potential for police fines, seatbelt use appeared to be a solely cultural behaviour.

Beliefs regarding the safety benefit of seatbelts were most relevant to their use. A number of drivers stated that they solely used seatbelts for protection during an incident. One Company B driver stated that he had always worn seatbelts as they increase the likelihood of staying within the truck cab. Similarly, another Company B driver stated that he wore a seatbelt as he doesn't "wanna die in a crash". Some drivers however, held mixed views of the benefits of seatbelts, largely based on the expected outcomes of a roll-over or driving into a river or creek. One Company B driver said he was "not sure if seatbelts actually help, probably like a car, sometimes yes, sometimes no, if you go into a creek with one you're stuffed".

*I don't always wear my seatbelt, sometimes I jump in and forget it on a short trip, but yeah you wear it for safety. You have your days when they just annoy you, but this day and age you never know when a car will come up behind you and tell you to pull over. Some days I'll drive down the highway and put it on when I get to Brisbane. If you roll it doesn't matter if you wear it or not but you could get thrown out. Sometimes they are a hindrance, sometimes they save your life. I'd rather be stuck here in the cab than thrown out the window and under the trailer. If you roll they say you can jump across but where are you gonna go. I had a friend who would have died if he wasn't wearing it. I never hop in a car without one though, in a car without a seatbelt you just feel naked. (Company B Driver Six)*

As discussed in section 9.2.3, drivers place significant trust in stories of other drivers. This was evident with seatbelt use, as every driver had stories of individuals who would have died if they were wearing a seatbelt. These stories are likely inaccurate, as there is no proof the driver would have died, yet these stories are typically trusted. As stated by one Company A driver, *“I have had a few friends crash without a seatbelt and said that if they were wearing it they would be dead”*. However, another Company A driver indicated that such incidents may differ depending on load being carried. It was stated that as grain transport carries a higher risk of roll-over, grain transporters should not wear seatbelts. Nonetheless, given the loads carried in Company A, seatbelt use was argued to be beneficial as *“you can’t control the truck if you get thrown out of your seat”*.

A number of other cultural traits also appeared in discussions regarding seatbelt use. Monetary losses associated with fines were seen to convince some drivers, who believed seatbelts were dangerous, to wear them. Thus, to avoid punishment seatbelt use was deemed necessary, often due to past fines. One Company A driver referenced a previous fine received for not wearing a seatbelt, detected through light reflecting off the buckle alerting a police officer on the side of the road. Due to this experience, the driver stated that he now always wears a seatbelt until the police officer sees it. Additionally, other gains such as comfort were seen to be relevant to seatbelt use (see section 9.2.5.4).

Whilst each company suggested that they expect their drivers to wear seatbelts, they appeared to have no method of monitoring their use. A lack of organisational emphasis on seatbelts was evident within Company A, partly due to the perceived autonomy of truck drivers. One Company A manager stated that *“all trucks are fitted with seatbelts, doesn’t mean they’re going to wear them”*, continuing to state that *“it’s the same as me, you taking me to the shop it doesn’t mean that I put my seatbelt on just because it’s in the car and you can say put your fucking seat belt on doesn’t mean I’m going to do it”*. Further, however, it



was suggested by the manager that as seatbelts were a common sense issue, there is no need to tell drivers to wear them. Though this statement was immediately followed by reference to the perceived danger of seatbelts.

*I believe tailgating is in the induction stuff. Seat belts, that's a good question I mean I suppose, I could be wrong here, it may be in there, I don't recall it, but I suppose you probably wouldn't have to, I mean you don't tell them to breathe when they get in the truck, why would you need to tell them to put a seat belt on although you know most blokes don't because they think it's safer without it. And quite often it is, in a truck. (Company A Manager One)*

Unlike other behaviours, seatbelt use appeared to be almost exclusively influenced by story-based beliefs about the benefits of seatbelts and beliefs about the likelihood of being punished. However, from the statements of the Company A manager above, it was apparent that there may be other cultural traits which present a barrier to the implementation of better monitoring and enforcement strategies.

#### 10.2.6. General driving errors and violations

As stated in section 4.2, driving errors and violations are a broad selection of behaviours relating to the driven path of vehicles and the manner in which this path is driven. Errors can be viewed as unsafe vehicle movements on the road, and violations as deviations from road rules which govern such movements. There are a number of contextual and cultural factors which were seen to influence the likelihood of errors and violations. These included the design of trucks, a number of cultural traits, and the role of the organisation and the government.

#### 10.2.6.1. Vehicle design and driving errors and violations

The design of heavy vehicles can influence the likelihood of incidents in a variety of ways (see section 8.8.2). It is worth noting, that many modern designs of vehicles possess technology aimed to reduce the effect of errors and violations. For example, during the observation of one Company A driver, a warning sound indicated the presence of a car to the rear end of the vehicle. Such technologies can reduce the likelihood of errors and warn the driver to take additional precautions; however, these technologies were not common in the studied organisations.

Given that errors and violations are typically inconsequential without the addition of another vehicle, members of the general public typically appeared in discussions of driver errors. As discussed in section 8.4.2, members of the general public were believed to lack sufficient understanding of truck design limitations and present a significant hazard to drivers. For example, one branch manager indicated that Company B has previously experienced incidents where trucks have backed into a vehicle they were unable to see.

*And obviously we're dealing, we have a lot more with the public or the public are in that area around them. As you know, the public, they don't think that the driver won't be able to see them backing out, we have Pantech body (word lost) it's totally blacked out. If they're not in the view of the mirrors then the driver can't see them. Obviously we've had one or two instances where they've backed into a car that's been passing because he didn't know the driver was going to keep on coming out you know, pretty straight forward things to anybody like ourselves. It's a straight forward thing, how can the driver see you? So we have had a few of those instances, that's one area about that. (Company B Branch Manager Two)*

It is worth noting that other truck drivers typically assist one another in overcoming the limitations of trucks (see section 8.7.4). Truck drivers will often flash their lights or provide radio calls to indicate if it is safe to merge or overtake.

#### 10.2.6.2. Cultural traits and driving errors and violations

Many of the cultural traits identified in Chapter 9 have a significant role in errors and violations. Of particular note are those which relate to the nature of truth and reality. As noted when discussing NOD (section 9.2.3.1.1) behaviours are commonly regarded as acceptable when incidents are attributed to other causes. It appeared that many error or violation-related incidents were attributed to individual stupidity, thus implicating the cultural trait of common sense. Additionally, the tendency to label errors and violations as ‘driver error’ may relate to the perceived responsibility of drivers.

In addition to these direct relationships, perceptions relating to the likelihood of incidents influenced the caution taken by truck drivers to avoid such errors. For example a number of drivers indicated a perception that incidents were likely and, thus, took additional precautions such as slowing down when other vehicles were close.

#### 10.2.6.3. The organisation and driving errors and violations

The organisation can play a role in limiting errors and violations through recruitment (see section 7.3.1), training (see section 7.3.3 and 7.3.4) and load choices. As these processes have already been discussed in detail only brief discussion is provided here. Members of each company indicated that organisations have a role in determining which drivers receive employment, potentially reducing drivers who are more predisposed to errors or likely to commit violations. Additionally, it was indicated that training, particularly regarding load types, can influence error rates. Lastly, the type of load being carried is typically determined

by the organisation when accepting jobs. Given that load type may influence the limitations of the vehicle, exposure to these risks are filtered by the organisation.

*But when you get into the over-dimensional freight where it's wider than what the trailer is, or if it's super high load, you've got to take into consideration of are you going to hit anything through the course of the journey. And the same for the width, you've got to be considerate of who you put on there, it's got to be a person that's experienced in that sort of work that knows the hazards to look for and knows that driving around corners, you've got to take a wider sweep to get around corners and that sort of thing. (Company B Operational Manager)*

#### 10.2.6.4. The government and driving errors and violations

Government departments and enforcement officers can also influence driving errors and violations. Though receiving little attention within the case studies, this influence is evident in punishment of road rule violations. Additionally, a significant degree of attention was given to licensing (see section 8.3.5.1), which it was indicated determines the level of experience and knowledge held by drivers, thus influencing the chance of an error.

#### 10.2.6.5. Errors and violations summary.

There are a number of factors which influence driving errors and violations, including the design of vehicles, cultural traits, organisations and government departments. Additionally, interactions between these factors with members of the general public were also seen to influence these behaviours. See Table 10.4 for a list of the factors found to be associated with driving errors and violations, and the direction with which they influence safety.

Table 10.4: Factors which influence general driving errors and violations

Outcome	Factors which reduce safety	Factors which improve safety
Driving errors and violations	Contextual Factors:  General public  Government licensing	Contextual Factors:  Organisational recruitment and training  Truck design  Load type  Broader industry
	Cultural Factors:  -	Cultural Factors:  Experiential and narrative learning  High perceived likelihood  Common sense

#### 10.2.7. Vehicle maintenance

As discussed in section 4.2.1.3.5, there is significant research demonstrating the effect of vehicle maintenance on crash outcomes. A number of participants highlighted the importance of maintenance, with one Company A driver even stating that *“accidents are often operator error, or simple errors or broken equipment”*. As vehicle maintenance is conducted by mechanical staff, maintenance cannot be the target of the identified cultural traits which are present in drivers. In fact, vehicle maintenance was considered a contextual factor in Study One. However, throughout the case studies, it became evident that vehicle maintenance requires the input of drivers in conducting vehicle inspections and reporting problems, and that there were a number of organisational, governmental and cultural factors which influenced the accurate completion of such inspections.

### 10.2.7.1. The organisation and vehicle maintenance

The organisation can influence maintenance through purchasing quality trucks, conducting maintenance on their own vehicles and requiring drivers to complete vehicle inspections. Whilst the purchasing of trucks and conducting of maintenance is clearly important to driver safety, the current discussion focuses on vehicle inspections. As was discussed in section 8.6, the organisation can only conduct their own complete maintenance if they have the associated NHVAS accreditation. Both this accreditation and TruckSafe accreditation require organisations to complete regular vehicle inspections. In order to ensure that mechanical staff maintain vehicles sufficiently, it is necessary for drivers to conduct regular inspections and report any identified problems.

*That's certainly very important for the driver's safety. Pre-start, go round and check your vehicle, make sure you've got no, you know, nothing that's visually you can see that loosening if I go down the road, the wheel nuts might fall off or you know there's a serious oil leak or something that can affect the vehicle's operation which could result in them having a motor vehicle accident. And that's why we push them fairly constantly for...that's just, that's part of their job. As important as it is to drive the truck and certainly some vehicle pre-start is an important part as well to ensure when you leave you know your truck is to your; because they're not all mechanics. But like you and I look at our car you're not going to drive down the road if you've got a flat tyre or something. Or nearly flat. So it's just as important to the guys as that. Especially if they're pulling a trailer, they might walk around and someone else has loaded the trailer the day before and might have had an oversight or it mightn't be tied down as well as it should be, so that's why certainly it's critical that their pre-start is done. So they do a visual check of the vehicle to make sure that before they're on the roads it's safe to do so. (Company B Region Manager One)*

Each of the studied organisations required drivers to conduct a pre-trip vehicle inspection, covering a range of factors including tyres, oil, water, lights, and trailer connections. It was noted by one Company A driver that the inspection forms also leave space to note if any problems are identified during the trip and each vehicle has a maintenance request book for any major concerns.

Within each of the organisations, failure to complete these forms was met with a non-conformance notification. As stated by one Company A driver, you receive a non-conformance “*if you don’t fill out your paper work perfect and don’t tick every box*”. This is typically monitored and enforced through regular paperwork audits.

*But yeah in terms of our non-conformance system every week I go through 15% of work diaries, 100% of pre-trip inspections and I go through mass as well and record all the mass. So if a driver from my perspective hasn’t been filling in work diaries correctly, hasn’t been taking the legislated breaks, if they’ve just missed one box on their pre-trip check form or again haven’t been filling it out correctly, then they’ll get a non-conformance from me. I try and do the majority of them on a weekly basis but I do leave filling out the forms incorrectly for a month. (Company A Manager Two)*

*When the drivers fill in their audit checklist, we’ve got (trainer name) down the front there. He’ll actually go through and make sure all the numbers are checked, the dates are correct, the driving hours correct. Breaks have been taken, is the fitness for duty checked? So there’s a process in place that we do the following morning. So whatever happens today all happens yeah tomorrow. (Company B Branch Manager Five)*

#### 10.2.7.2. Government departments and vehicle maintenance

Sufficient vehicle maintenance is a legal requirement. There is also a strong partnership between government departments and accreditation bodies, due to the fact that regular

government inspections have been replaced with organisational accreditation for conducting maintenance.

*You went for your yearly machinery inspection... (accreditation) it's fairly easy for us in the respect or whatever was that I think we'd been doing machineries for probably 10 or 15 years and never had a recall. So when the maintenance management scheme come in we got it fairly easy because we had a good record. Like I was paranoid about machinery inspections, absolutely paranoid that I would fail. To the state that I would change the brakes if they'd quarter worn out the day before the machinery so that everything was right, and I did no, that's a lie, I got failed once for a number plate light... That's their job mate.... Each year they had a special thing that they would look for, that's what I think. Like some years they were on something, some years they were on something else. If there'd have been a fatal somewhere where you know it had been found that something had been broken on the truck well that would be their, they would go straight to that yeah. But no machinery inspectors as machinery inspectors they were pretty good. They were really good.... No it's better for us because, like I said, back in the machinery inspection days you would change things leading up to an inspection that didn't need doing. You know what I mean? Whereas now you do them as they need doing. Like I say we run them over the pit every time they come home from a trip, bingo. Reasonably long trip, not as if they just go to town and back again. You know up to 400km trips and things like that which is an 800km by the time you go and come back. We'll say 1000km, round figures. Right? Every truck goes over the pit, it's greased, it's looked at and if there's brakes or something dodgy or getting down to the point of jumping a cam or something like that, it gets changed.*

(Company C Driver/Manager)



Maintenance can be enforced by on-road transport inspectors. One common example of this enforcement was infringement notices for faulty speed limiters which are issued to drivers detected exceeding 100km/h. However, it is typically the accreditation bodies that monitor and enforce maintenance. During the observed TruckSafe audit, the auditor indicated that the Queensland Department of Transport and Main Roads require organisations to provide objective evidence of maintenance. It was stated that one method of providing such evidence was to examine department records of infringement notices. Additionally, however, the organisation is required to keep up-to-date records of both identified mechanical problems and the maintenance conducted. This was seen as frustrating by the driver/manager of Company C, due to the lack of past mechanical problems.

*We've been doing it for years anyway except it's just not written down and it becomes a pain in the arse because there's things on that that are silly things. Yeah ... Not irrelevant, they're silly little things. Like you've got brakes and you've got tyres and you've got your steering and your king pins and your ring feeder are the main things. Like things one side light out or that that's not a safety issue. A kangaroo could have run into it going down the road do you know what I mean? You know like safety issues you know they can pin you for having a side light out and that's not a safety issue mate, that's...the rules are there's got to be five side lights on each trailer. Well if one's out there's still four you know. It's not as if they're all out. And then the other thing, since LED lights like you'll probably ask this question what's the best thing that's happened? Well I'll tell you. It was tubeless tyres and LED lights. You were always changing bulbs and tube tyres were a pain in the arse. LED lights and tubeless tyres I reckon. Yeah. (Company C Driver/Manager)*

Additionally, as noted within section 8.3.5.1, the lack of mechanical understanding necessary to receive a truck licence was criticised. This was seen as illogical due to a requirement of mechanical knowledge for forklift 'tickets'.

### 10.2.7.3. Cultural traits and vehicle maintenance

A number of cultural traits identified in Chapter 9 were seen to influence vehicle inspections. The traits most connected with this behaviour were related to the value placed on safety and the perceived likelihood of an incident resulting from failure to complete vehicle inspections. As discussed in section 9.2.2.4, drivers will go to great lengths to ensure safety. Pre-trip inspections were deemed significantly important due to the perceived likelihood of an incident occurring. For example, one Company C driver stated that *“you’ve gotta have an ounce to check the truck properly”* as even a small tyre leak *“could be a fucked seal or a bearing; you could get down the road and the wheel could come off and hit a car”*. Similarly, one Company A driver stated that he always checks the trailer pins as, if they are not correctly in place, the trailer could detach from the truck and *“it could be fatal and you’ll get a fine and it ruins your night”*.

*Oh your steering and your tyres mostly, steering, tyres, lights. Yeah steering is probably your, like your steering components taking steer tyres, ball joints all that sort of thing. Brakes are a big issue, but brakes in our business is just a normal every day, because of where we go. Every time the truck goes over the pit for a grease its brakes are checked. There’s only one thing between you and a post is your steer tyres and your brakes. And drivers are happy with that, you know drivers are, because they have daily checks and all that they’re responsible for their own safety to make sure that it’s within spec. (Company C Driver/Manager)*

Aside from the perceived likelihood of an incident, it was also noted by a number of drivers that breakdowns are a significant inconvenience warranting adequate inspections. Thus, drivers were motivated by an unwillingness to lose time on the side of the road waiting. Conversely, despite valuing maintenance, many drivers viewed the requirement to complete an inspection form and certain aspects of pre-trip inspections as unimportant. A number of

drivers perceived that their personal knowledge of the vehicle they were driving reduced the need for a thorough inspection. Thus, cultural traits such as time and punishment avoidance were more important to these drivers. For example, one Company A driver stated that due to the time requirement of a full inspection *“you just tick it off”*. This appeared common within Company A, also relating to the fact that enforcement was based purely on the completeness of forms, rather than a subsequent inspection. Thus, another Company A driver stated that *“if you don’t tick it off you get in shit, so I just tick it all off, if you know the truck you know how it will run, they are just covering their arses, you just tick it all off”*.

#### 10.2.7.4. Summary: Vehicle maintenance

Though vehicle maintenance is conducted by the organisation, drivers are required to complete regular vehicle inspections. Organisations, government departments and accreditation schemes influence the requirement of drivers to complete such inspections. The perceived likelihood of an incident or breakdown from poor maintenance appeared to be strongly linked with completion of inspections, as did the perception that punishment could be avoided without compliance. See Table 10.5 for a list of each of the factors seen to influence vehicle maintenance inspections.

#### 10.2.1. Load restraint (Company B only)

Within Company B a significant amount of attention was granted to adequate load restraint. Whilst one Company A driver briefly stated that he could be held accountable for insufficiently restraining a load, there was no other detail provided. This does not mean that correct load restraint was unimportant within Company A, simply that members of the company did not provide sufficient information. Conversely, as Company C transports livestock they are not required to restrain their loads. Prior to exploring the factors which contribute to load restraint within Company B, it is worth noting that this section will only

Table 10.5: Factors which influence vehicle maintenance-related behaviours

Outcome	Factors which reduce safety	Factors which improve safety
Vehicle maintenance inspections	Contextual Factors:  Government licensing	Contextual Factors:  Organisational material safety  Organisational monitoring and enforcement  Government monitoring and enforcement  Accreditation requirements
	Cultural Factors:  Low perceived likelihood  Punishment avoidance	Cultural Factors:  High perceived likelihood  Safety  Other gains

detail adequate restraint related to road incidents, and not injuries sustained during restraint which are discussed in section 10.3.

Adequate load restraint requires a number of behaviours, including correct loading, sufficient restraint and ongoing examination of the load. Adequate restraint is the responsibility of all COR members. Thus, the organisation and customer play a role in load restraint. Additionally, government enforcement can deter incorrect restraint. Additionally both environmental factors and a number of cultural traits may influence restraint.

*Whatever you're carrying, you have to stop at points throughout the drive to check your load restraints, check they haven't come loose. If you're carrying a large piece of mining equipment, that tension can come loose with the vibration of the road, vibration of the vehicle so you'd have to pull over every few hours to check them. (Company B Director)*

#### 10.2.1.1. The organisation and load restraint

Company B ensures adequate load restraint through a number of means. First, they regularly train their drivers on proper load restraint. Many drivers from Company B had a high level of knowledge regarding load restraint. Drivers often discussed estimates of the weight of items and the amount of restraint provided, both through direct (strap contact) and indirect (contact with a strapped item) means. Additionally, however, many drivers discussed the most effective means of restraint with one another and, at times, their relevant manager.

*We'll undertake training, load restraint training with them and various other training modules. I think we've been able to develop a culture in a couple of those sites where the guys actually now think all the time about safety because we've been able to show them what happens if they don't through our customer sends us anything that they get nationally, any significant safety occurrences. We'll then feed it back to our guys, look what happened in Victoria, look what happened in NSW, beware of this when you're doing it. (Company B Region Manager One)*

Company B also monitors load restraint through feedback between the organisation and the customer, and load audits. The organisation was indicated to have a strong, open, relationship with their steel products customer. This is particularly relevant to ensuring correct loading, as it is the customer that conducts loading.

*Safety is safety, so it depends on what we're aiming for. Like if we go through the drivers themselves we've got procedures and policies in place to make as I said the drivers' hours are correct, their fitness for duties, we do load audits. So if we're not happy with the loads that are loaded by (steel customer) we have load audits in place and risk assessments can be completed. (Company B Branch Manager Five)*

### 10.2.1.2. The customer and load restraint

Due to COR requirements, customers must also ensure adequate load restraint. In every Company B observation, the customer loaded the goods prior to allowing the driver to restrain the load.

As it is predominantly the driver's responsibility to then restrain the load, the driver is often also required to complete a declaration form indicating that he has inspected and restrained the load properly. In addition to these measures, one manager noted that their customer provides extensive guidelines regarding restraint of various items.

*A lot of our customer's customer's site probably half of our vehicles are loaded of a night when our driver is not there. So he comes in the morning when all the movement and all the loading has happened, he comes in the morning, restrains it and then goes. So it takes him out of that process, but there's you know someone is here while they're trying to load the vehicle as well, we try and split that up. Loading of an evening, delivery during the day.*

(Company B Region Manager One)

*Yeah well (Steel Customer) guidelines ...there's a whole book on (Steel Customer) guidelines it's as thick as you can get, it's that book there... That's guidelines and that's what you've got to go to. If we're auditing a load and we're not sure, I go to any section, any product we carry. Australian guidelines for miscellaneous equipment like pipes and all that. So it has all these guidelines and you can refer back to whatever you want, but it's the whole board there.* (Company B Trainer One)

### 10.2.1.3. Government departments and load restraint

Aside from COR legislation, transport inspectors also have a significant involvement in monitoring and enforcing safe load restraint. This is largely enforced at weighbridges located along the highways. Due to the potential for detection one Company B driver stated that it

was important to restrain the load correctly as if even a *“strap is twisted it reduces the load rating of the strap and you’ll get a \$130 fine”*. Many members of Company B felt that these requirements were acceptable and important, and it was indicated by one manager that the organisation chooses to exceed the legal requirements.

*But that’s the only aspect towards the government side I think (Company B) here and (Steel Customer) we, I think the law is 80% restrain your load, but we do it 100% here. You know we go, we got 20 tonne on, it’s five four-tonne chains, simple as that. Whereas elsewhere the law says you’ve only got to restrain 80% so you can put four chains on.*  
(Company B Trainer One)

#### 10.2.1.4. Environmental factors and load restraint

Both truck design and load type, discussed in section 8.8, can play a significant role in load restraint. Many taught-liner trailers require metal gates to prevent the load from piercing the canvas side. Conversely, it was noted by one driver that the trailer he was driving used Kevlar reinforcements within the canvas, reducing the requirement for these gates and the number of straps required to restrain the load. A number of other trailer design factors were discussed, including the use of ‘bearers’ on steel-carrying trucks, which lift the load to ensure it can be ‘belly wrapped’. Thus it was evident that the trailer’s design can play a significant role in assisting the driver to adequately restrain the load and reducing the level of driver input in restraint.

In regards to load type, the majority of information gleaned from Company B related to transporting steel. It was, however, noted by one driver that you cannot be complacent when loading as it is *“different for every load”*. Thus, regardless of the type of goods carried, each individual load must be restrained uniquely. As discussed in section 8.8.4.3, there are a

number of specific factors related to steel which influence load restraint requirements. These requirements will not be further discussed.

#### 10.2.1.5. Cultural traits and load restraint

There were two primary cultural traits which appeared to be relevant to load restraint within Company B. These were the value placed on safety, and the perceived likelihood of an incident. As discussed in section 9.3.1, the reliance on SORs within Company B increases the perceived likelihood of an incident, due to the value placed on stories and experience within the industry. Many drivers viewed incidents as likely to occur without sufficient load restraint. Additionally, it was noted that poor load restraint is not only a threat to the driver, but also a threat to members of the general public.

*How would you be if you lost a load on a family? Fuck dying yourself, that would be worse. I might sound like a do-gooder. I'm fucking not I tell you, but I just don't want to get in strife. I wanna drag this life out as long as I can. You need to know the right stuff when it comes to loading so you have to ask the right questions. I've got a few questions I need to ask (trainer name) when he gets back. (Company B Driver Three)*

#### 10.2.1.6. Summary: Load restraint

The factors which were seen to be related to adequate load restraint, and the direction with which they influence safety, are depicted in Table 10.6. It was seen that every member of the chain of responsibility – drivers, organisations and customers – play a significant role in ensuring the safe restraint of loads. Additionally, whilst government enforcement was evident, it was clear that for Company B and their drivers the risks associated with incidents were sufficient to warrant going beyond legal requirements and ensuring safety.



## 10.2.2. Crash outcomes summary

From the above discussion of crash outcome-related behaviours, a number of general points can be made. Crash-related behaviours are often the product of various contextual and cultural factors. Many of these factors influence behaviour through interactions with other factors. This aligns with the definition of safety culture provided in Chapter 2, which argued that cultural beliefs and values interact with contextual factors to produce visible patterns of behaviour which influence safety. Whilst seatbelt use was suggested to be ‘almost exclusively’ influenced by cultural factors, even within this behaviour it was evident that past experience of government enforcement shaped driver behaviour.

Table 10.6: Factors which influence load restraint-related behaviours

Outcome	Factors which reduce safety	Factors which improve safety
Load Restraint	Contextual Factors:  -	Contextual Factors:  Organisational training, monitoring and enforcement  Government monitoring and enforcement  Customer standards  Truck design  Load type
	Cultural Factors:  -	Cultural Factors:  High perceived likelihood  Safety

Chapter 2 argued that much of the previous research on safety culture emphasised the role of the organisational factors on safety behaviours. Whilst the case studies did highlight the importance of organisational factors, no behaviour was seen to be solely influenced by the organisation. Thus these traditional approaches to safety culture are vastly insufficient to explain road safety within the heavy vehicle industry. Conversely, due to the high number of contextual factors which influenced behaviours, the interpretive approach to safety culture (which emphasises cultural beliefs and values) is also insufficient to explain road safety in the heavy vehicle industry. Thus the synthesised conceptualisation of safety culture (see section 2.3.5), which was the guiding framework for the current research, appears uniquely suitable for road safety behaviour within the heavy vehicle industry.

Whilst quantitative investigation is required to statistically demonstrate the relative impact of each factor, and thus the most beneficial routes to improving safety, it appears likely that this model could provide significant improvements to safety. First, within each of the discussed behaviours it was evident that a high perceived likelihood of negative outcomes was associated with safe behaviour. The finding that perceived likelihood was heavily influenced by experience and stories within the industry suggests that the use of narrative education methods could significantly improve safety. This was further supported by the higher level of compliance seen within Company B, who utilised SORs in training sessions. Additionally, however, careful examination of each of the contextual factors which influenced behaviour, and the way in which these interacted with cultural traits, may provide useful approaches to reduce negative contextual influences.

### 10.3. NON-DRIVING INJURIES

As discussed in section 4.2.2, a significant proportion of injuries sustained by truck drivers occur under non-crash circumstances. These non-driving injuries come in a variety of forms and typically occur during loading and unloading, or checking a load during transit.

Given the varied forms of injuries and behaviours that can lead to these injuries it is difficult to separate these injuries into behavioural categories. Shibuya et al. (2010) analysed text descriptions of incidents from a Danish trucking firm. Amongst other variables, Shibuya et al. used mechanisms of injury to categorise incidents including: (1) slips, trips and falls; (2) overexertion; and (3) being struck by, or pinned between, objects. These three mechanisms overlap with the data collected in Study Three. Due to the lack of sufficient information for many specific behaviours, the categorising of data into mechanisms of injury is more beneficial in identifying how contextual and cultural factors interact to contribute to injuries. The following section starts by examining general factors which either relate to multiple mechanisms of injury, or the mechanism of injury was not specified. The remainder of the section provides specific analysis of the factors related to: (1) being struck by an object; (2) slips, trips and falls; and (3) muscular strains and overexertion.

#### 10.3.1. General points regarding non-driving injuries

There were a number of factors which were generally linked with non-driving injuries, though not specifically indicated to operate through a single mechanism of injury, including organisational, government departments, customer and load-type factors and a number of cultural traits.

##### 10.3.1.1. The organisation and non-driving safety

The organisation plays a significant role in non-driving incidents, through training and PPE (personal protective equipment) policies. As PPE was discussed in section 7.4.2, this will not be discussed in depth here. Both Company A and B placed some requirement on drivers to utilise PPE. PPE generally serves to reduce the impact of incidents or to reduce the likelihood of an incident. Thus the requirement to wear PPE can be seen to influence outcomes associated with both being struck by an object and slips, trips and falls.

*The only time they can wear thongs is out where the bedrooms are just outside the office we're sitting in here. They can walk out of there to have a smoke, there's a designated smoking area round there. It's okay to wear the thongs around there you know they're out of harm's way, there's no machinery, there's no nothing, it's just seats and trees so they're allowed to wear thongs out there. (Company A Manager One)*

*You've probably seen the old, well there's still a few round, stubbies and a singlet. Thongs maybe that was the unofficial truck drivers uniform, you don't see that, you see long pants, high viz protective long-sleeved shirts, gloves, helmets, glasses, hearing protection. It's all there and that's part of (Company B). (Company B) used to issue shorts, short-sleeved shirts, they don't anymore. They, I think they, I think there might be a site where they issue shorts, but they issue overalls as well. So when you go to the next site, say you come to (building materials customer) protective equipment's required, you put your gear on before you enter the site. (Company B Branch Manager Four)*

Training provides drivers with the necessary skills and knowledge to work safely and increases awareness and motivation for safety. Each company provided some form of initial training to their drivers, however, only Company B utilised significant ongoing training, much of which centred on non-driving injuries (see section 7.3.4).

#### 10.3.1.2. Government departments and non-driving injuries

In section 8.3.4, it was noted that workplace health and safety departments and WorkCover play a significant role in monitoring and enforcing workplace safety. Non-driving injuries are given significant attention by these departments. As this has been discussed in detail, little further discussion is warranted. Nonetheless, perceived increases in levels of enforcement have had a significant impact on non-driving safety.

*Oh just everybody realises what the repercussions could be. I think there's a lot more of a chase of it in the court system and you know a lot of the smaller transports and the way they went a lot of those have gone now because of that you know. There's nowhere near as many, I don't know I suppose you'd call them backyarders in the game these days you know. You know there was one guy that was an owner driver that did a lot of the little bits and pieces. The beer around (this location) for years... he would have been in business 15 years. He was the strangest guy. You know he'd go to the brewery and they'd make him wear boots which we all had to wear boots, metal tipped boots. And he'd just take his thongs off, pull his boots on with no socks on and just walk around the brewery with no socks on, yeah ridiculous nonsense like that. You know getting around working with kegs and this sort of thing and you've got no, the rest of the time he's got thongs on his feet. And that guy was in business for many, many years and finally it all caught up with him and he ended up having to get out of it totally... actually about a year ago he was probably one of about three that went out that same year... Just you know I suppose the repercussions are now that there is jail time too I suppose, whereas everybody got a slap on the wrist for it many years ago. I suppose now there's a bit more of a repercussion to it. (Company B Branch Manager Three)*

#### 10.3.1.3. Customers and non-driving injuries

Given that loading and unloading typically occur at customer sites, customers play a significant role in non-driving injuries. As discussed in section 8.5.2, customers enforce a variety of standards on drivers and transport companies. The customer primarily influences safety through auditing and communicating with organisations, enforcing onsite policies and, occasionally, pressuring drivers and their organisations. Each of these factors may influence non-driving injuries.

*Well, all the stuff here on site we do quite well, we control a lot of the getting on and off the trucks. What we get most complaints about the drivers, not so much about the drivers but the drivers complain about, stuff that happens off site. So it's all the stuff that we call the ma and pa little customers that haven't had the same safety standards. Here we obviously have exclusion zones, you know high viz vests, hard hat and all that. You go to other customers out the back of Toowoomba, up to Caloundra, don't have the same safety standards. So what we do is we run into an issue of when we're there is that they interact into a world where they're probably not as familiar. Because we push safety so heavily, where you don't have the exclusion zones, you're back up on top of a truck. We have like a wasp system here so when you're on the back of the truck you're actually harnessed in. When you're out on site you don't have that available to you. Not all sites don't have them but there is just a few. I think there's only one site that really does the harnessing. So that's the real risk. So our biggest complaint is how we can influence behaviours off site. Now whether that's through customers, forklift unloaders, even just being out on the road, that's our biggest concerns. So the more interaction with our customers and the ones that don't have the safety sense that we said. So as I said to you the exclusion zones, the getting up on the truck, the more the task out on site is probably the biggest concern for drivers because they come back with some pretty serious stories about you know near misses and so forth. So it's pretty serious mate. But that's the one thing we try to do here and we try to influence the behaviours of the customers. So...umm you know with the drivers, do everything as far as like the driving hours and all that all by the law, by the book and we audit that. So there's no issues there and we're a basically a six till six business so there's really no need for us, because we're delivering to customers, they shut by five o'clock usually anyway. So the driving sides of things. But the real big push is more stuff that happens on customer sites when we're unloading. (Company B Branch Manager Five)*

Throughout the case studies a number of different customer sites were visited. At each site, the level of involvement of the driver in these processes varied. Many customers conduct all of the loading and unloading without driver assistance. During a number of observations the researcher and driver were required to either remain within the cab or stand in a designated location until loading was completed. Conversely, however, at some customer sites the driver conducted significant amounts of loading and unloading. For example, one Company B driver was observed unloading palletised goods. Similarly, many Company B drivers stood on the trailer to connect goods to customer operated cranes, and one Company A driver operated a forklift. Due to the variety of loading procedures, the driver's level of hazard exposure significant changes between sites.

*But once he's really on site he'll un-restrain the load and then virtually it's then up to the customer, and some of the, some of the customers will need his assistance and that's always been the, that's always been the case in the transport industry. The driver will assist the customer to unload. You know it would be all well and good we can all say sorry we're not, our driver doesn't. He only delivers he doesn't assist. If we took that philosophy well we probably wouldn't have a business because the other 200 companies out there, their people will assist. So there's also a commercial understanding that we need to also understand at that point. And because we're delivering our customer's site to their customers we've got to be careful because if their customer doesn't you know if we adopt some particular procedure which impacts our customer's customer, our customer's customer doesn't buy the product so there isn't need for us to transport it. But certainly the end of the day if it's unsafe we're not going to do it, don't care who the customer is, how big they are we're not going to do it. (Company B Region Manager One)*

#### 10.3.1.4. Load type and non-driving injuries

A number of hazards related to the type of load being carried were identified in section 8.8.4. Whilst the slipperiness of steel and the risk of livestock kicking will be discussed under specific mechanisms of injury, it is important to note that sharp goods also pose a cutting hazard. The low level of information regarding cutting injuries prevented a more detailed discussion. However, as stated in section 8.8.4.2, sharp goods pose a natural hazard to drivers during any handling. This risk is typically managed through protective clothing.

So that alone is probably one of the biggest hazards, other than driving on the road. Product wise I think 1.5mm is the thickest product here. Everything is like a razor... Yeah basically any manual handling is an issue, not an issue but a hazard. (Company B Branch Manager Four)

#### 10.3.1.5. Cultural traits and non-driving injuries

A number of cultural traits identified within Chapter 9 were indicated to play a general role in non-driving injuries. These are discussed in order of appearance within the relevant chapter. Non-driving safety is typically viewed as being a matter of common sense. One Company A manager simply stated that “*most injuries are just stupidity, blokes doing the wrong thing*”. This was extended by drivers to customer and organisational inductions. The perception that inductions are common sense, led one Company A driver to state that he doesn’t “*remember much of the inductions, a lot of companies are all the same*”. One Company B driver similarly stated that most inductions are “*common sense, ‘use the walkways’, ‘follow instructions’, ‘wear the correct PPE’*”.

*Had stupid things like common sense things... Kicked in the head with a gate and that’s normal in the livestock industry that’s normal. Like I said every beast is different. You can go and close the gate behind 300 and the 301st bastard will kick the gate.... That’s across the board. Yeah that’s across, that’s so much as being in the truck but yeah...falling off–*



*– crates and things like that, we've never had anyone fall off... Had a bloke fall in.... That's the nature of it, the human nature it's the fact that there's a risk factor in every job and if you take the risk you're going to get hurt... like getting on a motor bike and riding down the road mate...It's like getting in the car and driving down the road, there's a risk factor in everything you do. Some get hurt some don't. (Company C Driver/Manager)*

The value placed on time may result in significant risks in order to speed up unloading and loading and other non-driving tasks. One Company A driver was so concerned about saving time that he breached organisational policy regarding involvement in loading and unloading. It is worth noting, however, that one Company B manager suggested that 'cutting corners', which could be viewed as time saving, was simply laziness coupled with an ability to breach policies without detection.

*I think you've got a core group of guys that probably are lazy, they're always going to be, they'll always be looking for the shortcut. And I suppose a truck driver because they're not here like in a factory you don't ...unless something happens you don't see what they're doing out there. So ...the ones that probably do have an incident, it probably isn't the first time they've done it a particular way, just unfortunately this time it's gone wrong. So if it's only a small component you just put it down to laziness. Rarely is it ignorance because it's really fairly a basic task that they do it, that they've been doing, that they haven't done it correctly. (Company B Region Manager One)*

The general belief that drivers are good natured, but make errors, or are behaving similarly to anyone else, along with the belief that drivers are heavily motivated by money and other gains, were seen to be related to non-driving injuries by members of the studied organisations. It was often suggested that drivers make simple unintentional errors or that unsafe acts equate with the behaviour of everyone else outside the industry. When viewing

these incidents as simple errors or common behaviour, strict enforcement or punishment was deemed unreasonable. Unfortunately, this then allows unsafe behaviour to continue.

You know trying to drill into blokes' heads to wear not necessarily steel cap work boots but just covered footwear. You know we can walk out here now and find half a dozen blokes wearing thongs. And that's not to say they wear thongs all night it's just, they've just sat in the truck for 10 to 12 hours. You know I'm sure when you get home from work the first thing you do is kick your shoes off. If these blokes are wearing work boots of course they want to kick their boots off and the problem with that is that they're still in an industrial, on an industrial work site. And they want to walk upstairs to the shower or walk in to get a drink or walk upstairs to the kitchen, but them blokes are walking through a workshop area to get to those areas and it's a hazard. (Company A Manager One)

It was also evident that many safety procedures and policies may be neglected for gain. PPE was often rejected on the basis of comfort. For example, despite one manager's claim that drivers wear boots all day long; it was evident during the observations that some drivers wear thongs throughout their shift until entering a strict depot. Drivers may be strongly motivated to take shortcuts to increase income, as was discussed in section 8.3.4. Drivers may also exaggerate or falsify injuries to receive significant payouts from WorkCover.

The desire to conform to a specific 'trucking image' may also pose barriers to non-driving safety. Though no direct link to outcomes was observed, it was noted that drivers may be somewhat hesitant to offer advice or instruction to one another. Though argued to be part of the cultural of 'Australian blokes', it may also be the result of the autonomous 'look out for yourself' truck driver image and the general view that safety is 'uncool'.

*We try and instil on our men when they're out working if they see their mate doing something that they think is ..to pull him up, don't let him keep going. That's a hard culture to get across because men and Australian men always think: Oh we're tough, we're invincible and we don't realise some of the things we do. We're not as tough as we think we are. And that's the problem and I mean some blokes can get upset if you tell them they shouldn't be climbing up like that but it's in the approach, the way you tell them. And I really, firmly believe that it doesn't happen, their mates telling them is a lot better than someone like me racing down.* (Company B Region Manager Two)

The perceived likelihood of incidents and the attitudes held towards rules and regulations were also seen to relate to non-driving injuries. A number of drivers indicated that non-driving injuries were very likely. As stated by one Company C driver, “*even changing a tyre can kill you or maim you quick*”. Thus, many drivers viewed the rules and regulations set out by organisations and customers as being useful in improving safety.

*If you follow the policies and procedures put in place by (construction supply customer) you won't come unstuck. It doesn't mean things won't happen, it just means they are trying to prevent anything.* (Company B Driver Four)

Despite many drivers viewing loading and unloading policies and procedures as relevant to safety, other drivers do not share these views. Where individual policies were viewed as pointless, punishment avoidance strategies were evident. For instance, as stated above, many drivers opted to only wear PPE at depots where enforcement was likely. Similarly, managers at Company B indicated that some drivers will only adhere to certain policies when under direct supervision.

*I think another hazard is the mentality of people, of the drivers, when they're out of the depot is they revert back to old ways. So they'll take off all their high vis, they'll walk around in thongs, they'll put on their stubbies, they'll smoke, they'll eat and drive, do all of those things where we've got very clear procedures, but how do you monitor that? Really hard to monitor because you're not sitting out the back of woop woop watching them. So some of the ways that we reduce those risks is a lot in the culture. So a new focus is a cultural behavioural shift is people just behaving in a way that is safety-related so that it becomes a behaviour, that it will be done regardless of whether you're being seen or not being seen. (Company B Director)*

*So we're not ...we're nowhere near perfect, we're striving but no it's not as rosy as we have things...we have drivers climbing up on trailers and won't put their helmet on. They know they've got to have it on and you'll see them, they'll see you walk around the corner and straight off and into the truck and grab their helmet. ... Same thing we expect if you're in our yard you must have a helmet on if you're above the ground. Same thing I walk down the back and our yard blokes are there with me and you'll see, he'll say here he comes get your helmet. But you know what I'm trying to get through to him, don't let it get to that, tell him straight away put your helmet on, in our yard you must have your helmet on. But it will always happen. (Company B Region Manager Two)*

### 10.3.2. Being struck by an object

Within the industry there is a significant risk of injury associated with being struck by an object during unloading and loading and other activities around a truck. Within Study Three the major hazards related to items falling off of a trailer or being struck by a restraint as tension is released. Many of the general non-driving injury factors discussed in the previous section also apply to this mechanism of injury. A number of specific factors were also

identified including organisational policies and material safety, customer standards and policies, load type and truck design, and a number of cultural traits.

#### 10.3.2.1. The organisation and being struck by an object

In regards to organisational policies and training, the principal behaviour targeted was standing too close to the vehicle during loading and unloading. This was managed through exclusion zones, which identify the safe location for drivers to be situated during unloading and loading. Whilst heavily dictated by customer policies, within Company B significant attention was given to exclusion zones. Managers and drivers alike demonstrated a high level of awareness of exclusion policies. Company B utilises an approach based on three colour-coded zones (similar to the example in Figure 10.1), which served as a guideline for instances where customers used no policies. In a side loading example, drivers should stand at either end of the vehicle or, if necessary and granted permission, the corners of the trailer. However, drivers are prohibited to stand either directly beside the loaders or on the opposite side of the vehicle.

With respect to material safety, only Company B appeared to have specific precautions limiting the potential for injuries from being struck by an object. First, many company branches required staff to wear hard hats, offering significant protection for drivers in the case of an object striking the head. Additionally, significant attention was given by managers to the form of restraints used. As discussed in section 7.4.2, Company B has banned the use of ‘lever dogs’ to restrain equipment. Due to tension arising from lever-dog restraint, they have a tendency to ‘flick’ when loosened, potentially striking the driver.

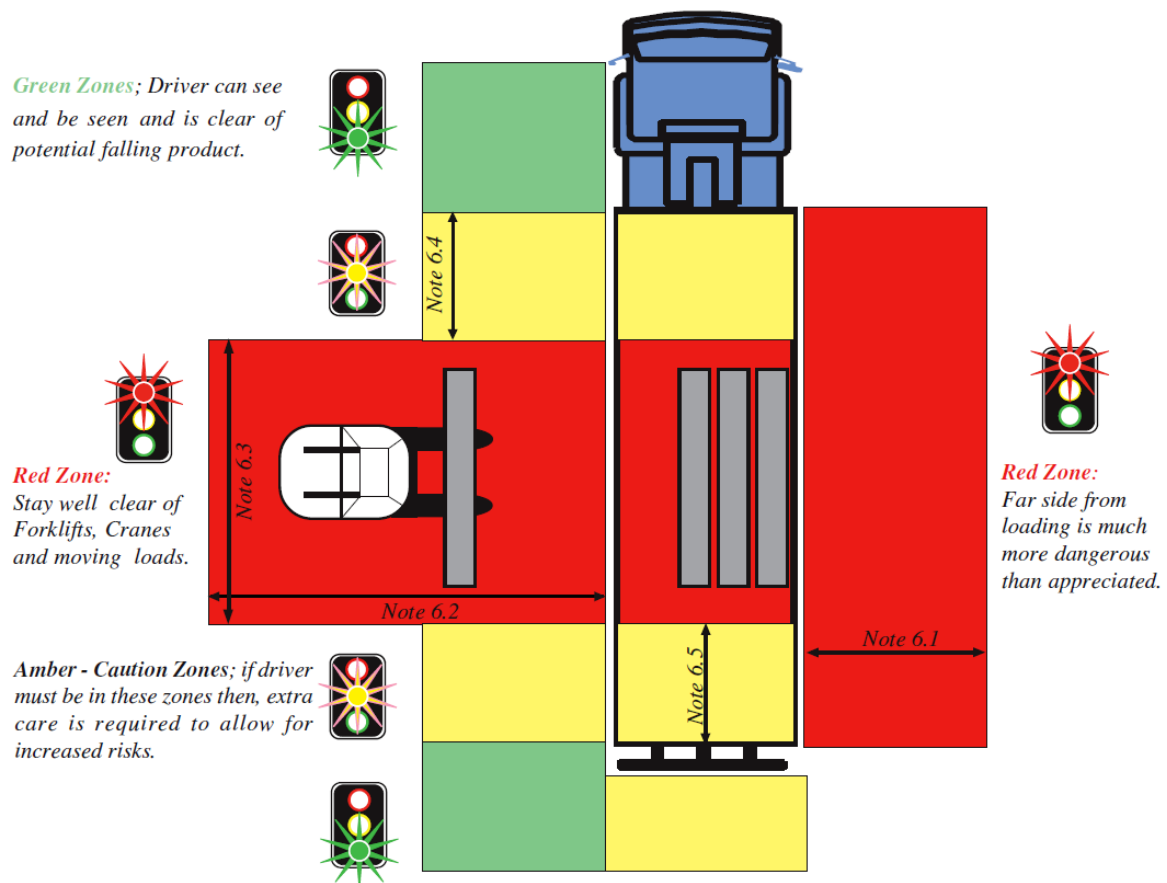


Figure 10.1: Example of a three coloured exclusion zone similar to that used by Company B

(Image Source: Australian Steel Institute, 2011)

#### 10.3.2.2. Customers and being struck by an object

As loading and unloading occurs at customer sites, customer policies and procedures significantly influence the risk of striking injuries. As discussed in section 10.3.1.3, customers may require different levels of driver involvement in unloading and loading. When drivers are not permitted to be involved in these tasks and are required to wait in an exclusion zone, they are completely protected from falling objects. However, some customers will allow the driver to stand in dangerous locations and the driver must choose to adhere to organisational exclusion zone policies.

*Some have nothing, you gotta use your common sense, they'll let you stand right next to a forklift, but if you don't want to die. (Company B Driver Two)*

### 10.3.2.3. Load type and truck design and being struck by an object

The type of load and the design of the truck and trailer can significantly influence the risk of striking injuries. Within Study Three, specific attention was given to the risks associated with cattle and steel. With regards to steel, pipes were noted to be highly risky due to their propensity to roll. As stated by one Company B manager, *“if you don't have the right pipe racks on the trailer, as they lift one pipe up some can roll off the other side of the trailer”* and, therefore, drivers *“have to be aware that they shouldn't be on the opposite side of the trailer when people are unloading”*. Conversely, cattle can pose a significant striking risk when they kick directly at the driver or kick a gate which strikes the driver.

*Carrying cattle you gotta make sure you don't get injured by a beast. Where you put your arms and where you stand, you can quite easily get hurt by getting kicked by the cattle. (Company C Driver Three)*

*You have to be careful wandering around the crate that you don't get kicked or hit with the gate. They can kick you out the side of the crate... Reading the animals, you learn to read them and can see in their eye if they are crazy and will try to eat you. You can't always tell but I'm pretty good at it. (Company C Driver Two)*

*You don't do stupid things, you don't run in behind them and kicked in the guts do you? And the same going back too, every load is different. I mean some cattle kick, some don't, some chase you, some won't. You pick that, you know that. You know that the minute you, you*

A number of factors associated with trailer design, such as racks which prevent loads from shifting, have an impact on reducing risks. Within Company C, the importance of crate design was highlighted as reducing the risk of being struck. Through the use of gates which lock upon closure, drivers are less likely to be struck by a kicked gate before it can be locked in place. Similarly, crates are designed with spaces between the gate and wall, enabling drivers to stand in safety where they cannot be kicked.

*Like....there's a law in the bush never stand behind a gate. But in a crate how do you shut the gate if you're not standing behind it? So there is a rule don't stand behind the gate, because if they hit it they're going to squash you. The crates are designed, the gate can't come right back. It's a space in between the gate and the side like, so they can't really get at you. They can get at you but they can't hurt you. But that's why the crates are made and that's where manufacturing and industry and itself, like most, most crates are designed out of people like us or whatever who come up with these little ideas. And then the manufacturer takes them on board and they refine them and it's all come from industry. It hasn't come from manufacturers... Oh L pens and just chains around gates, they all got slam shuts now so you just slam the gate and it shuts. Like before you had to go and push the gate and put your chain around it. Yeah. And anyone that's been carting cows for 30 odd years will have some sort of a mark on his face or his teeth or somewhere where he's been kicked in the head with a gate. (Company C Driver/Manager)*

#### 10.3.2.4. Culture and being struck by an object

Many of the traits discussed in section 10.3.1.5 equally apply to being struck by an object. Additionally, common sense and the perceived likelihood of incidents were particularly relevant to striking injuries. Safety related to being struck was largely viewed as common sense. Thus it is unlikely for these companies to take additional precautions (see section 9.2.3.2). For example, when discussing drivers standing too close to a forklift one



Company B driver simply asked “*what did you think would happen if you stand that close?*”

Similarly one Company A staff member stated that “*you shouldn’t have to tell anybody, they’d been near a forklift*”.

*See most of the stuff’s done elsewhere. All the loading is done elsewhere. You know most of the types of injuries you get is somebody yakking to somebody. Like the forklift driver. Last injury had the guy that was standing beside his truck and the forklift driver was operating and talking. Right and they didn’t see the box on top of something else and it fell off and hit him on the back... Yeah you shouldn’t have to tell anybody. They’d been near a forklift. You shouldn’t have to tell somebody to drive forklifts at a reasonable pace. You shouldn’t have to tell somebody not to drive around the area at 10km/h but you’re continually doing it you know... what do you have to put in place?* (Company A Health and Safety Officer)

A number of drivers suggested that incidents involving items falling from a trailer were bad luck. One Company A driver discussed a friend who was standing on the opposite side of the trailer when it was unloaded and was pinned beneath an item. The driver attributed this to luck, as the driver was simply “*in the wrong place at the wrong time*”. Conversely, many other drivers, particularly in Company B, did expect that injuries could occur from falling objects and discussed the importance of standing clear.

### 10.3.3. Slips, trips and falls

Slips, trips and falls (STF) are another major hazard faced by truck drivers. Whenever a truck driver works from a trailer or back of the prime mover, or when entering and exiting the truck, there is a risk of falling from heights. Specific factors which were identified as relating to this type of injury included organisational policies and procedures, government enforcement, customer procedures, load type and truck design factors, and a number of specific cultural traits.

### 10.3.3.1. The organisation and slips, trips and falls

The organisation plays a role in STF injuries through training, policy enforcement and material safety. Training regarding working at heights, and using three points of contact when climbing, was given by both Company A and B. However, one Company B driver noted that, due to the company desiring drivers not to climb onto a trailer, Company B provides little training regarding safe work on trailers.

*At height, yeah you know, we go through all the training, all the shit to be in a cage on the forklift. There's no passing or anything. It's just in a cage on a forklift or don't do it. That would be round the, you know, the workshop blokes fixing roof lights or, you know, the tops of air cleaners or pipes and that. They'd be in the fork..on the fork. The wash boys have occasional forklift up there. The only other height stuff is the odd rare occasion when they've got to climb up in the back of a trailer, you know high end of the trailer for some shit but that's a once-in-a-blue moon thing. (Company A Manager One)*

Both Company A and B have policies regarding working at heights, where STFs are more likely to lead to severe injuries. Within Company B the policy is generally that drivers are not allowed to climb onto a trailer, however, in some cases this is not possible. Within Company A the major policy regarding working at heights is that drivers must always use a forklift cage. When breached, typical enforcement strategies are invoked (see section 7.4.3.4).

*Yeah if they're seen to be doing it I will give them a warning... So all that stuff is covered off in our inductions and that now, so people are aware that we won't accept just climbing up, being on the forklift that's not in a secure cage and that's attached to the forklift. (Company A Manager One)*

Lastly, regarding material safety that influences STF injuries, members of Company B indicated that the company utilises harnessed platforms for loading within onsite depots, ceased using tarped trailers (reducing time above a load), and have attached additional steps to a number of trailers (enabling drivers to safely examine a load from a higher position). In addition, the director of Company B indicated that they are currently investigating transportable steps enabling drivers to climb safely.

*They have loading platforms. So I guess it's not so much that you can't get on there, you can't fall off. Because there's something you're attached to on the site. So you can fall off the truck all you like, you just land on this bloody platform whereas out in the street...(director name) has often said she doesn't want anyone on the back of a truck. Ultimately she doesn't want anyone on the back of a truck and people go well that's not freaking possible, that's ridiculous. Got to dream. You've got to pursue something and that's what she's in pursuit of, nobody gets on the back of a truck. We can't drive around with the platforms and so on and so forth but they made up stools, ladders, things that can...rather than get on the back of the truck give you that little bit of extra height to reach to the top of the truck you know. So they're always looking for ways to improve: One, how we get on and off if we have to; and two, reduce the amount of times that we have to get on and off. Ultimately you can't not get someone...when...I shouldn't say that. But it's pretty hard to imagine a day when no one has to get on the back of the truck. But if you don't try and imagine it you're not going to get as far as you can are you? So... I mean there's a way around every single issue but once you put three issues on the same truck it then becomes hard. I mean you can get the poles out the centre of the truck without getting up there if you want to. But once you add some sheeting or you add a little bit of rust you know, add more friction, it reduces your ability to do things from a distance. (Company B Branch Manager Four)*

### 10.3.3.2. Government departments and slips, trips and falls

There is significant legislation covering the requirements of organisations and customers to provide workplaces that are safe from STFs. Due to effect of punishments, one Company A manager stated that the company must ensure drivers do not dangerously climb on trucks and trailers. The manager stated that previously he would climb “*all over the thing, but you just can’t do that now*”. Whilst the risks associated with this behaviour had not changed, the punishments were deemed more severe. Whilst it is clear that government enforcement has had some impact upon STFs, members of Company C argued that government officials were unable to identify safer work methods for livestock crates and thus have not influenced STFs in the livestock industry.

*Yeah in the actual industry I think Work Health and Safety has been pretty good. They don't really, like we've had them look at putting handrails on crates and safety harnesses and all this and it just don't work in this industry. They look at it, and they see what we do and they come away with it, you know they put issues on there. They put stipulations on that we've done anyway. But they had to be in writing, another little chapter that you can't climb up the side of the crate, you must use the ladders, you must do this... which is common sense. But they had to put their little bit in there, make it look like they were doing something... Like you can climb on the top of the crate; even though it's four-and-a-half metres off the ground when you're on the catwalk you can only fall one-and-a-half metres into the crate. Because you're not walking along the little bar on the side, four-and-a-half metres above the ground, you're walking along a catwalk. And if you fall in there you're going to get hurt. Because there's 40 other things in there with four legs. (Company C Driver/Manager)*

#### 10.3.3.3. Customers and slips, trips and falls

As unloading and loading is conducted at customers' sites, customers play a role in STF safety. Many customers differed in their approach to STF safety. Whilst at some sites drivers were seen to climb up the side of trailers to identify items to unload, clear an obstruction, or direct a forklift driver, other sites had strict policies requiring use of ladders and platforms. Additionally, it was noted that even site cleanliness was important for trips. Building sites visited by Company B drivers were indicated to have significant trip hazards from building materials and rubbish which are left on the ground.

#### 10.3.3.4. Load type and truck design and slips, trips and falls

Regarding the influence of load type and truck design on STF injuries, many factors discussed in section 10.3.1.4 were also relevant to STFs. Some loads, such as those unloaded by crane, require the driver to climb the trailer, thus increasing the risk of falls. Similarly, many steel products are slippery, posing risks to drivers on the trailer. Additionally, when transporting livestock, there is also a requirement to climb the crate. Conversely, with palletised goods there is a lower requirement for driver to work from heights. As stated by one Company B driver, “*unless a pallet gets stuck you don't need to get on the back*”.

*And then they've got mesh on the trucks or reo-bar which is reinforcing bar so you put down extensions. So to get up on the truck they've got to put the straps around it or the lifting chains around it. So they can lift it off and actually lift it off themselves with the crane, which obviously causes a new problem, getting it on and off the truck, obviously chaining it down and having to move it because you haven't quite got it centred or whatever, and obviously using the crane. (Company B Branch Manager Two)*

Truck design factors can also play a significant role in STF safety. Whilst much of the current discussion has centred on climbing trailers, entering and exiting vehicles also poses a

risk for STFs. It is easy to slip when entering the vehicle, particularly during wet weather (as discovered by the researcher). Without using the provided handrails, drivers may fall and suffer injury. This is contributed to by the fact that steps and ladders into trucks are often made of steel. Whilst members of the industry gave little focus to this hazard, one Company A driver described one truck as a *“prick of a thing to get out of, you gotta bloody crawl out backwards”*. Thus, the design of trucks can play a significant role in STFs.

#### 10.3.3.5. Culture and slips, trips and falls

The perceived likelihood of an incident, the responsibility of drivers and the effect of experiential learning on attitudes towards rules were all identified as being relevant to STFs. Many STF injuries were attributed to luck by members of Company A and C. One Company A driver discussed a number of STF incidents, each resulting in medical attention. Despite the fact that the driver could have avoided each incident he simply stated that it was *“just unlucky”*. Similarly, when describing a driver who had slipped on ladder rails of a livestock crate, the driver/manager of Company C said *“it was just one of those things”*.

*There was another one, a bloke, but this was at the sale yard on a very dewy wet morning, a cover up job. He went to climb the ladder to go up to the top ramp, it had no handrails on the ladder, just a ladder, just a ladder. He put his foot on the ladder and grabbed the ladder because there was no rails and he'd been doing it for 50 years, the same old ladder had been there, but it was just one of those things. You could say it was an accident going somewhere to happen but it hadn't happened. And when he grabbed the rail the ..the runners of the ladder it was slippery from the dew, his hand slipped, his foot went through the rungs and he fell back and broke his leg off there. (Company C Driver/Manager)*

As with any incident, when the cause is attributed to luck there is a reduced perceived need to act more safely or identify design and procedural issues. For this reason, it is important to note that many drivers did highlight the risks associated with climbing and the need to use caution. One Company B driver discussed the occasional need to climb a trailer, citing an example injury, stating that *“it’s deadly, you just need one foot in the wrong place and you’ll go off the side”*.

The emphasis placed on experience and stories was again seen to relate to the perceived likelihood of an incident. Drivers were commonly stated to jump from trailers and trucks and, when warned of the risks this poses, state that they have done it for years without injury. Thus, a lack of experienced STFs may promote ongoing risks through NOD.

Whilst it is commonly held that drivers are responsible for resisting customer pressure, it was evident that there is significant pressure to help some customers in loading situations which breach company policies. Whilst it could be argued that this is more a result of the influence of customers, as discussed in section 9.3.2, the expectation that drivers will resist pressure may lead customers and organisations to push the driver until they refuse to comply. The responsibility drivers feel towards the load they carry, and the organisation’s equipment, can also influence drivers decisions to breach policies. During one observation, a Company B a driver stated that he chose to break rules regarding climbing the trailer in order to prevent the unloader ‘stuffing up’ and *“so I’m not a bastard telling them you’re not going to help”*.

#### 10.3.4. Muscular strain and overexertion

Muscular strains and overexertion are a common form of injury within many workplaces. There was significant attention granted to these forms of injuries within Study One’s literature (section 4.2.2), however, within Study Two these injuries received little attention (section 5.2.1.2). Throughout Study Three, once again relatively little information on these forms of injuries was provided. The majority of information regarding these injuries

came from Company B. As Company B conducts a higher proportion of short distance transport than the other two companies, this trend supports the hypothesis that the absence of such information in Study Two was from an over-representation of line-haul drivers. The specific factors which were linked with these form of injuries included organisational training and material safety, customer policies, truck design and load type factors, and a selection of cultural traits.

#### 10.3.4.1. The organisation and muscular strains and overexertion

Whilst Company A has a detailed manual handling policy within their driver's manual, neither Company A nor C indicated that they conduct manual handling training. Given that Company C drivers are not required to conduct manual handling of goods and Company A drivers are generally not permitted to load and unload their trailer, it is to be expected that there would be less focus on these injuries. Company B, however, dedicates significant attention to reducing strain and overexertion injuries. Recently prior to the case study, Company B had completed a manual handling training program for all its staff. Additionally, however, Company B conducts regular 'refresher training' and has worked with its customers to develop safety procedures.

*Probably because I work with the managers in each site we develop training programs. Some of our sites are obviously manual handling intensive so consequently we've developed over the years where we'll have a manual handling, a refresher program, being provided where we bring an occupational therapist in who we use who understands the industry. He knows trucks, what the handling is and then he'll provide a specific training package for that business. We work with our customers in developing safe operating procedure that's to do with driving, load restraints, fatigue, particular equipment that we use. (Company B Region Manager One)*



Company B also utilises a number of devices to reduce manual handling. No Company B driver was observed manually carrying any goods and the most intensive action witnessed was the use of an electric pallet jack. Regarding these jacks, one Company B driver stated that manual pallet jacks result in “*sore necks and backs and shoulders*”. In addition to providing electric pallet jacks, one Company B branch purchased a forklift mounted clamp to significantly reduce the amount of lifting conducted by staff.

*We've found a crowd that actually made a hydraulic clamp that attaches to the forklift so you can build layers of the pallets. So if certain customers, one might want 30 cartons of Gold stubbies which is three layers, and it's got the four hydraulic pads, you just slide it over the top of the pallet and it just grabs in and it lets you pluck those 30 cartons off and you just lift it up and take it over and put it on another cart... where we would have done that manually, if we wanted 30 cartons there would have been somebody there picking 30 cartons one by one. And of course so the less of the injury we normally \*words lost on recording\*. And I think it's done a marvellous job really. But it's done, it was only a, cost \$30,000 outlay which is really at the end of it all we ended up doing it with one person less than what we would so it basically paid for itself in less than 12 months. So basically they have a life of about five to 10 years so it's well and truly get your dollar's worth out of it as well as the lack of, you know, the less impact of injury. (Company B Branch Manager Three)*

#### 10.3.4.2. Customers and muscular strains and overexertion

Customer policies regarding loading and unloading also have a strong impact on reducing muscular strains and overexertion. As previously indicated, many drivers are not permitted to assist loading and unloading, removing the main manual handling task. It was however noted by one Company B driver that, in some cases, customers may have lower

standards regarding manual handling. It was noted that some customers have previously loaded *“extra items into the same pack and put a second sticker on it”*. Thus, a single package recorded on an order may contain additional items. The driver continued to say that *“according to the sheet it only weighs 20 kilograms but it might weigh 36”*.

#### 10.3.4.3. Truck design and load type and muscular strains and overexertion

The type of load carried determines the level of manual handling. Palletised goods are moved via forklifts and pallet jacks and larger items may be unloaded via a crane. However, smaller loose items require manual handling. Additionally, truck design factors can also influence strains and overexertion. The metal gates used within taught liners are required to be lifted into place and can weigh a significant amount. Within one Company A observation, a truck was fitted with ‘runners’ for the gates. These runners limit the lifting task required to dislodge a gate to approximately 10cm, at which point it can be dragged from side to side on its runners. Unfortunately, in this instance, the runners were only present on one side of the trailer and, thus, the driver was required to lift the gates on the opposite side.

*Our gates are on skates so they don't have to lift them up and down to the ground all the time. There's new lightweight materials being used for the gates, you know things are done by fork lift, mechanical means, all those kinds of things and I think that's evolved over a long period of time and, you know, we've got strict rules. (Company A Health and Safety Officer)*

Whilst the above discussion has focussed on manual handling, strains can also occur as a result of non-lifting tasks. For example, drivers can suffer strains from throwing straps over loads, climbing into the cab, or even from jolts incurred by jumping from the trailer. In terms of truck design factors, a number of drivers indicated that air cushioned seats have reduced

the long term strain placed on drivers' backs. Additionally, one Company A driver noted that he commonly experiences pain in his knee due to the angle at which his leg is positioned.

#### 10.3.4.4. Culture and muscular strains and overexertion

The tendency of drivers to value experience and stories over communicated facts, and the associated NOD, along with the value placed on money were seen to influence strains and overexertion. With regards to the motivation of money, the argument that injuries may be exaggerated was common (see section 8.3.4). As this has already been discussed, it is sufficient to note that strains which occur outside of work were suggested to be claimed as a work injury. Additionally, it was evident that one Company A manager perceived muscular strains to often be minor injuries that are exaggerated. Further, it was also indicated that repetitive strain injuries are effectively blamed upon the organisation which employs the individual at the time that the injury becomes evident.

*All that dude has ever done since he's worked here, he gets in his truck goes to (customer name), hooks up his trailers goes to Sydney unhooks them and goes to bed. Does that every night of the week, five nights a week. All of a sudden, you know, we've caused his hernia. Turns out, we sent him to our doctor yesterday. He doesn't have a hernia he's got a strained stomach muscle. That could happen from taking a crap mate, you know? How does he put that down to being a work injury? The hardest thing he does is climb in his truck, which is probably no taller than his front steps at home anyway. Unfortunately everyone knows now that you can get lots for a work injury. We had a bloke working here for a few months, he only had one arm, he was diagnosed with carpal tunnel and had to have an operation. So that goes on our Work Cover. You know that's a life time of using one arm to do everything, but he was working here when it happened and it cost us tens of thousands of dollars. But then when Work Cover offered him a thirty thou, or twenty three thousand dollar payout he said no and now he's personally suing the company for three quarters of –*

*– a million dollars. Because he thinks he deserves that because he got carpal...he was diagnosed with carpal tunnel when he was working here. That's something that happens over a lifetime of repetitive strain. (Company A Manager One)*

It was often indicated that drivers may conduct incorrect lifting techniques, climb using their upper body rather than legs or jump from parts of the truck regularly without experiencing injuries. Thus, through NOD drivers are resistant to being warned about injuries resulting from such activities. This was particularly highlighted when discussing strains, which can be cumulative injuries, as drivers may have sustained unrecognised damage. Therefore, the emphasis given by drivers to experiential learning may prevent drivers from recognising the risks of behaviour until injury has been sustained.

Other things that cause injuries that I'm finding is a lot of, just the repetition of the work. Always lots of strains and sprains. Climbing in and out of a truck even. We train on three points of contact and to use your legs to get in the truck, but everyone will revert. Well not everyone. A lot of people revert back to just pulling themselves up into a truck, that they jump out of a truck. They don't climb down, just like a trailer. They will jump from the trailer rather than climb down the points... So they think they're young, they've done this 100 times before, it's not that far, the calculated risk they'll take. But the amount of times they've done that, there's just going to be one time they jump and then they go, my knee hurts from that one jump. No it's not from the one jump, it's from the 200 jumps you've done prior because you've just taken it as, 'this is okay'. (Company B Director)

#### 10.3.5. Summary: Non-driving injuries

Unlike crash outcomes, there was insufficient detailed provided in Study Three to warrant specific behaviour-focussed analysis. By focussing on the mechanisms of injury it was possible to identify a broad range of factors which influence injury. Generally, non-

driving safety is contributed to by a number of organisational, government, customer and environmental factors. Additionally, cultural traits relating to the nature of truth and reality, the nature of time, the nature of human nature and the nature of human relationships, along with the second order traits of luck and the likelihood of incidents, responsibility and rules and regulations were evident within non-driving injuries. As no single non-driving injury mechanism was attributed solely to a single source, or exclusively to contextual or cultural factors, the synthesised conceptualisation of safety culture, again, appear suited to understanding non-driving injuries within the industry.

Similarly to crash outcomes, further study is required to quantify the effects of each factor and determine the level of interaction between factors. Nonetheless, the current approach to safety culture appears to hold significant potential to reduce non-driving injuries. Once again, the perceived likelihood of incidents, based strongly upon the value given to experience and stories, was evident within each mechanism of injury. Thus, increasing the perceived likelihood of an incident could reduce incidents. Additionally, the belief that safety is largely a matter of common sense appeared to hinder efforts to improve safety. The belief that drivers should be responsible for their own safety also appeared to expose drivers to pressures. These two traits may be useful targets for intervention. The factors identified as relevant to non-driving injuries, generally and through each of the injury mechanisms discussed, along with the direction with which they influence safety, are presented in Table 10.7.

Table 10.7: Factors which influence non-driving injuries and related behaviours

Outcome	Factors which reduce safety	Factors which improve safety
General non-driving injuries	Contextual Factors:  Customer pressures  Load factors	Contextual Factors:  Organisational training  Organisational material safety  Government enforcement  Customer standards, policies and enforcement
	Cultural Factors:  Low perceived likelihood/luck  Rules are bad  Common sense  Time  Unintentional  Money and other gains  Keeping up the trucking image	Cultural Factors:  High perceived likelihood  Rules are good
Being struck by an object	Contextual Factors:  Load type factors	Contextual Factors:  Organisational policies and training  Organisational material safety  Customer standards, policies and enforcement  Positive truck design
	Cultural Factors:  Low perceived likelihood  Common sense	Cultural Factors:  High perceived likelihood

Slips, trips and falls	Contextual Factors:  Load type factors  Poor truck design	Contextual Factors:  Organisational policies and training  Organisational material safety  Government enforcement  Customer standards, policies and enforcement
	Cultural Factors:  Low perceived likelihood/luck  Experiential and narrative  Learning/NOD  Drivers are responsible	Cultural Factors:  High perceived likelihood
Muscular strain and Overexertion	Contextual Factors:  Low customer standards  Load type factors  Poor truck design	Contextual Factors:  Organisational policies and training  Organisational material safety  Customer standards, policies and enforcement  Load type factors
	Cultural Factors:  Low perceived likelihood/luck  Experiential and narrative  Learning/NOD  Money and other gains	Cultural Factors:  -

#### 10.4. HEALTH OUTCOMES

Whilst heavy vehicle drivers are subject to a number of health concerns, participants gave little attention to these outcomes. Throughout Study Three a small amount of discussion

was given to eating and lifestyle-related diseases and psychosocial concerns. There was insufficient detail provided to comprehensively understand these health outcomes and the factors which contribute to them. However, a number of points emerged which may inform future research. Prior to exploring these two health outcomes, a general point on health and medical examinations should be made.

Many accreditation schemes require heavy vehicle drivers to undergo medical examinations. As such, each company enforces their drivers to provide up to date medical information. One Company A manager stated that the company regularly uses one doctor for these examinations, which the company pays for. In the event that a driver's medical examination reveals medical concerns, the organisation will 'stand down' the driver until the problem is resolved. Additionally, one Company B driver noted that some customers will also require a separate examination in order to offer a contract.

Other than that just, just the training, the induction stuff, the bare bones stuff. You know medicals, we make blokes get out of the truck if there's something wrong with their medical or stand them down until the health issue is fixed or whatever... we like to be a little bit health conscious with our staff here because ultimately they're the money earners here not us. So if there's a health problem we work closely with them to try and rectify it as quick as possible so they're not out of their job. (Company A Manager One)

#### 10.4.1. Eating and lifestyle health

Eating and lifestyle-related diseases are a major concern for truck drivers. Obesity and smoking are common within the industry. Regarding healthy eating, it was noted by one Company A manager that many drivers predominantly eat fast food. Even if a driver wants to eat healthily along the road, it was indicated that it can be difficult to find a place to park a truck to purchase food. Thus, many drivers are required to visit fast food venues at truck



stops which typically offer little healthy food. Only one observed driver discussed choosing to eat healthily. This choice was influenced by past experience of a heart attack. The driver stated that, due to requiring heart surgery, he now needs to watch what he eats.

Due to the significant amount of time spent waiting at customer sites, a number of drivers smoke to pass time. Additionally, it was noted that night-time driving contributes to levels of smoking. As stated by one Company A driver, “*I smoke more coz I’m going solid sitting there all night*”. Smoking was seen to reduce the symptoms of fatigue. Additionally, many drivers will also turn to other substances, or high levels of caffeine, to manage fatigue.

*So I guess the only way to combat it is healthy eating. Yeah. It’s all energy drinks and shit, whether they work for you or not. Some people love them, some people don’t. I heard a rumour that some people take drugs to stay awake but I don’t know how real that story is. But I guess it’s down to the individual ... When I was working nights I bought some No Doz from Woollies. No Doz was about as good as Tic Tacs. Man, I don’t think it’s that good. Some blokes, you know, some blokes think it’s great. There’s a lot of stuff you can get now off the internet or from health stores that are claimed to be a pseudo-ephedrine to keep like energising everything but man there’s one particular thing. I don’t know the name of it. You know people joke around ‘it’s Japanese Duromine’. You know, back in the day truck drivers used to use Duromine and it’s a diet pill that blokes take because it’s got pseudo in it and it fucks with blokes’ head man. With prolonged use just sends blokes fucking bonkers, paranoia you know. I know of a bloke that was using that stuff and when he got out of the truck he went to a nut house for 10 days. It really fucks with your head. It’s easy to get. It’s cheap to get off the net, they ship it straight to you, it works great. It’s a great product to keep awake but prolonged use it destroys blokes and I’ve seen it happen to a few people and it’s not nice stuff. You know there’s some stuff you can get from health shops –*

– and that that’s pretty good, it works alright. How good it is after prolonged periods of time after long periods of time I don’t know. It’s yet to be seen I suppose because I’ve only seen some blokes using it in recent times. Other than that drink 47 cans of Red Bull every night I suppose or take drugs and run the risk of getting the drug swab somewhere I suppose. Pay money, take your chances I guess. That’s just staying awake. (Company A Manager One)

#### 10.4.2. Psychosocial concerns

Psychosocial concerns received little attention within the case studies, only identified by members of Company A and typically in a negative manner. The major concern highlighted within Study Three was psychological trauma resulting from crashes. As was previously indicated (section 8.4.4), one Company A driver, when discussing a past no-fault crash, was visibly distressed and still trying to process the fact that he may have ‘killed’ someone. Similarly, when discussing a recent high profile truck crash, one Company A driver stated that *“that driver who went through the house in Urunga, the ute driver was drunk, but how would you live with that? He killed a boy”*.

There was some degree of stigma surrounding the issue of psychological trauma. Within Company A it was evident that, due to crashes being blamed upon stupidity, there was little sympathy for individuals suffering psychological distress unless they were not at fault. For example, when discussing an incident, one Company A manager stated that the driver was *“claiming post-traumatic stress because he’s a fucking idiot that just had a lose in the wet”*. Thus, regardless of whether the stress was considered real, the fact that the individual was at fault invalidated this stress. Unfortunately, in many cases it was evident that post-traumatic stress was viewed as fake or exaggerated. When discussing one driver, who had not

worked in seven years due to fear resulting from a crash, the manager asked whether the claim sounded real then answered: “*I’m thinking not champ*”.

*Shit happens. People break their ankles but, you know, as for psychological damage for crashing a truck seven years ago and you’re too scared to do anything. Like this bloke hasn’t worked for seven years because he’s too scared. Do you really think that sounds real? I’m not calling him a liar but I think he might be just tricking us just a little bit you know. I can understand if he was maybe too scared to run down that highway or drive a cab over truck but to do anything ever? I’m thinking not champ* (Company A Manager One)

#### 10.4.3. Health outcomes summary

Due to insufficient attention granted to health outcomes, it is difficult to draw conclusions regarding the effect of culture on health outcomes. Further, it is difficult to determine the suitability of the synthesised conceptualisation of safety culture in understanding health outcomes. Future research should investigate these health outcomes in isolation. The factors identified as relevant to health outcomes, and the direction of their effect, are presented in Table 10.8.

Table 10.8: Factors which influence health outcomes and related behaviours

Outcome	Factors which reduce safety	Factors which improve safety
Health outcomes	Contextual Factors:  Road design (truck stops)  Environmental factors (time)	Contextual Factors:  Organisational enforcement  Accreditation requirements  Customer policies
	Cultural Factors:  Common sense  Money	Cultural Factors:  -

### 10.5. Summary: Safety-related behaviours and outcomes

The current chapter examined specific behaviours relating to crash outcomes, mechanisms of non-driving injuries and a small selection of health outcomes. The purpose of this chapter was to identify how contextual and cultural factors, identified in Chapters 7 to 9, influence these outcomes. Whilst the discussion of these findings in relevance to the synthesised conceptualisation of safety culture and improving safety within the heavy vehicle industry is discussed in Chapter 11, a few points should be made. Throughout this chapter every factor which was identified in Chapters 7 to 9 was seen to impact safety in a number of ways. Whilst not every factor was evident in a given behaviour, no single outcome was governed exclusively by contextual or cultural factors. Given that previous safety culture approaches have focussed solely on either contextual or cultural factors, the findings of this chapter highlight the benefit of the synthesised conceptualisation of safety culture in understanding behaviour. In the absence of quantitative investigation, it is not possible to directly demonstrate that each of the identified factors has a genuine, rather than industry-perceived, impact upon safety. Nonetheless, it appears that many of the identified factors have potential to be used to reduce the number or severity of incidents within the industry.

### 10.6. STUDY THREE CONCLUSION

The purpose of Study Three was to examine the impact of cultural and contextual factors on safety and the manner in which they influence behaviours within specific organisations. The choice to use a case study methodology was based upon the findings of Study Two. Study Two revealed that there were significant differences in safety between organisations, based primarily upon the size and location of the organisation, and the type of trucks, type of cargo and distance the cargo is transported. Thus, a collective case study methodology was chosen, in which cases were selected not out of intrinsic interest, but to inform a broader issue. Whilst there were major contextual differences between the

organisations, it was apparent that many of the cultural traits were common between organisations. Despite some variance in the valence of traits, and the strength at which they are present, it appears likely that the identified cultural traits are somewhat common within the broader heavy vehicle industry.

The case studies provided significant detail regarding the contextual and cultural factors which are relevant to safety within each company. The findings of Chapters 7 to 10 are presented within Figure 10.2. This figure is an adapted form of the model proposed in Chapter 2 (context, culture, behaviour and outcomes), updated with the major headings discussed in Chapters 7 to 9. Thus the figure provides a detailed overview of the findings of Study Three relative to the culture and context of the three studied organisations, and the behaviours and outcomes that they influence.

As was the aim of the current chapter, the manner in which these factors interact to produce behaviour was examined. Whilst further research is necessary to quantify the impact of these factors and interactions, the case studies have provided significant theoretical depth to the synthesised conceptualisation of safety culture within the heavy vehicle industry. The next chapter discusses how the findings of each of the three studies have contributed to the existing knowledge of safety culture, via the synthesised conceptualisation proposed in Chapter 2, and the knowledge of safety within the heavy vehicle industry. Further, discussion surrounding the limitations of the current research and directions for future research is provided.

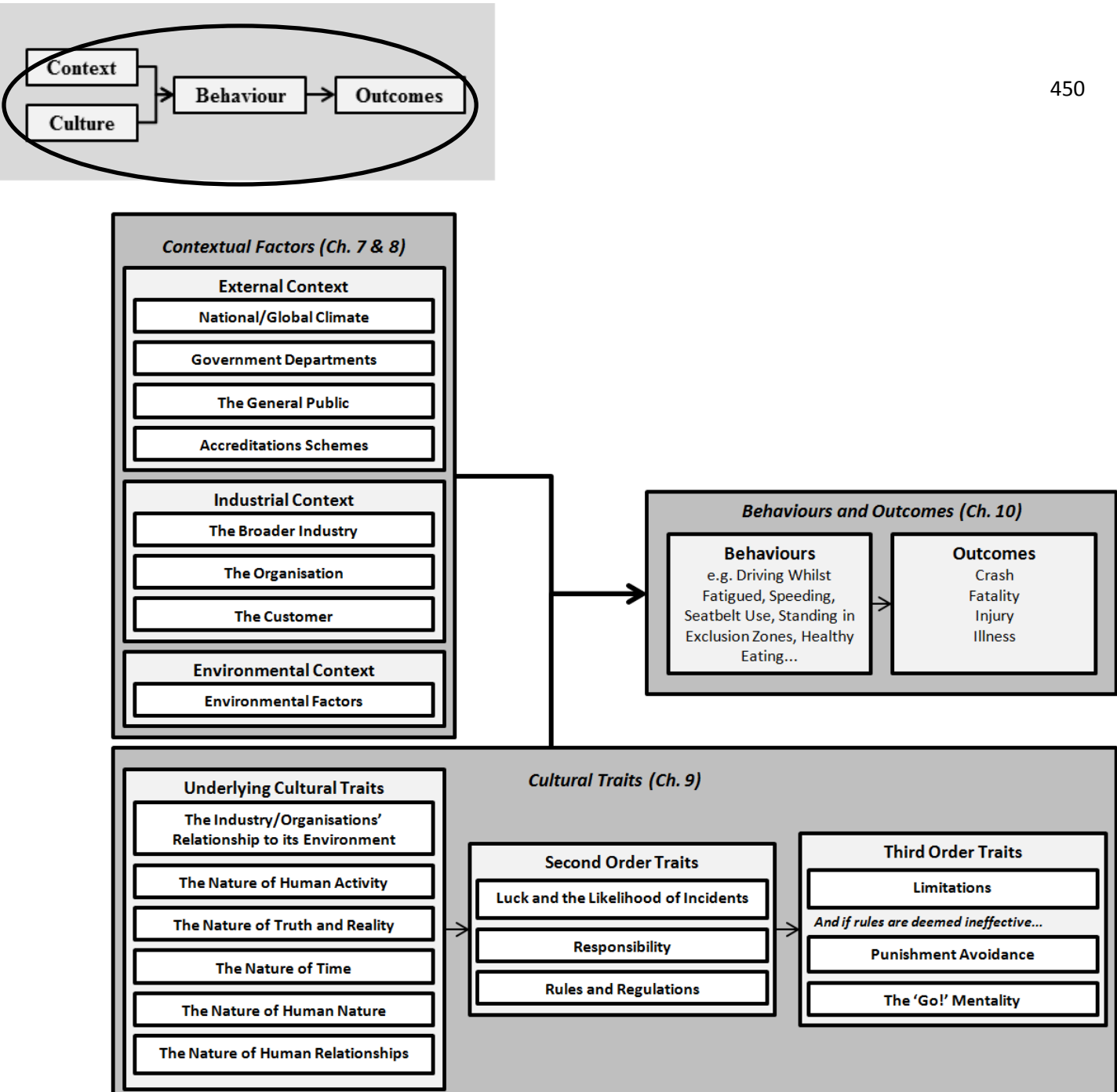


Figure 10.2: Synthesised conceptualisation of safety culture within the studied organisations

## **Chapter 11: Discussion, Conclusions and Moving Forward**

### **11.1. THE PURPOSE OF THE CURRENT RESEARCH**

The purpose of the current thesis was twofold. As discussed in Chapter 1, the heavy vehicle (or road freight transport) industry is a crucial component of the Australian economy, yet has a number of health and safety concerns which must be addressed. Due to the nature of the heavy vehicle industry, health and safety is a combination of both workplace health and safety issues faced within many industries, and road safety. It was noted, however, that the heavy vehicle industry has been resistant to standardised intervention strategies, and safety culture was identified as a potential focus of exploration for health and safety within the industry. Thus, the first purpose of the current research was to explore the influence of culture on safety within the heavy vehicle industry.

Unfortunately, due to a lack of previous research which has explored safety culture in similar industries around the world, there is a lack of tested approaches to applying the safety culture concept to this industry. Further, research within the field of safety culture is divided over even the most basic definitions and methods of investigation to be utilised. For this reason, it was noted that previous researchers had described safety culture as a concept in chaos. Despite a lack of general consensus within the field of safety culture, researchers tend towards either a functionalist or interpretive approach. The first emphasises organisational

structures and systems and the latter emphasises shared beliefs, attitudes and values. Due to the extreme levels of autonomy held by members of the industry, taking a solely organisational approach to safety culture was seen to be too restrictive. Further, the number of external influences on a driver's behaviour, such as government regulations and organisational and customer policies and procedures, meant that sole focus upon shared beliefs, attitudes and values was similarly too narrow for this industry. Thus, the second aim of the current research, which was necessary to address the first purpose, was to return to the theoretical roots of safety culture to provide a theoretically grounded conceptualisation and framework of safety culture.

### 11.2. The synthesised conceptualisation of safety culture

Chapter 2 was comprised of a literature review which sought to provide a theoretically grounded framework of safety culture. Within the field of safety culture there are many different definitions and conceptualisations of safety culture, in part influenced by the different academic or professional background of researchers and practitioners. Due to the lack of consensus within the field regarding the basic definitions and key components of safety culture, it was argued that there was a need to develop a stronger theoretical understanding of safety culture to advance the field beyond a loose collection of organisational safety research. Whilst the behaviours which comprise safety differ between organisational settings, it is the use of the word 'culture' in safety culture that provides the primary connection within this field. Thus, by better understanding the meaning of 'culture' in safety culture it is possible to provide a theoretically grounded framework of safety culture.

As many safety culture researchers have recognised safety culture to be a component or effect of organisational culture, organisational culture was seen to be a valid first point of examination for understanding culture. However, just as safety culture has been linked with



organisational culture, organisational culture has been conceptualised in terms of more traditional anthropological and cultural psychological conceptualisations of culture. Thus, to truly provide a theoretically grounded framework of safety culture, it is necessary to understand how these fields view culture. Brinkmann (2007) reviewed three conceptualisations of culture which appear within the literature – the normative, anthropological and pragmatic conceptualisations. These three conceptualisations were used to examine the existing literature on safety culture.

The normative conceptualisation of culture is typically viewed in an individual-focused manner, and holds that culture is the knowledge of the best that has been said and thought. Thus, the conceptualisation argued that every individual can and should be ‘cultured’, by gaining this knowledge. Whilst safety culture has not been viewed as an individual construct, the treatment of safety culture as a predetermined ‘best’ standard has been common since the term was first introduced. As it is believed that this best standard can and ought to be possessed by organisations, this has led to an emphasis on creating or shaping a culture. Inevitably, this has resulted in safety culture being considered a type of best safety practices model in which organisations are judged on their policies and procedures resulting in changes being made where necessary.

The anthropological conceptualisation of culture, however, views culture as a set of shared beliefs, attitudes and values. Whilst many definitions of safety culture match with this conceptualisation, there has been relatively little research which uses this conceptualisation. The lack of research is arguably contributed to by the difficult and time consuming nature of ethnographic and qualitative research.

The third and final conceptualisation of culture, the pragmatic conceptualisation, holds that culture is essentially about practices or behaviours. Whilst safety culture is not often defined or viewed in such terms, a behavioural focus on safety culture is evident within much

of the practice-oriented literature. However, this literature differs from the pragmatic conceptualisation in that the latter requires that practices be driven by underlying beliefs, attitudes and values, whereas much of the related safety culture literature has relied upon other social and organisational psychology theories to explain behaviours.

Each of these conceptualisations has seen some use within the field of safety culture and possesses a number of strengths and weaknesses, outlined in Chapter 2. Due to the unique strengths and weaknesses of each conceptualisation, it was argued that, by combining the focus of each conceptualisation in order to harness their relative strengths whilst minimising or eliminating their weaknesses, safety culture could be more amenable to a wide variety of industries and safety issues. Thus, the synthesised conceptualisation of safety culture was proposed in which safety culture was defined as the assembly of underlying assumptions, beliefs, values and attitudes shared by members of an organisation, which interact with an organisation's structures and systems and the broader contextual setting to result in those external, readily-visible, practices that influence safety. In simplest terms, culture (shared beliefs, attitudes and values) interacts with contextual factors (environmental factors, many of which are readily amenable to change) to produce behaviour. This distinction between cultural and contextual factors that interact to influence behaviour is the key distinctive of the synthesised conceptualisation of safety culture. This conceptualisation formed the basis of each study throughout this thesis.

### 11.3. THE RESEARCH APPROACH

Chapter 3 set out the aims and methods to be used in the current research. Following on from the two purposes of the current research highlighted in section 12.1, Chapter 3 proposed two primary research objectives. The first objective was to enhance the current understanding of safety culture by providing an approach to safety culture which can be applied across a variety of industries and settings, including the heavy vehicle industry. In order to address

this objective it was necessary to both develop the framework presented above and examine its efficacy in explaining safety-related behaviours. The second objective was to utilise the developed framework to explore the effect of culture on safety in the heavy vehicle industry.

Whilst Chapter 2 provided the framework to be used, the remainder of the current research was required to examine the framework's efficacy and utilise it within the heavy vehicle industry. Thus, the following aims were employed for the research:

- a. Examine the suitability of the key components of the synthesised conceptualisation of safety culture (culture, context and behaviour) to the heavy vehicle industry
- b. Identify factors previously identified within heavy vehicle industries, which comprise the key components of the framework
- c. Identify major factors within the heavy vehicle industry which have eluded previous research
- d. Identify the best methodological approach to investigating the effect of culture on safety in the heavy vehicle industry
- e. Examine how cultural and contextual factors affect safety-related behaviours in the heavy vehicle industry

In order to address these aims a three-part research project was developed which relied heavily upon a combined ethnographic and grounded theory methodology (see section 3.2.2). The first study, which sought to address aims A and B, was comprised of a systematic literature review of previous heavy vehicle health and safety research. The second study, which addressed aims C and D, was comprised of a series of key stakeholder interviews with members of the industry. Lastly, based on the findings of Study Two, and in relation to aim D, Study Three sought to address aim E by utilising case studies of individual transport organisations. A discussion of the findings of each of these studies is presented below, with

particular emphasis on how the studies addressed their respective aims, and what limitations are inherent in the studies.

### 11.3.1. Study One

As stated above, Study One sought to address aims A and B by conducting a preliminary assessment of whether the key components of the synthesised conceptualisation of safety culture were suitable for use within the heavy vehicle industry. It also addressed these aims by identifying the factors shown in previous research which comprise the key components of the theoretical framework. A systematic literature review of previous heavy vehicle health and safety research was conducted and those studies which identified contextual or potential cultural factors relevant to safe and unsafe behaviours were selected for review. A total of 132 peer-reviewed journal articles were selected, which were found to provide results which aligned with the key components of the theoretical framework. Whilst the vast majority of these papers related to crash outcomes and behaviours, a number of papers were identified which examined factors related to non-driving injury outcomes and health outcomes. Additionally a small selection of papers were included which examined factors which did not directly align with the above outcome categories, yet appeared to hold information relevant to the framework and safety within the industry.

The results of this review, presented in Chapter 4, included the identification of: (1) a number of behaviours which were linked with safety outcomes; (2) a number of contextual factors which were seen to either have a direct relationship with safety outcomes or with behaviours linked to outcomes; and (3) a number of potential cultural beliefs, attitudes and values. The lack of previous research examining cultural beliefs, attitudes and values means that, within the current research, any cultural factors drawn from previous research can only be referred to as 'potential'. In addition to these findings, it was found that there were a number of individual factors which related to these behaviours and outcomes. A number of

individual factors were also identified, however as individual factors are not theoretically relevant to the synthesised conceptualisation of safety culture (which emphasises shared, rather than individual, beliefs, attitudes and values, and the context surrounding the workforce), these factors are discussed in Appendix A.

In relation to the stated aims of this study, a number of key points can be made. Firstly, the large number of identified factors strongly supports the idea that the synthesised conceptualisation of safety culture is suitable for use within the heavy vehicle industry. Whilst a number of papers were excluded from the review, due to a primary focus on issues such as pedestrian safety, road wear and the effects of air pollution on the health of the general public, there was evidence for both cultural and contextual influences on safety within the industry. The sheer number of factors identified in each of these categories highlights the importance of not solely examining shared beliefs, attitudes and values, or organisational structures and systems. When compared with existing approaches to safety culture, the synthesised conceptualisation of safety culture appears much more suited to the heavy vehicle industry and thus, in response to aim A, it can be stated that the synthesised conceptualisation is well suited to the industry.

In relation to aim B, whilst a full recap of the identified factors would be neither necessary nor required, a number of general categories of factors should be noted. Firstly, as it is a requirement of the synthesised conceptualisation for identified factors to be relevant to behaviours, a number of safe and unsafe behaviours and behavioural scenarios were identified, including driving whilst fatigued, drug and alcohol driving, speeding, seatbelt use, driving errors and violation, behaviours during loading and unloading and entering and exiting the vehicle, receiving health care, and eating and exercise. These behaviours were linked with crash rate and severity, injuries and fatalities, locomotor disorders, cancer, respiratory diseases, obesity and related diseases, and common illnesses.

In terms of contextual factors which influence these behaviours and outcomes, it was seen that government departments, the organisation, customers and the workers union all have a role in shaping the context which influences heavy vehicle driver safety. Further, it was seen that a number of road environment and work environment factors also influence safety. With regards to cultural factors identified within previous research, the fact that previous research was not explicitly aiming to identify cultural beliefs, attitudes and values limits the ability to draw significant conclusions. Whilst it could be argued that previous research has not identified any cultural factors, a number of studies have identified trends in attitudes, beliefs and values which influenced safety-related decisions. For this reason, a number of potential cultural traits were identified within the existing literature.

In terms of the general limitations of Study One, the number of papers identified could be argued to appear relatively low. Whilst there was a significant amount of grey literature, such as government reports and government-funded research, there was less peer-reviewed literature to examine. Further, many of the databases originally searched were ill designed to adequately limit search results and were not practical for use within the study. For example, Google Scholar returned thousands of results and, though some of the results on the first couple of pages appeared to be unique to Google Scholar, an inability to apply any relevant filters on the results prevented this database from being practically useful. Thus there were some limitations in the number of papers identified and potentially significant past research may have been left out of the current review. However, as the second two studies examined these factors within the industry, the potential for missed research in the first study does not significantly reduce the validity of these findings for the current research. In terms of the first aim of the current study, further information would only serve to strengthen the suitability of the current framework to the heavy vehicle industry by identifying further factors. Study One, however, may have been limited in its ability to comprehensively address aim B.

### 11.3.2. Study Two

Study Two consisted of a series of 30 interviews with key industry stakeholders, including government personnel, managers, drivers, and representatives from industry associated groups such as the Australian Trucking Association. The purpose of these interviews was to identify major contextual and cultural factors which had eluded previous research and to identify the best approach to exploring the effect of culture on safety within the heavy vehicle industry.

Throughout the interviews a number of additional factors were identified which did not appear within the systematic review (see Chapter 5). Thus, in regards to aim C of the current research, Study Two identified a number of factors previously not identified in the literature, each of which may serve as a vital focus of research regarding the effect of culture on safety. In terms of behaviours and outcomes, there was a significant degree of overlap between Studies One and Two, and the only new factors that were identified were the extension of speeding to include inappropriate speeds below the posted speed limit, and the additional identification of anxiety and stress as an outcome. Additional contextual factors included a number of industrial groups and affiliations, which also encompassed the previously identified workers union, the contracting organisation which serves as an additional customer to subcontractors, and the notion of a temporal context comprised of the past state of the industry. Further, whilst other vehicles had been identified by Study One as being a component of the road environment, it was deemed necessary to disaggregate other vehicles into a separate factor, entitled the general public, due to the additional influences of electoral power and public perception of the industry.

Regarding cultural factors, again it can only be stated that the identified factors were ‘potential’ due to the relatively lower representation of drivers within the interview sample. Whilst managers and industrial affiliates may have a great understanding of heavy vehicle

drivers, it is questionable whether their opinions on the shared beliefs, attitudes and values can be truly considered representative of the culture of drivers. Additionally, due to the wide scope of the interviews with participants sampled from across the industry, it is difficult to know whether factors identified were unique to subsections of the industry or could be applied broadly. Nonetheless, when combining the potential cultural factors identified within Study Two with those identified within Study One, it was possible to broadly categorise the potential factors. The cultural factors identified throughout the first two studies could be categorised as beliefs about the general public, beliefs and attitudes towards enforcement and regulations, the notion of an 'old school' subculture, the value of autonomy and the lifestyle of trucking, beliefs and attitudes towards money, attitudes toward work, attitudes toward safety and risk, attitudes towards family and friends, and beliefs and attitudes regarding the organisation.

In regards to aim D of the current research, Chapter 5, section 5.3, explored a number of findings from Study Two which were used to determine the best approach to exploring the influence of culture on safety within the heavy vehicle industry. It was found throughout the interviews that there was significant heterogeneity within the industry. Despite previous suggestions that drivers may identify themselves with a broader road culture rather than with their individual organisations, many of the differences within the industry were linked with organisational factors such as the size of the organisation and the location of the depot, load-related factors such as the distance and type of goods are carried, and the size of the truck. Given that the size of trucks used and many of the load-related factors are determined by the organisation for which the driver works, it appeared evident that organisations could serve as a vital focal point for Study Three. Thus, these results suggested that the use of case studies, aimed at sampling subsections of the industry by examining individual organisations, was the best approach to address the final aim of the current research.



Prior to moving forward to the results of Study Three a number of general limitations should be mentioned with regards to Study Two. First, as this study was comprised completely of interviews many limitations common to qualitative research apply to Study Two. The results of these interviews are largely based on the opinion of interviewees. Though well informed due to their status as stakeholders within the industry, the information may be incomplete or biased. This is particularly the case due to the inability of interviews to directly measure the relationship between the factors identified and behaviours or outcomes. Further, the relatively low representation of drivers within the sample population may further bias the results, as the factors which managers and government personnel see as relevant to driver behaviour may not align with the factors that would be identified by drivers. Conversely, the high number of managers present within the sample may have a biasing effect, as managers may be less likely to recognise their own involvement in the unsafe actions performed by their drivers. Lastly, the biases of the researcher can play a significant role in qualitative research, as the researcher is required to identify meaning within the words of participants.

A brief note should also be made regarding the potential for censorship of negative information to provide socially acceptable responses which may not align with reality. Due to the number of government regulations governing safety, and that the project was funded by government departments, participants may have opted not to share negative information which they felt could have led to punishment. This issue was not overly problematic within Study Two, however, as much of the information retrieved was presented in a third person perspective and negative information was typically provided about 'others'. Some of this information may have been actually relevant to the study participants, and not simply other members of the industry, but as it was typically presented in a very negative manner it did not appear to have been censored to appear more positive. Conversely, however, data gained

which genuinely related to a third party may have been, in part, conjecture and thus should be interpreted with caution.

In order to reduce the effect of these limitations two key approaches were used. Firstly, the use of grounded theory analysis techniques, in which themes are identified from multiple sources, reduced the effect of individual biases. Additionally, the use of two researchers for the analysis of interview transcripts reduced the possibility of researcher bias, as alternative interpretations could be considered and discussed. In order to reduce censorship of information participants were informed of rigorous confidentiality, in which all the collected data was de-identified prior to analysis and any presentation of results. Given that the purpose of Study Two was to identify major factors that were missed in previous research and to identify the best approach for Study Three, ensuring the highest validity within this study was not necessary. The distinction of ‘major’ for the factors which eluded previous research highlights that the key importance was to identify potential gaps in past research which should be examined within Study Three. Whilst some of the factors highlighted by Study Two may have been the result of biased information, they still served to identify factors worth investigating. Further, the sheer degree of overlap between Studies One and Two provides confidence in the reliability of the findings.

With regards to aim D, whilst it was important to identify the best approach to Study Three, the findings regarding the heterogeneity of the industry served primarily as a warning to ensure that Study Three was not confounded by a lack of homogeneity. Thus, even if this level of heterogeneity was incorrect or exaggerated, the choice to allow the perceived heterogeneity to guide the sample selection of Study Three will not limit the findings of this study. If Study Three was to find no differences within different subsections of the industry, it could be argued that there may be a broad industry-wide culture. Conversely, if major differences were present, the choice of case studies will enable the results of Study Three to

be interpreted with due caution. Thus, whilst there were a number of limitations to Study Two which may have led to biased results, these limitations do not pose a significant problem for the interpretation of results.

### 11.3.3. Study Three

The final aim of the current research was to examine how interactions between cultural and contextual factors affect safety in the heavy vehicle industry. Following on from the results of Study Two, it was determined that the best approach to investigating these interactions was to conduct case studies with organisations chosen to sample the perceived heterogeneity of the industry. This approach forms a collective case study, in which multiple cases are examined not out of intrinsic interest, but rather to sample a broader whole. In this instance, the three chosen organisations were selected due to a combination of convenience (that is, the need for organisations that are willing to participate) and due to the differences between each organisation that aligned with the key sources of variation identified within Study Two. A detailed summary of the selected organisations can be found in Chapter 3 (section 3.2.3.4.3) along with a table demonstrating the differences between each organisation. As discussed in Chapter 3 (section 3.2.3.4.2) the primary methods of data collection within the case studies were based upon the ethnographic method, primarily consisting of interviews and participant observations.

Whilst document analysis is a common method employed within ethnography, the sheer degree of data and the extent of consensus between sources within each organisation rendered document analysis unnecessary. Whilst driver's manuals were provided by each organisation, they were primarily used simply as an additional source to clarify what was meant by participants who referred to specific policies and practices and to confirm the method of employment used within each company. Further information that could be drawn from the provided documents was solely of a policy or procedural nature. This information

was unnecessary as managers described the relevant policies in detail. It was also potentially irrelevant, as the actual practices associated with policy enforcement within an organisation may not directly align with the written procedures and the perception of procedures may be more relevant to driver behaviour than official procedure statements.

The data that was collected was analysed using a grounded theory analysis approach (see section 3.2.2), consisting of open coding in which data is coded into major categories or factors, axial coding in which subcategories are identified and the relationships between these categories is explored, and selective coding in which the relationships between categories and a key theme are identified. It could be argued that the current research is not ‘true’ grounded theory, in that a framework of safety culture was developed prior to commencing the research. However, this was a necessary step to ensure that the findings of this research were truly valid to the first purpose of the current research, namely to identify the effect of culture on safety in the heavy vehicle industry. Thus the grounded component of the current research was not to form a theory of safety culture, but to identify what specific factors formed the broader components of the framework (context, culture, behaviour and outcomes) within the target industry. In this sense, the current research is inductive in approach.

Due to the need to adhere to an existing framework of safety culture, the interviews and observations were in part guided by the findings of Studies One and Two. Thus information which was relevant to the factors identified in the previous studies was given particular attention and sought out where possible. However, as much of the data obtained naturally aligned with the findings of Studies One and Two, the researcher was able to focus on ensuring that any further information was sought. This largely was achieved by approaching the interviews and observations in an open manner, allowing participants to share information that they believed was relevant to safety, rather than guiding the participant towards existing

preconceptions. Nonetheless, when passing reference was made to apparently relevant factors, the researcher encouraged the participants to further expand upon these comments.

The data analysis for the case studies was conducted using the software program NVivo. During the open coding aspect of the data analysis, collected data was coded as either sources of contextual influence (e.g. government departments, the organisation), culture (broadly at this stage), or driver factors (for individual factors, see Appendix A). Due to the requirement for factors to be linked with behaviours and outcomes, the transcripts were simultaneously coded according to the relevant behavioural or outcome category (e.g. crash, fatigue, loading, musculoskeletal injuries). The results of this coding led to the main sections found within Chapters 7 to 10. Following this initial open coding, each of the existing coded factors was further analysed for subcategory themes. Each of these subcategories was discussed in detail within the relevant chapters. For example, within the organisation (Chapter 7) data was coded into a number of subcategories including safety management (7.4) and general employee management (7.3). Within each of these subcategories a number of further subcategories could be identified (e.g. within general employee management there were initial training and inductions (7.3.3), ongoing training (7.3.4), and payment (7.3.6) etc.). Lastly, Chapter 10 was the result of selective coding, identifying the manner in which each of the identified factors was related to specific safety outcomes.

Whilst the key focus of Study Three was to examine the interactions between factors and the effect they have on safety, it was necessary to first detail the factors identified in order to discuss these interactions. Thus, there was a significant degree of attention devoted to explaining the identified factors through Chapters 7 to 9. However, the key findings of Study Three, that is, how Study Three has addressed aim E, can be primarily found in Chapter 10 where the effect of interactions between contextual, cultural and individual factors on specific behaviours was discussed.

### 11.3.3.1. Overview of Study Three findings

It would not be possible to provide a complete overview of the findings of Study Three within the current chapter, however, a number of key findings should be noted. The results of Study Three were presented over Chapters 7 to 10. Chapter 7 examined the role of the organisation in influencing safety within the studied organisations. Studies One and Two had identified that general organisation characteristics, employee management practices and specific safety management practices had an influence on safety behaviours and outcomes. Within the case studies, general organisational characteristics were already outlined in Chapters 3 and 6 and formed the basis of selection for Study Three. Thus, whilst the influence of these factors was evident throughout the study, they did not receive specific attention. Employee management practices and specific safety management practices were again identified as having an affect on safety, though where Study One and Two emphasised the differences between good and bad practices, Study Three simply sought to examine the practices that were occurring in the studied organisations and the influence that these had on safety.

Chapter 8 focussed on the remaining identified contextual factors. An additional level of influence was discovered, referred to as the influence of national and global climate. It was found that economic conditions, employee availability and even national cultural traits influenced safety through applying financial pressure, limiting the ability of organisations to choose suitable employees and shaping individual behaviour respectively. Regarding government departments, the essential mechanisms through which government departments influence safety were found to match with the results of Studies One and Two, but a number of specific departments and policies were identified which influenced safety in the studied organisations. Regarding the general public, the research did not find any direct affect of public perception and their electoral power over governments on safety. However, a number

of issues were identified with members of the general public in terms of the manner in which they drive, particularly around trucks. Though the effect of cars on the road could be considered a road environment factor, as it was in Study One, the degree of information obtained, especially regarding the lack of education about truck limitations, warranted specific attention and thus the general public remained as a specific level of influence. Similarly to the influence of government departments, the mechanisms of influence did not differ much from the earlier studies, though a number of specific policies and enforcement techniques and demands and delays were identified.

The previous two studies identified a number of organisations, labelled as industrial groups and affiliations, which influenced safety. These organisations included the transport workers union, a number of accreditation bodies, and organisations that provided external safety guidelines. Within the studied organisations, however, the workers union and external guidelines, though mentioned, were not found to have a direct influence on safety. Conversely, accreditation schemes received significant attention and were seen to have large impacts on safety, so only accreditation schemes remained in the model for the studied organisations. Another additional level was also discovered, termed the broader heavy vehicle industry, where members of other transport companies were found to influence safety. It was found that industry-wide cultural values, assistance offered between organisations, competition and direct driver-driver interactions all had an influence on safety. This was either directly on driver behaviour or through altering the level of risk via the organisation for which the driver works.

Lastly, regarding environmental and situational factors, the previous studies had identified the road and work environment as separate influences. With exception to passengers and health care access, each of these factors was identified within the case studies, though in further detail. Generally it was found that road design and condition, truck design

and limitations, environmental conditions, and factors related to the type of load being carried influenced safety. The absence of passengers being identified as a relevant is to be expected given each of the organisations studies had policies dictating passengers. For that matter, during all of the observations the researcher was the passenger and it was difficult to determine what effect the researcher's presence may or may not have had. Further, due to the requirements of certain accreditation schemes which each organisation was a part of, drivers receive regular medical examinations. Thus, the current sample of organisations was not able to identify whether many other drivers find health care access a difficulty.

It can be generally stated, with regards to contextual influences on safety, that Study Three provided significant depth and detail regarding the context surrounding drivers within the studied organisations. There were some differences between the findings of Study Three and Studies One and Two. However, the purpose of Study Three was to explore how contextual and cultural influences interact to influence behaviour in the three chosen organisations, rather than to provide an industry-wide model. Thus, these differences are simply a reflection of what was important within the studied organisations. Further, studies One and Two were somewhat hypothetical in nature, examining more general possibilities of factors to consider, whereas Study Three examined factors which were shown to be important for safety in the studied organisations.

With regards to cultural traits, the traits outlined in Chapter 9 were identified through an inductive approach. Though previous research had identified attitudes, beliefs and values which influenced safety, and there were a number of similar factors identified within the stakeholder interviews, these findings were of a 'potential' nature due to a lack of previous approaches specifically targeting the identification of cultural factors. Within Study Three themes were identified through grounded method analysis techniques, with open coding consisting of identifying data as relevant to culture, axial coding consisting of identifying



specific cultural traits, and selective coding consisting of identifying the relationships between these traits and with behaviours and outcomes. After the axial coding phase was completed 20 cultural traits were identified. For ease of access and understanding, and due to the apparent similarity, these traits were presented using headings taken from Schein's (Schein, 1990) 'underlying dimensions of culture'. Whilst the relationship between the findings of Study Three and Schein's dimensions was unintended, it serves to validate the focal topics of the identified traits. Further, Schein's dimensions provide a useful organising structure with which to group thematically related cultural traits. Thus the majority of identified traits could be categorised as relating to the industry and organisation's relationship to its environment, the nature of human activity, the nature of reality and truth, the nature of time, the nature of human nature, or the nature of human relationships. Additionally, however, a small selection of cultural traits appeared to be largely based and dependent upon other traits. These traits were identified separately as second or third order traits. For example, the second order trait of 'luck and the perceived likelihood of an incident', appeared to be comprised of a combination of the value placed on safety and on experiential and narrative learning.

The final component of the case studies, presented in Chapter 10, explored the relationship of each of the previously discussed factors with specific behaviours and outcomes. Generally, it can be seen from the analysis of specific behaviours that safety is a complex issue, with a large number of factors contributing to many behaviours. The first behavioural category discussed, fatigue, was influenced by almost every one of the identified factors, except a small selection of cultural traits. Conversely, some behaviours were only influenced by a small number of factors. For example, seatbelt use appeared to be determined solely by the perceived likelihood of injury or punishment resulting from lack of use, which was drawn from the experience of drivers and the stories they have heard from others. This

final component of the case studies therefore addressed aim E by identifying the complex interactions of multiple contextual and cultural factors which influence safety.

#### 11.3.3.2. Limitations to the findings of Study Three

As with Study Two, the third study was comprised completely of qualitative data and thus the same limitations that were present in Study Two also apply to Study Three. Additionally, due to the reliance on qualitative data, the relationships drawn between the identified factors must be interpreted with caution. In the absence of quantitative validation, it cannot be stated that the relationships between factors and behaviour have been demonstrated in a positivistic sense. Thus the relationships which were identified represent those which were either perceived by participants, or interpreted by the researcher from the interview and observation data.

The results of Study Three were based primarily on the expressed opinions of participants and data gained from direct observation, which is subject to researcher bias. Conversely to Study Two, however, as the case studies sought to examine the influences that were present solely within the investigated organisations, the opinion of members of the studied organisations is extremely valuable. Whilst it is important to recognise that the views of participants may have been biased by a desire to convey specific aspects of safety, where the participants shared their own positive and negative behaviour, and the contextual influences which shaped it, there is likely to be a high level of validity. It is worth noting, however, that there may have been a significant degree of negative information which participants opted not to share, either out of a desire to appear in a given way or out of fear of potential repercussions.

The potential for the censoring of information in this way was partly countered through rigorous confidentiality that was ensured to participants. Participants were consistently informed of the degree of confidentiality that they would receive. This confidentiality

included the guarantee that the research team and transcriber alone would have access to the recordings and transcripts of interviews, as well as the researcher's observation notes. Additionally, participants were ensured that at no point during the presentation or dissemination of results would the data be presented in such a way that any government or organisational member could identify the organisation or individuals in question. Despite this, it was evident that some participants were hesitant to discuss certain matters, particularly when discussing substance use, as noted by the manager who requested that the recording be ceased.

Due to the highly implicit nature of culture, in that the underlying shared beliefs, assumptions and values may not be directly expressed, there is a significant need for the researcher to interpret the information that is gained. Thus, whilst the data regarding contextual influences will have a high degree of validity, the identified cultural traits could be argued to be somewhat subjective due to the researcher posing a significant limitation to the identification of cultural traits. Both this limitation and the general limitation of biased individual responses were managed through the requirement of responses from multiple participants to form a theme, and through the assistance of additional members of the research team in interpreting results. Further, it is important to recognise that ethnography, through the use of participant observation and interviews, is the fundamental approach to investigating the culture of a population of people and, thus, whilst there are certain weaknesses inherent to this form of data, it is the most trusted technique to the initial exploration of a culture. However, future research is necessary to further validate the findings of Study Three with regards to the culture of the industry and organisations in question.

A final limitation to Study Three can be found in the selection of cases. Whilst every effort was made to sample organisations that represented different subsection of the industry, there were difficulties associated with gaining participation from organisations. For this

reason the organisations which were selected were in part selected out of convenience, or simply the fact that they were willing to participate, along with meeting the requirements set out by the findings of Study Two. As outlined in Table 2, section 6.1, the organisations selected were either small (less than 10 trucks) or medium (approximately 50 trucks) and based in either a capital city or regional centre. Further, each organisation carried different cargo, typically over different distances, and though each organisation used semi-trailers and B Doubles, Company C also used road trains, whilst Company B also used a number of rigid trucks. The weaknesses in the sample include the absence of larger transport organisations, the absence of organisations based in truly rural regions, and an absence of certain goods types, such as dangerous goods or liquids. Further, whilst each organisation was unique in some way (Company A was the only general goods company and had the longest regular transport routes; Company B was the only company to carry metal and over-dimension products and the only organisation which used rigid trucks; and Company C was the only small, regional or livestock-carrying organisation) there was significant overlap between many of the characteristics with at least one of the other two organisations. Thus, the ability to draw conclusions regarding the broader application of the findings may be somewhat limited.

#### 11.3.3.3. Study Three conclusions

Despite the limitations inherent within Study Three, a number of conclusions can still be drawn. Firstly, as is the purpose of ethnography, Study Three provided a detailed description, using the industry's own language (phrases and descriptions, as opposed to the English language), of the culture, context and behaviours that relate to safety within three heavy vehicle industry organisations. Through the use of grounded theory data analysis techniques, the culture and context were able to be categorised into a series of specific factors, which were seen to be linked by members of the industry with safety-related

behaviour and outcomes. Whilst there were contextual differences between each organisation, and differences in the prevalence and valency of cultural traits, many were common between the organisations. Thus, the findings and figures presented throughout Chapters 7 to 10 represent a synthesised conceptualisation of safety culture within the studied organisations. This partially addressed the aim of Study Three to examine how interactions between cultural and contextual factors affect safety in the heavy vehicle industry. However, the use of three specific organisations may limit the ability of these findings to apply more broadly within the industry, and the absence of quantitative data limits the extent to which these factors can be claimed to actually have an effect upon safety.

#### 11.4. RELEVANCE OF FINDINGS

The aims of the current research were to: (1) explore the influence of culture on safety within the heavy vehicle industry; and (2) return to the theoretical roots of safety culture to provide a theoretically grounded conceptualisation and framework of safety culture. Thus, the current research has implications to both safety within the heavy vehicle industry and to the field of safety culture. These implications are discussed below.

##### 11.4.1. Implications for safety in the heavy vehicle industry

The current research represents the first major study which has explored safety culture within the heavy vehicle industry. Whilst the first two studies were of high methodological importance, it is the findings of Study Three which have the greatest implications to safety within the heavy vehicle industry. Each of the identified factors has implications for safety within the heavy vehicle industry, though only a few key factors will be discussed here. First, however, a number of general implications are important to consider. Though Study Three only examined three organisations, and the findings therein may be somewhat limited to the studied organisations, there was a significant degree of overlap. General organisational

factors such as the type of goods carried and the location of the depot appeared to have broader effects on safety within the organisations. Of particular note, there were differences in the number and type of government regulations associated with the load being carried. For example, as Company C carried livestock they were subject to animal welfare regulations. Again focussing on company C, being based in a regional area and conducting significant proportions of their travel on private roads leading into and out of grazier properties, meant that there was less interaction with policing and members of the general public on the road. Further, each organisation and customer appeared to have significant differences in policies, requirements and even employment methods. Whilst the interactions with members of the general public is beyond the control of either government departments (save for designing roads such that heavy vehicles are separated from other vehicles), customers or the organisation, many of the other differences are easily amenable to change. The policies and procedures set out by these groups can be changed relatively easily, if the groups in question should choose to do so, though of course government regulations are time consuming to change and may have broader implications to consider.

Conversely, as was discussed within Chapter 2, culture can be very difficult to change. However, there was evidence of a high level of similarities between the organisations. The relevance of the specific cultural traits will be discussed further below, yet it is important to note that many cultural traits were common to each organisation. Given the deliberate selection of organisations which sampled the heterogeneity of the industry, it seems likely that, to some extent, the shared cultural traits may be common throughout the industry. Thus there is some evidence for an industry wide culture that is comprised of these traits.

There is uncertainty regarding the extent to which cultural traits can be deliberately changed. However, as many of the identified contextual factors can be changed, a number of potential avenues for intervention can be identified within the findings of this research.

Firstly, it may be beneficial to determine a number of 'best practices' within the industry which are suited to the existing culture. Secondly, contextual factors and practices of customers and organisations which reduce safety should be targeted for change. Finally, future interventions should be design to suit the culture of the industry to ensure the greatest impact on safety and minimise resistance.

#### 11.4.1.1. Best practices

Whilst further research will be required to truly identify, and quantitatively validate, best practices within the industry, the current research highlighted the following organisational and customer practices as potential 'best practices'. Starting with the organisation, many of the practices employed by Company B appear to have the greatest safety impact. Organisations aiming to minimise incidents should conduct thorough interviews, screening and reference checks. Further, new employees should be required to undergo a probationary period during which both trainers and other drivers accompany the new employee to conduct on-the-job training and assessment of skills, attitudes and knowledge. There is a requirement for thorough inductions, and initial and ongoing training. Training should be conducted on a regular basis and should incorporate serious incident reports and stories of incidents that have resulted from failed compliance. Drivers should be rostered both according to legal and individual requirements, and the rosters should be flexible and subject to daily fitness for duty examinations. Further, drivers should be paid an hourly rate, rather than paid by the day, trip or distance travelled.

Regarding specific safety management practices, there is a need for ongoing regular communication with drivers. Additionally, technology should be designed and implemented which reduces the risk of injury or incidents, by removing potential hazards. Organisations should also seek regular feedback from customers regarding their driver performance, and conduct regular audits of paperwork completed by drivers with accompanied objective

examination of the accuracy of these forms. Satellite tracking should be utilised by organisations to monitor fatigue management compliance, speeding and driving to the conditions. This would require satellite tracking with the relevant posted speed limits in-built. Lastly, though a complete listing of policies and enforcement cannot be presented here, there is a need for stringent monitoring of policies and fair but serious punishment.

Regarding best customer practices, the following can be identified from the results of Study Three. Customers should require prospective transport companies to be accredited by both TruckSafe and NHVAS fatigue management at a minimum. Customers should conduct their own audits of transport companies and provide safety guidelines to the organisation. Customers should require all heavy vehicle drivers to undergo inductions, and enforce strict safety procedures and policies. Customers should process heavy vehicle loading and unloading in a speedy manner to reduce delays. If delays are inevitable, customers should provide adequate rest facilities for the driver to use and should provide information regarding the delays to the organisation whilst simultaneously keeping a record of delays which have occurred. Lastly, though timeslots are beneficial to planning the loading and unloading of multiple vehicles, these time slots should provide significant additional time to prevent any pressure on the driver to drive unsafely to arrive.

#### 11.4.1.2. Unsafe contextual factors

Regarding unsafe contextual factors and customer and organisation practices which should be the target of change, relatively few were identified. Starting with government departments, there was a significant need for greater enforcement. This is difficult due to the resources associated with enforcement, however, it was evident that many regulations are too easily broken without sufficient monitoring and enforcement to punish breaches. Specific examples include the weaknesses associated with point-to-point speed cameras which are too distantly spaced to prevent drivers from speeding to make up for delays, insufficient



enforcement of COR legislation, and insufficient monitoring of seatbelt use. Additionally, as identified by the manager of company C, it is important to prioritise the stringency of legislation. It was argued by the manager of Company C that it was easier to justify breaches in fatigue management than breaches in animal welfare. In crudest terms, this effectively means that cattle are valued more highly than truck drivers. Undoubtedly this is an issue which was never intended to occur but must be addressed. Finally, there was also evidence that the current licensing requirements for heavy vehicle drivers are insufficient and drivers with no relevant experience are permitted to drive many vehicles.

Whilst best addressed through government departments, there is also a need to improve the manner in which cars drive around trucks. Members of the general public were commonly viewed as the single biggest danger to members of the studied organisations. It was believed that this stemmed from a lack of understanding of the design and limitations of heavy vehicles. Whilst this is unavoidable to some extent, in that without having driven a truck it is difficult to understand these limitations, government regulations should target the manner in which cars drive around trucks. For example, similarly to the manner in which tailgating is punishable, 'jumping in front of' a truck should be given a similar status as it is equally dangerous. Further, education campaigns should be directed at the general public concerning how to safely drive around heavy vehicles. At the customer and organisational levels, it is difficult to identify specific problems as it was typically a lack of sufficient action that appeared problematic. Adherence to the suggested best practices could remove many problems, but two specific points should be made. First, there is a need to reduce the pressure placed on drivers through rostering, timeslots, and direct demands. Second, payment methods which remunerate drivers based on a daily, trip, or distance rate should also be removed.

#### 11.4.1.3. Designing interventions which suit the culture of the industry

Regarding the identified cultural traits, quantitative validation of the extent to which they are truly shared throughout the industry is required. However, if the traits which were identified within the studied organisations are found to be in common, interventions should be designed with these traits in mind. The following discussion outlines the shared traits which were identified and how interventions can be shaped to work with the cultural traits.

Though the source of uniqueness differed between organisations, members of each company tended to view themselves and their co-workers as unique in some respect. This had the potential to reduce the perceived legitimacy of external information and interventions. Whilst it is true that there were a number of reasons why the organisations or industry subsection did differ from other organisations or industries, many safety related issues were found to be common. Thus, future interventions must be designed with an awareness of the relevant differences between subsections of the industry. Additionally, interventions should be presented in such a manner as to support this perceived uniqueness. For example, whilst fatigue is common for all heavy vehicle drivers, members of Company C felt that the use of private roads and transitioning to sealed public road reduced the impact of fatigue. In this case, rather than simply educate livestock carriers in the same manner as other transport companies, an emphasis could be placed on the degree of physical stress from driving on rough surfaces and the need to be alert due to increased traffic on public roads. Simply providing separate guideline statements for differing subsets of the industry, potentially with quotes and examples from the relevant group, may increase the perception that the uniqueness of these groups has been considered and accounted for in the creation of interventions.

Regarding the collection of traits categorised under the nature of human activity, a number of suggestions can be made. Education which emphasises the fact that safe work

results in higher long-term productivity (for example, that a well rested driver is able to work harder) could reduce the negative impact of the value placed on hard work. The value placed on fairness, and the resultant decreased commitment to organisations and regulations which are deemed unfair, suggest a need to consider whether government regulations should be more equally applied to other members of the general public. Whilst it is difficult, time consuming, and potentially much higher in cost, every effort should be made to reduce the implication that the heavy vehicle industry is viewed more negatively or even criminally. Whilst the exact means of specific enforcements could differ, members of the industry may value from having similar regulations in other industries explained. For example, many organisations are required to ensure that workers who have worked over hours have alternative means of transport. Thus, whilst fatigue regulations are viewed as unfair, explaining the manner in which similar precautions are taken for others may reduce the feeling that transport drivers have been treated unfairly. The trait entitled 'hold you line' was absent from company C, due to a lower interaction with other vehicles. Further, as this trait primarily applied to avoiding no-fault crashes, there is little that can be done to manage this aspect of the culture. Further, it could be argued that the decision to not risk one's life in order to avoid a crash that is caused by someone else is actually an ethically sound decision. This, along with the manner in which members of the general public drive around trucks, highlights a major need to better educate the public regarding safety around trucks. Given that the vast majority of car driver and passenger fatalities resulting from crashes with trucks are the fault of the car driver (Driscoll, 2013), it is simply a truth that truck drivers don't kill members of the general public, car drivers do. Thus, there is a need for general-public-centred truck safety initiatives. Lastly, the fact that truck drivers will go to great lengths to improve safety highlights the fact that effective communication of the safety benefits and risks associated with specific behaviours is essential. Throughout each of the specifically

discussed behavioural categories, this value consistently influenced safe outcomes. In many ways it could be argued that this is the single most important finding of the current research; however, to adequately use this trait, effective communication is required.

The need for effective communication highlights the importance of the first cultural trait categorised under the nature of truth and reality. Drivers from all companies appeared to hold the assumption that knowledge gained from personal experience and heard stories was more accurate and reliable than ‘cold’ information. Though it would appear intuitive to suggest that government departments and organisations should, therefore, utilise true accounts of the consequences of behaviour (which appeared effective within company B), there is a need to further investigate this technique. It is important to identify the type of stories which have the most impact on truck drivers, the most effective means of communicating those stories, and any factors relating to the source of this information which affect the perceived legitimacy of the stories. It may be the case that the same accounts presented by government personnel, managers and other drivers may be differentially accepted. Further, drivers may need to have already formed a trusting relationship with the individual who shares the account. Nonetheless, the use of true stories, which represent what incident statistics have shown to be true, appears to be a promising manner in which to increase the perceived likelihood of an incident and, thus, due to the value placed on safety, lead to safer behaviours. Regarding the emphasis placed on common sense, however, it is important to identify where common sense may be counter-productive to safety. The increasing requirement of government and accreditation bodies for safety to be common knowledge rather than common sense, as noted by members of company C, is disliked by members of the industry. However, this appears a valid means of reducing a reliance on common sense which may or may not be reliable within individuals.

The value placed on time by members of the industry can be counter-productive for safety in that drivers may take shortcuts to save time. Interventions should be designed which require the least amount of time taken for compliance with maximum effect. However, this may be more difficult than it sounds, and thus identifying safety interventions which require other organisational members to take some of the time burdens away from drivers may be beneficial. For example, pre-trip vehicle inspections were commonly not completed due to the amount of time taken to accurately inspect the vehicle. Thus removing the requirement for drivers who are not 'on-the-road' to inspect vehicles, by instead requiring maintenance personnel to conduct inspections, would result in no additional 'required cost' for organisations (assuming the mechanical team take the same amount of time to complete an inspection as a driver would if they were to complete it correctly) but would ensure that inspections are correctly conducted. Additionally, it is important to note that the manner in which drivers are paid influenced the extent to which time was valued. Put simply, no organisation should be permitted to pay drivers by the kilometre travelled or a total trip wage. Payment by the kilometre translates directly to a need to minimise trip time by speeding, taking shortcuts during inspections and completion of required forms, and resting solely as legally required rather than when fatigued. Whilst regulations banning payment by the kilometre may be disliked by members of the industry, and could result in difficulties associated with price quoting as delays would need to be accounted for when factoring driver wages, this is an important step to consider to improve safety.

Beliefs regarding the nature of human nature may be significantly more difficult to account for in the development and implementation of interventions. Though absent from company C, members of companies A and B commonly attributed unsafe acts to unintentional errors. If these attributions are true, then the implementation of driver feedback measures may reduce errors, but such measures may be impossible to implement for non-

driving tasks. Further, trucks and machinery could be developed in such a way as to require certain tasks to be adequately completed, though such measures would likely be overcome through non-compliance means if the requirement was not believed to influence safety. For example, regulation could require all new trucks to be designed in such a manner as to require an engaged seatbelt to operate, however, perhaps in such a situation the seatbelt could be fastened underneath the driver to enable the truck to operate without compliance.

However, the use of such measures would remove the potential for unsafe acts to be blamed on unintentional errors in cases where the driver has deliberately failed to comply. Similarly, the tendency to blame negative safety events within the industry on the 'rogue element' may be difficult to counter through education, and thus members of the industry may continue to view safety issues as 'someone else's' fault. Finally, the value placed on money and other gains has been somewhat discussed when examining the value of time. Further, however, many regulations already have associated financial punishments and thus the only way to strengthen these regulations would be through more stringent enforcement. Where other gains, such as those related to comfort, are involved there may be little that can be done to remove these gains and costs. However, it appeared evident that in many situations these other gains were a motivation to not comply with rules that were already viewed negatively, and thus these other gains may be less relevant than education regarding safety.

With regards to the nature of human relationships, only the value placed on autonomy was clearly shared between organisations. Generally truck drivers appear resistant to any management strategies that reduce autonomy. This poses a threat to safety in that drivers can be difficult to adequately monitor. Thus interventions aimed at improving safety must be designed in a way to provide control over unsafe acts without reducing autonomy beyond that which is required. Approaches which encourage driver autonomy to continue in a safe manner should be explored.

With exception of the 'go!' mentality, each of the second and third order traits was evident throughout each organisation, though the valence of these traits differed between organisations. The perceived likelihood of an incident was one of the most direct influences on safety due to the value placed on safety. As previously discussed, it is important to find effective means by which to communicate the risks associated with unsafe acts. Further, there is a need for education efforts to reduce the perception that incidents are simply bad luck. Regarding the belief that many incidents are inevitable and that, therefore, the organisation and drivers are limited in their ability to improve safety, there is again a need to better educate the industry regarding how to reduce incidents to counter this belief. Due to the assumed accuracy of experience and stories, rules and regulations are often viewed as irrelevant to safety and thus disliked. When rules are viewed as irrelevant, the typical result is that drivers will either comply to avoid punishment, or avoid detection without compliance. There is a need to increase the certainty of punishment within the industry, but this however, as this would require significant resources to increase monitoring and enforcement, efforts to improve compliance through an increased belief in the validity of regulations may be more efficient. Lastly, though presented out of order, the belief that drivers hold the key responsibility for safety appears to stem from the long-standing autonomy that has existed within the industry. With the introduction of chain of responsibility legislation there has been an increased onus placed on organisations and customers, thereby removing some of the responsibility from drivers. However, as it appears that COR legislation is yet to have been sufficiently enforced, there is a risk that drivers are taking less responsibility without an increase in responsibility being taken by organisations or customers. Thus, interventions must aim to ensure that drivers are still held accountable, yet that organisations and customers do not 'push' drivers until they refuse to comply. Put simply, due to the manner in which the industry has operated in past years, there is a tendency to pressure drivers to work hard under

the assumption that the driver will refuse to comply if it is unsafe. Unfortunately, despite COR legislation being implemented this behaviour has continued. Thus there is a need to target organisations and customers, in a proactive manner, rather than just to prosecute after an incident has occurred.

#### 11.4.1.4. Summary: Implications for safety in the heavy vehicle industry

From the above discussion it can be seen that the results of the current research have major implications regarding safety within the heavy vehicle industry. Through the examination of the influence of cultural and contextual factors on safety, a number of potential avenues for intervention have been identified. These include the identification of potential best practices for organisations and customers, contextual factors which currently reduce safety, and means by which future interventions can be designed to be suited to the culture of the industry. Regarding the latter, whilst many of the cultural factors had associated means by which safety could be improved, the most consistent need was for effective communication of the risks associated with unsafe behaviour and the benefits of compliance.

#### 11.4.2. Implication for the field of safety culture

The current research has also contributed to the field of safety culture through the development and application of the synthesised conceptualisation of safety culture. As was discussed in Chapters 1 and 2, despite significant attention within the literature in recent years, there is significant debate regarding definitions and conceptualisations of safety culture. Naevestad (2009) identified two dominant approaches to safety culture within the literature, referred to as the interpretive and functionalist approach. The interpretive approach to safety culture views safety culture as a series of shared beliefs and values, whereas the functionalist approach views it in terms of organisational structures and systems. By examining the links between safety culture, organisational culture and traditional views of



culture found in the cultural psychology and anthropology literature, it was found that traditional conceptualisations of culture could be used to explain the different approaches to safety culture. Further, due to the unique strengths and weaknesses of each conceptualisation, it was argued that combining these approaches into a single conceptualisation of safety culture could allow for a better understanding of safety culture.

It was argued in section 2.3.5 that this synthesised conceptualisation would enable researchers to understand the interactions between both contextual and cultural factors and, therefore, understand the complex manner in which safety culture influences safety outcomes. Further, it was argued that this synthesised conceptualisation would allow the myriad of published research from each of the pre-existing conceptualisations of safety culture to be brought together under a single framework, permitting a greater understanding of the research and knowledge that has already been gained in this field. Thus, the synthesised conceptualisation of safety culture was presented, which represents the first major contribution of this research to the field of safety culture.

Chapter 2 consisted of the theoretical development of this framework, which was then applied to the heavy vehicle industry throughout the current research. In addition to verifying that the synthesised conceptualisation of safety culture was suitable for the heavy vehicle industry, Study One further demonstrated the utility of this conceptualisation. Despite an absence of previous safety culture research within the heavy vehicle industry, by conducting a systematic literature review of health and safety in this industry, a preliminary framework of safety culture was developed (see section 4.3). Whilst a number of additional findings were made throughout Studies Two and Three which further developed this framework, there was a significant degree of overlap between the initial preliminary framework and the frameworks developed from the stakeholder interviews and case studies. Whilst Chapter 2 argued that existing safety culture research could be positioned within the synthesised

conceptualisation of safety culture, the findings of Study One, and the congruence this had with the findings of Studies Two and Three, demonstrated that the provided conceptualisation could be used to provide an approximated model of safety culture from safety research which did not seek to explore the effect of culture. This ability to develop a framework from theory and literature, rather than investigation, is the second key contribution of the current research to the field of safety culture.

Throughout the case studies a number of key findings were made which have been discussed in relation to their implications for safety in the heavy vehicle industry. However, when examined in relation to their contribution to the field of safety culture a number of further points can be made. As stated in Chapter 10, with the potential exception of seatbelt use, every safety behaviour or behavioural category was seen to be influenced by a combination of both contextual and cultural factors. Returning to the arguments of Chapters 1 and 2, previous research within the field of safety culture has tended to emphasise either contextual or cultural factors in isolation. The key purpose or argument behind the presentation of the synthesised conceptualisation of safety culture was that this isolated focus was neither necessary nor beneficial, in that culture interacts with the contextual environment to produce behaviour. Whilst there is a need for quantitative validation of the findings of Study Three, at this stage the evidence supports the need to examine both of these factors and the interactions between them. Despite finding effects of both contextual and cultural factors, no single behaviour appeared to be entirely explainable solely through contextual or cultural factors. Thus it can be argued, assuming quantitative validation verified the current findings, that previous conceptualisations of safety culture provide less predictive validity toward safety within the heavy vehicle industry than the synthesised conceptualisation. Further, as per the implications for safety in the heavy vehicle industry, the synthesised conceptualisation appears to provide further avenues to improve safety than either the

dominant functionalist or interpretive approaches, which would, respectively, only provide either best practices and negative practices to target, or the ability to design interventions to match the existing culture (though with less understanding of how contextual factors interact with the existing culture). This may further apply to a number of other industries.

All the previously discussed limitations of the current research can be noted to apply to the findings of Studies One, Two and Three with relevance to the field of safety culture. As these have been discussed in detail, it is sufficient to restate a couple of key points. Firstly, the current research relied heavily upon qualitative data and thus could be biased or incomplete. The findings were, however, somewhat validated by the systematic literature review which demonstrated that many of the key identified factors had also been identified within previous safety research. Whilst a number of approaches were taken to reduce these limitations there is still a need for quantitative validation to confirm that each of the identified factors does indeed influence safety in the manners discussed.

Additionally, however, it is worth noting a final limitation unique to the relevance of the current research to the field of safety culture. One criticism levelled at traditional views of culture found in the anthropology and cultural psychology literature is that many definitions of culture are so broad as to lose all predictive validity. Whilst the synthesised conceptualisation is not as broad as some of the definitions referred to by critics, it is questionable whether the scope of this conceptualisation is 'all-encompassing'. The inclusion of both cultural and contextual factors could be seen to indicate that safety culture includes everything except individually held psychological factors. Whilst this is true to some extent, the requirement of factors to be linked with safety outcomes reduces the scope of this conceptualisation to only those aspects relevant to safety. Further, whilst contextual factors were included within the conceptualisations, the true focus of this conceptualisation is on cultural traits, and contextual factors are primarily included to explain the mechanisms by

which culture influences behaviour. Thus despite the conceptualisation's apparent all-inclusiveness, there is a significant level of specificity. Nonetheless, future researchers who utilise the synthesised conceptualisation must take seriously the requirement of cultural and contextual factors to be relevant to safety, and contextual factors to be relevant to the means by which culture influences safety.

In summary, the current research presents a number of contributions to the field of safety culture. First, the research presents a new conceptualisation of safety culture which encompasses previous approaches, allowing for a greater understanding of safety culture whilst reducing the limitations of existing approaches. Second, this conceptualisation can be used to interpret existing research to identify key factors relevant to safety culture within a target industry. Third, though there is a need for further research, the current research demonstrates that the synthesised conceptualisation appears to provide a greater understanding and predictive validity of safety within the heavy vehicle industry (and potentially other industries).

### 11.5. DIRECTIONS FOR FUTURE RESEARCH

Whilst the current research has significant implications for both safety within the heavy vehicle industry and for the broader field of safety culture, there is a need for further research to expand upon the current contribution. In order for the findings of Study Three to be demonstrated to hold predictive validity for safety within the studied organisations, there is a need for quantitative validation. This requires the development of quantitative tools to measure the identified factors. Once such tools have been designed and assessed for reliability and validity, they could be used to statistically verify the relationships between these factors and safety outcomes and behaviours. Additionally, however, such tools should be developed with an awareness of the importance of individual factors (see Appendix A) as

a failure to control for differences between individuals may limit the predictive utility of any tool.

Further, after the validation of findings there is also a need to then apply such tools to a larger sample within the industry to confirm that the shared cultural traits within the studied organisations are also more broadly shared across the industry. This would confirm whether or not there is a common culture within the heavy vehicle industry, thus identifying if the suggested means to improve safety within the industry would be beneficial outside of the studied organisations. Additionally, should the identified factors and relationships be shown to hold under statistical analysis, it will be possible to provide a validated list of best practices and negative practices to target for intervention. Interventions which are suited to the culture of the industry and organisations should be designed and piloted to examine the efficacy of this approach.

In addition to validating the findings that relate to safety within the heavy vehicle industry, statistical validation would benefit the field of safety culture by providing evidence for the synthesised conceptualisation of safety culture. Further research could also examine the difference in predictive validity between the synthesised conceptualisation and the interpretive approach to safety culture within the heavy vehicle industry, by examining the level of prediction accomplished through cultural traits in isolation within contextual factors. Similarly, by comparing prediction between the complete measure and organisational contextual factors in isolation, it would be possible to compare the validity of the synthesised conceptualisation and the functionalist approach to safety culture in the heavy vehicle industry.

Finally, research should also seek to apply the synthesised conceptualisation of safety culture to other industries or target populations. This may require further qualitative research to identify the relevant contextual and cultural factors within the target population. Further,

due to the general nature of many of the identified cultural traits and their alignment with previous organisational culture research, research should examine whether these similar traits are found across different industries. It may be the case that many of the identified factors represent common dimensions which could be used to compare industries and organisations.

Separate to future research in safety culture. The results of the case studies can also be seen to relate to the social construction of gender and, specifically, masculinity. Hegemonic masculinity has been a key area of research within sociology for many years and has been historically defined as a “pattern of practices (i.e. things done, not just a set of role expectations or an identity) that allowed men’s dominance over women to continue” (p.832; Connell & Messerschmidt, 2005). Connell and Messerschmidt (2005) indicate that the core component of hegemonic masculinity is not specifically the dominance of men over women, but the existence of multiple ideals or forms of masculinity which may compete against one another for dominance. The Australian heavy vehicle industry has typically been a male industry (referring here to the ratio of men to women and not the perceived roles or stereotypes of each). When examined with respect to this view of hegemonic masculinity, it can be seen that many comments made by study participants were also rich with notions of what makes a ‘good bloke’ versus one who is lazy, a stupid man, or even one who complains about minor injuries. Barrett (1996) argued that masculinity was most shown to have meaning when placed in opposition to an outside group, typically females, and thus the ‘other’ group is attributed with the opposite characteristics of what makes a good man. In the absence of comparisons to female truck drivers it is unclear whether the differing descriptions of individuals could be viewed as multiple competing masculinities, or simply as competing images of a truck driver. Whilst findings with regards to this direction of study have little bearing on the current presence of the identified cultural traits, or their relationship to safety, if the industry was to increase its recruitment of females, masculinity-related traits may

become less shared and there may be a shift in dominant beliefs, attitudes and values. Future research should, therefore, examine the extent to which the cultural traits identified within this thesis are more closely tied to industry conceptions of masculinity or what it is to be a truck driver.

#### 11.6. CONCLUSION: SAFETY CULTURE AND THE AUSTRALIAN HEAVY VEHICLE INDUSTRY

The current research sought to provide a theoretically grounded definition and conceptualisation of safety culture and use it to examine the effect of culture on safety in the heavy vehicle industry. After examining the literature on safety culture, giving key attention to its relationship to organisational culture and thus traditional views of culture, the synthesised conceptualisation of safety culture was presented. Safety culture was defined as the assembly of underlying assumptions, beliefs, values and attitudes shared by members of an organisation, which interact with an organisation's structures and systems and the broader contextual setting to result in those external, readily-visible, practices that influence safety. The current research then examined whether this conceptualisation was suited to the heavy vehicle industry by conducting a systematic review of health and safety within heavy vehicle industries. It was found that a significant number of the factors identified as influencing safety in the existing literature could be positioned within the synthesised conceptualisation of safety culture. Thus the current research used key stakeholder interviews to confirm the findings of past research and identify the best approach to exploring how the interactions between cultural and contextual factors influence safety within the Australian heavy vehicle industry. Due to the heterogeneity of the industry, it was found that the best approach to examining the interactions between culture and context within this industry was to conduct case studies of individual organisations. After conducting three such case studies a number of

contextual factors and cultural traits were identified, many of which were shared between organisations.

The current research has identified a number of potential ‘best practices’ within the industry, along with negative practices which should be reduced. Additionally, based on the apparent shared nature of many of the identified cultural traits, a number of guidelines for future interventions were provided. External to the heavy vehicle industry, the current research has provided a new approach to safety culture which is beneficial in understanding existing safety and safety culture research. The current research demonstrated that this synthesised conceptualisation of safety culture appears to hold greater explanatory validity than previously existing approaches to safety culture. Whilst there is a need for further research, the findings of the current research will serve to improve safety within the heavy vehicle industry and provide future researchers in the field of safety culture a more adaptable conceptualisation of safety culture.



## **Appendix A: Individual Factors Identified Within the Current Research**

### **A.1 APPENDIX A INTRODUCTION**

Throughout the current research, a number of individual factors were identified which were seen to have an influence on safety within the heavy vehicle industry. Whilst these individual factors do not align with typical views of safety culture, it is necessary to be aware of such factors as they may interact with cultural and contextual factors, thus changing behavioural outcomes. Without having an awareness of the relevant individual factors it may not be possible for future research to accurately identify the links between culture and its consequences. Whilst these findings were excluded from the main body of the current research, future research which seeks to quantify the relationships between contextual and cultural factors, and behaviours and outcomes, should be conducted with an awareness of these factors.

### **A.2 INDIVIDUAL FACTORS IDENTIFIED WITHIN STUDY ONE**

Throughout the Study One literature review, a number of individual factors were identified which had been previously demonstrated to influence safety within the heavy vehicle industry. The following section examines each of these findings with relevance to crash outcomes, non-driving injuries and health outcomes within heavy vehicle industries.

#### **A.2.1 Individual factors and crash outcomes within previous literature**

A number of individual factors were identified in the literature as being related to crash

outcomes. Whilst culture is typically considered to be comprised of shared factors, and contextual influences typically affect a number of people, it is important to be aware of individual differences that may affect crash outcomes. As these factors fall outside of the presented model of safety culture they will only be briefly discussed but are nonetheless important to safety. The individual factors identified in the literature which were seen to influence crash outcomes included general health, lifestyle-related health, demographic variables and driver history.

#### A.2.1.1. General health

Brodie et al's (2010) exploration of coroners' recommendations from fatal crashes found that the requirement of truck drivers to report health issues was one of a number of key recommendations. Poor physical health has been seen to be correlated with poor sleep and sleepiness whilst working (Braeckman et al., 2011). Further, medication use has been seen to predict falling asleep at the wheel (Heaton et al., 2008). Additionally, however, poor mental health, in the form of depression, has been seen to increase the chance of crashes and near misses by between four and five times (Hilton, Staddon, Sheridan, & Whiteford, 2009).

Lifestyle-related health issues form a specific subcomponent of health issues which can significantly influence crash outcomes. Lifestyle-related health factors found to influence crash outcomes included obesity, and sleeping patterns and problems.

*Obesity.* Anderson et al. (2012) conducted a longitudinal study of 744 truck drivers recruited by a single firm and found a strong correlation between obesity and crash rates. Similarly, Cantor et al. (2010) examined driver-related factors and crashes and also found a link between obesity and crashes. The manner in which obesity is linked to crashes is not clear, however, research has shown that obesity is linked to fatigue (Cui et al., 2009; Lemos et al., 2009; Wiegand, Hanowski, & McDonald, 2009). Similarly, it has been seen that diet and exercise, two major components related to obesity, are linked with fatigue and crashes,

with drivers finding it hard to include exercise and healthy eating due to the confines of long hours and life on the road (Moreno, Louzada, Teixeira, Borges, & Lorenzi-Filho, 2006; Snyder, 2012).

*Sleep patterns and problems.* Fatigue has already been identified as a major safety concern in heavy vehicle drivers. Canani et al. (2005) assessed sleepiness in 438 Brazilian truck drivers. A number of sleep complaints were identified including insomnia (26.6%), loud snoring (45%) and witnessed apnoea (7.6%). Twenty-two per cent of drivers reported falling asleep while driving and 2.8% of subjects indicated falling asleep daily or almost daily. Such sleep problems have also been found by a number of other authors. Sleep apnoea is one of the most common sleep disorders that has been shown to affect fatigue and fatigue-related incidents (Braeckman et al., 2011; Lemos et al., 2009). Additionally, non-specified sleep disordered breathing (Cui et al., 2009; Sakurai, Cui, Tanigawa, Yamagishi, & Iso, 2007) and snoring has also been seen to be common in truck drivers and linked with fatigue outcomes (de Pinho et al., 2006; Moreno et al., 2006). Another common sleep-related factor associated with fatigue is sleep duration. A number of studies indicated that low sleep duration and quality were associated with fatigue-related outcomes (P. H. Gander et al., 2006; Heaton et al., 2008; Maldonado et al., 2002; McCartt et al., 2008; McCartt et al., 2000; Morrow & Crum, 2004; Sabbagh-Ehrlich et al., 2005).

#### A.2.1.2. Demographics

A number of demographic variables were also seen to influence crash outcomes. These included age, marital status, ethnicity and gender. The age of drivers has regularly been shown to influence crash rates and severity (Cantor et al., 2010; F. Chen & Chen, 2011; Duke, Guest, & Boggess, 2010; Stein & Jones, 1988). Typically, it has been shown that both the youngest and oldest of drivers have the highest rates of crashes, with many indicating that decreased cognitive ability at older ages and both a lack of experience and higher risk taking

at younger ages are responsible for the pattern. In addition to the direct effect of age on crash outcomes, age has also been seen to be related to fatigue, though the direction of this relationship has been seen to differ between studies (Baas et al., 2000; Braeckman et al., 2011; de Pinho et al., 2006; McCartt et al., 2000). Lastly, da Silva et al. (2009) found that age was protective against drug use in Brazilian truck drivers.

Whilst only one study was found which highlighted both ethnicity and marital status as relevant to crash outcomes, it is still worth briefly mentioning these factors. Mir et al. (2012) compared drug and alcohol use in 857 commercial drivers in Pakistan. As was indicated when discussing drugs and alcohol as a risky behaviour, truck drivers were found to use more alcohol and cannabis whilst driving than other drivers. In this study it was found that certain ethnicities were more likely to use these substances. Additionally, whilst unmarried and married drivers showed similar substance use patterns, divorced and widower drivers were seen to have significantly higher substance uses. It is thus clear that background factors related to a driver's heritage and family can also play a role in determining crash-related outcomes.

The gender of drivers was also seen to play a role in crash outcomes. This is interesting as, at least within Australia, female truck drivers are much rarer than male truck drivers. It has been seen that male truck drivers pose a higher risk for crashes (Cantor et al., 2010), which is consistent with road safety research which commonly shows males are a higher risk for crashes. Interestingly, despite the greater tendency towards crashes for males, Chen and Chen (2011) found that female truck drivers experienced more severe injuries than male truck drivers. It is thus clear that the gender of drivers is differentially involved in both crash occurrence and severity.

#### A.2.1.3. Driver History

Lastly, the past experiences of drivers can play a significant role in crash outcomes. As previously indicated, a lack of driving experience in younger drivers has been indicated to be responsible for their increased levels of crashes (Duke et al., 2010). Similarly, however, a lack of driving experience may account for a number of critical incidents regardless of age (Hanowski et al., 2007). A lack of driving experience has also been shown to be related to increased poorer sleep and increased sleepiness (Baas et al., 2000; Braeckman et al., 2011). Interestingly, however, McCartt et al. (2000) found that older and more experienced drivers were more likely to fall asleep at the wheel. The contradiction in these findings is difficult to explain, however, it is clear that driving experience is important to consider when exploring safety in the heavy vehicle industry.

Drug use has also been seen to be influenced by past experiences. Lower education levels were seen to be related to drug use in Brazilian truck drivers (da Silva et al., 2009), whilst in Australia it was shown that past drug use history was also strongly predictive of current drug use (Davey et al., 2007).

#### A.2.1.4. Summary: Individual factors and crashes

Whilst individual factors were not originally suggested as a target of investigation in the synthesised conceptualisation of safety culture, a number of individual factors were shown to be relevant to crash outcomes in the literature. Whilst it is difficult to argue that these are truly relevant to safety culture, it is important to be aware of these factors as they may prove relevant to organisations in determining who to hire, as well as serve as a quasi-contextual influence which affects individual drivers. The individual factors which were shown to be relevant to crash outcomes were the driver's general health (including medication use, mental health and lifestyle-related health problems), demographics (including age, ethnicity, marital status and gender), and driver history (including level of

experience and past drug use history). Together, these factors were seen to directly relate to crash occurrence and severity as well as fatigue and drug and alcohol use.

#### A.2.2 Individual factors associated with non-driving injuries in previous literature

Only one paper was identified which again revealed links between individual factors and injuries in non-driving situations. This paper was again Williamson et al's (2009) survey of truck drivers in the greater Sydney region, which highlighted that job satisfaction and years of driving experience were correlated with worsening injuries, illnesses and injury claims. Similarly, personal commitment to the driver's organisation was correlated with worsening injuries. In regards to job satisfaction and organisational commitment, it is unusual that these are correlated with worse health and safety outcomes when they are typically seen as positive traits leading to better adherence to policies. Nonetheless it may be possible that drivers with higher satisfaction and commitment may push themselves harder than other employees. Years of experience, however, may be associated with worsening physical condition, leaving the driver prone to injury and illness, and must be interpreted with caution. Regardless of the mechanism by which these factors influence injury, it again reveals the importance of considering individual factors when exploring otherwise corporate factors.

#### A.2.3 Individual factors associated with health outcomes in previous literature

Section 4.2.3 reviewed literature which explored health outcomes within the heavy vehicle industry. Within this section Buxton et al's (2009) survey of 542 truck drivers in the USA was discussed. Whilst the main focus of this section was on exploring how contextual and cultural factors influenced health outcomes, this paper also revealed a number of individual factors which were seen to be relevant to health outcomes. Buxton et al. aimed to assess relationships between work environment, sleep adequacy and diet. It was found that fruit and vegetable consumption was correlated with non-Caucasian ethnicity, bringing food from home, and getting adequate sleep. Similarly, consumption of sugary drinks and snacks

were correlated with lower education, younger age and inadequate sleep. Due to the relationship of adequate sleep to more sugary diets, poor sleep adequacy was also explored revealing correlation with working more hours, Caucasian ethnicity and job strain, whilst good sleep adequacy was associated with supervisor support, lower job strain and job satisfaction. From these findings it can be seen that age, ethnicity, education, individual sleep patterns and even job satisfaction were predictive of diet choices.

#### A.2.4 Summary: Individual factors and Study One

Throughout the systematic literature review a number of individual factors were found to have an influence upon safety. Crash outcomes were seen to be influenced by general health, demographics and driver history. A number of individual factors including job satisfaction, commitment to the organisation and level of experience were also identified as being relevant to non-driving injuries. Lastly, health outcomes, in the form of eating and exercise-related diseases, were seen to be influenced by ethnicity, age, education, sleeping patterns and job satisfaction. The individual factors identified within Study One can be seen in Figure A.1.

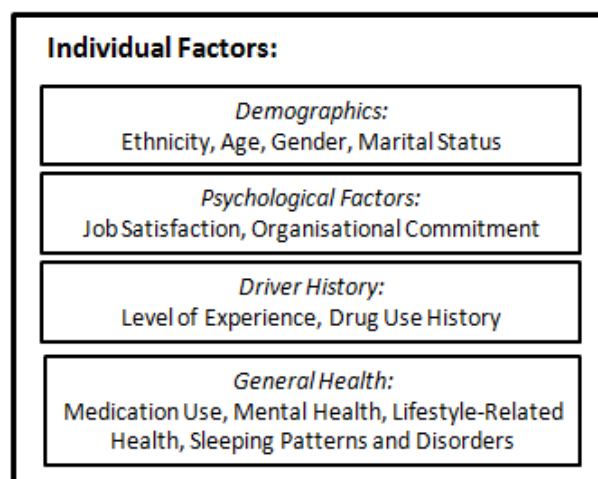


Figure A.1: Individual factors identified in Study One

### A.3 INDIVIDUAL FACTORS IDENTIFIED IN STUDY TWO

In addition to the contextual and cultural factors identified within Study Two, a number of individual factors were highlighted by interview participants as being relevant to safety. As was discussed in Chapter 4, individual factors were not recognised as part of safety culture when formulating the synthesised conceptualisation. The literature regarding heavy vehicle safety has, however, revealed a number of individual factors which impact upon safety and should be considered when examining the effect of culture on safety in order to ensure that an accurate reflection of the cultural effect is established. Similarly, throughout the Study Two interview process a number of factors relating to individuals were identified. As stated by one interviewee: *“It takes a select person to be a truck driver”* (Transport Department Representative Two).

Whilst much of the following information provided regarding heavy vehicle drivers is shown in a negative light, it is important to note that many managers suggested that most drivers are generally good. As safety is often described in a negative light (i.e. crashes and incidents, risk factors rather than positive lead indicators) there is a natural bias in the following data regarding heavy vehicle drivers. This is simply because negative occurrences are perceived to be more noteworthy. Despite this negative bias, the majority of interviewees stressed that most heavy vehicle drivers are *“honest men”* who *“work hard”*, are *“trying to do the right thing”* and *“love what they do”*. Most drivers are also reported to be conscious of not wanting to unintentionally harm someone.

*They’re the same as anyone else. They’re doing a job. They finish their job, they get paid and go home, probably the same as any of us do.* (General Goods Transport Company Manager Four)



Despite this general positive perception of heavy vehicle drivers, a number of issues were raised regarding health and safety. The following discussion explores the interpersonal relationships of drivers and their demographic characteristics.

#### A.3.1 Interpersonal relationships

The interpersonal relationships of heavy vehicle drivers can have a significant impact on safety. A number of industry members referred to the relationships between heavy vehicle drivers and the associated occurrence of peer pressure. Whilst peer pressure has previously been seen to be associated with drug use in the heavy vehicle industry, through pressure to fit in with a cultural stereotype (Davey et al., 2007), the indication that peer pressure is involved in the formation of other behaviours was new. In addition to relationships between drivers, the relationships between heavy vehicle drivers and their families can provide support or alternatively added pressure.

*Relationships between drivers.* It was reported that in past years there was a high level of mateship within the industry. This mateship was evidenced in the practice of heavy vehicle drivers warning each other over the radio of upcoming obstacles or law enforcement. Additionally one manager claimed that in the past if you had a tyre blowout or a breakdown you could expect other heavy vehicle drivers to stop and help. However, it was argued that this culture of mateship is beginning to pass, in part due to the increasing pressure to meet deadlines and continue driving until a rostered rest location is reached.

A number of managers suggested that peer pressure is a significant issue in the industry. For example, one manager highlighted that some individuals maybe wouldn't feel the need to use drugs but they may choose to "*because their mates use them*". This peer pressure is also seen in an increased desire for heavy vehicle drivers (who are predominantly male) to protect their own masculinity. The desire to prove masculinity can also be seen through the reported culture of bullying that can occur in the industry. Whilst this may start

as harmless nicknames, some drivers are unable to handle it which can result in physical fights. It was suggested that there was a natural difference between the older and younger drivers, in that many of the older guys are “*genuinely tough*” whilst the younger guys are “*softer*”. Many of the older guys will tell the younger guys to “*suck it up*”, “*harden up*” and “*get over it*”, and make reference to “*back in my day...*”. The idea that drivers need to ‘harden up’ can be perceived as an attack against their masculinity, and it is therefore significant that drivers may attempt to hide psychological trauma rather than show signs of weakness. In addition to these aspects of bullying and peer pressure, many drivers may also feel the desire to push themselves in order to not let each other down. The following quotes were provided by managers within the industry:

*“Maybe if one of the drivers is feeling a bit tired he may push himself a little bit harder to make that next changeover point so he’s not letting someone else down, I suppose, instead of running an hour late and having an extra hour’s sleep. I suppose it’s that sort of culture in the industry that we have to try and change... Still a hesitation for drivers to admit they’re tired and, as I said, that’s just a cultural thing that we just keep putting in front of the drivers that it’s ok to be tired and it’s ok to stop if you are.”*

(General Goods Transport Company Manager Four)

Finally, it was suggested that there is a great deal of urban legends and mythology in the industry. Whilst it was believed that some of these myths may originate from driver-focussed magazines, it was suggested that a number of drivers have a propensity for storytelling. As stated by one manager “*drivers talk a lot of shit, but some of it is true*”. Whilst this tendency to tell stories may appear insignificant, it may be the case that the content of these stories may influence drivers.

*The driver’s family.* The family of heavy vehicle drivers can play a significant role in safety. Though marital status was seen to have an association with safety in the literature, the

way in which a driver's family may influence safety-related behaviours was not clear.

Throughout the interview process a number of participants highlighted the role that the driver's family has on safety. One of the ways in which family can influence safety is through providing direct support. For example, one interviewee who was also the wife of a driver claimed that many drivers rely on phone calls from their wives between 12am and 5am in order to stay awake when they don't have time to stop. Conversely, family members can also apply significant additional pressures to heavy vehicle drivers, such as the pressure to return home earlier. In addition to this a number of drivers may desire to make it home and drive outside of driving hours regulations, despite a lack of overt pressure from home. It was also suggested by a number of managers that general family life can lead to ongoing fatigue during working hours:

*"Most of our accidents occur after a driver has had a weekend off or come back from holidays. A driver has to be prepared for when he goes back to work after days off. And that's where a lot of our data shows that we have accidents and incidents is from people coming back from leave and weekends off... May not have slept, may be fatigue issues or inattention... Probably the biggest issue I think.*

*"We try to do a fair bit of work with our fleet drivers to try to get that message across to those drivers to make sure they are prepared for work. I would assume that if you take a driver that has small kids or something like that, if he's got to take a sleep during the day or something he probably finds it very difficult to do. His partner might be asking him to mow the lawn or whatever before he goes. The guy's life at home prior to him going back to work could impact on his next day's work. He may have to work for 12 to 14 hours."* (General Goods Transport Company Manager Four)

### A.3.2 Heavy vehicle driver demographics

The demographic characteristics of individual drivers were also shown in the literature to have a significant impact on safety, including ethnicity, age and gender. Characteristics which emerged as themes in the interview process were the age of drivers and their level of intelligence. Whilst many more characteristics may play a significant role in determining safety outcomes, only these were discussed in significant detail to warrant inclusion.

*Age.* Whilst some of the differences between older and younger drivers have seen significant attention within the literature, there were a number of differences between older and younger drivers reported by interview participants. Many younger drivers were reported to have different expectations of work. Whilst the ‘older guys’ saw work as a long-term commitment to a company, the ‘younger guys’ may desire a wide range of experiences. It was suggested that many of these younger drivers will “*rush into the industry wanting to be a long-distance driver*”, but don’t understand that many companies want to build trust with a driver before releasing them on longer drives. Furthermore, it was suggested that whilst the older guys look after the vehicles and understand how to handle them safely, younger less experienced drivers reportedly try to drive heavy vehicles like a car, only want work within office hours, and “*drive with loud music and the air-con turned up*”. Whilst this description paints older drivers in a positive light, it is also important to note that some managers related older drivers to the older, more entrenched culture of driving “*fast, hard and heavy*”, breaking every rule and holding injuries as a badge of honour.

*Remember that a lot of these people, it’s an older workforce and some old habits are very difficult to change even though we try very hard to make sure those people don’t do the wrong thing. (Steel Transport Company Manager)*

*On average 50-53 years old... they are often stuck in their ways and don't want to change things that have worked for them for years. (General Goods Transport Company Manager Seven)*

*Intelligence.* The stereotype surrounding heavy vehicle drivers is one of individuals with a lower intelligence level who are often illiterate. As it was phrased by one manager “lots of drivers didn't go to uni, they don't have a big brain”. It was suggested that some of these drivers need help to fill in their log books properly and, rather than admitting that they don't know how or are illiterate, will use excuses like they forgot, are tired, or simply that it is too hard.

#### A.3.3 Summary: Individual factors identified within Study Two

Whilst less individual characteristics were revealed by the interviews, perhaps even more so than what was seen in the literature, it is evident that the factors identified are relevant for consideration when exploring safety culture in the industry. In particular, the interpersonal relationships of drivers are important to consider as they represent specific contextual variables which are unique to each driver. Additionally, whilst the age of drivers was identified in the literature, the findings of Study Two have begun to develop a better understanding of how age plays a role in safety. Specifically, rather than old age being solely linked to deteriorating cognitive ability, it was recognised that old habits may be present which are unsafe. Additionally, rather than just seeing younger drivers as irresponsible and inexperienced, it is evident that they can approach the industry with different desires and expectations than their older counterparts. Lastly, the recognition of lower intelligence levels is important to be aware of when considering potential safety interventions. These factors have been added to those identified in the literature and can be seen in Figure A.2.

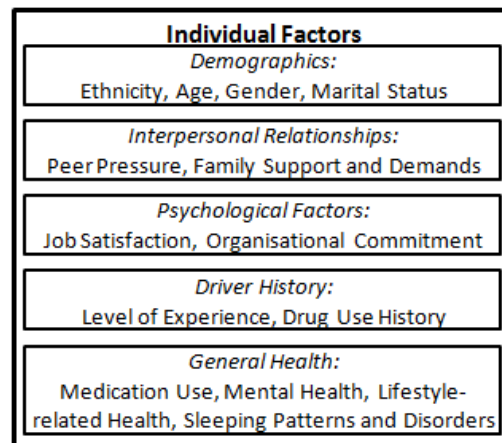


Figure A.2: Individual factors associated with safety in the heavy vehicle industry – updated with results from Study Two

#### A.4 INDIVIDUAL FACTORS IDENTIFIED WITHIN STUDY THREE

Similarly to the previous two studies, Study Three identified a number of individual factors which were seen to be relevant to safety within the heavy vehicle industry. In addition to contextual and cultural influences on behaviour, each individual driver possesses characteristics and may have had various past experiences which will influence his or her behaviour. Despite the fact that cultural elements are shared, drivers may have many individual differences which present a challenge to predicting behaviour. These factors can be broadly broken into driver history, knowledge and skills, individual differences, their transient state of mind, and their family. In Company C however, only the driver's history, knowledge and skills, and individual differences were noted. Whilst there were slight differences in emphasis between participants from each company, the general content of factors relating to the heavy vehicle driver appeared fairly consistent between companies and there appears to be no reason why factors which received little attention in some companies should not equally apply. It is important to note that, due to the manner in which this information is obtained (relying strongly on first person accounts and descriptions of others), the case studies did not identify many of the individual factors that have appeared in previous

literature through associating specific factors with crash and injury rates or through targeted use of specific questionnaires. The following section presents the results pertaining to individual factors which were seen to influence safety within the case studies.

#### A.4.1 Driver history

Drivers may come to a transport company with a wide range of past experiences within the industry. In fact, the vast majority of the drivers at the studied companies had been employed within the industry prior to entering the service of the companies which were studied. It was indicated by the manager of Company C that *“there are some people I would never employ”*, particularly due to the manner in which they drive a truck, arguing that *“a lot of that depends on who they drove for before”*. Whilst the examples provided by the manager centred upon negative past experiences, one driver from Company C also indicated that past experiences can provide significant benefits to a driver by equipping them to safely drive a truck in a number of situations. The driver stated that due to previous experience in logging, he was required to learn to avoid crashes as in the event of a crash with a logging truck the driver is at a higher risk of death or injury.

*Used to do logging, it's an education in driving, with logs you don't get a second chance... if you have an accident they slide forward into the cab... the thing to look at is stopping yourself from being in a crash. (Company C Driver Two)*

During drivers' past years within the industry they may have received differing levels of training through other transport companies. For example one manager from Company A indicated that drivers may have previously received training in fatigue management.

*They drive to standard hours yeah. We get some who come through saying that they've got BFM but legally they can't do BFM for us until they've sat our BFM course. (Company A Manager Two)*

Additionally, drivers may have a varied history of education from sources outside of the industry. It was noted within Company B that it is important to look beyond simply years of experience and licences. It was argued that due to weaknesses in the licensing system a driver may be licensed for a vehicle for which they have no related experience. Further, whilst a driver may have many years' experience driving trucks, differences between truck and load types can mean that a driver does not possess the required set of skills for a given job. It was therefore indicated that it is necessary to understand the experience of a given driver in order to ensure the driver is capable of a given task.

*I have a lot of problems with people coming down with B-double licences and all this and they can't drive a single trailer with steel. You know 25 tonne of steel on is a little bit different to handle on a trailer than 22 tonne of Weetabix, do you know what I mean? It's a whole different aspect you know. Especially when they're about 20m and all that, because they're long and they get trailers out 20m and they're 3.2 wide, sometimes 3.3.... Whole different ball game. Like we've had a lot of drivers come here with B-double licences and couldn't drive a body truck you know. I believe that goes back to the government. You can hold a HR licence in Queensland, go and pay \$3000 to "Major" or whoever does "B-double national", or whoever does that, of a weekend, and come out a B-double driver. And yet you've never driven a trailer, why's that? So I believe if you're going to become a B-double driver in Queensland, I know I used to it in NSW and I got my artic licence, you had to drive for years, as a 21-year-old, say I think it was three years before you could actually step up and go for your thing like that. And I believe you should have to drive a single trailer before you can sit for your B-double. Say two years, let's say that. If you were going around in a HR pushing 12 to 14 tonne around to pushing 86. Friday afternoon you stop the truck and you're pushing 12 tonne of steel. Monday morning you're in a –*



– *truck pushing 86 tonne of steel. Where's the go, where's the experience and that's where, I think, where the government falls down badly in Queensland.* (Company B Trainer One)

In addition to previous driving and training experience, drivers' experiences working for other companies may influence their behaviour and expectations within a new company. A number of drivers mentioned the negative experiences they had in previous companies. One Company A driver stated that when he raised certain safety concerns with a past employer he was victimised and eventually had to leave the company. In this case, the driver was pleased with the requirements placed on him by Company A and was happy to comply. Conversely, other drivers' experiences may have jaded them in their approach to working for Company A. For instance, one Company A driver indicated that a past employer had made unsafe demands on him and fired him for refusing to comply. This driver then suggested that you "*have gotta cover your arse in this job*". The driver even stated that he had previously made multiple unfair dismissal claims against companies. In this case, these past experiences appeared to lead the driver to take a very individualistic approach to work, rather than feeling part of the company he works for at a given time.

The final component of a driver's history which was identified in the case study was his or her past experience of near misses and incidents. Whilst this is clearly related to the tendency for experiential learning within the industry, this is comprised of the actual experiences that an individual driver has had. Examples of these experiences and their influence include not driving under the influence of alcohol after a drunk driver crashed with their truck, leaving additional space in traffic due to previously witnessed erratic car drivers and being more aware of fatigue after having near misses.

#### A.4.2 Knowledge and skills

Due to drivers' past experience within the industry and other industries, and the training they have received, they may have a vastly different skill set and knowledge base. Despite

extensive experience attained over years of service, it was noted by one Company A driver that “so many guys want to get out of the industry but it’s all they know”. The common pathways where drivers gain skills and knowledge are organised training courses (such as fatigue management and licensing courses) and driving and work experience.

Whilst the history of each driver is unique, it was noted within each company that many drivers have similarities in terms of their skills and knowledge base. For instance it was argued that many drivers either have a lower academic intellect or simply a lack of formal education. This was not to indicate that drivers are unintelligent, but rather that much of their skills and knowledge come from years of practical experience within the workforce. In Company C it was particularly noted that many drivers are illiterate but have compensated for this by developing their memory to a high enough level that they can remember the locations of graziers and agents without relying on maps or directions.

*And I'm like that. Like I'll say you know it's 10k down this road and turn after that like that. I could go there and take you straight to it, but I probably couldn't tell you how to find it. I mean I wouldn't be able to say you go seven grids and turn left. Because I've never counted the bloody grids. I mean I know where to go. (Company C Driver/Manager)*

The primary issue with this informal mode of education is that drivers may have habits and ideas which may be out-dated or dangerous. It is for this reason that a director of Company B indicated training is necessary to bring drivers up to current practices.

*I think education. We try to educate. I think the level of people that come into the industry aren't the smartest. Not all the time, there are some very smart people, but most of the time these are people who haven't been successful at school, who have just floated through life and have just wound up going well I can drive a truck because I can drive a car or I like driving, I like being away from people, I like being my own person and just doing my –*

*– stuff, no one tells me what to do. It's a little bit of that thought process, they're generally older generation. Most of the older generation are very smart men but they haven't finished high school and they say, I haven't got a high school degree. So we try and do some education stuff just to get them back into what is current practices or what are different ways. And what I say to them is they know their job, they have done it for so many years, they don't need to be the smartest man on the earth to do it very well because they've refined it. (Company B Director)*

Despite low levels of formal education, drivers often develop skills specifically needed in the industry. It was evident throughout the case study of Company B that drivers require a number of specific skills and knowledge. As put by one driver from company B, “*truck drivers are not just truck drivers, they have to be multi-skilled*”. There are many skills needed by drivers, ranging from those related to driving ability, such as being able to safely control the vehicle and accurately judge stopping distances, to those specific to certain loads, such as the ability to operate a crane. A number of drivers from each company discussed these skills which they suggested indicated that it's not possible to be ‘a dumb truck driver’.

*All the public thinks is that they are dumb truck drivers... You can't be a dumb truck driver... there are none... Some jobs you need to guess the weight of goods to make the weight even across the axels... You've got to read the minds of other drivers... Always trying to work out who the next idiot is... Without a buffer zone you can wipe out cars ... Your awareness needs to be spot on... Check left and right and decide in a split second... Going down hills if you select the right gear and use compression braking you shouldn't speed up... On certain hills if you use a foot break you will get fined... You'll burn out your brakes too quick. (Company A Driver Three)*

Whilst differences in such capabilities will be briefly discussed when examining individual differences, it is important to note that many drivers have developed a significant set of skills and knowledge which enables them to understand the job they do. One manager from Company B even indicated that due to his own lack of experience driving a truck he often relies on his drivers to inform him of the requirements of certain jobs.

*But I mean heavy haulage is a bit different, you pretty much discuss a lot of the jobs. Like I certainly use a bit of an open forum sort of policy I suppose with my guys. I might invite them into my office and I use a whiteboard to display the jobs and I give those guys as much warning as I can about what they're going to do and I discuss that with them, even when they're coming up, like these guys. I don't have a truck licence, I've never driven a truck, these guys do. So I utilise their knowledge and expertise even when I'm quoting jobs. If I've got questions about: how do you think about this? So I get those guys in there and actually step through a lot of things. (Company B Branch Manager One)*

In regards to general skills required by all drivers, it was noted by one driver from Company C that a driver must be able to understand the basic mechanics of a truck in order to accurately conduct mechanical checks on the truck.

*You've gotta have an ounce to check the truck properly. Some blokes just check the oil and water and go... some would see a tyre leak and think nothing of it... but it could be a fucked seal or a bearing... you could get down the road and the wheel could come off and hit a car. (Company C Driver Two)*

In Company C, however, the majority of noted skills related to livestock-specific factors. As put by one Company C driver, “you've gotta understand cattle and understand moving freight”. Similarly, another driver stated that when transporting livestock it is important to understand the different sizes and weights of each animal in order to safely load

the crate. This is important for both the driver and the animals' safety, as an incorrectly loaded crate can increase the risk of a rollover and if a crate is overloaded cattle may be injured or die. Similarly, it was noted that it is important to assess the health of each animal to ensure you can safely transport it.

*You need to be able to estimate the weights of the cattle to load the trailer, and the size; if you overload a pen some will fall and get trampled... You've gotta inspect the health of the animals to see if they are healthy enough to travel. (Company C Driver Two)*

#### A.4.3 Individual differences

There are a number of individual differences between drivers. These differences range from individual capabilities to their personal values. It was due to the combination of these individual differences that an operations staff member from Company A indicated that 'safety' is not the same for each driver. When asked what a driver needs to do to be considered safe the staff member responded: *Well what would you determine as being safe? Like you know you can probably get 10,000 different answers as what is being safe... It's what the individual himself is classified as being safe* (Company A Operations Staff Member).

In terms of the capabilities of drivers, within Company B it was noted that different capabilities are required for different loads. For example, it was noted that within heavy haulage drivers need a certain level of common sense and intellect to be able to accurately determine the capabilities of the load being carried. For this reason it was indicated that not all drivers are capable of conducting this form of work.

*If he shows that he's got it doing the line haul and he's interested in doing that heavy haulage, if you think that you know we can try and train him up to it, well it's like anything, you know, you like to try and train your own guys up to sort of make that level. But in all –*

*– honesty it's probably one in 10 that I see that I think have actually got the nous to go and do it. (Company B Branch Manager One)*

Similarly, with craned loads it was indicated that drivers must be able to carefully operate the crane to avoid potential damage to the truck. It was stated that despite offering significant training to drivers, some drivers are simply incapable of safely operating a crane.

*I have some really good drivers, some really good crane operators there. They know how to use a valve that lets so much oil go through at certain times. So the more the valves is open, the quicker the movement will be so my guys are really smooth on that control so they can really operate the cranes really good. I've seen some really shonky drivers that are very jerky and snatchy and things swinging around and crashing into the side of their truck. I would never operate like that, it's too risky. A lot of the times you're working in very small spaces with a lot of people around you so you've got to be a really smooth operator and also you've got to be very aware what's going on around you... we had a driver over at (customer name 1) that actually worked for (main depot), he actually worked with (customer name 2) when I was up there but he had a few issues over there so they moved him down here. He was actually one of my relief drivers. He went over to our (customer name 1). He had probably been over there for eight, nine or 10 days with two drivers. I swapped the drivers around. He was going to try and send one of the drivers, one of the*

Fatigue was one of the key areas that organisational staff members in Company A referenced as susceptible to the differences between drivers. It was often suggested that different drivers have different requirements for rest and sleep and that, due to this, it is not possible to simply apply a predetermined framework for fatigue on drivers. This is not to suggest that the company felt that driving hours legislation didn't apply to it, but rather that even when adhering to these restrictions drivers are not always capable of working.

*Obviously fatigue is an issue and that needs to be controlled by everyone not just the person you know that you're talking about but your senior staff members and schedulers and all that sort of crap. Need to take into account what time that bloke got in, when he can go out. Not only legally but what he's capable of. You know some blokes are capable of doing better things than other blokes or different things than other blokes. (Company A Manager One)*

In addition to the differences between the capabilities of drivers, there were a number of psychological characteristics of drivers which were discussed by members of the studied companies. This included differences in drivers' propensity for rule breaking and risk taking. Whilst some drivers work in a safe and controlled manner, others were suggested to take significant risks and refuse to comply with rules. As stated by one Company A driver during an observation, *"there are some who insist on breaking the rules, they know what to do but do it wrong anyway"*. One Company C driver stated of himself that he left the steel industry when they became safety focussed. Whilst the driver primarily focussed this discussion on his own perceived attitudes towards work boots, claiming to be safer without boots, it is clear that drivers may hold unique attitudes which may not be shared with other members of the industry.

*I'm not really one for safety, I always wear thongs, never my boots... I've got them with me but I never wear them... I even used to work in steel but got out of that when they got all safety focussed... I'm less safe in boots, I have worked with thongs for years and never crushed a toe but when I wear boots I trip on everything coz I'm not used to the extra depth. (Company C Driver Two)*

Similarly, drivers appear to have different levels of desire for money. It was often suggested that, as Company A does not pay above the reward rate, drivers leave Company A

in order to receive more money elsewhere, whilst other drivers are happy to receive lower pay in exchange for a better working environment. This was also suggested to apply to drivers' attitudes towards workers compensation for injuries. It was indicated by members of both Company A and B that whilst some drivers want to return to work quickly, others exaggerated their injuries to receive further compensation. As stated by one Company A manager, *"it all depends on the individual, depends how many dollar signs they can see"*. This was also related to differences in work ethic between drivers. It was suggested that whilst some drivers were happy to receive money for resting an injury, others simply wanted to return to work.

*Yes sure if you need a day or two take it you know but...and then you get other blokes here that you know you could chop their arm off and it's like 'oh fuck I've got to go to work, but fuck, my arm, you know ....it's not even there but it's still sore'. (Company A Manager One)*

*Depends on the person. You can generally pick them. I had one person who fell off the truck, the trailer and fractured his hip. Fifty percent overall permanent impairment, can't drive a truck today, has never gone common law. Could have gone to state claim and common law no worries. Never gone common law because he felt supported through the process. He has a job that he still works around the heavy vehicle injury but he just said, "I'm not that type of person. I don't believe in that sort of system. I've got a payout that has been sufficient for me to do what I need to do for ongoing surgery". Because he needed a hip replacement in the end and that came out of a stat payment. He did all that, he's happy. I've got somebody who has a small tear that was based on a pre-existing tear but they did it, the straw that broke the camel's back was here. It'll be in common law, no worries. They've already got their lawyers involved... I've got some people that use the system because they know they've got money and they're not really going to need it going –*



– *forward but they know they can get it. Got other people who don't believe that they should milk the system like that. Then we have other injuries where people haven't even, they don't even think about it. They just focus on, I'm going to get back to work and it's a small part and its then back on the job. They've focussed on the job rather than the injury.*

(Company B Director)

#### A.4.4 State of mind

Whilst the other driver factors that have been discussed relate to the long term accumulation of knowledge, skills, experience and values, a number of transient states of mind were discussed within companies A and B which were described as having an influence on safety. These included maintaining awareness, a good attitude, and patience.

One of the most important states of mind for a driver to maintain is a high level of awareness. When discussing the requirements of operating a crane, a manager from Company B stated that *“you've got to be very aware what's going on around you”*. This is particularly critical when driving. Driving a truck safely requires a significant level of awareness of the surroundings. This was stated to be particularly important due to the behaviour of cars on the road. As stated by one Company A driver about cars, *“you never know what they are going to do... You always have to be aware of what they will do”*. This was further emphasised by another Company A driver who stated that when driving a truck, *“you've got to read the minds of other drivers, always trying to work out who the next idiot is... Without a buffer zone you can wipe out cars, your awareness needs to be spot on”*.

Due to the size and weight of trucks and the load they are carrying, they have long and variable breaking distances. For this reason it was stated by one Company A driver that when driving a truck the driver needs to *“keep an eye way up in front not just right in front”* in order to ensure that a collision is avoided. A number of members of Company B similarly noted the importance of awareness of hazards ahead which could increase the risk of an

incident. For example, one Company B driver stated that *“taking your eyes off the road for a moment is where you come unstuck”*, continuing to say that *“you look well ahead because at least at that distance you have enough time to make a reaction”*. In terms of the specific hazards that could arise, Company B drivers listed cars braking suddenly, cars overtaking the truck dangerously and doors of parked vehicles suddenly opening when travelling in the city. For these reasons another Company B driver stated that *“you gotta keep an eye up ahead, always looking ahead”*, and that *“if you look ahead, nine times out of 10 you can see it coming, but if you don’t look you can’t see it”*.

Drivers also suggested that keeping a good attitude and mindset is crucial for safety. One Company A driver even stated that *“if you can get a good mindset and get your body clock right you can get right to Sydney no problem”*. Similarly it was suggested that a good attitude with enforcement agencies is necessary to avoid additional fines. Whilst it is part of maintaining a good attitude and mindset, a number of drivers also discussed the importance of patience when driving a truck. It was often suggested that when driving for significant periods of time it is easy for frustration to build up, leading to poor decisions. It was even suggested by one Company A driver that most accidents are caused by impatience.

#### A.4.5 Family

The final driver specific factor which can influence safety within the industry is the driver’s family. A number of drivers from companies A and B indicated that their family plays a supportive role in safety, however a number of organisational staff members also raised concerns about the demands that family may place upon the driver. Similarly to the pilot study, the majority of information pertaining to the influence of the driver’s family on safety in Company A centred around fatigue. Whilst this information will be covered when discussing fatigue, drivers indicated that they rely on phone calls from their wives to stay awake and that their families help them to plan their weekends in order to gain sufficient rest

and sleep. Conversely, the driver's family can play a significant role in determining whether or not the driver is able to gain sufficient rest when with their family. For example, one driver from Company B indicated that his partner doesn't understand how tiring heavy vehicle driving is and expects him to be able to do significant work around the house or partake in a number of activities for which he is too tired. The driver stated that his partner "*thinks I sit on my arse all day*" indicating that when he is asked to conduct certain activities by his partner his response is "*Fuck! I'm tired*".

Additionally, however, many indicated that a driver's family can provide significant motivation and support for safe behaviour. Separately to fatigue, one driver from Company B described the manner in which his partner supports and encourages him to live a healthy lifestyle. The driver argued that due to the nature of work on the road he previously would eat unhealthily and smoke. However, after suffering a heart attack, the driver indicated that he had been required to make significant lifestyle changes to improve his health. The driver stated that his wife was a significant encourager of these lifestyle changes.

Further, it was often indicated by drivers from Companies A and B that their family provides a strong motivation for remaining safe. A number of drivers indicated that they avoid certain unsafe practices and behave in a careful manner in order to prevent their family from the loss of a grandfather, father, husband or son. In this way the family appear to give additional motivation to drivers to value their own safety.

*Better to get there late than not at all... Have run off road a few times from being too tired and hit the little white poles... Scares the shit out of you, it's a feeling you'll never forget... At the end of the day its only freight, it can get there late it doesn't matter... Coppers don't have to call your family and say you're dead. (Driver)*

*I've got grandkids now. I don't want to die on the road, I want to go home and see them.*

(Company B Driver Three)

*I try to keep a safe distance. If another vehicle pulls in front of me I slow down a bit... once again it's about safety. I want to go home to my family.* (Company B Driver Four)

#### A.4.6 Individual factors and specific safety behaviours and outcomes

The following section details how these factors were found to influence the behaviours and outcomes identified within the case studies. As such, this section is divided into specific crash outcome related behaviours, non-driving injuries and health outcomes.

##### A.4.6.1. Individual factors and crash outcomes

The crash outcome-related behavioural categories identified within the case studies included (1) driving whilst fatigued; (2) substance use; (3) speeding; (4) seatbelt use; (5) general driving errors and violations; (6) vehicle maintenance related behaviours; and (7) load restraint behaviours. The role of individual factors in each of these is discussed below.

##### A.4.6.1.1. Individual factors and fatigue

Chapter 10 identified a number of key themes relating to fatigue within the studied organisations. These included factors which were related to: (1) the causes of fatigue; (2) attitudes towards log books; (3) the difference between log books and fatigue; (4) driving out of hours; and (5) driving whilst fatigued.

##### A.4.6.1.1.1. The causes of fatigue

Regarding the causes of fatigue in drivers, the contributors were individual differences, the driver's state of mind and lifestyle related factors (which emerged within Study One but not as a key theme within the case studies). The role of these factors is discussed below.

## A.4.6.1.1.1.1. Individual differences between drivers

Individual differences were described in section A.4.3, and one of the major differences noted was the different tolerances for certain activities before feeling fatigue. It was for this reason that one organisational staff member from Company A suggested that ‘safety’ is different with each individual and comes down to what *“the individual himself is classified as being safe”*.

*You know some blokes do this job standing on their head, it's not a problem. Run down the road every night just like you go to your job every day and I come and sit at my computer every day, doesn't affect them you know. They can do six thousand ks a week and sweet, do it standing on their head. But then there's other blokes that just shouldn't be truck drivers because they're a danger to themselves and everyone around them because they're just not meant to be awake all night doing 100kmh everywhere. I mean it's the same as any job. Some people are made for it, some people can kind of get away with it and some people just can't do it. And driving trucks is no different, especially being awake at night time is no different you know. I don't have a problem staying awake for stupid amounts of hours or all night and all day and all night again or whatever, doesn't affect me at all. Some people would shake their head because they can't get past one day or something. That's just how your body works. I suppose it's just what you're used to, it's just what you're capable of doing. (Company A Manager One)*

Similarly, however, it was noted by a number of drivers that every driver is different, and that even on a given day there can be differences in how far a driver can go before needing to rest. One Company A driver stated that *“sometimes you need a nap after 1.5 hours, sometimes you can go straight to Sydney with only the regulated breaks”*. It was due to both general individual differences, and day-to-day differences, that it was commonly

suggested that rostering of drivers needs to be flexible and take into account these differences.

*Obviously fatigue is an issue and that needs to be controlled by everyone not just the person you know that you're talking about but your senior staff members and schedulers and all that sort of crap need to take into account what time that bloke got in, when he can go out. Not only legally but what he's capable of. You know some blokes are capable of doing better things than other blokes or different things than other blokes. (Company A*

#### A.4.6.1.1.1.2. The driver's state of mind

The driver's state of mind may be one of the factors which contribute to daily differences in fatigue tolerance. Whilst the driver's state of mind was typically more connected to awareness in avoiding incidents, it was stated by one driver from Company A that *"if you can get a good mindset and get your body clock right you can get right to Sydney no problem"*. Whilst there was little other reference to the driver's state of mind influencing fatigue levels it is still worth noting this potential connection. Additionally, however, it can be noted that this appears to highlight a notion of what is considered to be the best or most correct way of behaving. It could be suggested that this hints that due to the value placed on hard work, drivers may feel that they have been unsuccessful in properly adjusting their body clock, and thus have not worked hard enough. This may lead drivers to push themselves to drive longer than they should, as 'if they had gotten their state of mind correct' they should be able to do the trip without concern.

#### A.4.6.1.1.1.3. The driver's family

As was covered in section A.4.5, the driver's family and home life can have a significant effect on their experienced fatigue whilst working. Essentially it was argued by members of the studied organisations that family issues, and activities conducted for the

family at home, can interfere with a driver's ability to receive sufficient rest to prepare for driving.

*But I have a great concern about some of the drivers. Like when they're at home, are they getting proper rest? Are their wives taking them out to hang onto and do the shopping and so forth and so forth. We don't know what they do at home. I can control it if they're here, like I can always, if I see them standing around outside I can always hunt them off to bed and you know shoo them off type thing but whilst they're at home. Same as in Sydney I can't basically pat them on the arse and put them into bed. And that is one of my main issues, I don't know what they do at home. (Company A Operations Staff Member)*

*Umm...in relation to safety?...got to ensure that even before they start they have a fitness for duty to acknowledge. So if they come to work and they've had a bad night, they're fatigued because they haven't slept because they've had the flu, because they're taking a medication that may affect their driving, their responsiveness, they have an undertaking to put their hand up and say: I'm just not coming to work, I'm not well. We've had instances where we've had drivers come in and they've had some family issues at home, they've been visibly upset. We've said: no, no not in a truck today mate, you call it quits and head off home, get on top of things and then come back. We've done that for guys that are sick for a day, we've done it for one or two, we've sent them off and given them extended leave for a couple of weeks because they've had issues, so that's even before they start at work. (Company B Region Manager One)*

One Company A driver indicated that gaining sufficient rest at home on weekends can be a significant struggle. The driver argued that because of this, Monday nights are the hardest for fatigue, as on Sunday he is up all day with his family and, particularly in summer, it is difficult to sleep in on a Monday due to the heat of the day. Thus, when he works

Monday evenings he is often tired. Ultimately, the belief that drivers should be responsible for their own safety was again evident here, as drivers indicated that it is the driver's responsibility to gain sufficient rest when at home. For example, one company driver who regularly carries loads early in the morning suggested that managing fatigue is "about making sure you get home at a decent hour" as he needs to go to sleep 8pm to be sufficiently refreshed when he wakes at 2am.

#### A.4.6.1.1.1.4. General lifestyle-related factors

The last set of factors which were identified as causing fatigue were lifestyle-related choices, which whilst they were not discussed elsewhere in the case studies, were the subject of research discussed in Study One (section 4.2.3). It was stated by one manager of Company A that he had investigated the relationship between food intake and fatigue, and that he had been informed that bananas were one of the best foods to consume. Similarly, one Company B driver stated that whilst he previously did not believe it to be true, it has been his experience that *"food affects how you feel"*. Whilst there can be positive benefits of healthy eating in reducing fatigue, it was also indicated by a number of drivers that they rely on cigarettes and coffee to maintain alertness. For example, one Company A driver, when asked how he managed fatigue, stated simply *"coffee and smokes"*. Another driver from Company A however, stated that sleep was the most important method of reducing fatigue and that *"a lot of guys don't sleep enough"* as they just *"sit around drinking coffee instead"*. Whilst it could be argued that illicit substances may also be relevant to this section of the discussion it is worth noting that this will be discussed later as it appears that illicit substances are not so much a means to maintain alertness as to drastically 'remove' fatigue which is present. Coffee and cigarettes, on the other hand, have a less significant immediate impact and are consumed regularly to maintain a 'normal' level of alertness.



#### A.4.6.1.1.2. Log books and log books vs fatigue

Section 10.2.1.2 and 10.2.1.2.1 discussed the general views held by members of the studied organisations about log books and whether or not log books are an effective tool for managing fatigue. Though these views are separate to individual factors, it is worth noting that perceptions of individual differences were cited as one reason why the log book system was not effective. It was due to the perception of the ineffectiveness of log books in managing fatigue that driving over hours and driving whilst fatigued were considered as two separate topics. The following is a direct excerpt from section 10.2.1.2.1:

Individual differences were commonly cited as being overlooked within fatigue management legislation. This was particularly the case in Company C where a number of individuals indicated that the maximum legal driving time assumes that every driver will be tired after a given amount of work. For example, one driver stated that he did not like log books due to the fact that *“they say that when you’ve worked 12 hours you’ve gotta be tired”* and this was not necessarily the case in his opinion. It was for this reason that the driver/manager of Company C stated that log books are *“shit”*.

*No, no I said that. No because the fatigue laws say you’ve got to drive for five hours and then you’ve got to have a break and then you’ve got to do something else and then you’ve got to have a break. Sometimes you don’t want to go for five hours. Sometimes you might get weary after two hours. But the laws say you must, to get the amount of time in a day of driving, you must break it up into those specific breaks. (Company C Driver/Manager)*

#### A.4.6.1.1.3. Driving over hours

When exploring driving over hours it was evident that the individual driver’s history may play a role in deciding to continue driving. Above, it was argued that the individual driver’s personal history may influence behaviour. It was noted that drivers may come to a company with a range of different employment, driving and training experiences, which may

influence their behaviour in a variety of ways. When discussing fatigue and driving over hours a number of drivers discussed past experiences and the impact they have on current behaviours. The driver who was discussed, when examining the role of government on driving over hours, as having been made to work a 19-hour shift openly shared how this experience helped him to understand the importance of driving within regulated hours. The driver indicated that he felt ‘like a robot’ by the end of the shift, and thus will not conduct such an activity again. Similarly, a number of other drivers said that, due to the experience they had gained when driving over hours for past companies, they felt that it was important to adhere to driving hours’ regulations.

#### A.4.6.1.1.4. Driving whilst fatigued

Similarly to drivers’ decisions to drive outside of hours, a driver’s past experience can be relevant to decisions regarding driving whilst fatigued. This experience is also particularly relevant to the individual differences in levels of fatigue and tolerance for fatigue-inducing stimuli. As stated by one Company A driver, *“you get to know yourself, and your own signs of fatigue”* and that because of this *“you know when you need to stop”*.

Essentially, this experience affects the perceived likelihood of an incident when fatigued. Another Company A driver stated that from his own experience, *“if you don’t get to sleep you feel like shit and are wandering all over the road”*. One Company C driver, however, suggested that his past experiences mean he knows he can drive fairly safely whilst fatigued. But due to the additional traffic on the road in recent times, he no longer believes it is safe to drive fatigued due to the reduced reaction times and likelihood of crashing into a car. Whilst this is more a case of a perceived likelihood due to other vehicles, it was evident that the driver’s past experience of fatigue was sufficient to know that his reactions would be too slow around other vehicles.

*I have had a few near misses when tired; never a fatal though. A fair bit of that is luck, it's not that I'm a better driver than others, just lucky to pull out of the near miss... then you think: Fuck I gotta sleep. Those experiences help you judge your fatigue. For me it is speed. If I start slowing down and can't keep it at 100km that's my first sign. You have to keep the pace up, you can't be a Sunday driver. If you relax it's game over. Well, that's me anyway. Chatting on the phone doesn't help. (Company A Driver Six)*

Finally, as previously discussed in section 9.6, the driver's family can also serve as a significant motivation for safe behaviour. Thus when combined with a driver's past experience of fatigue increasing the perceived likelihood of an incident, the motivation to behave safe can significantly shape behaviour.

*Better to get there late than not at all. Have run off road a few times from being too tired and hit the little white poles. Scares the shit out of you, it's a feeling you'll never forget. At the end of the day its only freight, it can get there late it doesn't matter. Coppers don't have to call your family and say you're dead. (Company A Driver Three)*

*Used to work for a company in Bathurst where we wouldn't sleep for days. Just would lie down on the wheel while they loaded us then keep going. I've got grandkids now. I don't want to die on the road, I want to go home and see them. (Company B Driver Three)*

#### A.4.6.1.1.5. Summary: Individual factors and fatigue

From the above discussion it can be seen that individual factors were significant to both the causes of fatigue and decisions to continue to drive either when fatigued or already outside of legislated working hours. In fact, with exception to a driver's individual knowledge and skills, every individual factor previously identified was seen to influence fatigue outcomes in some way.

#### A.4.6.1.2. Substance use and individual factors

Though there were limitations in the amount of information obtained about substance use within the case studies, the studies identified the effects of a driver's history and family on substance use. Section 8.4.4 recounted the story of one driver who was involved in a crash with another vehicle whose driver was intoxicated. The driver shared this story and then stated that even though he had previously driven whilst intoxicated he never would again after seeing the results of that incident. This is a clear example of how a driver's experience can shape their perceptions regarding the consequence of behaviour and thus alter their behaviour. Whilst some similar cases will be discussed in the next section when discussing the perceived likelihood of an incident, it was generally noted that drivers' previous experiences and witnessed events shaped their behaviour choices. However, it was also clear that when drivers had experienced drug use in the past without consequence, they appeared to have a different attitude towards drugs. During one observation of a Company B driver, another member of the company was met at a customer site. This driver appeared to almost boast about past experiences with drugs. The driver claimed that when he worked for a previous company, the organisation itself provided him with "*half a bag of speed*" and told him that they needed him to "*go like stick and not stop*". Whilst the driver suggested that this was a negative event, his smile and tone of voice suggested that he was proud of this story to some extent. It is important to note, however, that the driver who was being observed on that day subtly indicated that the story may be untrue afterwards, in which case, sharing such stories may be more related to the cultural trait of keeping up appearances.

Lastly, as has been previously discussed, see section 4.2.1.4 and 9.2.5.6, a driver's family may also be linked with decisions regarding substance use. It was evident that a driver's family can be linked with increased pressure to make money and thus drive longer hours; however, it was also evident that family provides an incentive to be safe.

#### A.4.6.1.3. Speeding, seatbelt use and individual factors

Unlike the previously discussed behaviours, none of the individual factors which have been identified were directly linked to speeding or seatbelt use behaviours within the case studies. However, it is worth noting that due to the cultural assumption of the accuracy of personal experience and stories it is clear that a driver's history will to some extent influence these behaviours. This may particularly be the case due to the importance of the perceived likelihood of incidents in determining behaviours related to speed selection and seatbelt use.

#### A.4.6.1.4. General driving errors and violations and individual factors

As many errors are lapses in concentration or attention, it is not surprising that members of the studied organisations suggested that the driver's state of mind was also relevant to such behaviours. In particular, however, it was noted by one Company B driver that the design of the vehicle cab can have a direct influence on this state of mind. It was argued that *"if you are not comfortable you are not able to concentrate"* thereby increasing the risk of errors. For this reason, the driver indicated that the quality of seats within truck cabs is important and that, whilst the seats within the vehicle he was driving at the time were good, the seats of other vehicles within the Company B fleet *"are starting to fall apart"*.

#### A.4.6.1.5. Vehicle maintenance and load restraint and individual factors

Similarly to both seatbelt use and speeding, individual factors were also not identified as relevant to vehicle maintenance and load restraint behaviours within the case studies. However, it is worth noting that again the individual driver's history may influence their perceptions regarding the likelihood of an incident and thus indirectly influence these behaviours.

#### A.4.6.2. Individual factors and non-driving injuries

Non-driving injuries were seen to typically result from either: (1) being struck by an object; (2) slips, trips and falls; or (3) muscular strains and overexertion. No individual

factors were found to be directly linked with these forms of injuries, however, as has been noted above, the significance of the perceived likelihood of an incident, coupled with the cultural assumption regarding experience and stories, highlights that the driver's history may be relevant to these injuries.

#### A.4.6.3. Individual factors and health outcomes

Though little information was obtained regarding health outcomes in the case studies, it can be seen that individual factors may be relevant to health outcomes. The two forms of health-related outcomes which were identified within Study Three were eating and lifestyle-related health and psychosocial concerns. Though psychosocial concerns were often seen to result from crashes, in this case crashes are the causal stimulus and thus a driver's past history of crashes is not necessarily related to psychosocial concerns. Eating and lifestyle-related health however, did appear linked to individual factors, in that the driver's history of previous illnesses was seen to influence current health decisions.

#### A.4.7 Summary: Individual factors identified within Study Three

The purpose of this section was to outline the specific forms of individual heavy vehicle driver characteristics which may interact with the contextual and cultural influences on safety. Due to the shared nature of culture it is uncommon for safety culture to focus on such individual characteristics. As was discussed in Studies One and Two however, it is apparent that there are a number of individual factors which may interact with the context and culture of the industry to further influence behaviour. Whilst these factors may not be important to consider in all industries, nor form an important focus for future safety culture research, it is important to consider these factors in this research in order to understand factors which may confound the relationship between culture, context and behaviour. This is particularly the case for future quantitative research, as it may be difficult to accurately

examine the statistical relationships between both contextual and cultural factors and behaviours and outcomes, without first controlling for individual factors.

As can be seen from the discussion of these factors, there are a number of individual variables which can influence safety. These primarily included drivers' past experiences, skills and knowledge, along with differences in individual capabilities, attitudes and values. These past experiences, skills and knowledge lay the foundation for the driver's employment within the industry and may significantly shape driver behaviour if not controlled for by the organisation through adequate testing and training. Additionally, however, it was noted that the state of mind of a driver can have important influences on driver safety. As this factor is very transient in nature, it is potentially better viewed as a requirement of safety and or a hazard or risk factor. Lastly, however, of a more contextual nature, is the driver's family. Whilst the driver's family could have been included as a contextual variable, the very fact that every driver has a unique family precludes their family from serving as a shared influence on safety and thus can be treated as a social extension of the driver.





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