

An Inquiry into Contextual Factors Impacting the Occupational Health, Safety, and
Well-Being of New Zealand Truck Drivers: An Ecological Systems Approach

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ABSTRACT

This thesis provides an exploratory and critical inquiry of the system including contextual factors that impact the occupational health, safety, and well-being (OHSW) of truck drivers in New Zealand.

Truck drivers, both in New Zealand and abroad are reported to be experiencing consequences of poor OHSW. Society, communities, families and individual workers have been found to be paying, directly and indirectly, for working arrangements in which truck drivers consequently work harder and longer, for less benefits and a greater share of the risks. Given how little was known about the impact of the system on the individual a critical inquiry into the trucking industry was required.

Previous attempts to address such issues in Australasia have predominantly been narrow in approach – considering only small sets of variables, and generally centred on modifying driver behaviour. This study used Ecological Systems Theory to identify and understand wider contextual factors not previously considered, and the roles and interactions of these.

There were three phases of data collection covering: archival data review – both public and private, and Key Informant and driver interviews. The methods drew together 45 interviewed participants from positions throughout the system levels including national bodies, industry representatives, organisations, and the individual truck drivers. There were 25 Key Informants and 20 truck drivers interviewed.

Five key themes resulted. The organisation of work in the industry was found to have a detrimental impact on the OHSW of truck drivers in New Zealand. Secondly, those in management positions faced conflict between profit and their responsibility to the drivers' OHSW. This is linked to the third key theme: the role of the employment relationship, which as a discipline, has been largely overlooked in the trucking industry in New Zealand. The fourth theme explores the industry culture and how norms were found to be a barrier to change. The final theme highlights how a failure in systems thinking meant previous efforts to improve OHSW have been fragmented and do not consider the complexity of the trucking industry in New Zealand.

There is appetite to address the issues to some degree, but regulators, government officials and others desirous of change need better evidence of the potential size of the prize from addressing the issues highlighted in this thesis. This study provides that evidence.

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ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

A handwritten signature in black ink, appearing to read 'Clare Tedestedt George'. The signature is written in a cursive style with a large, prominent initial 'C'.

Clare Tedestedt George

28th of March 2018

CO-AUTHORED WORKS OR PUBLICATIONS ARISING FROM THIS THESIS

- Tedestedt George, C., Tedestedt, R., Bentley, T., & Lamm, F. (2015). Running on empty: New forms of vulnerability in the trucking industry in New Zealand. Paper presented at the ILO's Regulating for Decent Work Conference, Geneva, July 2015.
- Tedestedt George, C. (2014). New forms of vulnerability: The trucking industry in New Zealand. Paper presented at Human Factors and Ergonomics Society of New Zealand Conference: Auckland, 2014.

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ETHICS APPROVAL

This research was approved by the Auckland University of Technology Ethics Committee AUTEK on the 20th of May 2015, Ethics Application Number 15/64.

ABBREVIATIONS

ACC – *Accident Compensation Corporation (Te Kaporeihana Āwhina Hunga Whara)*

ACC is a New Zealand Crown entity responsible for administering the country's universal no-fault accidental injury scheme. The scheme provides financial compensation and support to citizens, residents, and temporary visitors who have suffered personal injuries.

HoS - Hours of Service (Regulations)

HPMV - High Productivity Motor Vehicles

HPWS - High-Performance Work Systems

JIT – Just-in-time Management

MoT – *Ministry of Transport (Te Manatū Waka)*

This ministry is the public service department of New Zealand charged with advising the government on transport policy.

NRC – *National Road Carriers*

Based in Auckland is a descendant of Auckland Owner-Driver Carriers Association and was set up in October 1936 to represent town carriers. While NRC still has strong owner-driver membership, it has spread its representation nationwide and now encompasses all sizes of operations.

NZD – *New Zealand Dollar(s)*

NZTA – *New Zealand Transport Agency*

NZ Trucking Association - New Zealand Trucking Association

Previously the Combined Owner Driver Association was founded in 1988 to represent owner drivers. The Association has grown to represent anyone who owns or operates a commercial vehicle or vehicles. Members include owner drivers, large fleet operators, and corporate partners nationwide.

OD(s) – Owner-Driver(s)

OHS and OHSW – *occupational health and safety, and occupational health, safety, and well-being*

In some instances, well-being has been left out purposefully because either the study did not include it, or it was not mentioned. This omission is on purpose.

RTANZ – *Road Transport Association New Zealand*

Based in Christchurch is made up of four regional associations spread throughout New Zealand. It can trace its origins back to the Master Carriers Association founded in 1924 and the New Zealand Road Transport Alliance founded in 1932. It represents trucking operators of all types and sizes from owner drivers to large fleet operators.

RTF – *Road Transport Forum.*

The Forum exists to represent the interests of road freight operators nationally and to build wider public awareness and understanding of the contribution road freight transport makes to the lives of all New Zealanders.

DEFINITIONS OF KEY CONCEPTS

The contextual factors present in the system and how they relate to the occupational health, safety, and well-being of truck drivers is the core tenet of this thesis. Below are the definitions used by the researcher when referring to these key concepts.

Occupational Health: The ILO defines it as: the term health, in relation to work, indicates not merely the absence of disease or infirmity; it also includes the physical and mental elements affecting health which are directly related to safety and hygiene at work (ILO, 2018)

Occupational Safety: Exposure to hazards, risks, fatal and non-fatal accidents in the workplace (OSHA, 2018).

Occupational Well-being: Mental health is defined as a state of well-being in which every individual realises his or her potential, can cope with the normal stresses of life, can work productively and fruitfully, and can contribute to her or his community (WHO, 2018).

Working Environment: The term ‘working environment’ was set in accordance with International Labour Organization (ILO) Convention No. 155 and defines a modern approach considering technical safety as well as general prevention of ill-health (European Agency for Safety and Health at Work, 2018).

Contextual Factors: The definition of the term Contextual Factors differs between studies because each system has a different purpose and unique set of elements for consideration. This is important to consider when using a particular framework to explain the happenings in a different setting to that in which it was developed. For example, Bronfenbrenner’s Ecological Systems Theory (EST) model was developed in an educational setting in which the whole system was considered context for learning. Bronfenbrenner’s unit of focus was the single child in the classroom and therefore contextual factors were all the forces external to the child and the classroom. This differs from others who have used a systems approach. For example, Tappin’s (2008) work in the meat processing industry considered contextual factors to be “forces that are external to the industry but which act on it” (Tappin, Bentley, & Vitalis, 2008, p.1577). The unit of focus in Tappin’s work was the industry, therefore contextual factors were those forces outside the industry but impacting on it.

Initial data collected in this study highlighted that forces at the organisational, industry, and macro level were impacting the OHSW of New Zealand truck drivers. In other words, the whole system was relevant for consideration, as was the case in Bronfenbrenner's work. For this reason, Bronfenbrenner's EST model was used as a starting framework and was developed to include contextual factors relevant to the unit of focus for this study – New Zealand truck drivers and their OHSW. Therefore, contextual factors were defined as forces external to the driver and their immediate work surroundings (i.e. truck cab) but which had an impact on their OHSW. Immediate factors, such as in-cab conditions i.e. broken seats, were not considered contextual factors but symptoms of interacting contextual factors.

Systems Approach: A systems approach ensures consideration is given to all elements of the work system relevant to the unit of focus, recognising the interaction between the system elements, and acknowledging these interactions do not occur in isolation (Tappin, 2008). This approach is typically illustrated using concentric rings. As mentioned above, each system has a different purpose (e.g. the purpose of the trucking industry is to move goods with minimal damage and maximise return) and therefore each system depiction will include specific elements and a unique level of abstraction.

The framework used in this study is based on Bronfenbrenner's Ecological Systems Model (EST) which acknowledges the inclusion of a macrosystem (culture), exosystem (industry), mesosystem (organisational), microsystem (family or peers), and the individual. This study has taken the structure of this model but adapted it to reflect the system of the trucking industry in New Zealand.

Interactions: "Interactions between two or more elements of a system that have an effect upon one another" (Shorrock & Williams, 2017, p.5).

Elements: Elements may be human, technical, informational, social, political, economic, organisational (Wilson, 2014), and physical (Shorrock & Williams, 2017)

Truck: A truck is a non-passenger carrying vehicle designed to carry loads. Light trucks weigh less than 3.5 tonnes, about the same as big four-wheel drive

family vehicles. Most light commercial vehicles are vans or utes. A truck driver operates these vehicles in a professional capacity.

Standard Heavy Vehicles: These are trucks weighing up to 25.8 tonnes laden or truck and trailer combinations which can collectively weigh up to 44 tonnes and in most instances, can be up to 20 metres in length. Logging trucks and trucks with pole trailers, commonly used for transporting cars, can be up to 22 metres long. These vehicles can operate as of right on virtually all roads. (Diagrams of Truck Configurations can be found in Appendix 1).

CHAPTER ONE: INTRODUCTION

1.1 Introduction

This thesis considers the role of contextual factors that underlie truck driver health, safety, and well-being (OHSW) in New Zealand.

The immediate risks associated with truck driving have been well documented in the literature (Quinlan & Wright, 2008; Hensher & Battellino, 1990; Rawling & Kaine, 2012; Mackie, 2008; Mackie & Moore, 2008; Charlton & Baas, 2001; Murphy, et al., 2012; Thornthwaite & O’Neill, 2017) and in a multitude of media stories in which driver behaviour is often the narrow explanation for an incident.

Initial Reports

The need for a critical inquiry of the New Zealand trucking industry became apparent to the researcher having heard concerning stories from truck drivers and observed the research gaps. The drivers explained the impact they felt their working conditions were having on them as individuals and on their families. They spoke of the pressure to meet unrealistic deadlines, drive poorly maintained trucks and therefore struggled to maintain their health, safety, and well-being. They reported increasing instability in their employment exacerbating an already challenging environment.

A host of issues relating to unstable and precarious working conditions presented in the informal conversations with the drivers. This instability was synonymous with changes seen in other industries and was well-documented in the literature (Johnstone, Quinlan, & Walters, 2005; Walker, 2011; Johnstone & Quinlan, 2006).

A Multi-Disciplinary Approach

The problem-lead nature of the inquiry in this study is somewhat unique; the extent to which it sat in any one discipline was guided by the information gained. Once all the evidence had been collected, the strongest theoretical approach was determined to place the data in context, not bound by arbitrary discipline borders. The chosen approach had to have enough breadth to accommodate inclusion of a wide variety of data which spanned across various disciplines. Obvious choices such as Employment Relations, Public Health, Business Psychology, or Sociology were considered. Human Factors and Ergonomics (HF/E) by its very nature is multidisciplinary and tackles complex problems in a systemic way (Wilson, 2014). A systems approach was adopted for this

thesis to ensure inclusion and consideration was given to wider contextual factors from a multidisciplinary field of information.

This Chapter

This introductory chapter presents a statement of the research problem to outline why change is needed in the New Zealand trucking industry and what we stand to lose if we do nothing. The following section in this chapter then outlines the significance of the systems approach taken given that many studies have typically taken a narrow approach to intervention and ignored wider contextual factors that affect driver OHSW. The purpose statement and research questions that have guided this study are presented followed by the theoretical perspectives used to address and answer the above research questions. The chapter concludes with a thesis overview in which each chapter is outlined in turn.

1.2 Problem Statement

Heavy vehicles account for approximately 18 percent of all road deaths across Australia and New Zealand annually but we still do not understand the mechanisms and costs well enough. In Australia that equates to, on average, 250 fatalities and in New Zealand, 65 per year (Quinlan & Wright, 2008). In 2014, the death toll was even higher with 67 people dying and 772 people injured in road crashes involving trucks (Trucks: Ministry of Transport, 2016). New Zealand figures also showed that truck drivers were ten times more likely to be killed in work accidents than those in other jobs (Driscoll et al., 2004), and that an increasing number of truck driver deaths are attributed to speeding, fatigue, and poor vehicle maintenance (Rawling & Kaine, 2012). These observed outcomes have been characterised as symptoms of deeper contextual issues, as summarised by Hensher and Battellino (1990):

“These conditions, which manifest themselves in declining freight rates, tightening schedules and increasing competition confront drivers daily as they try to forge a living on the road. If the problem of safety on our roads is to be addressed... it is important to look beyond the symptoms of speeding, infringement of driving time regulations, and driver fatigue and consider the underlying causes which result in this behaviour” (Hensher & Battellino, 1990, p.553).

The trucking industry in New Zealand reflects the global trend of the increasing use of contractors. The shift from employee to contractor is indicative of a management pattern where the hiring party sets the wages and conditions, reportedly with insufficient regard to the impact on drivers, including their health, safety, and well-being (Lamare, Lamm, McDonnell, & White, 2014; Quinlan & Wright, 2008). Uncertainty and a lack of control are inherent aspects of their daily life (David, Cloutier, Ledoux, 2011; Quinlan, Bohle & Lamm, 2010; Underhill & Quinlan, 2011). In many cases, the ill-effects of this work have been reportedly veneered over by profit motives and labour market policies (Quinlan, 2013). OHSW issues are secondary to production and are typically only addressed when the solutions do not threaten production goals (Quinlan, Bohle, & Lamm, 2010).

Gaps in the Literature

The literature lacked evidence on the role of the manager and the conflicts they faced when presented with a decision between profit or OHSW. Additionally, little focus was given to anything going right in the trucking industry. Very few critical examinations of success stories were found in the literature.

What was needed, therefore, was to understand the OHSW consequences of the external and internal contextual influences on the New Zealand trucking industry, such as the impact of deregulation, the organisation of work, the type of employment, pay structures, autonomy, indebtedness, and increasing work pressures. There was also a need to examine the OHSW consequences for the drivers who operate at the end of a long and complex supply chain, face increasingly tight delivery timeframes, and who work in isolation.

Overall, there is a lack of understanding about the elements and interactions within the system, and less again about the indirect impacts where it performs badly from an OHSW perspective.

1.3 The Significance of the Research

As mentioned above, much of the previous research in New Zealand and further afield had taken a somewhat narrow focus when attempting to address OHSW issues in the industry. For example, physical aspects of ergonomics research has focused on the driver-fit to the truck (e.g., Guan et al., 2012), while psychology literature has focused

on drivers' risk-taking behaviour (e.g., Rosenbloom, Eldror, & Shahar, 2009; Sullman, Meadows, & Pajo, 2002; de Vries et al., 2017). Medical literature, on the other hand, centres around the poor health outcomes for the drivers (e.g. Talmage, Hudson, Hegmann, & Thiese, 2008; Sieber et al., 2014). Contributions from such sources are useful, but they largely address downstream, individual aspects of OHSW and do not take account of wider contextual influences, restricting the potential of interventions (Wilson, 2014; Shorrocks & Williams, 2017).

Wilson (2014) notes that this may be for a number of reasons. He writes, "Most acceptably, it may be because of the impracticality in some settings" (p.3861). Continuing he suggests that some projects are designed to concentrate on micro issues and in such cases time, permission, or access may limit further inclusion. However, less acceptable are the instances in which a narrow, non-systems approach is taken because those investigating are concerned with only one component or interested in a narrow channel of inquiry. Assumptions that a task occurs in a vacuum away from external influences may mean that findings have less value and transferability (Wilson, 2014). Anecdotally (Personal Communication: Mackie and Moore) clients will also restrict scope in order to protect themselves personally from criticisms of earlier decisions.

In response, a systems approach was adopted for this study whereby multiple perspectives from key informants were gathered thus also reflecting the researcher's methodological stance. Given the little existing research, the chosen method needed to be explorative and one that allowed the researcher, together with the researched, to co-construct ideas as they arose, with the aim to uncover potentially unknown contextual factors. A qualitative, critical interpretive study design was useful in that it exposed the underlying contextual factors while also considering the potential political nature of such an inquiry. The extended face-to-face interview sessions with the participants also allowed unique insight into the working conditions of New Zealand truck drivers.

Given the dependence New Zealand has on the trucking industry for the movement of goods, and the large number of people involved, the country has much to gain from an attempt to address and improve practices with both short and long-term benefits. This study provides not only an identification of the related contextual factors but seeks analysis of how they interact to ensure future decisions are made with a strong-evidence base.

1.4 Purpose Statement

The purpose of this explorative and qualitative, critical interpretive study was to discover the underlying contextual factors that impact the OHSW of truck drivers in New Zealand. Using a systems framework, this study looked specifically at the interaction of the contextual factors, and notably those concerned with the organisation of work, to explain what has been observed in the industry.

The research questions have been formulated to capture a wide breadth of information given that research in this area has typically been narrow in focus and that little is currently known about the New Zealand trucking industry as a system. The aim was therefore to build understanding and provide an evidence base for subsequent studies to work from.

Literature, anecdotal evidence, and publicly available industry and government reports were used to identify the gaps that the following research questions seek to address. The section following the presentation of the research questions outlines the theoretical perspectives adopted to answer them.

1.5 Overall Research Question and Sub-Questions

What role do contextual factors play in the occupational health, safety, and well-being of New Zealand truck drivers?

Sub-Questions

- What are the underlying contextual factors impacting the occupational health, safety, and well-being of truck drivers in New Zealand?
- What role do cultural, structural and organisational influences play in truck driver health, safety, and well-being risk?
- How do the contextual factors interact with each other?

THEORETICAL AND CONCEPTUAL PERSPECTIVES

1.6 Ecological Systems Theory – A Systems Approach

The literature on the OHSW of truck drivers, particularly in New Zealand, has focused on individual workers and their immediate working environments. However, as noted by Dejoy (1996, p.66), “efforts to influence the beliefs and attitudes of workers and thus, motivate them to follow safe practices may fail if the environment is non-supportive (as cited in Barclay, 2015, p.42). An investigation of the environment the individuals operate within was therefore required. This investigation would allow for an examination of the interactions between “organisational structures, payment systems, industrial conflict and other organisational, industrial and social factors” (Quinlan, Bohle, & Lamm, 2010) and highlight weaknesses all across the system to address.

This study, therefore, primarily adopts systems perspective that “pays explicit attention to the social, institutional and cultural contexts of people-environment relations” (McLaren & Hawe, 2005, p.12). A system is defined as a bounded structure “consisting of interrelated or interdependent elements” (McLaren & Hawe, 2005, p.13). Through the lens of this perspective, the environment is not seen simply as the setting for work but is understood as a key determinant that also needs modification (Barclay, 2015). Emphasis is placed on the relationship between different elements within the environment, and it is acknowledged that it cannot be decomposed without losing an understanding of the whole system (McLaren & Hawe, 2005).

The specific systems approach adopted for this study is based on the work of Urie Bronfenbrenner (1979, 1994) who developed the Ecological Systems Theory (EST) (Watling Neal & Neal, 2013). The EST places individual human experiences within the context and considers behaviours mostly as responses to other contextual elements (Derksen, 2010). The framework, often depicted as concentric circles (see Figure 1.1. below), further explains the bi-directional nature of interactions within the system (Newbury, 2011) and helps to identify “contextual predictors or points of intervention that lie beyond the individual” (Watling Neal & Neal, 2013, p.723).

The EST has four key elements: the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1994). A fifth element was added to later versions and was called the Chronosystem, which depicted patterns of events over periods of time (Rosa & Tudge, 2013). The macrosystem refers to the overall patterns and ideas that

characterise a society or a social group; it is the most overarching concept in this model (Bronfenbrenner, 1994; McLaren & Hawe, 2005). The exosystem depicts the interconnectedness between two or more settings of which one does not contain the individuals in question (Bronfenbrenner, 1994). The mesosystem can be seen as a system of microsystems (Bronfenbrenner, 1994) referring to settings of which the individual is a participant, for example, a workplace, family or community (McLaren & Hawe, 2005). The microsystem is the final aspect of the ecological environment and includes the individuals' immediate situation and the connections between other individuals within the setting (McLaren & Hawe, 2005). This level is seen as a pattern of activities, social roles, and interpersonal relations experienced by the individual (Bronfenbrenner, 1994). Other terms have been used for the levels within the system including and variations on societal, industry, organisational and individual-level factors (Blackwood, 2015; Buckle, 2005; Moray, 2000).

Figure 1.1 below is a visual depiction of Bronfenbrenner's Ecological System model showing the levels of the system that were used for his work on child development and the education system.

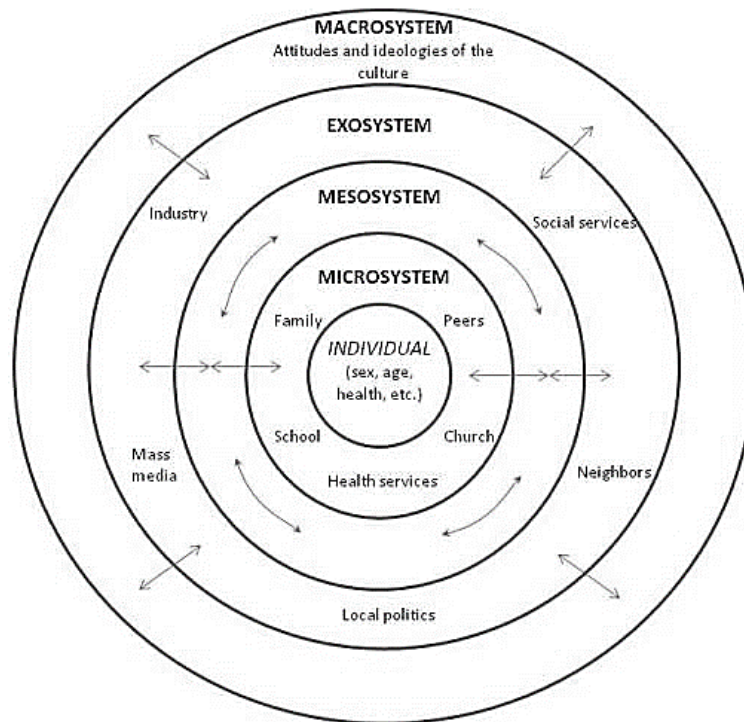


Figure 1.1: Bronfenbrenner's Ecological Systems Theory model initially created in response to psychologists, sociologists, educators and other's research who, at the time, studied child development from a narrower perspective (Newbury, 2011).

Given that this study follows more the narrowly focused attempts to build understanding of OHSW in the trucking industry, the EST was used to expand the known information base. The inclusion of the organisation of work and the socio-political environment in this study expands the EST to reflect a more industry focused depiction of the systems approach.

Bronfenbrenner's EST model was developed in an educational setting in which the whole system was considered context for learning. The unit of focus was the child in the classroom and the contextual factors were the forces external to the child and the classroom. Despite being developed within an educational environment rather than in industry, the simplicity and structure of the EST were useful in capturing complex interactions between elements which were uncovered in this study. Initial data collected in this study highlighted that forces at the organisational, industry, and macro level were impacting the OHSW of New Zealand truck drivers. In other words, the whole system was relevant for consideration, as was the case in Bronfenbrenner's work. For this reason, Bronfenbrenner's EST model was used as a starting framework and was

developed to include contextual factors relevant to the unit of focus for this study – New Zealand truck drivers and their OHSW.

Central to this thesis was the idea that an exploration of the environment the drivers operate within may uncover deeper contextual problems. Bronfenbrenner, in an educational setting, argues that:

“The analysis of the microsystem must take into account the indirect influence of third parties on the interaction between members of a dyad because a focus on dyadic social interactions alone ignores the wider social context and is thus insufficient to capture the social forces bearing on the focal individual” (Bronfenbrenner, 1979, p.68).

In the trucking industry, dyadic social interactions may be seen, for example, when animosity arises between the driver and the dispatcher, however, the conflict has been set up at a latent level by those who signed the contract with those higher up the supply chain. Adopting the EST reflects the growing recognition that addressing OHSW in the trucking industry involves inclusion of elements throughout the whole system.

System Boundaries

One of the challenges reported when adopting a systems approach is creating appropriate boundaries around the system for example, which elements to include and which to exclude. John Wilson, a key author in this area suggests that there are no real rules for creating the boundaries other than being clear and practical when acknowledging that efforts “must produce something useful” (Wilson, 2014, p.3863). Consideration therefore, he argues must be given to the uniqueness of each of each study, and the nature of the problem should be taken into consideration. For example, the New Zealand trucking industry is not a European pre-school (as was the focus for much of Bronfenbrenner’s work). This study will have elements and interactions that the EST did not have to accommodate.

As a starting framework, the EST provided a map for data collection ensuring that each of the primary stakeholder populations were represented and their experiences shared. The multiple perspectives (Newbury, 2011) on the system and its dynamics were sourced from various participants framed by the layers presented by Bronfenbrenner (1994). The preliminary work in this study had shown the importance of interpersonal relationships for the drivers. Using, the EST meant data could be collected from these

people who live and work in the groups in which they belong. This, according to McLaren and Hawe (2005) requires a qualitative line of inquiry. The qualitative approach adopted for this study is elaborated on in Chapter Four.

1.6.4 Key Authors in Systems Thinking

Authors in this field have used a systems approach, similar to that of Bronfenbrenner's, to explain complex interactions within a specific industry or to address a particular problem. Although each have contributed to the systems thinking, their versions of the approach emerged from situations different to the one in focus for this study. Those considered for this study are introduced below; followed by why the EST was finally chosen as the starting point framework.

Error Tolerance in Systems

In 1984 Charles Perrow wrote the book 'Normal Accidents: Living with High Risk Technologies' which outlined the complexities inherent in a system that make failures inevitable and necessary steps to go through. Perrow argued for error tolerance to be tested in a fast-fail approach, to cost- and time-effectively understand the failures inherent in the system. He further argued that multiple and unexpected failures were built into society's complex systems and that often organisations and managers were the problem, not individuals or technology. The socio-technical approach taken by Perrow highlighted the role of the manager and the organisation of work.

Perrow focused his efforts on high-risk industries such as Nuclear Power Plants - an industry where there were clear guidelines and hierarchies in the chain of responsibility. This is a notable difference to the organisation of the trucking industry. This ties into Erik Hollnagel's Safety II approach and his development of the FRAM approach. A Safety II approach considers the system's ability to function under various conditions, "so that the number of intended and acceptable outcomes are as high as possible" (Hollnagel, Wears, & Braithwaite, 2015, p.22). The basis for a safe system must therefore be an understanding of why things go right. As Perrow, Hollnagel's work points at where industries should be aiming, and provides information for resilience development. Approaches such as Safety II have highlighted how far away the trucking industry in New Zealand is from the industries considered by Perrow, for example. The trucking industry would feature at the other end of the continuum because of practices such as dependent contracting which has reportedly dragged progress backwards.

Resilience

More recently Erik Hollnagel created the FRAM (Functional Resonance Analysis Method) to explain events by showing how functions can be coupled and the variability of everyday individual performance may lead to unexpected outcomes – both good and bad. As a method rather than a model it makes no assumptions about how the system under investigation is structured or organised, instead the system results when the method is used to create a model. The FRAM is used to model functions that are needed for success in performance (as in the Safety II approach). Given that the trucking industry in New Zealand is still in operation, it is suspected that the drivers must have to compensate for and absorb the impact of the wider systemic factors (sometimes referred to as latent failures). In other words, the everyday individual performance of the drivers is ensuring more does not go wrong.

Latent Failures

James Reason (1998) described settings where causes could be found up-stream from an accident where latent failures may be lying dormant. Further, Jens Rasmussen (1990) suggested that socio-technical systems were both complex and unstable and that it was increasingly difficult to explain them in a single causal path. Rasmussen further acknowledged the difficulty of capturing the temporal and complex nature of the events that surrounded the initial manifestation of the accident. Both Rasmussen and Reason's work have been widely used to explain the impact of latent failures within a system. Approaches such as theirs were useful in forming the layers of the system and understanding the interconnectedness between the layers.

As Perrow, Reason presented his work using industries with defined structures and hierarchies of which are not clear within the trucking industry in New Zealand. Wilson's work in the rail network, as discussed below, confirmed that the trucking industry does not play host to stratified, well-defined systems within systems and therefore identifying clear chains of responsibility or entry points for intervention would be difficult.

Systems within Systems

John Wilson explained the interaction of systems within systems (Wilson, 2014) looking specifically at the rail network in the United Kingdom. Wilson's work

highlighted a parent-child-sibling relationship between systems enabling more clear boundaries to be drawn around each system. The parent-child-sibling format was given consideration for this study however it was realised that the real-world complexity of the trucking industry in New Zealand could not be so easily stratified. It became evident that there was no obvious parent i.e. industry body, government agency, regulatory body, like the National Rail Network of which interventions could be targeted. The New Zealand trucking industry may be better described as “orphans in clubs” (personal communication, Moore, 2018) in which those with established power will set the rates and the rules.

Influences from Each

Elements from each have been used to address the problem presented in this study. For example, Wilson’s work highlighted a gap in the trucking industry – the lack of a parent figure. Rasmussen ensured the consideration of upstream factors and their interaction guiding the researcher on appropriate levels of abstraction. Perrow prompted and confirmed the addition of the socio-technical lens to the trucking industry, additionally the focus on managers and the role of the wider organisation. Hollnagel’s work highlighted the lack of analysed success cases in the New Zealand trucking industry. Each day a truck driver gets home safely is a success, even if long-term he or she is on track to die ten years early.

Use of the EST

After consideration was given to each of the approaches above Bronfenbrenner’s EST was used as the core framework given that the study was exploratory and all within one system, i.e. it was outside the scope of this study to include international parties which may have been considered, for example, a parent system using Wilson’s framework. Bronfenbrenner’s system allowed the researcher to acknowledge the interactive nature of the contextual factors and consider the complexity of the trucking industry in New Zealand. Further, his approach had enough breadth to ensure inclusion of elements from other disciplines and was less constrictive than other approaches. As this study does, Bronfenbrenner’s work considered the whole system as relevant for inclusion.

1.7. Sociological Perspective

As mentioned above, Bronfenbrenner's EST model was used as a starting framework for this study, however acknowledging that it was developed in an education setting not in industry, additional information was required for inclusion. Initial reports indicated that the organisation of work and the socio-political environment were relevant to include when looking at the poor OHSW of truck drivers in New Zealand. Therefore, the inclusion of the organisation of work and the socio-political environment in this study expands the EST to reflect a more industry focused depiction of the systems approach. For this reason, the sociological literature was consulted as a secondary body of work for inclusion.

There is emerging evidence to indicate that certain forms of work organisation have been linked to adverse OHSW outcomes for workers (Benach, Muntaner, Solar, Santana, & Quinlan, 2007). Poor OHSW outcomes are not random; it is believed that they are "logical and predictable outcomes of the organisation of work" (Quinlan, Bohle, & Lamm, 2010, p.115). Without an understanding of the work environment, workers will continue to be held responsible and targeted for intervention. The structure and agency debate along with Labour Process Theory have been consulted to help solve the problem presented in this study.

1.7.1 Structure and Agency

Prior to this study, the literature offered little social insight into why truck drivers continued to skip breaks, work over their legal limits, and in many other ways, break the law, putting not only themselves but also others at risk. Drivers have cited reasons for working excessive hours, for example, normalising it as part of the job and that they all do it. Structure and agency literature has been used to understand the role of the system (structure) and whether the drivers have agency to make decisions that keep them healthy and safe. However, within the Sociological community there is considerable debate around the concepts of structure and agency (Reed, 2005). Iterations and developments of the concept include Giddens' Structuration Theory (Giddens & Sutton, 2014; Jones & Karsten, 2008; Marsh, Akram & Birkett, 2015) and Archer's Analytical Dualism – a morphogenetic approach (Akram, 2012) which takes a unique perspective on the structure and agency debate. It is not within the scope of this study to delve into this debate any further.

In-line with the systems approaches discussed above, the premise of the structure and agency debate is that social phenomena cannot be reduced to the properties of individual parts but should be studied within the social system in which they occur (Wang, 2008). Individual agency and social structure are both relevant for analysis, however, any attempt to reduce either structure or agency is inadequate (Giddens & Sutton, 2014). One presupposes the other (Wang, 2008). Agents use the rules and resources that make up the structure and in doing so reproduce the structure. Hays (1994) recognises that choices made by agents are ones selected from a “set of structurally provided alternatives” (p.63). Therefore, it has been suggested that structure both enables and constrains the agent in their action. At some point, the individual agent internalises the reality and hardens the structure in which they operate. The ability for an agent to be reflexive is determined by one’s access to resources; large organisations, for example, have a greater opportunity to be reflexive and therefore strategic. Individuals, on the other hand, may have fewer resources and so may be more likely to have “their volitions shaped” (Marsh, Akram & Birkett, 2015, p. 584).

1.7.2 Labour Process Theory

Labour Process Theory (LPT) is an additional sociological theory the researcher has consulted for this study. The EST model demands a review and inclusion of the entire system, and literature along with anecdotal evidence from the trucking industry has hinted to the role of deregulation and capitalism on working conditions. LPT acknowledges the degradation of work under capitalism and distinguishes between the impact on the workers (labour) and the owners (capital) (Braverman, 1998; Lordon, 2014). This theory aided in amplifying the voices of the drivers - those earning their living in challenging conditions, under the illusion of freedom, in the name of profit and efficiency. This theory further elucidated the role of the managers and their personification of capital but, like the working class, possesses little economic or occupational agency (Braverman, 1998).

THESIS OVERVIEW

This thesis provides an exploratory and critical inquiry of the contextual factors that impact OHSW of truck drivers in New Zealand. Interviews with Key Informants and truck drivers, in addition to the review of relevant secondary data, has provided insight into the underlying contextual factors impacting the OHSW of New Zealand truck drivers, the nature of the contextual factors and how these factors interact with each other. What follows is how the upcoming chapters inform and answer the research questions outlined in this study. Each chapter throughout this thesis features a conclusion that can be read first to gain an overview of the entire study.

Chapter Two: *Introduction to the System*

This chapter establishes the setting for the New Zealand trucking industry. Given the approach adopted for this study, this chapter utilises the concentric ring formation inherent in the EST model to map out the contextual factors related to the trucking industry in New Zealand. Starting from the outer most ring, this chapter begins with a review of the relevant literature on the socio-political environment and information on the background to work in the trucking industry. After establishing the wider context, an outline of the trucking industry and the job of a truck driver is provided. This chapter aims to explore how factors from the wider context interrelate in line with the research questions for this study.

Chapter Three: *Literature Review – OHSW in the Trucking Industry*

Chapter three is a review of the literature that looks specifically at the OHSW of truck drivers globally. The chapter begins with the literature review methods, outlining the process for the review and the characteristics of the included studies. Following this, each component of health, safety, and well-being is reviewed and discussed in turn. The main purpose of this chapter is to establish what has already been covered about the OHSW of truck drivers, and to better understand how previous studies have sought to identify and solve the issues at hand. This section concludes with a review of the select few studies that have taken one or more contextual factors into consideration when looking at the OHSW of truck drivers and thus introduces the main gaps identified.

Chapter Four: *Research Design*

In this chapter, the underlying interpretive critical theoretical paradigm is explained and justified. The research strategy is discussed for the data collection which is informed by the EST as a road-map for participant selection. The nature of the trucking industry is

highly complex, the EST model allowed for the categorisation and presentation of the complex data in a systematic way. It also facilitated the collection of multiple perspectives on a problem from those considered experts, which is in line with the ontological and epistemological views of the researcher. The use of interviews, in line with a qualitative approach, allowed the researcher to explore the multiple perspectives from key informants and the drivers. This chapter outlines how those interviewees were selected, how the data was collected and analysed to ensure the research questions and objectives of this study were met. The research design outlined in this chapter facilitated the findings presented in the following chapter which are categorised into the three phases of data collection.

Chapter Five: *Findings (Phase One, Two and Three)*

This chapter describes and presents the findings from the three phases of data collection. Data collection was sequential with each phase informing the next. Phase One provided insight into the working environment of operators, truck drivers, and their colleagues. This helped familiarise the researcher with the industry and informed the interview questions for the Key Informants (Phase Two). During Phase Two, issues arose that the researcher sought clarification on in the final phase (Phase Three), the interviews with the drivers. This chapter presents the various perspectives of those in the trucking industry in New Zealand. At the end of each phase, the views of the participants are depicted in an EST model format along with mind maps showing the interactions between contextual factors.

Chapter Six: *Discussion*

The views of the participants and the findings from the literature, hosted in the previous chapters, are the backbone of this Discussion Chapter. Five key findings are explored and discussed in detail. They include the organisation of work in the trucking industry, the role of the manager, the role of the employment relationship, industry norms, and challenges to future OHSW reform in the industry. Conclusions are offered at the end of each theme in addition to highlighted gaps and next steps required. Using the findings from this study, a developed version of Bronfenbrenner's EST is presented.

Chapter Seven: *Conclusions*

The concluding section provides an overview from each chapter to tell the full story of this thesis. The main contributions to theory and knowledge, including the gaps in the literature addressed by this study, methodological contributions, and key findings are

then discussed. The strengths and limitations of the study are then featured, and the main body of the thesis concludes with the implications for industry and practice. This chapter concludes with a final reflection on the research process.

CHAPTER ONE CONCLUSION

Details about the wider system New Zealand truck drivers operate within was largely unknown. Symptoms manifest as speeding, fatigue, poor vehicle maintenance and ultimately poor OHSW. This study took up an opportunity to collect research on the wider systemic factors with the intention of addressing the gap in knowledge.

A systems approach was selected to gain insight into the consequences of both higher-level issues such as the organisation of work and more micro issues such as employment relationships. Consideration was given to key authors in this area and ultimately Bronfenbrenner's Ecological Systems Theory was chosen as the specific systems approach adopted. The EST allowed consideration to be given to contextual factors throughout the whole system, best suiting the multi-disciplinary approach adopted for this study.

The upcoming chapter introduces the New Zealand trucking industry as the unit of focus in this research. The purpose of Chapter Two: An Introduction to the System, was to establish and provide context given the premise of this study was to understand the role of contextual factors and how they interact.

CHAPTER TWO: INTRODUCTION TO THE SYSTEM


2.1 Introduction

The inclusion and presentation of relevant contextual factors are central to the premise of this thesis; therefore, this chapter provides context to the topic under investigation: The New Zealand trucking industry.

This chapter begins with the wider, more macro issues about this study, and navigates down through the levels to the individual drivers (micro) in Chapter Three (OHSW of Truck Drivers) following the structure of Bronfenbrenner's EST model.

It is acknowledged that factors interact across many levels and that they are not decomposable or self-contained. However, to ensure the information is systemically and tidily presented, the researcher has placed them in an order beginning with the higher-level picture first as outlined below in Table 2.1. The information housed in this chapter was obtained from literature and other sources such as industry and government reports.

Table 2.1: Structure of the Chapter following the System Levels

Macro	HEADINGS	SUB-HEADINGS
	Socio-Political Background to the Work (in the New Zealand Trucking Industry)	Deregulation - <i>Legislative response in New Zealand</i> OHS Legislation Dependent contractors Non-standard work and the link to OHSW - <i>Payment type</i> - <i>Fewer resources</i> - <i>Training</i>
	Industry Characteristics	The Wider Transport System - <i>Systemic Factors</i> Risks in the industry - <i>Contemporary approaches to safety</i>
	The New Zealand Trucking Industry	The trucking Industry as an employer New Zealand Trucking Associations Government Agencies, Crown Entities, and Ministries
	The Job of a Truck Driver	On-the-road Activities Driver, Truck, and Delivery Configurations Driver Employment Status

SOCIO-POLITICAL BACKGROUND TO THE WORK

The following section outlines more broadly some of the relevant literature on socio-political influences which were explored to determine potential external forces impacting the industry. Connections have been made in the literature between the changing nature of work, precarious work, and poor OHSW outcomes. For this reason, deregulation and its impact on work have been included, followed by a discussion on non-standard forms of work.

2.2 Deregulation

There has been much written about the deregulation of the labour market with multiple perspectives of the debate argued. Deregulation has arguably had a drastic impact over the organisation of work both globally (Herman, Brandt, and Schulten, 2008; Dammen, 2005; Belman & Monaco, 2001), in New Zealand (Bollard & Pickford, 1998) and consequently the trucking industry. With the rise in deregulation proponents (Campbell & Brosnan, 1999), came a surge in flexible work practices and an increasing focus on individual bargaining as opposed to collective bargaining. In New Zealand this was accentuated by the introduction of the Employment Contracts Act 1991 in which collective bargaining and trade union membership were considerably limited (see Rasmussen & Deeks, 1997; Rasmussen, 2009).

There was a greater push for so-called ‘globalisation’, which resulted in an opening up of the markets to cheaper goods and services. As this occurred, competition increased globally in which New Zealand industries were not immune. Because of several factors, including diminishing export markets and a dramatic rise in the price of crude oil, the New Zealand economy began to stall in the mid-1980s (Rasmussen & Lind, 2003) and it was argued that the economy needed to be reformed. Those in favour of creating a more liberal labour market influenced both the Labour Government (1987-1990) and the National Government (1990-1999), radically reforming New Zealand’s employment relations (Buchanan & Callus, 1993). The proponents’ concern was over the employers’ inability to compete in the global market due to the restrictive nature of the current employment relations regulations. In other words, it was argued that organisations did not have the flexibility they needed to respond to the rapid changes brought about by global competition (Quinlan & Johnstone, 2009; Bollard & Pickford, 1998; Belman & Monaco, 2001).

In response, long-term stable employment was limited to a core of workers complimented by a periphery of temporary and casual workers which provided a buffer for the changes in the market (Deakin & Wilkinson, 1991). This came as a response to the Dahrendorf Report (OECD, 1986) which cited that a primary cause of poor job growth was over-rigid regulations around employment protection and collective bargaining. It was further noted in the report that labour market flexibility was key to economic efficiency (OECD, 1986) and that rising labour costs resulted in labour market imbalances. Job security was still noted as being important, but job security legislation was a part of the problem, alternative arrangements such as part-time work were deemed an appropriate response. The report came out in favour of new working time arrangements because it was felt that, again, the pre-existing rigid arrangements prevented organisations from working at full capacity and did not allow for seasonal adjustments.

2.2.1 Legislative Response in New Zealand

Partly in response to the increased philosophy of self-regulation, in 1992 the Occupational Health and Safety legislation in New Zealand was replaced with a new suite of laws (Health and Safety in Employment (HSE) Act, 1992). The legislative approach had changed over the years, oscillating between self-regulatory to highly prescriptive (Lamm, 2000). Under the 1992 legislative changes, a co-regulatory approach was adopted, a position somewhat in the middle (Lamm, 2000). Under a co-regulatory approach, those covered under the Act were required to take on more responsibility for managing and regulating their own workplace hazards, previously the role of the Inspectorates. OHS Inspectors went from a role akin to community policing and regulatory enforcement to a role that was more targeted to complaint-response and telephone advice. The Act was introduced as a part of the then-current Government's employment package and was intended to reflect the non-interventionist approach epitomised by the dominant political ideology of the early 1990's, namely deregulation and self-regulation (Lamm, 1994; Kelsey, 1997).

The HSE Act also replaced a system that had evolved with parallel legal, regulatory, and inspection provisions by sector to an umbrella legislation with special sector consideration to be applied at the regulatory level. This suite of regulations was never as complete as its predecessor. More importantly, unlike other countries that had introduced a Roben's Model to OHS law, the New Zealand equivalent failed to include

worker participation and representation, which are important ingredients of OHSW. The reason being that both practices were incompatible with the 1991-2000 National Government's employment reforms, which omitted trade unions from the tripartite employment relationship. A shift in power balance occurred during this time. More extreme practices from the right came into being but this period also saw a reduction in unhealthy, union-forced, institutionalised practices that also impacted OHSW.

2.3 The Organisation of Work

The organisation of work over the past four decades has witnessed profound and worldwide changes largely influenced by the effects of globalisation and increasing dominance of free-market discourse (Johnstone, 2016; Quinlan, 2013; Dastmalchian & Blyton, 2001, NIOSH, 2002; Allan, Brosnan, Horwitz & Walsh, 2001).

As mentioned above, with the removal of barriers to trade, market activity intensified (Belman & Monaco, 2001) and organisations became subject to increasing competitive pressure (Dastmalchian & Blyton, 2001). Managers, some suggested, under this new *raison d'être* went from "paternalistic guardians" (Greenhalgh & Rosenblatt, 2010, p.7) of the workers in which they employed, to champions for profit, pressured to remain competitive in a rapidly expanding market (Lordon, 2014). In response, flexible working arrangements were increasingly adopted.

By employing flexible working arrangements, organisations could overcome market volatility with the freedom to hire and fire at will and thereby avoid large-scale redundancies when demand dropped (Burgess, 1997; Dastmalchian & Blyton, 2001; Herman et al., 2008). Organisations could externalise labour costs and run on a demand basis (Allan et al., 2001). Consequently, many once in standard forms of work were substituted with casual, fixed-term or contracted workers (Rawling & Kaine, 2012; Underhill, Lippel, & Quinlan, 2011; Herman, et al., 2008; Johnstone, 2016) to drive the cost of production down (Quinlan, 2012) and respond to market changes. This allowed for "superior competitive outcomes which contribute to improved competitiveness and financial performance" (James, Johnstone, Quinlan & Walters, 2007, p.166).

Forms of non-standard work include but are not limited to agency work/ leased labour (Johnstone & Quinlan, 2006), contracting and subcontracting, fixed-term contracts, direct-hire temporary work, on-call, casual work (Underhill et al., 2011), outsourcing

and seasonal work (Johnstone et al., 2001; LaMontagne et al., 2012). Adverse outcomes for the workers differ among the various groups (LaMontagne et al., 2012).

2.3.1 Non-standard Work and Precarious Work

Non-standard work forms are typically marked by more irregular working hours and uncertain time-frames essentially making the jobs of a burgeoning group of workers precarious (Underhill et al., 2011; Walker, 2011; Jay et al., 2017). In 1997, Bourdieu (as cited in Bauman, 1998) spoke of the lack of stability causing uncertainty in work, labelling this the *précarité* of the 21st Century or the Precariat as reaffirmed by Standing (2011). Precarious work refers to work arrangements characterised by instability in employment whereby the worker faces a lack of protection and is rendered socially and economically vulnerable (LaMontagne et al., 2012; Quinlan & Bohle, 2004). Quinlan, (2013) points out that “precarious employment is not a new phenomenon... it is a problem that has re-emerged with the rise of neoliberalism” (p.17).

When business practices shifted to promote contingent work practices such as outsourcing and contracting, consequences of these arrangements took time to surface.

“Unfortunately, this rich vein of prior knowledge on the health effects of work organisation was all but forgotten by researchers examining the “new world of work” from the 1980s and ignored by those promoting flexibility in the labour market” (Quinlan, 2013, p.21)

The far-reaching consequences of precarious work are not new. What is new is the reduced visibility of risky practices (Johnstone, 2016) such as restructuring, downsizing, outsourcing, and fragmenting the labour force (James, et al., 2007; Quinlan & Bohle, 2004; Standing, 2011; Quinlan & Bohle, 2009; Elmuti, Grunewald & Abebe, 2010; Belcourt, 2006). Labour market studies have shown that non-standard work and use of precariously employed labour have again grown exponentially in recent decades (Mayhew & Quinlan, 1997; Belcourt, 2006).

Employment precarity is a result of a person losing or have a fear of losing their job (Standing, 2011). Vulnerability is heightened when they have little to no alternative opportunities for employment in the labour market (Standing, 2011). For these individuals, their lives are filled with uncertainty around income, safe work, representation, and alternatives (Kalleberg, 2009; Standing, 2011). Sargeant and Tucker (2009) argue that under these conditions, workers are considered vulnerable. The

definition of a vulnerable worker centres on a power imbalance within an employment relationship. Other definitions further emphasise the lack of rights the worker has and a lack of capacity or means to protect themselves (Barrett & Sargeant, 2011). Vulnerable workers are most commonly found in industries with highly fragmented work practices and long, intricate webs of supply chains hosting any number of subcontractors (James et al., 2007) such as the trucking industry (Rawling & Kaine, 2012). Many precarious workers are considered vulnerable.

According to Quinlan et al. (2010) and Lucarelli and Boschetto (2011), contractors are potentially more precarious than permanent employees especially those dependent on one customer, for example. In comparison to employees, contractors lack union representation, have limited organisational support, receive lower and more output-based pay, experience increased workloads and higher turn-over (Mayhew & Quinlan, 2006; Johnstone et al., 2005; Burgess & Campbell, 1998). They also tend to have low involvement in OHSW and are often without vital OHSW information, frequently work long arduous hours, and have limited access to social security support (Barrett & Sargeant, 2011; Underhill & Quinlan, 2011). Their work history is often complex and, due to incentive-based reward, the work is competitive and uncertain (Walters & James, 2011). One group is that is noteworthy and of relevance to this study due to the prevalence in the trucking industry (Fenton, 2011; Rawling & Kaine, 2012; Mayhew & Quinlan, 2006) is dependent contractors (Lamare et al., 2014).

Dependent Contractors

Changes to the organisation of work have seen increases in contracting out with the understanding that the individuals are self-employed (Sargeant & Barrett, 2011). Some of the contractors have the hallmarks of employee dependency and are of greatest concern in this situation - the 'dependent contractors'. They lack the genuine autonomy associated with self-employment. As pointed out by Lamare et al., (2014) there is a key legal distinction between a contract of services (i.e. hiring an employee) and contract for services (i.e. hiring a self-employed or independent contractor). A contract of services regulates the relationship found in typical employment, which is based on a Master-Servant relationship, which date pre-Industrial Revolution times. Both the employer and employee have defined roles, and both are obliged to specific commitments and responsibilities (Lamare et al., 2014; Budd, 2011). A contract for services stipulates the employment relationship for self-employed contractors, independent contractors, such

as taxi drivers and tradespeople as well as professionals (lawyers, accountants, doctors). The contract of the employee is governed by employment law, while the contract of the independent contractor (referred to below as simply the contractor) is governed by commercial law.

Contractors are, as the name suggests, bound by a contract between themselves and the enterprise, which may be referred to as the employer or principal but is, in fact, the company or enterprise who is buying the contractor's services. A basic premise of contract theory is that parties freely come to the market and bargain with each other as buyers and sellers. Their ability to determine the price is supposed to depend only on factors such as supply and demand. When the lowest-price seller willing to sell meets the highest-price buyer willing to pay, the market works. For this market to work efficiently, buyers and sellers must be free of non-market distortions. The invisible hand of the market is believed to work its economic magic and ensure fair prices when both buyers and sellers meet in the market as economic equals. An independent contractor remains in the eyes of the law a contractor with sufficient economic power to bargain individually with those who seek to buy their services (Lamare et al., 2014).

Regulation is usually enacted to promote competition – to ensure that the buyers and sellers compete against each other and do not collude on price. The problem is that many truck drivers are, de facto employees but de jure independent contractors. They find themselves in a Master-Servant relationship but without the protection and benefits offered by employment laws such as the opportunity for alternative dispute resolution services or the New Zealand Mediation Service or the Employment Relations Authority. As contractors, not employees, their choice in the event of a contractual dispute lies with the much more expensive civil courts. The irony is that the law views the truck driver as the trucking companies' economic equal. The decision to work as either an employee or a contractor is made by management or the employer and is based on considerations as to what arrangements might be most beneficial for the enterprise (Lamare et al., 2014). What is 'best' for the driver is not always considered. They lack the ability that employees have to unionise and the power of contractors to bargain effectively (White, 2014).

A lack of collective protection and the intensely competitive nature of the industry means bargaining down to the bare minimum of legal requirements and sometimes even

illegal practices to secure the contract occurs. This is an ongoing threat to OHSW compliance (Quinlan et al., 2009).

Non-Standard Work and the Link to Occupational Health Safety and Well-Being

“Just as precarious modes of work are not new, nor should the mounting evidence of their adverse effects on worker health, safety, and well-being come as a surprise” (Quinlan, 2013, p. 19). Johnstone et al., (2001) discussed in their study an international review on the OHS effects of outsourcing, all the studies where an effect could be determined confirmed that outsourcing adversely affected OHS. Quinlan and Bohle (2009) reviewed international studies of the OHS effects of job insecurity undertaken in the previous 20 years and found that 85 percent confirmed poorer OHS outcomes. This is an outcome confirmed earlier by Sverke, Hellgren, and Näswall, (2002) and other authors at a similar time (Virtanen et al., 2003; Quinlan, Mayhew, & Bohle, 2001; Johnstone, Quinlan & Walters, 2005; Rawling & Kaine, 2012).

Health and Safety

Underhill et al., (2011) note that precarious work has adverse effects on health and safety outcomes with higher incidences of injury, “exposure to hazardous substances, occupational violence, psychological distress, work-life imbalance, and non-compliance with workplace safety regulations” (p.1). Explanations for such outcomes are related to unclear regulation, complex webs of responsibility, poor communication and training, payment and reward structures, and low visibility among others. These outcomes are leading to work intensification, long shifts, irregular work, and invisible work (Johnstone, 2016). OHS regulation typically requires employers to identify, assess, eliminate, or at least minimise the exposure to risk but for this to occur it is necessary that they know the potential risks and methods of work. Visibility of such individuals is often difficult, and out of fear of being labelled troublemakers, workers are discouraged from speaking out about unfavourable conditions (Quinlan & Bohle, 2004).

Well-being

The high levels of uncertainty that affect those associated with these forms of work are inevitably causing poor well-being outcomes, not only poor OHS. LaMontange et al., (2012) confirmed that employment arrangements are “an important upstream determinant of psychosocial working conditions” (p.102). Uncertainty is known to lead

to high levels of anxiety and stress (Coffey, Dugdill, & Tattersal, 2009; Kohler & Munz, 2006; Vakola & Nikolaou, 2005) for those not awarded the genuine autonomy of self-employment. Further studies point to the mental-health damage from insecure work and spells of unemployment (Malenfant, La Rue, & Vezina, 2007). These impacts extend to the households of the workers due to an inability to financially plan, the quality of housing and education afforded, and the effects on children in the household (Aronsson, Daller, Lindh, & Göransson, 2005; Hensher & Battellino, 1990).

Payment Type

Typically, work arrangements such as self-employment and contracting operate on an output-based payment scheme, and this encourages quicker completion times, intensification of effort with consequences of a loss of the tenure (Mayhew & Quinlan, 1997). This further encourages long working hours (LaMontagne et al., 2012), working while impaired (Mayhew & Quinlan, 2006), or the misuse of safety equipment (Reiman et al., 2015). The promotion of non-standard work forms in support of flexibility has “undermined the effective implementation of mandated minimum labour standards” (Quinlan, 2013, p.26), in particular, those related to working hours and wages. As self-employed workers, they are typically paid on piece-rate and are not covered by collective agreements (Herman et al., 2008).

Quinlan and Wright (2008) have shown a clear link between low pay and reduced safety in the transport industry, as have other authors (Rawling & Kaine, 2012; Belzer et al., 2002). As mentioned above, low pay and reward structures encourage corner-cutting on health and safety due to underbidding on contracts, reduced staff levels, and poorly maintained equipment as examples (Johnstone, 2016; Johnstone & Quinlan, 2006).

Fewer Resources

The outsourcing of work is not always associated with poorer OHSW (Jay et al., 2017). For example, when work is outsourced to a specialist organisation where the work is carried out in a specialised environment and work risks are better understood and controlled (James et al., 2007). However, if the work is outsourced to a smaller organisation, characteristically they may possess less sophisticated systems and may be off-site where the managers are unable to monitor the safety. The fragmented chain of responsibility may also prevent those engaged in the hiring of labour to invest in

preventative measures (Johnstone, 2016). Additionally, smaller businesses are less frequently inspected due to their low profile, and the workers' presence is inconsistent (Quinlan, Johnstone, & McNamara, 2009). There is evidence to suggest that different relationships within the supply chain lead to situations where the larger and financially stronger parties "secure financially beneficial contractual terms that can detrimentally affect the management of health and safety in those organisations with whom they contract" (James et al., 2007, p. 169).

Lower contract prices demanded by more dominant clients mean there is not always surplus to invest in health and safety (Johnstone, 2016; Rawling & Kaine, 2012). For many self-employed, particularly in the transport industry, drivers are solely dependent on one company for their work (Quinlan & Bohle, 2004). Knowledge on the nature and extent of the problem in the trucking industry in New Zealand is lacking.

Training

Workers who had previously been employed and are now in a new form of work require greater supervision, adequate training, and increased managerial support (Johnstone, 2016). However, it has been suggested that non-standard forms of work such as sub-contracting can be associated with lower levels of training and supervision and can dangerously disallow opportunities for participation and involvement (James et al., 2007; Johnstone et al., 2005). Workers in this group tend to be younger and less experienced, further risking their health and safety (Underhill & Quinlan, 2011). Quinlan and Bohle (2004) suggest some employers are reluctant to train temporary, transient, low-cost workers and therefore they are often excluded from on-going training altogether. The transient nature of their work further implies that any attempts to learn from experience may be difficult.

INDUSTRY CHARACTERISTICS

In this section, the trucking industry is introduced and discussed both from a global and a local perspective utilising the information found in the literature and information provided by trucking industry associations and government agencies. The section begins with information relating to the wider trucking industry, utilising the available literature on the topic from both local and global sources. Included is an overview of the current literature pertaining specifically to the risks associated in the industry.

The following section contains information pertaining specifically to the New Zealand trucking industry including key statistics that reinforce the importance of the industry to the country. Information about the industry as an employer then follow and outlines the number of workers employed and how they are distributed throughout the industry.

The trucking associations are then described, followed on by a brief outline of the relevant government agencies, crown entities, and ministries. This section provided insight into the key players in the system, which then aided in the selection of participants for this study.

2.4 The Wider Transport System

The trucking industry “has a well-earned reputation for being highly competitive” (Mayhew & Quinlan, 2006, p.212) and over the past decades a combination of new work-systems, government policies, and supply chain pressures have intensified competition (Belzer 2000; Mayhew & Quinlan, 2006; Rawling & Kaine, 2012). The current work system places the individual driver at risk of severe injury, poor health and well-being (Thorntwaite & O’Neill, 2017). If a sustainable work system is defined as one that can achieve the economic and operational goals required but not at the cost of the human beings involved (Docherty, Kira, & Shani, 2009) then currently the trucking system is unsustainable.

It has been argued that occupational health, safety, and well-being issues result from a set of interrelated issues (Quinlan et al., 2010; Mooren, Grzebieta, Williamson, Friswell & Olivier 2014). For example, a truck accident may have resulted from the road and traffic environment, safety culture of the transport organisation, driver’s payment structure, driver’s skills and health, or the level of training driver has had (Mooren et al., 2014). Mooren et al., adds “a systematic approach can be taken to manage these factors

to reduce the risk of OHS incidents” (p.80). However, there is little empirical guidance about which factors should be considered for inclusion, something that has been identified in the wider occupational health and safety literature (Grayson & Helman, 2011).

The trucking industry, both locally and globally, is thought to be one of excessive scheduling, high demands and delivery pressures, and distance-based or incentive-based payment structures (Apostolopoulos, Sönmez, Shattell, Gonzales, & Fehrenbache, 2013; Lemke, Apostolopoulos, Hege, Wideman, & Sönmez, 2017; Chen, et al., 2015; Rawling & Kaine, 2012). Apostolopoulos et al. (2013) suggest that the intensity of the industry does not allow many opportunities for preventative care for the workers and that the nature of the work environment exacerbates adverse outcomes. Friswell and Williamson (2010) explain how the environment drivers operate within is highly dangerous. They summarise the industry in the below quote.

“...insufficient rest breaks, excessive work hours, insufficient staff to move goods safely, unreasonably tight deadlines, conflict with a supervisor, unsuitable loading docks, lack of un/loading equipment, and repetitive movements”
(p.2071).

Lemke et al., (2017) suggest that the work organisation characteristics induce a poor quality of life and shorter life expectancy which then impacts the industry, as well as other road users and the wider community. Chen et al., (2015) conclude that the environmental factors, unsafe driving behaviours, and the high rate of crashes and injuries among truck drivers are interconnected.

2.5 Risks in the Industry

The road transport sector rates amongst the worst industries for occupational health, safety, and well-being internationally (Quinlan & Wright, 2008; Rawling & Kaine, 2012). Although recent improvements have been seen in patterns of injuries and fatalities, the industry continues to demonstrate a disproportionately high number compared to other industries (Thornthwaite & O’Neill, 2017). Injuries in the trucking industry alone each year cost the Accident Compensation Corporation (ACC) in New Zealand around NZD 20 million to support approximately 4,500 claims (ACC, 2014). Despite the decrease in the number of fatal crashes involving a truck from the 1990’s,

there has subsequently been little change since 2008 (Trucks: Ministry of Transport, 2016).

Due to the physical size and weight of a truck, the chances of a fatality occurring in a road accident involving a heavy vehicle are high (Häkkinen & Summala, 2001). Brodie, Lyndal, and Elias (2009) conducted a study of coroner's death reports for heavy vehicle drivers killed in road transport crashes. They found that crashes occurred mostly on weekdays and were most frequent between 10 am and noon, and again from midnight to 2 am. However, it is also known that many crashes, particularly in rural areas and those involving single vehicles go unreported (Meuleners, Less, Cercarelli, Legge, 2006).

In 1996, New Zealand Parliament's Transport Committee conducted an inquiry into the causes of fatal truck crashes in New Zealand. In 2005, the Committee was tasked with assessing how quickly and effectively the recommendations from the inquiry were implemented. Back in 1996, they found that there was a widespread level of offending by truck drivers and trucking companies, estimating that 30 percent were being operated unsafely. They found trucks to have inadequate brakes, faulty steering, worn tyres and the drivers were seriously fatigued. It appears little has changed.

In addition to high-risk road traffic accidents (RTA), truck driving is linked to many health problems (Mackie, 2008; Edwards, Davey, & Armstrong, 2014; Sendall, Crane, McCosker, Fleming, & Rowland, 2016) including obesity (Olson, et al., 2016; Anderson, et al., 2012), cardiovascular disease (Mabry, et al., 2016), and type two diabetes (Gilson, et al., 2016). Research has also shown high levels of stress among truck drivers, poor nutrition (Mackie, 2008; Sendall et al., 2016) dehydration, muscular skeletal injuries (Robb & Mansfield, 2007), and exposure to noise and other pollutants (Pan & Boulet, 2014; Jain et al., 2006).

These health implications are fuelled by long working hours and irregular work patterns (Quinlan & Wright, 2008; Rawling & Kaine, 2012). Truck drivers are overweight compared to New Zealanders of similar age and gender (Mackie, 2008). The inability to exercise due to the long and irregular shifts are cited as reasons (Sendall et al., 2016; Korelitz et al., 1993; Mabry et al., 2016; Mackie & Moore, 2008). Truck drivers may not realise the harmful effects of their working lives until the long-term effects have manifest (Saltzman & Belzer, 2007). Surprisingly and dangerously, truck drivers typically appear to perceive their health to be better than it is (Angeles et al., 2014; Apostolopoulos et al., 2013). It has been suggested that for those that did realise the

health consequences, they felt they were an “inherent, unavoidable outcome of their occupation” (Greenfield et al., 2016, p.1). Fatigue is linked to and exacerbated by poor health, which can then cause an increased safety risk (Apostolopoulos et al., 2013; Jensen & Dahl, 2009).

Fatigue is a prominent issue in the trucking industry worldwide (Williamson & Friswell, 2013; Saltzman & Belzer, 2007), fuelled by the long shifts and irregular hours (Mackie & Kalasih, 2012; Stevenson et al., 2013). Research in this area has typically focused on long-haul drivers. However, fatigue also affects local and short-haul drivers (Friswell & Williamson, 2013; Saltzman & Belzer, 2007). Breaks are often few with brief periods of physical activity only if they engage in the loading and unloading (Mackie, 2008). A high percentage of drivers, surveyed in 2012 said that they were pressured to skip rest breaks to meet delivery times (TWU, 2014). Direct pressure from dispatchers often forced drivers to work long hours in unsafe conditions (Chatterjee, 1996). Further research has also highlighted that drivers are not always able to take rest breaks when their bodies most need it due to poor rest infrastructure or rigid schedules. A study into log truck drivers in New Zealand found that often rest breaks were taken while in the queue to be (un)loaded, proving difficult to obtain adequate rest given they could be called to move at any time (Mackie & Moore, 2008)

Incentive-based payment and unpaid waiting time in queues were predictors of driver fatigue (Williamson & Friswell, 2013). Williamson and Friswell (2013) further highlighted the associated dangers finding that fatigue was a major contributor to poor OHSW outcomes for truck drivers. They found that one in five drivers suggested that fatigue might have been responsible for dangerous events in their last trip. “Tight schedules, fatigue, increasing demands on drivers, and low pay are positively correlated to crash occurrence” (Rodriguez, Rocha, Khattak, & Belzer, 2003, p.98). For this reason, it is essential that “underlying or associated factors be considered and a broad systems approach applied to the study of heavy vehicle crashes” (Brodie et al., 2009, p.563).

2.6 Contemporary Approaches to Safety

Under highly competitive conditions, the drivers are often the ones that are required to be mercurial to sustain the running of the system (Reiman et al., 2015). Humans, as the adaptable element, are considered in different approaches to OHSW in other industries

such as aviation. As detailed by Erik Hollnagel and colleagues (Hollnagel, Wears & Braithwaite, 2015), the Safety-I approach suggests that things go wrong because of identifiable failures of which the human element is one. It is a responsive approach; similar to the current state of the trucking industry in which workers perform safely because they adjust to the conditions. ‘Work-as-imagined’ is an idealised view of how work should be done and disregards the requirements to adjust to situations, or contextual factors, that changes to the world of work present. Further, it describes how work should be carried out under ‘normal’ situations. Today’s environments require that we address safety differently, that we look at ‘work-as-done’ and consider the real impact of the system and its changes. Hollnagel and colleagues are not alone, Dekker discussed the concept of ‘Safety-Differently’ calling for an end to ‘zero-harm’ instead suggesting accidents are a part of working life and that humans should not be seen as a problem rather a solution to harness (Dekker, 2013)

Given the complexity of the trucking industry, it is a surprise not only that things do not go wrong more often, but that things do go right at all. Attending to the occasion that individual error causes an accident, for example, does not explain why things go right. By contrast, Safety-II looks for what is going right, with the intention of balancing thoroughness and efficiency (Hollnagel et al., 2015) and producing solutions to safety based on ‘work-as-done’. The basis for safety should be shifted, as suggested by Hollnagel et al. (2015), from ‘eliminating what goes wrong’ to ‘ensuring things go right’ and that analysis of wider, contributing factors are relevant to avoid an individualised focus.

Approaches such as the above have been acknowledged and adopted by those sitting within higher levels of the system in New Zealand such as the Ministry of Transport, the New Zealand Transport Agency (NZTA), the Accident Compensation Corporation (ACC) and the Police among others. For example, in combination, the above agencies set up the “Safer Journey” campaign (www.saferjourneys.govt.nz). To achieve road safety, this campaign considers “the entire road system” and recognises that people make mistakes, but it is important to reduce the severity, so crashes do not result in death or serious injury. There has been a recognition that the consideration of contextual factors across the system is beneficial if risk measures are to be addressed. However, we hear very little of this language used at the industry or organisational level in the trucking industry in New Zealand.

THE NEW ZEALAND TRUCKING INDUSTRY

Trucks transport between 80 to 90 percent of New Zealand's total domestic freight (Mackie, Baaz, & Manz, 2006; National Freight Demand Study, 2014). New Zealand research shows that a 1 percent growth in national output requires around a 1.4 percent increase in transport services. As New Zealand's economy expands, the Road Transport Forum (RTF) suggests that trucks will be needed to keep the country growing. It is expected that trucks will still carry over 90 percent of all domestic freight in 2042 (Road Transport Forum, 2017).

The road transport industry turns over around 6 billion NZD annually and contributes 1.4 percent of economic activity nationally; it is an even higher percentage in smaller towns (Road Transport Forum, 2017). Road transport is particularly important to regional New Zealand and the export industries that drive these local economies. Trucks carry an estimated 95 percent of export fruit, 86 percent of export wool, 85 percent of export dairy products, 65 percent of export logs and 35 percent of export meats. Collectively these exports are worth nearly 21 billion NZD a year in overseas earnings.

It has been suggested that New Zealand domestic freight will grow by around 75 percent between 2006 and 2030 in New Zealand (National Freight Demand Study, 2014); road freight is the most common mode of choice when transporting goods in New Zealand (National Freight Demand Study, 2014). Other modes including rail and shipping are viewed as being inflexible and restrictive, unable to provide the door-to-door service that road transport allows. Businesses are often compelled to use road freight because of customer demands for timely and secure delivery (Road Transport Forum, 2017). Demands for lower prices extend further. A 2002 study by Infometrics found that a 10 percent reduction in road transport freight rates would create over thirty-thousand new jobs, increase GDP by 3.7 percent, and would boost exports by 3.9 percent or more than an estimated 1.5 billion dollars. By Comparison, a 10 percent increase in road freight rates would cut twenty-thousand full-time jobs, reduce GDP by 1.6 percent, and cut exports by 1.7 percent.

A 2008 study found that New Zealand road freight costs are 30 percent higher on average than in Australia. One of the major causes was that Australian trucks could carry a lot more, with a 62.5-tonne maximum weight compared to 44 tonnes here, and longer at 25 metres while the New Zealand maximum length was 20 metres (Road

Transport Forum, 2017). In 2009, the Government was persuaded by the Road Transport Forum (RTF) to trial 50-tonne trucks. According to the RTF, these larger trucks could increase productivity by 10 to 20 percent. In 2010, the Government was convinced by the results of the trials to allow the heavier and longer vehicles (known as High Productivity Motor Vehicles, HPMVs) to be introduced. However, they were to operate under permit over restricted routes.

2.7 The Trucking Industry as an Employer

According to the Ministry of Transport, there were 3,671,867 licensed vehicles in New Zealand at the end of 2014. Of these 132,316 were “heavy vehicles” or trucks weighing over 3.5 tonnes. Around 23,000 are operated by the road freight industry (Road Transport Forum, 2017). Most of the heavier trucks are owned and operated by individuals and organisations not primarily involved in road freight: tradespeople, developers and contractors, local councils, manufacturers and other businesses (Road Transport Forum, 2017).

Approximately 25,470 people, or about 1.5 percent of the New Zealand workforce, are directly working in road freight according to Statistics New Zealand. It is an even higher percentage in smaller towns. The local carrying company is often at the heart of local communities and is frequently a major employer and creator of new job opportunities. It can also be a leading customer for other locally based businesses and service suppliers (Road Transport Forum, 2017). It is estimated that a further 15,000 people are indirectly working in the industry, providing services ranging from vehicle equipment and maintenance to legal and accounting advice. With over 4,000 individual firms, road freight is typical of most other industries in New Zealand, being largely made up of locally-based and family-owned and run businesses (RTFNZ, 2011). Most companies operate fewer than five trucks and have fewer than five people working for them.

New Zealand is experiencing a driver shortage both in the long and short-term. In a study conducted by RTF in 2014, it was found that over 500 hundred drivers were needed in the short-term, and approximately 1100 were needed in the long-term (no time frame given). Many of the respondents to their survey, circulated to their members, indicated their urgent need for skilled migrant drivers. Recent changes to the immigration policy and the Government’s decision to take truck drivers off the

Essential Skills in Demand List were cited as reasons for a fewer number of available skilled migrants. Over 45 percent of those interviewed said they had trucks parked up due to driver shortages. Some transport operators have been reported saying that they cannot even get unskilled drivers (McKenzie-McLean, 2013). The amount of freight on the roads has approximately doubled since 2000; however, the number of drivers with class five licences has only increased by 10 percent.

Challenging working conditions, road safety and driver health have been the focus of much research in this area. The importance of this work to the transport sector is demonstrated by the challenging task of attracting and retaining drivers in the industry. Younger people are increasingly avoiding the industry as a career option, and the workforce is aging, with the average age of drivers suspected to be around 53.

The industry is also attempting to encourage more women in to fill the jobs; currently, only three percent of drivers in New Zealand are women according to the NZ Trucking Association (NZ Trucking Association: Is Your Workplace Ready for Women Truck Drivers? 2016). One of the barriers to getting women into the industry is that the stereotype of the male-only industry is well ingrained.

Currently, truck drivers in New Zealand can earn on average 16 – 25 NZD an hour (Occupational Outlook, MBIE, 2017), however, pay can vary depending on the type of vehicle, the hours worked, the payment structure, and their employment status. This is little above the minimum wage (\$15.75 at 2018) in New Zealand and the living wage (\$20.20 at 2018) in Auckland indicating a potential further reason for the driver shortage. In the US, drivers' wages have fallen 30 percent since 1980 (adjusted for inflation) (Chen et al., 2015). Further pointed out in the NIOSH report (Chen et al., 2015), drivers are paid often by the kilometre and are not always compensated for waiting or loading time, which is estimated to take up to 25 percent of their total work time.

It has been suggested that very few companies make a profit in the industry, so many drivers work long hours. In 2013, a trucking company in New Zealand was heavily fined after admitting their drivers broke the driving hour laws (Eder, 2017). The judge heard how several logbooks had been falsified. It is also known that at least ten other freight companies had broken the law in the past two years (Personal Communication). It has been well documented in the literature that inadequate remuneration leads to unsafe practices (e.g. Quinlan & Wright, 2008; Belzer, Rodriguez, Sedo, 2002; Mooren,

Williamson, Grzebieta, 2015; Rawling & Kaine, 2012). In a supplementary report on the death of three truck drivers in Sydney, Deputy State Coroner Dorelle Pinch stated:

“As long as driver payments are based on a (low) rate per kilometre there will always be an incentive for drivers to maximise the hours they drive, not because they are greedy but simply to earn a decent wage. I anticipate that this incentive will remain an overriding concern for drivers irrespective of legal and safety considerations” (Pinch, 2003).

2.8 New Zealand Trucking Industry Associations

Trucking associations in New Zealand play a key role in the industry by representing their members' interests with local and regional government, and organisations. It is their role to advise on compliance with local bylaws and central government legislation and provide practical and authoritative advice on how to establish and run a transport business. Members receive benefits such as buying opportunities and competitive, member-only prices.

There is one overarching Forum (Road Transport Forum) who are lobbyists for the industry. The Road Transport Forum is made up of trucking association constituents, which according to their website, operate to serve the interests of road freight operators nationally and to build wider public awareness and understanding of the contribution road freight transport makes to the lives of all New Zealanders (Road Transport Forum, 2017). Within the Forum there are several associations: Road Transport Association (RTANZ), National Road Carriers (NRC), and New Zealand Trucking Association (NZ Trucking Association – not to be confused with the NZTA – New Zealand Transport Agency). The NZ Trucking Association was previously the Combined Owner Driver Association. Many of the associations are set up for transport operators, for example, the NZ Trucking Association was founded in 1988 to represent owner-drivers however now the Association has grown to represent anyone who owns or operates a commercial vehicle or vehicles. Recently Women in Road Transport (WiRT) has been added; WiRT sits as a working stream within the forum.

2.9 Government Agencies, Crown Entities, and Ministries Related to the Trucking Industry in New Zealand

New Zealand has a Minister for transport, who is responsible for the Ministry of Transport – a public service department charged with advising the government on transport policy. Additionally, there is a New Zealand Transport Agency that is focused on providing an integrated land transport system. The Chief Executive of the NZ Transport Agency (NZTA) reports to the NZ Transport Agency Board. The board is appointed by the Minister of Transport and is responsible for making independent decisions on allocating and investing funds from the National Land Transport Fund (NZTA, 2018). Different regions around the country rely on regional councils to roll out transport safety initiatives in collaboration with other partners such as the Commercial Vehicle Investigation Unit (CVIU), the Accident Compensation Corporation (ACC) and WorkSafe.

WorkSafe was set up in 2013, as New Zealand's primary workplace health and safety regulator. New Zealand is implementing the most significant reforms to workplace health and safety in more than 20 years (worksafe.govt.nz, 2018). These 'Working Safer' reforms are the Government's response to the recommendations of the Independent Taskforce on Workplace Health and Safety that came as a result of the Pike River mine tragedy in 2010.

The Accident Compensation Corporation (ACC) is a New Zealand Crown entity responsible for administering the country's universal no-fault accidental injury scheme (ACC, 2018). This unique system supports anyone in New Zealand that has had an accident; the cover they provide helps pay for the costs of recovery including payment towards treatment, help at home and work, and help with income. ACC also work on preventing injuries and operate an auditing system that provides safety ratings to businesses.

The Commercial Vehicle Investigation Unit (CVIU - renamed the Commercial Vehicle Safety Team in 2018), as a section of the Police, monitor all areas of the commercial vehicle industry, including trucks, buses, taxis, couriers, mobile cranes, and mobile homes. The CVIU carry out vehicle inspections at compliance stations and the roadside as a part of the Operator Rating System. They work with road transport operators to make sure drivers and vehicles meet health and safety requirements, including the

securing of loads, work-time rule adherence and the transportation of dangerous goods. Additionally, they attend commercial vehicle crashes and advise police staff on scene.

The inclusion of the above information, although brief and descriptive, helped to establish a sense of who the key players in the industry were. Thus, giving the researcher direction for the inclusion of participants in this New Zealand-specific study. What follows is an outline of the job of a truck driver.

THE JOB OF A TRUCK DRIVER

This section begins by outlining the specific tasks of a truck driver and then it looks at how it differs between categories of truck drivers to help understand the likelihood of potential hazards occurring. To address the OHSW of a driver or any other worker requires the identification of the hazards inherent in the role. The interaction between the individual and the environment is of relevance when attempting to reduce on-the-job risks (Friswell & Williamson, 2010). The role of a truck driver involves not just driving a vehicle, but various other tasks. The large variety, however, creates challenges when attempting to identify and address factors associated with the OHSW of all drivers (van der Beek, 2012; Shibuya, Cleal & Klines, 2010).

2.10 On-the-Road Activities

While operating the vehicle, truck drivers are required to anticipate on-the-road activity, observe traffic, use and control onboard technology, and arrive at the destination on time. In addition to transporting goods, truck drivers' duties include completion of adjacent administration documentation, participation in loading and unloading of goods, day-to-day maintenance and handling of the truck (Wioland, 2013; Shibuya, et al., 2010; van der Beek, 2012), and regular contact with dispatchers.

Factors such as the availability of relevant staff or equipment and the type of goods can determine how involved a driver may be in the loading and unloading of the goods (van der Beek, 2012). Additionally, they may be required to inspect their vehicle to ensure it is in good working order and is compliant. Somewhat surprisingly, much of the work can comprise of tasks outside of the truck. For example, drivers may be required to ascend to, descend from and operate at heights when working in or around the truck's cabin, body and platforms (Shibuya et al., 2010). They may also be responsible for the opening and closing of the truck's compartments, checking the stability of the load, and fastening the goods. Often the cleaning of the truck is also the responsibility of the truck driver and completed at the end of the shift.

Further, interaction with customers, other road users, and colleagues may be required, and although this can sometimes be a positive experience, it can add further demands to their shift (van der Beek, 2012). Drivers can spend a great deal of time waiting either in

traffic, in queues, for delivery windows, or during loading and unloading (van der Beek, 2012; Friswell & Williamson, 2013).

2.11 Driver, Truck and Delivery Configurations

There are various categories of drivers, and among them, there are similar and unique risks (Williamson, Bohle, Quinlan, & Kennedy, 2009). Drivers can be categorised based on the distance travelled or the time spent away from home, day or night work, or the type of goods transported (for example petrol tankers, stock transportation or refrigerated goods) (Wioland, 2013). Local drivers, for example, operate no more than 50 miles from the home base. Additional tasks of a local driver include manual handling of materials, loading, unloading, and movements in various work sites and environments. International literature suggests that for these drivers, this comprises around two-thirds of the work shift (Hanowski, Wierwille, & Dingus, 2003; Hanowski, Wierwille, Gellatly, & Dingus, 1999; Reiman et al., 2015). Short-haul drivers typically make many stops in a shift to collect and deliver goods directly from or to the end users. Much of their work is urban (Friswell & Williamson, 2010). Their work profile is different to that of long-haul drivers. Comparatively, long-haul drivers cover greater distances (Dahl et al., 2009) without as many deliveries along the way. They can be required to spend time waiting for loading or unloading and often have a time frame for delivery set by the customers (Friswell & Williamson, 2013). Typically, long-haul drivers operate an articulated truck, a B-train, rigid truck or road train. See Appendix 1 for diagrams of heavy vehicle configurations.

A heavy vehicle has been defined as a heavy-rigid truck or heavy articulated truck with a tare weight of more than 12 metric tonnes (Stevenson et al., 2013). It is not surprising that truck type has been found to affect the injury severity of crashes in the US (Zhu & Srinivasan, 2011). The severity of the crash and the resulting injury increased with trucks which were hauling a trailer with heavy cargo (>20,000kg). Single-unit straight trucks were found to be associated with the least severe injuries. In New Zealand, there are much bigger vehicles allowed on private roads in forests and mines (e.g. Stem Trucks), for example, which are not allowed on public roads as they would cause damage to the infrastructure and would not safely fit within the designed curvatures and standard turn radius templates.

Typically, a driver will work under the command of logistics operators, dispatchers, and fleet managers whose job it is to schedule their delivery route. Deliveries can be made based on a hub-and-spoke system, which is a “network of centrally located trucking terminals or hubs where loading and unloading can occur in preparation for distribution to outlying locations” (Apostolopoulos et al., 2010, p. 286). The alternative is when drivers carry goods long-haul moving shipments from origin to destination. Within this latter supply chain, shippers and consignees dominate the market by setting the rates and the schedules for delivery (Belzer, 2000; Apostolopoulos et al., 2010).



2.12 Driver Employment Status

Owner-drivers and owner-operators can be distinguished from employee drivers because they own and maintain the truck, they typically pay for the fuel and other maintenance costs, and have a contract with carriers (Cantor, Celebi, Corsi, & Grimm, 2013). “Relationships range from single haul transactions (trip leases) to long-term contracts, with the usual arrangement resembling repeated short-term contracts” according to Nickerson and Silverman, (2003, p. 94) in the US.

As highlighted above, there is a growing body of literature on the nature of work for contractors, particularly dependent contractors. This presents a unique set of risks related to a specific group of drivers. The dependency of the contractors adds confusion over the status of the drivers, and this is reflected in models that apply to their working conditions. The complication is that the drivers who are dependent contractors straddle employment and self-employment and require a different approach to risk management. Within the New Zealand context, self-employment is encouraged, it is part of a cultural mentality and is seen as something to strive for. Herein lies the conflict. It is unsurprising then that an estimated 70 percent of the long-haul workforce in New Zealand are owner-drivers or on a short-term contract (Fenton, 2011), though statistics have been difficult to gather.

In the same way, we know that there are dangers present in the trucking industry – anecdotal, general media, grey literature, and scholarly literature, for example – we know there are risks and benefits associated with employment status for drivers. Without going into detail (see the findings chapter for more depth on employment status), the table below has been presented to briefly capture the differences in status and how it links to OHSW risks.

Table 2.2: Driver Status in relation to OHSW Risk

	Employed	Dependent Contractor	Independent Contractor
Decreases OHSW Risk (Protective) 	<ul style="list-style-type: none"> • Regular pay • Training • OHSW advice and support • Sick pay and other similar benefits • Low/no capital exposure 	<ul style="list-style-type: none"> • Some access to OHSW advice from principal company • Somewhat predictable cash flow • Asset owner 	<ul style="list-style-type: none"> • Daily autonomy including job sharing • Multiple choices of clients • Various sources of funding for loans etc • Freedom to sell the business • Freedom to change business (to a different type of transport)
Increases OHSW Risk 	<ul style="list-style-type: none"> • No asset building (no business to sell) • No alternative role immediately if dismissed • Doesn't own the means to production • The low strategic sense of prospects • Low daily autonomy including no job sharing 	<ul style="list-style-type: none"> • Limited freedom/autonomy • Limited ability to sell their business (under company control) • Bigger Hours • Less access to specialist advice • No sick pay/cover • High capital borrowing exposure • Low control over business decisions • Bigger total hours (on and off the road) • Little opportunities for alternative employment • Owns the means of production on paper but different in reality • Dependence on one company leads to a high risk 	<ul style="list-style-type: none"> • Bigger total hours (on and off road) • Less predictable cash flow • Less access to daily OHSW specialist advice • No sick pay/cover • High capital borrowing exposure

The first and second columns, Employed and Dependent Contractors, have received research attention. There is a growing body of literature that looks at non-standard forms of work, which includes the risks of dependent contracting. In this table, the dependent contractor sits between the other two categories because typically there is a blurred line between whether they are contractors or employees and are exposed to risks from both. (See *Bryson v Three Foot Six Ltd* [2005], NZSC 34 – a decision made in the

Supreme Court of New Zealand regarding the real status of a worker as either an employee or an independent contractor). Very little research has focused on truly independent contractors in the New Zealand trucking industry, and what success looks like for them.

CHAPTER TWO CONCLUSION

The purpose of Chapter Two was to establish context and provide background to the wider issues. Given that the premise of this study was to understand the role of underlying contextual factors relevant to the OHSW of New Zealand truck drivers, the New Zealand setting had to be chartered.

An analysis of the socio-political environment highlighted how the push for a more deregulated market paralleled a rise in flexible employment/contracting work practices. Moreover, the increasingly competitive, globalised market corresponded with a surge in non-standard work practices across many industries including the trucking industry. Non-standard work is not a new phenomenon. However, the poor working conditions associated with such practices have intensified over previous decades. A substantial number of workers are precariously employed and subsequently vulnerable to OHSW risks such as inconsistent and output-based pay, fewer resources, and less access to training. While some contractors genuinely welcome the chance for self-employment, for the majority the status of being a dependent contractor provides the disadvantages of self-employment without the benefits.

These changes have been reflected in the trucking industry both globally and locally. There are consequences for truck drivers who, as will be outlined in upcoming chapters, are working under uncertain conditions, paid by piece-rate, and face the daily realities of intense industry competition all of which are suspected to be having serious implications on their OHSW.

The next chapter provides a critical view of the current literature relating to the occupational health, safety, and well-being of truck drivers globally and locally. Further, it elucidates the risks faced by drivers, their increasingly concerning health, and the impact on their well-being.

CHAPTER THREE: LITERATURE REVIEW ON THE OCCUPATIONAL HEALTH, SAFETY, AND WELL-BEING OF TRUCK DRIVERS

3.1 Introduction

This chapter looks specifically at the occupational health, safety, and well-being issues documented in the literature relating specifically to truck drivers internationally and in New Zealand. It begins with an outline of the literature review search methods employed in this study and an overview of the characteristics of the included studies.

The safety, health, and well-being of truck drivers are each discussed in turn. Within the discussion on safety risks, this section presents information about safety climate and culture within the industry and how other organisational factors such as pay, unionisation, and employment status impact the safety outcomes experienced by drivers.

Following on from the section on safety is a review of the literature that focuses specifically on the health of truck drivers. It looks at the known contributing factors, how the working conditions contribute to the ill health, and the solutions recommended to address the issues. Driver's mental health and stress are then explored.

This chapter concludes with a review of the studies that included one or more contextual factor when viewing occupational health, safety, or well-being in the trucking industry. The purpose of this final section of the chapter is to determine how many studies considered contextual factors, which factors they included and the implications it had for the OHSW of truck drivers.

LITERATURE REVIEW SEARCH METHODS

3.2 Methods

Given the wide range of potential contextual factors relevant to this study, information has been collected from various sources including government reports, industry websites, academic and industry seminars, and reports, in addition to the literature. Chapter one (introduction) and chapter two (introduction to the system) have been informed by the above sources given the study's industry focus and the scholarly framework. Chapter three (literature review on the OHSW of truck drivers) uses scholarly sources to determine the gaps in the extant literature and the methods for the collection and review of this scholarly literature are outlined below.

An initial literature search provided the researcher with an idea about the scope of the research available and helped to solidify key words. As a result of electronic database searches, the reference lists of key authors' publications, the AUT library search function, and the researcher's resources, a list of key search terms was formulated. These are shown in Table 3.1 below.

Table 3.1: Key Search Terms for Literature Review

Primary Search			
Trucking Industry	Health and Safety	Exclusions	Limited to
Truck Trucking Trucker Transport industry Heavy vehicle Motor vehicle Road transport Road Haulage Freight transport Road transportation Freight transportation Transportation management Logistic* Freight forward* Consigne* Freight movement by road Fleet	Occupational health and safety Workplace safety and health Workplace safety Workplace health Worker health and safety Worker safety and health Occupational Well- being Well-being OR wellbeing OR "well being" Occupational intervention Workplace intervention	taxis, buses, light vehicles, i.e. cars, tractors and farming vehicles, and fire engines or ambulances or cyclists	English Peer Reviewed Academic Journals Date Restricted

Worker Workers Workplace Worksite Employee Owner-driver Contractor Contract driver	Worker intervention Work-related intervention Organization* health and safety Organisation* health and safety Occupation* risk Organisation* risk Organization* risk Accident Accidents On the road Depot Non-road accident Non-vehicle Risk assessment Risk management		
Secondary Search			
Deregulation Sociology of Work Chang* nature of work Precarious work* Non-standard work* Vulnerable work* Self-employment SME Small business Family business	Occupational health and safety Truck* Truck* industry Transport industry Workplace safety and health Workplace safety Workplace health Worker health and safety Worker safety and health Organization* health and safety Organisation* health and safety Occupation* risk Organisation* risk Organization* risk Accident*	See above	See above
* = multiple character wildcard search			

The search terms, as listed above, were used in a variety of arrangements to search the electronic databases; some were used separately, (e.g. “transport industry”) and others together (e.g. “truck driver” AND “occupational health and safety”). Where the

keyword was present in the result, the researcher considered it for inclusion. If necessary, the results were refined by either searching for the keyword in the abstract or the title to narrow the results. Two main searches were conducted, one in March/April of 2013 and the other in May of 2017. Throughout this study, further articles were obtained to assist often as a result of collegial conversations or conference attendance.

Search engines examined included:

- Business Source Premier
- ABI/Inform (ProQuest)
- SCOPUS
- Web of Science
- Emerald
- AUT library Search Engine
- EBSCO
- Google Scholar

Alternative Sources of Information:

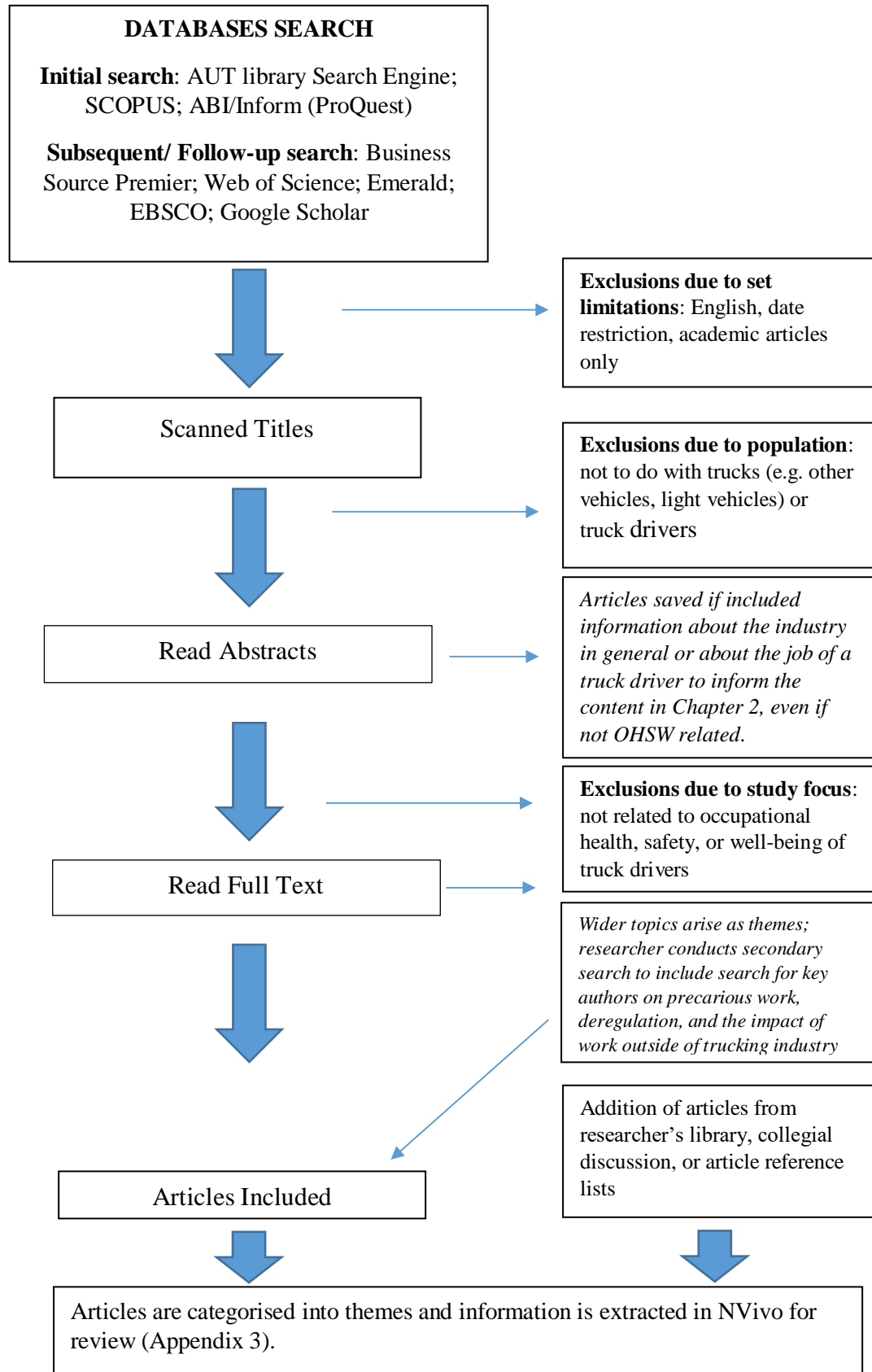
- Attendance at both trade and academic conferences.
- Personal communication with industry representatives, government agencies, academics, conference attendees, industry association members, truck drivers, employee advocates, lawyers, journalists, retired drivers.
- Industry/trade websites including TERNZ, RTF, Transport Association websites.
- New Zealand Government Websites including Accident Compensation Corporation (ACC), WorkSafe, NZ Police, New Zealand Transport Agency (NZTA).
- Media sites including NZ Herald, stuff.co.nz, provincial newspaper sites.

If many results presented from a search, the author narrowed the results by field such as social sciences as an example. Excluders such as date restrictions, peer reviewed, and academic journals were also applied. Consideration was given to trade journals for sections of the Introduction to the System (Chapter Two) above. Articles were briefly considered if published before the year 2000 however if after reading an abstract the author believed more recent data had been written about, the article was excluded.

Choosing the time frame limiter allowed the research to see the developments in OHSW

discussions in the trucking industry but also ensured that dated information such as that referring to older legislation would be excluded. All exclusions ensured that the selected papers addressed the research questions and identified existing key concepts in the discussion on the OHSW of truck drivers.

For an article to be included in the review, mention of certain topics was necessary, such as occupational health concerns, occupational health programs or interventions, or prevention of ill health at work, safety risks faced by truck drivers, injuries, fatalities, accidents in the trucking industry, or the mental health and well-being of truck drivers as examples. This provided the outline of what was currently being discussed around OHSW risks in the trucking industry. Those studies that linked such issues as the above to wider contextual factors were then considered separately so the researcher could better understand how many studies approached the problem of OHWS from a wider perspective. These articles have been tabled (See Appendix 2a & 2b) and are discussed later in the review. The entire process is shown in the flowchart (Table 3.2) below.

Table 3.2: Literature Search Process: Based on Table in Barclay (2015)

Endnote was used to categorise the chosen articles, and NVivo was used to organise the analysis of the content of the articles. As a result of thematic coding using NVivo, twelve categories arose, and a table was created, each article was placed in the table using the Endnote Library Reference number (see Appendix 3).

3.3 Characteristics of Included Studies

Articles focusing specifically on the trucking industry were published between 1990 and 2017, showing that the issues of OHSW are longstanding in the trucking industry and that no less attention was currently being given to this topic. This further highlighted that issues have not been resolved to date. The articles came from a broad number of countries showing that this is a global issue. However, the majority were from Australia and the United States of America (US). Five studies were from New Zealand, though only one specifically focused on truck drivers (see Mackie & Moore, 2008).

The literature confirmed that truck drivers warrant immediate attention given the high-risk nature of their jobs including poor health. Well-being was discussed under the guise of concepts such as stress and fatigue, high work pressure and poor work-life balance. More recently, researchers have begun to understand the connection between precarious work and poor OHSW outcomes (Quinlan & Wright, 2008; LaMontagne et al., 2012; Mayhew & Quinlan 1997; Quinlan & Bohle, 2009; Johnstone & Quinlan, 2006). However, only found one article that focused specifically on this issue in the trucking industry (Mayhew & Quinlan, 2006) was found in this review. Other authors hinted at the dangers of working as an Owner Driver (OD), but the inconclusive results highlighted the need for more research on the link between employment status and OHSW outcomes in the trucking industry and in New Zealand.

Research relating specifically to occupational health, safety, and well-being in the trucking industry aided in establishing the gaps by reviewing how previous studies had sought to address the issues. It allowed the researcher to comprehend the nature of the problem and to establish how urgent the research was.

With the OHSW issues understood, articles were reviewed to see whether other authors had considered at least one contextual factor when discussing OHSW for truck drivers. The articles that took a wider focus are tabled in Appendix 2. All the articles featured in

this table are specifically related to the trucking industry and consider at least one other level of the system in the study.

The period in which the articles were selected is from 1990 to 2017. Hensher and Battelino (1990), is a good example of some of the early research on the topic in which they outlined the importance of looking beyond the symptoms of speeding and fatigue and considered the underlying issues. A selection of articles focused on the link between pay and safety (e.g. Quinlan & Wright, 2008; Belzer, Rodriguez, & Sedo, 2002) while others looked at the antecedents of accidents, fatigue, and unsafe driving behaviour. Authors researching this area criticised the methods for investigation when accidents occurred, citing issues with the limited information found in Coroners' Reports for example. Additionally, authors discussed wider issues of work such as deregulation and the impact on work intensity. Issues of pay, accident causation, and organisational factors were considered relevant contextual factors, but very few studies placed all the issues into one systemic framework to examine how the issues may interact.

Despite the coverage of the system that these articles cover collectively, only a few articles considered a wider perspective and attempted to show connections to OHSW in the trucking industry (Edwards, et al, 2014; Thornthwaite & O'Neill, 2017; Mackie & Moore, 2008). It must be noted that only English articles were considered meaning that these conclusions have been drawn based on the predominantly Anglophone countries examined. Two of these articles came from Australia and one from New Zealand respectively.

The researcher approached an author of the New Zealand study, and in discussions with him found that information they collected from individual log-truck drivers pointed to a pressing need to understand the wider issues at play and how the industry had determined what was and was not published in their report.

“The log truck study was, by agreement with the sector, focused just on individual driver health. The methodology adopted though inevitably generated far more. Full stories come out when spending several hours out on the road with someone. One story that has stuck with me was told by a log truck driver of around 50 who wanted to share a vehicle with another driver and just do half the job each. They could afford to as both the mortgages had been paid off, and

both men had recently become grandparents. They knew they had missed out as dads due to the extreme demands of the job and wanted to do better for the next generation. Their last chance. The company rejected the idea saying that while it would not cost them anything if they allowed it then everyone would want to do it.

This raised multiple questions, all beyond the scope of our brief at the time. But it was clear that the multi-generational impacts and wider social context generally of a commercial heavy vehicle driving as an occupation in New Zealand required urgent investigation. We also recognised though that the industry was not ready to hear this, struggling as it was to address the immediate questions regarding poor driver health...it is about time the wider picture was established” (Personal Communication).

Although the focus of the New Zealand study previously mentioned was primarily health-focused, their study provided a foundation for this study to further uncover the underlying and systemic factors impacting the OHSW of truck drivers in New Zealand.

The above quote reinforces the urgent need for a critical view of the trucking industry in New Zealand – one that includes contextual factors pertaining to truck drivers’ health, safety, and well-being.

LITERATURE REVIEW ON THE OHSW OF TRUCK DRIVERS

3.4 Safety in the Trucking Industry

The concern for truck drivers' safety has been at the forefront of research in trucking because of, among other reasons, the enormous risk that large vehicles pose not only to the drivers but also to the public. Truck-related accidents are over-represented in work-related deaths globally (Murray, Newnam, Watson, Davey & Schonfield, 2002; Chen et al., 2015; Wioland, 2013; Newnam, Griffin, & Mason, 2008), and it has been estimated that heavy and tractor-trailer truck drivers are 12 times more likely to die on the road than the general US working population (Chen, et al., 2015). Another study from the US conducted by Zhu and Srinivasan (2011), found that crashes involving trucks carrying a trailer with heavy cargo were more likely to result in more severe injury. Extensive research has been conducted internationally on the safety of long-haul truck drivers (e.g. Heaton, Browning & Anderson, 2008; de Vries, de Koster, Rijdsdijk, & Roy, 2017; Birdsey, et al., 2015; Mayhew & Quinlan, 2006; Crizzle, et al., 2017; Chen, et al., 2015; Hanowski., Perez, & Dingus, 2005). The nature of short-haul sector is comparable with safety issues seen in the long-haul sector. Overlaps in transport operators, scheduling systems, and clients were also found to be of concern (Friswell & Williamson, 2010; Williamson et al., 2009; Hanowski et al, 1999).

Significant monetary and social costs are incurred when accidents happen (Douglas & Swartz, 2017; Cantor et al., 2013; Chen et al., 2015; Adams-Guppy & Guppy, 2003; Rodriguez et al., 2003). It has been suggested that the driver-related costs in Australia (including personal injury time, medical and hospital costs, rehabilitation, absence from work, workers compensation, lost productivity, and potential loss of business) are about ten times the average repair bill (Federal Office of Road Safety Data as cited in Murray et al., 2002). That was close to two decades ago. For every truck driver killed on the road in the US, six other people, including those in other vehicles, pedestrians, and cyclists died (Chen et al., 2015). Recent studies suggest hundreds more are injured or permanently disabled each year (Thorntwaite & O'Neill, 2017; Smith & Williams, 2014).

3.4.1 The High-Risk Nature of the Industry

Thornthwaite and O'Neill (2017) surveyed 559 drivers across Australia and confirmed the hazardous nature of truck driving by revealing a high percentage of drivers who had experienced a hazardous event of the type that could lead to fatality or a permanently damaging injury. However, they estimated that the actual percentage was higher than that recorded due to the drivers' underestimation of the seriousness of the event. However, they found that if drivers participated in health and safety training, and had personal experience with the hazard, their risk perception was stronger and more accurate. Those who did not have the relevant training or had not experienced that type of hazard underestimated the consequences.

This appears to be a widespread issue among truck drivers. Risk-taking and unsafe practices were noted as prevalent among some truck drivers in a Danish study, who referred to risk as "trivial" (Grytnes, Shibuya, Dyreborg, Grøn, & Cleal, 2016, p.145) and an accepted part of the job. In a similar vein, Chen et al. (2015) elucidated how widespread the issue of under-reporting was in the trucking industry in the US.

Similarly, in Australia, Quinlan and Mayhew (2006) found that workers' compensation claims were significantly lower than self-reported injuries, which they believe to be indicative of a significant reporting gap. However, they went on to say that owner-drivers were less likely to seek medical treatment for their injury even when it was severe.

It has been revealed that single vehicle and rural crashes tend to be under-reported throughout Australia (Meuleners et al., 2006). Shedding light on this, in a study of Danish transport organisations it was found that many of the companies reported having "an inactive or passive approach to workplace safety" (Mikkelsen et al., 2003 as cited in Grytnes et al., 2016, p.146). Possibly, for this reason, and others, many non-crash injuries are not reported to employers. Chen et al., (2015) proposed this was due to a fear of being fired or disciplined among other reasons. Research from Australia also supported this proposal, noting drivers were reluctant to report injuries and that working injured was common (Mayhew & Quinlan, 2006).

3.4.2 Injuries at Work but Outside the Cab

When truck driver safety has been studied in the past, the focus has typically been on the risk of on-the-road crashes. Although many problems are associated with road use

and interaction, safety concerns for truck drivers do not only result from motor vehicle accidents (Chen et al., 2015). According to Combs and Heaton (2016), commercial truck drivers experience some of the highest rates of injury and compensation claims compared to workers in other industries. When Mayhew and Quinlan (Quinlan, 2001) assessed the health and safety perception of long-distance truck drivers in Australia, they found that 25 percent of drivers had experienced a chronic injury or illness in the previous 12 months and 31 percent had reported a chronic back injury. Results were even higher from a study conducted in the United Kingdom (UK); Robb and Mansfield (2007) found that over 80 percent of the drivers reported some musculoskeletal pain in the previous 12 months.

Recently, more research has surfaced indicating that incidents getting in and out of the cab (Edwards et al., 2014), lifting during loading and unloading (Shibuya et al., 2010; Spielholz et al., 2008), slips, trips, and falls (Smith & Williams, 2014; Shibuya et al., 2010), or being hit by other moving vehicles were also of concern (Smith & Williams, 2013; Thornthwaite & O'Neill, 2017; Wioland, 2013). Drivers are commonly affected by back and shoulder injuries (Robb & Mansfield, 2007; Massaccesi et al., 2003; Friswell & Williamson, 2010; Smith & Williams, 2014), requiring the individual to take days off work (van der Beek, 2012; Combs & Heaton, 2016).

Spielholz et al. (2008) revealed that slip, trip, and fall injuries were occurring due to the use of improper equipment or procedures and drivers' efforts were further hindered by slippery ramps and docs in the US. More locally, industry interest from one large employer in New Zealand was indicated, as explained in a personal communication, due to a high number of their drivers twisting their ankles when jumping out of the cab on farms. Drivers were entering the farm on a concrete driveway and expecting smooth and clear surfaces however objects such as stones, tools or uneven surfaces were causing injury, often during times with little daylight. Approaches such as reviewing what constituted 'proper' footwear (not gumboots) were considered to ensure ankle support but also company auditing of farms and their delivery points.

Friswell and Williamson (2010) also looked at the hazard environment facing short-haul transport drivers in Australia and found comparable results. Of the 321 surveyed drivers, 82 percent described their top three safety problems. "Almost half of the drivers reported the physical nature and impacts of their work, particularly lifting and manual handling, and the potential for back and other injuries" (p. 2070). Four out of ten drivers

had issues relating to depots and delivery sites. This included cluttered sites, uneven surfaces or having to carry freight across roadways. In addition to infrastructure design, Hanowski et al. (1999) found that drivers of other vehicles and stress caused by time pressure were the highest ranked causes of potential injury in their study of local and short-haul drivers.

As mentioned above there are various phases of work for a truck driver and each activity may be situated on a different site or under-controlled conditions (Shibuya et al., 2010). Employers have limited control over their customers' worksites. This can be dangerous if drivers are under unrealistic time pressure (Kemp, Kopp, & Kemp, 2013; Friswell & Williamson, 2010; van der Beek, 2012; Johnson, Bristow, McClure, & Schneider, 2010; Shattell, Apostolopoulos, Sönmez, & Griffin, 2010). Competitive pressures in the logistics field can lead to compressed pick-up and delivery times (Reiman et al., 2015), increasing exposure to manual handling and other risks. Manual handling training and training reinforcement are also questionable throughout the industry.

According to Spielholz et al. (2008), employers and drivers have different perceptions about the causes of injuries. Spielholz and colleagues administered two state-wide surveys among employers and employees with commercial driver's licenses in the trucking industry in the US. They found that the employers attributed incidents to driver behaviour and cited the drivers' lack of risk perception as a barrier to implementing injury prevention solutions. This was supported by the findings of Reiman et al., (2015), who found that drivers and managers listed different hazards and reasons for injuries. In their study, Spielholz et al. (2008) asked about the barriers to implementing solutions and found that although the drivers felt that common sense was a barrier to the implementation of solutions to injury, they also cited the time pressures and tight deadlines. Of the drivers surveyed, 42 percent mentioned that they regularly felt pressured to work longer hours and 40 percent frequently felt pressure to work faster.

Working hours, tight deadlines and other hazards resulting from the poor management of work were found by Friswell and Williamson (2010) to be more associated with occupational injury than on-the-road hazards in their Australian based survey of truck drivers. This appeared a common theme throughout the studies reviewed.

3.4.3 *The Use of Archival Data to Understand Safety*

The collection of information about safety in the trucking industry has been approached in different ways. A conventional method includes the examination of previously collected accident data. In such instances, the studies are limited to what has been collected by the individual parties, for example, police reports or governmental agencies. In a New Zealand context, this is of importance because of the reliance on ACC for accident data. Data collected by ACC, although valuable and unique, relies on a no-fault system for accidents that occur in New Zealand and purposefully excludes injuries from gradual onset (among other exclusions). Consequently, there is the potential for claim-migration in which a gradual onset issue is linked to a single incident, when most likely it has resulted from a build-up of other external factors, for example long working hours, poorly designed truck, working under pressure. The data may show a high number of acute injuries, which is potentially misleading but also fails to capture the contextual factors contributing to the injury in the first place. Additionally, it is difficult to positively obtain details pertaining specifically to one subgroup, e.g. tanker drivers due to the limitations and ambiguity of the narrative lines in claim databases.

Despite limitations, the use of Accident Compensation forms (e.g. McCall & Horwitz, 2005; Smith & Williams, 2014), coronary reports (e.g. Brodie et al., 2009), and highway information are examples of data previously collected and analysed to help predict accidents occurring in other countries. Smith and Williams (2014) acknowledge the importance of reviewing this type of data and suggest it is vital to “maximise limited resources for injury prevention within this important sector” (p.63). They acknowledge the difficulty of collecting data from this group but also the urgent need to make headway.

Friswell and Williamson (2010) suggest that these types of documents only provide limited information about “preconditions of injury events and the range of work characteristics that should be targeted in prevention efforts” (2010, p.2069). Meuleners et al., (2006) further note the limitations of using, for example, hospital records suggesting that relevant information may not be recorded because patients were not correctly identified by hospital staff and consequently misclassified. Sullman (2002) recognised that additional information to secondary data was necessary if the aim was to decrease truck drivers’ crash involvement.

3.4.4 Fatalities

Investigations into the cause of fatalities in the trucking industry have also received attention. In an Australian context, Brodie et al. (2009) used the information generated through heavy-vehicle driver fatality investigations, which involved the Coroner, Police and the Occupational Health and Safety Authority to describe the type and extent to which trucks were involved in fatal accidents. They used the coroner's report to collect information about environmental conditions, the driver and vehicle, and occupational factors to better understand the nature of the crash. Among other results, they found that a third of the crashes were single vehicles crashes and around one in five were found to be travelling at excess speed for the conditions. What they also found was that making a connection between occupational factors and the risk of a crash was difficult because insufficient information was documented; improving driver safety requires more incorporation of such information they suggested. The coroners were required to establish the circumstances but not the causation of a crash.

A similar study was conducted in Finland, whereby the authors investigated contributing factors to the cause of fatal accidents (Häkkinen & Summala, 2001). Documents analysed in their study included: on-the-spot investigations immediately after the crash, survivor interviews, eyewitness accounts, and interviews with the relatives of the deceased victims. In the cases where the truck driver was at fault, the crash was most often caused by an error in operating the vehicle or a lapse in the driver perception, anticipation or estimation. They too acknowledged, however, that even with all the data they had available to them, further inquiry was needed to understand why such errors occurred.

Highlighted by these two studies are concerns about the narrow focus of investigation in fatal crashes. They acknowledged the need for investigations to rely on more than secondary data and that deeper inquiry may present relevant occupational factors that would otherwise be overlooked.

3.4.5 Accidents Linked to Fatigue

The causes of fatigue and the health-related outcomes will be discussed in further detail later in this section under the heading of 'Health'. However, fatigue has received considerable attention in the trucking industry, and researchers have for decades looked at its association with accidents (Braver et al., 1992; Wioland, 2013; Dahl et al., 2009).

Previous studies have reported that professional road transport drivers suffer fatigue-related problems while driving. However, it has been difficult to determine the role of fatigue in an accident because the data is not always collected or provided. Braver et al. (1992) note the subjective nature of fatigue evaluations done by those investigating the cause of an accident. This is supported by Brodie et al., (2009) who noted:

“Fatigue-related crashes, in particular, are difficult to identify as varying operational definitions of fatigue, and the absence of a precise method for its assessment in road crashes impedes determination” (p.563).

Different countries around the world specify working hours, restricting drivers to a set number of hours per day with clearly stated resting periods. However, studies have shown that drivers frequently violate the regulations; according to Braver et al. (1992), the primary reason is economic. Little research has provided insight into the social reasons for working beyond driving hour limits. Anecdotally it is thought that drivers like to get home at night; relationships with partners, families, and social groups are generally under pressure to deter drivers spending added time away from home. In such instances, social goals conflict with the legal requirements.

Häkkinen and Summala (2001) suggest that it is possible that drivers believe they can cope with fatigue and are less likely to associate it with an accident. This is supported by Gander, Marshall, James and Quesne (2006) who conducted a study of New Zealand truck drivers by surveying those drivers who had been involved in a crash. They sought information about sleeping habits in the lead up to the accident and found that 17.6 percent of crashes were identified as fatigue-related using an identification of physiological risk factors, the driver’s opinion, or the opinion of the attending Police Officer (tick-box on crash report). Gander et al., (2006) believe that many drivers and scene investigators may not have a sufficient understanding of fatigue and therefore the current estimation of the problem is potentially much lower than reality. This provides some explanation about why concerns were raised above given the number of studies that rely on data collected in such ways.

In response, fatigue management technology has been developed and trialled; eye closure, deterioration in steering skill, or heart rate data is used to detect fatigue (Meng et al., 2016) in addition to subjective measures. The data collected from these devices are of interest when working to understand fatigue, but it has been highlighted that

technological countermeasures are unlikely to prevent accidents (Häkkinen & Summala, 2001). Fatigue management technology does not consider the wider contextual factors and instead targets the individual.

3.4.6 Safety Interventions

Mooren, Grzebieta, Williamson, Olivier, and Friswell (2014) concluded that there was:

“...little robust empirical research in the heavy vehicle transport sector providing evidence of effective safety management characteristics that reduced crashes and injuries” (p.79).

Causes of accidents have been extensively proposed and debated in literature. Fatigue (Dobbie, 2002; Friswell & Williamson, 2008; Adams-Guppy & Guppy, 2003), employment status (Cantor, et al., 2013; Mayhew & Quinlan, 2006), and driver pay (Williamson, 2007; Belzer, et al., 2002; Quinlan & Wright, 2008; Rawling & Kaine, 2012) are but a few factors.

There is comparatively little research to address strategies for prevention of crashes and crash injuries, and even less research describing complete case studies with intervention implemented and independently evaluated. Mooren et al., (2014) reviewed the literature concerning safety management interventions that have been effective in reducing injury outcomes in OHS and looked pointedly at the heavy vehicle industry. Among other safety predictors, they discovered management commitment and safety training were the indicators most likely to have an impact at an organisational level. Whereas at an individual level, where the unit of analysis was groups of workers or managers, it was found that management commitment and attitudes towards safety, leadership, and trust were most related to safety outcomes.

Consistent with Cantor, et al., (2013), Mooren et al., (2014) found that carrier size, pay type, and rate were shown to be important. Despite these findings, Mooren et al. found that the majority of studies used either individual or group, or vehicle as the unit of focus, rather than considering all three simultaneously. Having a narrow focus made it difficult to understand whether the relationship between observed characteristics and safety outcomes was caused by systemic problems or could be attributed to individual differences. It has been suggested that focusing on individuals' compliance with safety procedures is unlikely to see reductions in work-related road injuries (Newnam et al.,

2017). Instead, looking to a broader systems framework in search for potential determinants may be more beneficial (Stuckey, LaMontagne, & Sim, 2007).

More research is needed to understand how occupational characteristics connect when attempting to address safety in the heavy trucking industry. Issues such as management impact should be further investigated (Mooren et al., 2014). Studies that look at decision-making and behavioural patterns of drivers typically target corrective measures at that level (Engström & Hollnagel, 2007). Edwards et al., (2014) recognised that safety behaviour is a result of many contextual factors including those which form a driver's understanding of "what ought to be done" (p.340) regarding work safety.

Few system-wide studies progress to intervention, implementation and independent evaluation, potentially due to the high-cost of data collection and multi-level commitment required. Furthermore, companies may only want to be involved in studies that preserve their reputation especially if they happen to have invested in interventions, only to be informed their investments could have been directed elsewhere. For this reason, research questions posed for this study demanded a critical exploration of the whole system to identify the underlying contextual factors, their nature, and how they interact to ensure OHSW reform in the trucking industry was targeted at levels of most significant potential benefit.

3.4.7 Risk Taking Behaviour

Analysis of the literature has helped advance understanding of the role of contextual factors and how they interact. Exploring the reasons why drivers take risks uncovered conflicting goals and elucidated on the link to safety outcomes.

Driving violations by drivers were related to crash involvement with truck drivers (Sullman et al., 2002). Poulter, Chapman, Bibby, Clarke, and Crundall, (2008) report similar links and go on to outline that leading offences were the violation of driving hours, overloading, driver and operating licencing offences among others. Poulter et al., (2008) used the Theory of Planned Behaviour (TPB), which looks at a person's intention to perform a particular behaviour, to understand driver compliance on the road. They explain how psychological antecedents of behaviour are good predictors of actual behaviour and found that drivers who intended to stick to the law were more likely to report driving within the law. This was supported by Swartz and Douglas (2009) who suggested that if drivers had a positive view of the regulations, they were

more likely to adhere to them. Poulter et al., (2008) further found that the easier truck drivers found it to obey the driving laws, the more likely they were to follow them. Kemp et al., (2013) added that if drivers had negative attitudes towards safety compliance standards, they were more likely to violate the HoS regulations.

The TPB was also used by Swedler, Pollack, and Gielen (2015) to explore personal and workplace behaviours that affected truck drivers' decision-making about distracted driving. Their findings concluded that supervisors had the strongest influence through their ability to enforce strict policies on distracted driving. If supervisors supported drivers in obeying the law, drivers were likely to comply. Previous research has shown that the safety climate of a transport organisation, as well as drivers' attitudes and perceived behavioural control, were important determinants of drivers' intentions to commit unsafe driving actions (Huang, Zohar, Robertson, Garabet, & Lee, 2013; Swatz & Douglas, 2009). This, again, highlighting the important role of the manager.

The environment in which drivers operate is complex and can vary daily. This factor increases uncertainty and risk and is vital to consider in the transport industry because drivers are lone workers (Huang et al., 2013; Mayhew & Quinlan, 2001) so, much of the time, they are required to rely on their own judgement. Consequences of drivers' safety decisions may be weighed up against their personal financial gain, meeting customers' expectations and their supervisors', and keeping the public safe. Wählberg (2015) discussed that drivers' personal disposition, for example, their driving style, is largely what determines crash predictability. What was not mentioned, but highlighted above, is the potential goal conflicts the drivers face.

In a US study by Kemp et al., (2013) drivers explained how issues such as pressure to deliver loads on time and internal and external stressors influenced their attitude towards safety. In addition, the lack of rest opportunities and the onset of fatigue reduced their motivation to comply with regulations. Emotional and physical exhaustion contributed to negative feelings about complying with safety regulations which resulted in "attitudes and behaviours that are counter to the desired regulations" (p.223).

Mooren et al., (2014) found that management practices such as support, pressure, training, scheduling and policies, as well as factors relating to employment and payment may have a direct influence over safety. A discussion on safety culture and safety climate follows. Moreover, given that there is a growing literature on safety culture and climate in the trucking industry in which a great deal of the research emanates from the

US (see, for example, Huang et al., 2013), it requires some attention. It should be noted too the emphasis in the literature is on safety climate, which focuses more on the behaviour of the *individual*, rather than the broader safety culture which focuses on the behaviour and systems of the *organisation*.

3.4.8 The Consideration and Use of Safety Climate and Safety Culture Concepts in the Trucking Industry

While this section does not attempt to cover the vast body of literature on the topics of safety culture and safety climate, or even how the two are distinguished from each other, it is important to note that the two concepts are connected yet separate (Huang et al., 2013). Safety climate, as described by Huang, et al. (2013) refers to “workers’ shared perception of their organisation’s policies, procedures, and practices as they relate to the value and importance of safety within the organisation” (p.5). By comparison, safety culture is described as identifying values and attitudes that interact with organisational structures that then form understandings of risk and safety influence the working environment (Grytnes et al., 2016). Many studies included in this review focus on safety climate which is reflected in the attention given below.

Safety Culture

Studies on safety culture have typically advocated for a top-down approach and have focused on the organisation’s ability to influence the values and attitudes of the workers (Guldenmund, 2000; Cox & Flin, 1998) however this perspective on safety culture may prove difficult in the trucking industry. Truck drivers are often a distance from their own company, and their working environment is influenced by the working environment of many other companies (e.g. the docs and delivery sites).

Safety Climate

Research has shown that safety climate is a strong predictor of safety outcomes (Huang, Lee, McFadden, Rineer, & Robertson, 2017; Christian, Bradley, Wallace & Burke, 2009; Newnam et al., 2017). It was found to be a leading indicator of accidents and injuries in industries including trucking (Murphy et al., 2012). Cole (2005) further explains this through a study conducted by Professor David Clarke of 2,000 accidents where the lowest rates were reported by companies with clear driving standards,

comprehensive training, and a reporting policy. Comparatively, the poorest rates were found in organisations with no clear training, ambiguous rules, and ineffective lines of communication.

Grytnes et al., (2016) acknowledges that truck driving work is solitary however, results from their study show that drivers are interdependent and share knowledge frequently, albeit informally. Peretz and Luria (2017) suggested that transportation organisations whose drivers frequently get together or even for drivers who work alone but have mobile contact should be aware of the notion that “relationships between drivers influence drivers’ unsafe driving behaviour” (p.355). It was thought that those in a managerial role could encourage communication and through this channel promote a positive safety culture among the drivers. Swedler et al., (2015), found in their US study the importance of consistent messaging from those in leadership positions, ensuring that workers are clear about safety expectations. The participants of their study described how managers could influence safety climate by ensuring consistent safety messages. Drivers that are conflicted about what is expected of them in an unsafe situation may be left to their own devices to make decisions. The ambiguity is a danger in itself. In this regard, organisations can use “good organisational management and planning” (Swedler et al., 2015, p.752) including clear communication to influence a positive safety climate.

Huang et al. (2013) recommendations centred on offering more opportunities for interaction among drivers in order to form shared safety norms, to increase communication, and to form group consensus. However, Grytnes et al., (2016) found that in Denmark, drivers are acutely aware of the risks they face in their job but when in communication with other drivers they trivialise the risk and play down the dangers they face.

A potential gap in the literature is how those in non-standard forms of work adopt safety climate measures, such as owner-drivers and sub-contractors.

Managers’ Role in Safety Climate

Zohar (2008) describes management commitment as the most critical factor affecting worker perceptions of organisational safety climate. This entails not only the presence of policies for safety but demonstrating commitment. This is somewhat problematic when there is a goal conflict.

Safety goals can sometimes conflict with organisational goals such as high-performance work systems (HPWS) and profitability. Typically, performance practices are not designed or implemented with consideration given to the role of safety (Newnam et al., 2017). The authors go as far to say HPWS are “predisposing drivers to unsafe driving conditions” (p.108). Then, they are misnomers and could instead be viewed as high-profit instead.

Newnam, Griffin, and Mason (2008) found that drivers were more motivated to drive safely if they perceived both their supervisor and fleet manager to value safety. Although Newnam and colleagues did not look specifically at truck drivers, this finding has been supported by Huang et al., (2017) who collected data from over 8,000 truck drivers in the US.

Huang et al., (2017) found those offering direct supervision to the drivers and those in top management had an equal part to play in perceived safety climate as indicated by the drivers; one was not a better predictor over the other. However, they also found that the relationship between safety climate at a direct supervisory level was stronger when top management was low, in other words, direct supervisors compensated for the lack of safety climate at the top management level.

Safety Climate and Pay

Newnam et al. (2017) found that safety climate was linked to remuneration. “Investment in remuneration encourages safe driver behaviour, but only under conditions of high commitment to safety” (p.108). Broader economic factors such as financial pressure and payment structure were found to result in unsafe driving habits (Quinlan and Wright, 2008) and were found to discourage the reporting of injuries, near misses or accidents in the past. Although noting that their findings on this point required more investigation, Newnam, Warmerdam, Sheppard, Griffin, & Stevenson, (2017) concluded that the effect caused by the financial pressures could be countered when management safety values were high. This suggests, “...investment by senior management in the health, safety and well-being of its employees is fundamental in balancing the extrinsic motivations inherent in remuneration” (p.108).

While there is a clear and present body of literature on safety climate and safety culture, the value of such work could be limited in New Zealand by the absence of industry attention to either. There is little evidence of uptake by New Zealand trucking

companies, and so for this study, there has been no assumption of knowledge about safety climate or culture in the upcoming proposed research questions or methods.

3.4.9 Safety and Pay

The link between safety and pay has been given much attention in the literature on the trucking industry. It has been reported that payment structure and payment rates are a predictor of truck driver safety (Belzer et al., 2002; Quinlan & Wright, 2008; Williamson & Friswell, 2013; Rawling & Kaine, 2012). As noted by Quinlan and Wright (2008) who have cited Hensher and Battelino (1990), the connection between commercial practices in the trucking industry and safety are not new. During the 1980's and 1990's some inquiries were conducted, in Australia in particular, finding clear links between factors such as scheduling pressures, unpaid waiting time, insecure reward schemes, speeding, excessive hours and drug usage by drivers. Exceptionally long hours were cited as a serious issue by Hensher and Battelino (1990), and they further noted that owner-drivers were earning much lower rates than employee drivers.

“The trip rate received by the owner drivers (i.e. gross earnings) and the freight rate obtained by the company using an employee driver have a significant influence on the propensity to speed. The negative relationship is strong for owner drivers as might be expected... on-road performance is strongly linked to economic reward” (p.96).

This seems counter-intuitive from a business perspective. It would be expected that owner-drivers could get a higher rate to offset the costs of being in that position. However, the competitive nature of the market in the trucking industry, in many countries, has intensified in previous decades and with it, pay levels have declined (Belzer et al., 2002; Quinlan & Wright, 2008; Rawling & Kaine, 2012). Quinlan and Wright (2008) cite findings from a New South Wales Trucking Safety report (Quinlan, 2001), which explained that the intensity of the competition meant that many operators, both small and large, were unable to run sustainable businesses. The low rate of return suggested that they could not run safe operations because the low freight rates encouraged shortcuts in maintenance, pushing working hour limits, and speeding for example. It was also suggested that low freight rates were a result of intense competition between transport operators pitching for work, many resorting to the use of sub-contractors to secure the job at a lower rate. This is supported by the findings of

Rawling and Kaine (2012) in their study of the regulation of supply chains in Australia. They presented evidence that large transport operators did engage in this practice to compete in the industry and meet the demands of the customers. In addition, the smaller transport operators, the sub-contractors for example, had little bargaining power to negotiate safer rates.

Evidence collected by Quinlan and Wright (2008) revealed complaints made about the activities of some freight forwarders or loading agents who negotiated a rate with a client or transport operator and then sub-contracted the task at an unviable rate.

Competition among freight forwarders and transport operators placed further pressure on the rates. However, Hensher and Battellino (1990) found that even decades ago, price competition was a phenomenon imposed mostly on the owner-drivers by freight forwarders and shippers, for example, and the rates were non-negotiable; there was “someone who will eventually take the load at a set rate” (p.543). This may serve as an indicator of a non-functioning regulatory system, the kind expected in less developed markets. Outcomes such as these imply that little priority is given to enforcement resulting in an uneven playing field, leading to a race to the bottom.

This is further compounded by the pay structure for drivers – both employed and owner-drivers – in the industry. Authors report that in Australia, many are paid on a piecework or incentive basis or a rate per kilometre (Quinlan & Wright, 2008; Rawling & Kaine, 2012), anecdotally it is suspected similar practices occur in New Zealand. Australian researchers, Williamson and Friswell (2013) reported that drivers who were paid based on results were almost twice as likely to report experiencing fatigue on at least half of their trips compared to drivers paid on an hourly basis. The way that drivers are remunerated inhibits the ability to manage fatigue.

In the NSW Trucking Safety Report (Quinlan, 2001) findings, as discussed by Quinlan and Wright (2008), the NSW Deputy State Coroner Dorelle Pinch issued her findings about the death of three truck drivers all of who died in a variety of crash circumstances. In her 2003 report, she concluded that “As long as driver payments are based on a (low) rate per kilometre there will always be an incentive for drivers to maximise the hours they drive, not because they are greedy but simply to earn a decent wage”. Drivers who gave evidence in Quinlan and Wright’s (2008) review indicated that in the past they had had their job threatened if they asked for an increased rate or refused additional work due to fatigue or being out of hours. In summary of their report, they conclude that

“overwhelming weight of evidence indicates that commercial/industrial practices affecting road transport play a direct and significant role in causing hazardous practices”. With the declining union membership, commercial practices have the potential to render truck drivers into a vulnerable position.

The industry has seen the number of unionised members decrease significantly (Belman & Monaco, 2001) over previous decades, which has taken protections away from pay and benefits. It was suggested that those firms that do pay higher wages were unionised giving workers higher income and therefore less need to work longer hours to reach their required earnings but also were in a stronger position to refuse extra work. Belzer et al. (2002) concluded, “Increasing driver pay decreases the likelihood that drivers will work more hours” (p.10). Long hours are only one part of the problem; it was also found that drivers worked unpaid time which can include waiting or queueing for example – necessary elements of their job.

In their inquiry, Quinlan and Wright (2008) found that several large trucking clients did not believe there was a connection between the safety and pay but admitted they had not specifically investigated the issue. They did not agree with government intervention on rates, with one interviewee indicating, “driver shortages would remedy any discrepancy in rates” (p.36) and arguing that all had individual responsibility to stay safe. However, in her submission, Professor Ann Williamson concluded that:

“...driver payment systems were incompatible with good fatigue management...Over the intervening 15 years, there has been no change to way drivers are paid... it is essential that the government takes a role to intervene to make payment systems for long distance truck drivers more compatible with safety” (as cited in Quinlan and Wright, 2008, p.47).

The impact of payment systems in the trucking industry was not limited to on-the-road safety but also the long-term health and well-being of drivers (Quinlan and Wright, 2008). Not only this, pay could be an intermediary factor for greater autonomy, of which is the impetus for many to become owner-drivers. The following section looks specifically at the relationship between employment status and safety as discussed in the literature.

3.4.10 Safety and Employment Status

There is now significant evidence that links temporary work and poor OHSW outcomes (e.g. Virtanen et al., 2003; Virtanen et al., 2003; Benavides et al., 2006). Further work has sought to clarify whether an employment category of truck drivers is more likely to pose a safety risk. It was suspected that owner-drivers, in particular, have poorer safety performance compared to that of employee drivers. In the US, Cantor, Celebi, Corsi and Grimm (2013) set out to determine whether there was statistical significance behind these claims. The study results showed that owner-operators were associated with more driver and vehicle-out-of-service violations, but experienced lower crash rates compared to employed drivers. This led them to investigate whether there were similar results in the employee sample and they found that the high turnover rate among employed truck drivers also posed a safety risk. It appeared that continuity with one carrier is critical for both drivers who are employed and for owner-operators, and discussions around reducing turnover in the industry needed to continue. These results have implications for motor-carriers throughout the industry, however, especially for those that rely on a contingent workforce.

Two studies in Australia (Mayhew & Quinlan, 2006; Williamson et al., 2009) provided initial insight into the working conditions of owner-operator long-haul and short-haul truck drivers respectively and the link to their occupational health and safety. Mayhew and Quinlan's study found that overall owner-drivers/operators reported worse occupational health and safety compared to the other drivers surveyed citing economic pressure as one reason why. However, they found that owner-drivers did not report more injuries compared to small or large fleet employee drivers. They reported reasons such as reporting biases and access to workers' compensation as potential reasons for this result.

Williamson et al., (2009) were less conclusive in their study suggesting that contingent work could take different forms and each form was associated with different sets of effects on workers. Contingent workers differ from other drivers on a range of organisational characteristics but not primarily on safety. However, in the US, Dammen (2005) tested the effect that firm characteristics had on injury and fatality accident rates, considering the degree to which firms used owner-operators as an explanatory variable. It was found that the use of owner-operators was significantly related to lower accident rates because, it was suggested if drivers owned their machinery they had more

incentive to engage in safe driving behaviour and vehicle preserving driving practices. Other than the studies above, there is very little empirical work connecting owner-operators with safety outcomes (Cantor et al., 2013). Given the inconclusive results, more research is required to better understand the link between employment status and safety in the trucking industry.

This concludes the section of the review on safety. What follows is a section specifically related to the health of truck drivers, as reported in the literature.

3.5 Health in the Trucking Industry

It has been suggested that the health impacts and implications for truck drivers have been widely overlooked in the transport and logistics literature (Boyce, 2016).

However, throughout the medical journals, there is a substantial amount of research that has uncovered health concerns and suggestions for improvement for the drivers. For some reason, the industry has not been held accountable despite the clear evidence.

The relevant literature is broadly split between considerations of the impacts of driver health on work and the impacts of work on driver health. This review focuses mainly on the later although they are related and interact.

Focus across the disciplines that look at truck driver health discuss how poor health compromises safety. It has been shown that diabetic truck drivers, for example, have an increased likelihood of accidents than those in good health. Wiegand, Hanowski and McDonald, (2009) found that obese drivers were more likely than those who are non-obese to be involved in a safety-critical incident. This research is important; however, truck drivers' health deserves attention in its own right (Dahl et al., 2009); "it appears that the truck driving life-style (in New Zealand) is associated with several health problems" (Mackie, 2008, p.3). As pointed out by Mackie, there are contributing lifestyle factors that add to the problem and a truck driver's lifestyle, and working conditions are closely linked (Dahl et al., 2009). It has been noted that truck driving is not so much a job, but a lifestyle and therefore managing the health of these workers requires more than an individualistic approach (Apostolopoulos et al., 2016). An outline of the known contributing factors and the health issues relating to the occupation of truck driving are provided below.

3.5.1 Identified Contributing Factors

Drivers' poor health may have a long-term, negative impact on the logistics and staffing levels in the industry. Massaccesi et al., (2003) have reported that drivers in Italy have to retire early, as similarly reported by others from the US who have noted the shorter lifespan of truck drivers (Lemke et al., 2017; Apostolopoulos et al., 2016). In the US, for example, unionised male truck drivers have a life expectancy of 63 years while life expectancy of members of an Owner-Operator Independent Drivers Association is 55.7 years, both of which are significantly lower than the 75.1-year average age for the general US male population (Saltzman & Belzer, 2007; Apostolopoulos et al., 2010). It has been reported that younger drivers are not wanting to enter the industry because the health implications of choosing this job are widely known (Boyce, 2016).

The literature describes a plethora of contributing factors to the poor health of truck drivers. Such factors are irregular shifts (Wiegand, et al., 2009; Apostolopoulos, et al. 2013), unrealistic schedules (Braeckman, Verpraet, Van Risseghem, Pevernagie, & De Bacquer, 2011; Adams-Guppy & Guppy, 2003), long hours (Lemke et al., 2017; Boyce, 2016; Wiegand, et al., 2009), manual handling (Reiman et al., 2015; van der Beek, 2012; Massaccesi et al., 2003), poor air quality (Cheng, Tan, Wang & Tay, 2006; van der Beek, 2012), sedentary nature of the job (Massaccesi et al., 2003), and limited time off to recover (de Croon, Sluiter & Frings-Dresen, 2003; Koda et al., 2000).

Other contributing factors have been linked to lifestyle (Crizzle et al., 2016; Dahl et al., 2009; van der Beek, 2012; Hill, Sendall & McCosker, 2015), for example many of the health concerns drivers face are a result of smoking (Jain et al., 2006; Sieber, et al., 2014; van der Beek, 2012), poor diet (Apostolopoulos et al., 2010; Wiegand, et al., 2009; Sendall et al., 2016; Boeijinga, Hoeken & Sanders, 2017), limited or poor sleep (Luckhaupt, Tak, & Calvert, 2010; Talmage et al., 2008; Apparies, Riniolo & Porges, 1998), and inactivity (Mackie & Moore, 2008; Apostolopoulos et al., 2010; Boeijinga, et al., 2017).

In the literature, we are starting to see connections between lifestyle factors and the organisation of work where researchers are highlighting the difficulty drivers have when attempting to make changes to, for example, their diet (Hill et al., 2015; McDonough et al., 2014).

3.5.2 *The Health Impact from Working Conditions and Job Characteristics*

The trucking industry is known to be highly competitive (Lemke et al., 2017; van der Beek, 2012) which has resulted in low wage rates for the drivers and an increased pace of work (Boyce, 2016; Apostolopoulos et al., 2010). Long working hours are causing many health problems for truck drivers (Koda et al., 2000; Quinlan, 2001) and although working hour regulations do exist it is financially beneficial for both the driver and the employer if long hours are worked (van der Beek, 2012). There are ways around the Regulatory limits, and in New Zealand, it is questionable if the political will is there to enforce them to the degree needed.

The working-hour regulations still often allow for long days, have enforcement gaps, do not always consider non-driving hours, and fail to consider circadian rhythms, cumulative fatigue, and sleep quality (Lemke et al., 2017). In the UK, Adams-Guppy and Guppy (2003) found that there were strong associations between driver fatigue experiences and management systems of break taking for drivers suggesting that the structure of operations was having a detrimental effect on the drivers. Long working hours have further implications for the health of drivers. Incomplete recovery is said to exacerbate health problems (Croon et al., 2003).

The long working hours do not allow for necessary recovery time (van der Beek, 2012). Wiegand et al., (2009) noted that some transport operations put individual drivers at high risk for obesity because of long hours, coupled with limited healthy food options on the road (Apostolopolus. et al., 2016). There is prevalence of obesity among truck drivers in New Zealand and internationally (Mackie, 2008; Anderson et al., 2012; Mabry et al. 2016; Olson et al., 2016; Dahl, et al. 2009; Sieber et al., 2014), and Wiegand, et al., (2009) have also suggested the same in relation to physical inactivity and fatigue. Boyce further supports these conclusions citing dangers of inactivity in combination with a poor diet. Overweight and obese drivers are not able to take steps towards recovery easily when inhibited by the nature of their job. van der Beek (2012) concludes that for truck drivers:

“...it is well known that long working hours are associated with adverse health effects, such as cardiovascular disease, diabetes, disability retirement, subjectively reported physical health, subjective fatigue” (p.292).

The logical recommendation would, therefore, be to reduce the working hours that truck drivers are working (Koda et al., 2000), however, as mentioned above, the financial

incentive is there to continue working these patterns (Quinlan & Wright, 2008; Belzer et al., 2002). Future employees may not want to enter an industry fraught with health problems which is a potential reason for the driver shortage.

Worksites

The worksite extends beyond the cab to include rest-areas, pick-up and drop-off points, truck-yards and truck stops, wash areas, weight stations, trailer crane sites, warehouses, and vehicle ferries.

The working environment which includes worksites, trucking terminals, and warehouses, and truck stops, is where drivers can spend a great deal of time (Apostolopoulos et al., 2016). These places provide limited opportunities to exercise and choose healthy food options. In a study conducted by Boeijinga et al., (2017), it was found that some truck drivers indicated their motivation to live a healthier life but were unable “to convert their intention into action due to the obstacles encountered with the work and personal environments” (p.540). A log truck study in New Zealand revealed the extra problems drivers faced due to their work schedules, in particular, those in rural areas, where there was no availability to 24-hour gyms or good food outlets (Mackie & Moore, 2008).

McDonough et al. have further noted (2014) that managers and drivers are aware of the profession’s potential to foster chronic diseases but listed off challenges of achieving a healthy lifestyle. Some of the challenges have been listed above such as long hours, financial pressures, prolonged sitting, however, Apostolopoulos et al., (2010, 2013, 2016) found that limited efforts were made at places such as truck stops. Such resting areas were described as lethal to drivers’ health; the air quality was poor, and space was set up to encourage consumption of vending machine food, television watching, with little to no walking or exercise space. Working conditions for truck drivers are not only detrimental to their health; they actively encourage unhealthy behavioural patterns (Apostolopoulos et al., 2010).

A more obvious worksite is the cabin of the truck. Diesel fumes, vibration, noise, and heat, are known to cause health problems among drivers. Suggestions have been made that windows are kept closed, for example, to manage the levels of dust and fumes that come into the cabin. However this is an unreasonable ask especially in warmer climates. Consonni et al., (2010) examined the link between occupation and lung cancer and

found that truck drivers were at risk because of their exposure to diesel fumes, a known carcinogenic. In New Zealand, Mannetje et al., (2008) found that truck drivers had an increased risk of non-Hodgkin's lymphoma due to potential chemical exposure.

3.5.3 Personal Lifestyle Factors

Dahl et al., (2009) concluded that in addition to the working environment, personal lifestyle factors were closely linked to poor health outcomes. Truck drivers were found to operate in an unhealthy working environment, and their exposure in such circumstances was exacerbated by lifestyle factors and choices (Crizzle et al., 2016). Truck drivers' unhealthy lifestyle has been said by van der Beek (2012) to be the best-known hazard of the job. Smoking is one of the strongest predictors of lung cancer and truck drivers, in particular, long-haul, were more likely to smoke than others working in the road transport industry (Jain et al., 2006). This was supported by Sieber et al., (2014) who found that long-haul drivers in the US were twice as likely to smoke as the 2010 US public, additionally, 61 percent of the drivers they interviewed reported having two or more of the risk factors including smoking, obesity, high cholesterol or hypertension.

Although Angeles et al., (2014) found in their study it was around 30 percent who smoked daily, they revealed that being overweight with a poor diet was over half their sample. Irregular eating and poor diet were prevalent among truck drivers despite many attempts to intervene in their health (Boeijinga et al., 2017). With little time at home and then when out on the road, little time to stop, truck drivers often ate the foods on offer at truck stops, petrol stations or other roadside food outlets (Dahl et al., 2009). Dahl et al. present concluding remarks stating that the drivers they analysed had an increased risk of hospital treatment for diseases related to excess calorie intake and lack of exercise. The high-fat consumption, daily tobacco use, and low physical activity also lead to cardiovascular diseases (Lemke et al., 2017).

3.5.4 Connections Between Factors

Studies relating to the health of truck drivers have attempted to make connections between different aspects of the job, for example, lifestyle choices and potential for crashes, or fatigue and poor health outcomes which then lead to safety-critical incidents.

In their US study of over one hundred truck drivers, Wiegand, et al., (2009) found that more than half the drivers they studied were obese based on body mass index (BMI) rating. They further showed how obese drivers were nearly twice as likely compared to non-obese individuals to be rated as fatigued based on their two measurements of fatigue. Obese drivers were 1.5 times more likely to be involved in a safety-critical incident, and that obese drivers were twice as likely to be fatigued while involved in the safety-critical incident. Their study showed that there was a strong link between obesity and fatigue which, as mentioned previously is a major safety issue in the trucking industry.

Also in the US, Lemke et al., (2017) found that around 40 percent of drivers they surveyed had high-risk total cholesterol to HDL cholesterol ratio; driving experience and sleep quality were associated with cholesterol ratios. Hypertension, diabetes, obesity and mortality have been linked to insufficient sleep (Alvarez & Ayas, 2004; Luckhaupt et al., 2010; Gangwisch, Malaspina, Boden-Albala, & Heymsfield, 2005). A lack of sleep also influences health behaviours including a lack of desire to exercise and eat well (Garaulet et al., 2011). Many of the health issues discussed can be linked to insufficient sleep, a poor diet, lack of movement or activity which have resulted in disease. The issues listed above can be indirectly associated with environmental attributes of commercial trucking (Apostolopoulos et al., 2016).

3.5.5 Health Promotion Programs

Despite knowing health outcomes can be linked to the nature of the job, the proposed solutions are often still targeted at the individual through workplace and onsite health and wellness programs. Driver education is potentially the easiest and cheapest intervention and failings from higher up the system are not widely acknowledged. It has been shown that health promotion initiatives are not reducing the health problems for truck drivers (Boeijinga et al., 2017; Apostolopoulos et al., 2016).

Many of the articles reviewed for this section concluded with recommendations based on the education of drivers and work-site programs designed to inform drivers of the risks inherent in their workplace and lifestyle choices. Some simply concluded that working conditions and workloads should be improved (Koda et al., 2000). Lemke et al. acknowledge that organisational factors influence the high-risk outcomes in their study,

however, conclude by saying: “targeted worksite health promotion programs are needed to curb these atherosclerotic risks” (p.149).

Similarly, Wiegand et al., (2009) concluded that to combat the high BMI ratings of the drivers, organisations might need to invest in more resources to develop health and wellness programs and also to screen potential employees for high BMI and sleep apnoea. Dahl et al., (2009), from their Danish study, concluded that drivers should be offered targeted health promotion programs that look at both lifestyle choices and workplace influences, they go on to suggest that opportunities for physical exercise should be offered to the drivers and better access to quality food. Similarly, in the US, Boyce (2016) suggests that the industry and the drivers do have the ability to make changes to alleviate some of the problems suggesting that firms could promote better health such as smoking cessation or the importance of healthy eating.

To address sleep problems in the industry, shortening the hours worked has been suggested (van der Beek, 2012) despite this not being based on research evidence. However, considering issues were identified at the individual and organisational level by Braeckman et al., (2011), health promotion interventions were again recommended to ensure the health of truck drivers. More holistically, van der Beek acknowledges that a multi-level approach is needed if hours are to be reduced. Targeting the individual would involve increasing awareness around the risks of working more than 60 hours per week. Transport operators could consider more flexible options to manage the schedules of the drivers and encourage short breaks where possible and discourage driving while tired. They might also consider having two eight-hour shifts with separate drivers. Finally, it was suggested that ministries of transport should engage further with enforcement of work time in this industry taking more serious action against those violating work time rules.

Some studies have shown that health promotion programs have worked (Olson et al., 2016), for example, by increasing their awareness about which foods are healthy and what the signs of fatigue are. The question of longevity or sustainability and added pressures on the drivers must be explored. Without system-wide support, the individually-targeted interventions ask the drivers to make decisions for their health under challenging circumstances where they have directives but no extra options.

Olson et al., (2016) evaluated corporate health programs for drivers in their literature search finding two uncontrolled pilot studies, three studies with non-randomly selected

groups and two randomised controlled trials. Three of these studies produced an average weight loss greater than three kilograms. They found one study presenting information about more effective intervention, but this involved a 12-month lifestyle counselling intervention with bus drivers and truck drivers in Scandinavia.

In a similar vein, an Australian study conducted by Sendall and colleagues (2016) used Participatory Action Research (PAR) to ensure that any suggested intervention first included relationship building between workplace managers and the project team to include workplace culture in their considerations. This way, they felt, it was easier to contextualise the interventions and offer guidance when needed. “Despite a progressive decline in truck drivers’ engagement in the project, positive changes in truck drivers’ health knowledge, health behaviours and self-reported health outcomes were achieved” (p.41). They credit their success to a change in workplace culture, and any problems of disengagement could be dealt with by the research project team.

Hill et al., (2015) reviewed the literature on truck drivers and health promotions. They identified the difficulty of reaching truck drivers because they do not have a proper workplace. They concluded that barriers to good health are the result of complex interactions and they found that few interventions target truck drivers as a population in a meaningful way because they are not easily translated into the working environment. Boeijinga et al., (2017) also analysed health promotion material for Dutch truck drivers, concluding that existing programs “are not sufficiently tailored to target the group’s mindset and health literary skills” (p.539). Further, they noted that despite the great number of health promotion programs available, unfavourable figures regarding truck drivers’ poor diet, inactivity, and absenteeism have not improved.

Apostolopoulos et al., (2016), lead researchers in this area, revealed, “health-supportive resources and options for drivers for healthy eating and physical activity were extremely poor” (p.90). The features of a truck drivers’ job characterised by tight schedules, payment by the kilometre, limited health insurance have created a profession named by Belzer (2000) as “sweatshops on wheels.”

Apostolopoulos et al., (2016) also found that truck stops, trucking terminals, warehouses and rest areas in the US are not included in efforts to advance truck drivers health, therefore, any educational efforts are in vain. They go on to explain that workplace health interventions are typically small scale, based on the behaviour of the individual and restrained by the resources of the transport operator. Interventions that

target the structural barriers in the trucking industry are non-existent and ongoing efforts are “slow, superficial, uncoordinated, inadequate, and ultimately ineffective” (p.91).

As noted above, the interventions targeted at individuals fail to recognise the complexities inherent in the world of trucking when trying to monitor fatigue, educate about healthy eating and encourage more exercise, for example. Apostolopoulos et al. (2016) conclude that worksite health programs “underestimate this systemic complexity and the complexity of the causes of driver health problems; hence, interventions have generated merely disappointing and unsustainable results” (p.92).

This concludes the section on the health of truck drivers. The following section discusses the psychosocial risks related to truck driving as found in the literature.

3.6 Psychosocial Risks and Truck Driving

3.6.1 Fatigue

“Much is known about sleep, fatigue and the risks involved, yet knowledge of actual working hours and how they should be distributed in the road transport sector is limited” (Beaulieu, 2005, p.18). This quote was printed in a report from the ILO on the issues of working time for truck drivers; the report outlines the serious infiltration of fatigue throughout the road transport sector but highlights how, regulatory changes to work time hours, for example, have made little difference.

Fatigue is possibly the most widely discussed issue in the road transport sector and its links to poor safety outcomes have been well documented and discussed (Mackie & Kalasih, 2012; Williamson & Friswell, 2013; Stevenson et al., 2013; Crizzle et al., 2016; van der Beek, 2012; Meng et al., 2016; Anderson, et al., 2017; Boyce, 2016; Hanowski, et al., 2003; Åkerstedt, 1995).

Safety is compromised by fatigue-related issues when drivers make poor judgements or fall asleep at the wheel. McCartt, Rohrbaugh, Hammer, & Fuller, (2000) interviewed 593 long-distance truck drivers throughout the US and found that drivers who had fallen asleep at the wheel had more arduous work schedules, drove longer than 10 hours, took fewer hours off than required, and falsified their logbooks. In agreement, Phillips (2015) suggested that a definition should consider the “development of fatigue as a dynamic

interaction between subjective experience and performance aspects” (p.53) and consider the role that the working characteristics play a role.

Extended Hours

The long hours that truck drivers operate have been linked to fatigue (Williamson & Friswell, 2013; McCartt et al. 2000; Stevenson et al., 2013). The job of a long-haul driver specifically, is characterised by long working hours, night driving, irregular schedules, high strain, incentive payment and long waiting times (Lemke et al., 2017; Williamson & Friswell, 2013; Stevenson, et al., 2013; Quinlan & Wright, 2008; Rawling & Kaine, 2012) though similarities in conditions have been highlighted in the work of short-haul drivers (e.g. Friswell & Williamson, 2010). In efforts to increase safety on the roads, governments worldwide have created stricter regulations on driving hours, imposing maximum limits and compulsory rest and break periods (Goel & Vidal, 2014; Boyce, 2016; Beaulieu, 2005).

Charlton and Baas (2001) found that a considerable number of New Zealand truck drivers are operating more than work-time regulations prescribe; one-third of the drivers in their study reported driving more than the maximum 11 hours out of 24. They conclude by saying that the current Hours of Service (HoS) regulations and enforcement regimes are not effective in managing fatigue in the New Zealand trucking industry.

This is echoed by Anderson et al., (2017) who discovered that attempts to further regulate the HoS in the US had little impact in reducing fatigue. Despite this, van der Beek (2012) stresses that every attempt should be made to reduce the very long working hours for truck drivers. This is easier said than done, he goes on to state because fewer hours are not practical in the trucking industry. Beaulieu (2005) also explains that legislation reducing working hours could potentially increase the costs of goods carried throughout the supply chain and that any changes that are made need to keep this in mind.

Schedule Design

Sleep deprivation has been linked to an inability to engage in health-related behaviours such as physical activity and diet (Lemke et al., 2017). This is not surprising and is only exacerbated by the lack of rest time and rest facilities available to drivers (Wiegand et al., 2009; Adams-Guppy & Guppy, 2003; Apostolopoulos et al., 2016). Feyer,

Williamson, and Friswell (1997) suggest that the effective management of fatigue involves considering the timing of work and rest for individuals, but also to consider facilities for rest along the trip. Not taking regular breaks, as outlined by Stevenson et al., (2013), has been associated with an increased risk of crashing. They go on to explain that the risk of a crash is increased significantly if a driver had driven for more than four hours without a break. Meuleners et al., (2017) predict it to be even less, they suggest that the risk of crashing was significantly increased if the time since the last break was more than two hours.

Adams-Guppy and Guppy (2003) have called for a more flexible approach to the management of driver schedules and to assist drivers in managing their fatigue by taking breaks as necessary. Other authors have suggested the way to combat fatigue is to take regular breaks of longer than 15 minutes. However, as indicated above, the infrastructure does not always allow for this (Wiegand et al., 2009), nor the high-pressure nature of drivers' schedules (Williamson & Friswell, 2013).

Work organised to meet the needs of customers' delivery schedules can often result in fragmented and erratic schedules (van der Beek, 2012; Ouellet, 1994). In 1995, Beilock asked 498 drivers what they felt most contributed to fatigue in their jobs and drivers most frequently cited the setting of unreasonable schedules by dispatchers and shippers. This is supported by Braeckman et al., (2011) who more recently found that around 47 percent of the drivers they questioned declared that they felt their work schedules were unrealistic. Beilock estimates from their study that around 26 percent of schedules given to drivers require them to violate work-time regulations when assuming that average speeds do not exceed the legal limits.

Payment Structures

There are other organisational factors that impact the number of hours worked, for example, incentive payments which encourage drivers to work longer hours because they are paid by the kilometre or the hours worked (Rawling & Kaine, 2012; Quinlan & Wright, 2008). To maintain the desired necessary income, drivers commonly elect to take the additional work to increase their hours (Williamson & Friswell, 2013).

Williamson and Friswell go on to state "Incentive payments were associated with longer working hours, greater distances driven and higher fatigue for more drivers" (p.26). In their Australian study, they found that drivers were infrequently paid for waiting,

loading, or unloading and that for these individuals, their working hours are much longer. Those who were paid for waiting in Williamson and Friswell's study were found to do significantly lower hours and were less likely to report fatigue.

Apostolopoulos et al. (2013) have highlighted that, in the US, being paid by the mile (as indicated by 70 percent of their sample) puts immense stress on truck drivers and reduces the time they can spend on food preparation, exercise, family time, and leisure activities, to name a few.

Sleep Quality

Poor sleep quality and quantity was found by Hanowski et al. (2003) as an issue for drivers who displayed fatigue on the job and therefore suggested that behaviour off the job was relevant to consider. Mackie and Kalasih (2011) uncovered that drivers most suffered from tiredness, fatigue, or loss of attention on Friday am/pm followed by Monday morning. Fridays seemed explanatory – drivers would be tired after a working week. The surprising result of Monday morning was explained by the drivers who suggested that adjusting to the shift after the weekends was most difficult. Further, de Croon et al., (2003) adds that domestic and social factors such as the private situation of the driver and their leisure activities, as well as individual factors such as lifestyle and their abilities to cope influenced and impacted their ability to recover after work.

Excessive traffic often meant that it was easier for drivers to be on the road at night. However, Meuleners et al. (2017) and Anderson et al., (2017) found that drivers who spent more than 50 percent of their trip driving between midnight and 5:59 am were four times more likely to crash. This is supported by Heaton et al., (2008) who also found that driving at night for longer than 6 hours quadrupled the probability of falling asleep at the wheel. Driving for three hours through the night has been compared to driving while under the influence of alcohol, and the risk of crashing is increased by prolonged periods of night driving (Anderson et al., 2017).

Prevention Interventions

Boyce (2016) notes that current regulations have been unable to ease the burden of driver fatigue, so he suggests that additional education to reinforce the dangers of fatigue is necessary to help drivers resist the temptation to work longer than they are legally allowed. This is supported by the drivers interviewed by Adams-Guppy and

Guppy (2003) who suggested that to reduce fatigue firstly they wanted more time to do the trips. Secondly, they wanted help with loading and unloading, and thirdly they called for further driver education.

From the managers' perspective, the most popular suggestion was driver education. This is a somewhat unsurprising response from those at a management level, however, a surprising response from the drivers as it has been indicated previously in another study that the drivers who participated were not interested in additional information (Apostolopoulos et al., 2013).

Mackie and Kalasih (2012) recommend that sick leave should not be penalised, further drivers should be encouraged to call in sick if they do not feel fit to work. In a similar vein, it has also been recommended that drivers be informed about sleep quality and quantity and the importance of adequate recovery outside of work hours (de Croon et al., 2003; Feyer et al., 1997; McCartt et al., 2000).

Preventative measures call for an organisation-wide culture shift. One that acknowledges the inevitability of fatigue in the industry but restricts work hours, encourages break taking, provides and supports rest facilities where possible, educates dispatchers and drivers alike about the signs and risks of fatigue and ensuring proper sleep, and finally, deterring drivers to continue when fatigued by supporting time off.

Reducing the Impact of Fatigue

Measures to reduce the impact of fatigue were also discussed in the literature. Some suggested that those drivers who are found to have sleep apnoea should be reassigned to other duties. This relies on the company providing screening for sleep apnoea and other sleep-related diseases (McCartt et al., 2000). However, if drivers are out on the road and are falling asleep behind the wheel, McCartt and colleagues highlight the effectiveness of roadside rumble strips to alert a drowsy driver who has veered off track.

Fatigue management technology works similarly. Meng et al., (2016) discovered from a survey of 600 Chinese drivers that overall, truck drivers had a positive attitude towards fatigue warning systems and had hope that this technology would warn them of potentially dangerous levels of sleepiness. This study highlighted that drivers feared the levels of fatigue they had experienced and recognised the job characteristics, for example, the tight delivery schedules, as being a primary factor causing fatigue. On this

basis, the drivers, in subsequent focus groups, stressed the need for fatigue warning technology.

Most available technology, according to Meng et al., (2016) focuses on monitoring fatigue and to then warn the drivers if levels are becoming dangerous. Few have attempted to keep the drivers awake or alert after their fatigue has been detected. The interest in the potential use of technology for fatigue management is growing (Beaulieu, 2005). Over a decade ago calls were being made to governments and involved stakeholders to invest in and develop technology to support fatigue management initiatives.

Many of the health issues that truck drivers have are thought to be widely underreported and understated. This is not surprising as authors have noted that truck drivers have overestimated the state of their health (e.g. Apostolopoulos et al. 2013). It is thought to be no different with fatigue. However self-reporting is a common method used to assess driver fatigue (Apparies et al., 1998; Gander et al., 2006). The accuracy of the measure is limited to how sensitive the individual is to factors that cause the fatigue and how far they normalise them.

The demands that may cause fatigue among drivers are complex. Due to this complexity and the challenges in collecting data, the inability to observe fatigue post-mortem, the normalisation of fatigue among drivers, and the fear of job loss if sleep apnoea is diagnosed it is no surprise that it is difficult to attribute definitively a crash or safety-critical incident to fatigue. Fatigue is pervasive, under-reported, and complex in the trucking industry.

3.6.2 Mental Health and Stress

The mental health of truck drivers is not an overly common topic discussed in the extant literature. This is despite many authors noting the excessive pressure and stress the drivers face daily and the ill health linked to the occupation. The few authors that have investigated this area have produced some concerning, though unsurprising results, much related to what has been discussed previously in this chapter. It is suspected that this is of relevance in New Zealand based on findings from Mackie and Moore's (2008) study of log-truck drivers.

Truck drivers regularly face high levels of occupational stress (Shattell et al., 2010; Saltzman & Belzer, 2003; Kemp et al., 2013; Friswell & Williamson, 2010; Mayhew &

Quinlan, 2001). For those who spend long periods of time away from home, their family and their social support network (Peretz & Luria, 2017), the stress is even higher (Shattell et al., 2010). Shattell et al. go on to reveal in their study that many of the stressors are rooted in the organisation of their work; unrealistic schedules, time pressure, loneliness, financial pressure, fatigue and poor sleep, unpredictable conditions on the road such as traffic and weather, violence exposure, negative reputation with the public and customers, low power positions, as well as the stress of driving around other uneducated road users. This is supported by Belzer (2000) who found that in the US drivers were earning less than half of their pre-deregulation wages (adjusted for inflation) while working on average, 65 hours a week; they were working harder and earning less. Truck drivers were found to be overall physically and emotionally exhausted (Kemp et al., 2013; Saltzman & Belzer, 2002). Authors in this area have shown links between the stress and depression among truck drivers (da Silva-Junior et al., 2009; Shattell et al., 2010). Given the severe time pressures and the conditions that are beyond their control, truck drivers may be particularly susceptible to emotional exhaustion from chronic stress (Kemp et al., 2013).

The most discussed factor causing stress among drivers was the time pressure they faced (Kemp et al., 2013; Friswell & Williamson, 2010; van der Beek, 2012; Johnson et al., 2010; Shattell et al., 2010). Chen et al. (2015) showed that drivers continued to drive while fatigued, in bad weather, or heavy traffic and often sped or broke work-time rules to deliver the goods on time. Just-In-Time (JIT) management arrangements gave drivers little flexibility, and such schedules gave drivers very little control over when and how to pace their drive (Kemp et al., 2013; Quinlan & Bohle, 2004). Drivers were noted as saying that often the HoS regulations made it worse (Kemp, et al., 2013; Johnson et al., 2010) citing that being forced to take a break when they are under time pressure could escalate feelings of stress.

Low decision latitude was further discussed by other authors (van der Beek, 2012; Shattell et al., 2012; Kemp et al., 2013) who noted low control for drivers in many areas of their job. Shattell et al., (2012) identified many factors outside of their control for example weather changes, traffic, and other road users, which can make deliveries on time near impossible.

Further to this, the drivers had very little control over how long they were required to wait to be loaded or unloaded, some having to wait up to 24 hours to be attended to

(Hensher & Battellino, 1990). In such situations, drivers were powerless and forced to sit and wait. This has been said to cause a great deal of stress and frustration among drivers. The time pressures the drivers then found themselves under meant they had to then overexert themselves to meet the delivery windows imposed by customers (Friswell & Williamson, 2010; Chen et al., 2015).

A driver in Johnson, Bristow, McClure and Schneider's (2010) study summarised his feelings about the job:

“You must drive 650 to 700 miles a day, and you had better accomplish it, regardless of the weather and other problems because you are on a schedule to deliver the freight on time... this is a stressful, often boring and physically tough job... there must be an easier way to earn a living” (p.70).

When drivers in the US were asked by Johnson et al., (2010) what single aspect of their work environment could be changed to improve the quality of their life, their second response after relaxing regulation, was to be able to spend more time at home. Many of the drivers commented on how difficult it was to be away from home for so long (particularly in countries where long distances require drivers to be away from home for weeks or months at a time). Williams, Thomas, and Liao-Troth (2017) uncovered how truck drivers experienced stress from loneliness and loss of family life. Shattell et al., (2010) uncovered stories of loneliness and isolation among drivers. In their study, drivers explained how they became depressed because of the loneliness with one driver explaining: “I'm sacrificing pretty much my sanity. My ability to talk to people. It is total isolation” (p.563) when talking about his job.

Shattell et al. reported that drivers were seeking companionship in the form of sex workers and were engaging in drug usage to combat the loneliness. Time away from home meant drivers had little social support when situations became untenable (Johnson, et al., 2010; Shattell et al., 2010). Support was found to be vital for individuals to maintain good mental health and social support from family, friends, colleagues and other community members and it has been shown to assist individuals in maintaining good health (Kawachi & Berkman, 2001). This is absent for many truck drivers.

In addition to feelings of isolation, it was mentioned that drivers often felt disrespected in their profession by, for example, other road users, shippers and customers, and their

employers (Johnson et al., 2010; Shattell et al., 2010). One driver noted “Sometimes I am ashamed to admit what I do for a living” (Johnson et al., 2010, p.63) and this caused feelings of frustration and sadness.

Other road users were seen to cause a great deal of stress for truck drivers (Friswell & Williamson, 2010; Shattell et al., 2010; Johnson et al., 2010). The unpredictable and oblivious actions of car drivers, for example, were a significant hazard on the road due to their danger around trucks, which also resulted in feelings of stress and frustration. Road rage was a potential outcome from such situations; experiences of violence were not uncommon for some drivers (Mayhew & Quinlan, 2001; Anderson, 2004).

According to Anderson (2004), compared to other industries, the transportation industry had a very high percentage of workplace victims who were attacked by an offender with a weapon, robbed, and assaulted.

Consistent with the health promotion programs mentioned above, solutions proposed were in the form of wellness programs as well as education for drivers focusing on stress management, depression and other mental health issues (Shattell et al., 2010). These authors go on to suggest online access to health information and ensuring health professionals are present at truck fairs and truck stops to connect with drivers. This is supported by Kemp et al., (2013) who also suggested that web-based health seminars could be made available to drivers in addition to preventative stress management programmes which could alter the individual’s response to occupational stressors.

These aforementioned issues need to be examined within “the broader ecological context of the trucking sector which includes geographical, social and occupational factors” (Shattell et al, 2010, p.561) in addition to government regulations, corporate policies as well as the built environment (Apostolopoulos, et al., 2010) if there is any hope of improvement. It is estimated that the mental health state of truck drivers worldwide is under-reported and only vaguely known. This is a much larger problem than currently captured.

3.7 Conclusion for the Section on Safety, Health, and Well-Being of Truck Drivers

With daily exposure to compromised OHSW factors, truck drivers face a high risk of injury, accident, and poor health and well-being. The nature of the role means the drivers are not only exposed to risk while on the road, though undoubtedly the risk there is high, they are also injuring themselves interacting with the truck, at customer sites, and while using equipment. Risk is heightened as they find themselves under pressure. Compromised safety has been linked to low pay and reward schemes in the industry; this too compounds the pressure they were found to be under and was one of the many contributing factors of poor health for the truck drivers.

Problematically, health promotion programs are frequently recommended to address the lifestyle and behaviour of the individual drivers. The drivers were facing high levels of fatigue, stress, and compromised mental health as a result of their occupation. However, as alluded to in some of the studies, the causes of such outcomes were further upstream. The individual focus of an intervention diverts from the more important underlying problems influencing driver risk, making the problem and potential intervention less effective.

For this reason, the following section considers and reviews the articles that include one or more contextual factor when attempting to view the health, safety, or well-being of truck drivers. The above section provides a review of the issues the drivers are facing and provides insight into what we stand to lose if nothing is done. Comparatively, the following section looks more at the approach taken, rather than the conclusions made.

STUDIES ON TRUCKING THAT INCLUDE HIGHER LEVEL / DISTAL FACTORS

3.8 Literature Review

Many of the studies in previous sections of this review relied on the constructs from one discipline or body of knowledge to attempt a description of or intervention for the truck drivers. Some topics discussed above took a wider perspective compared to others, for example, the research conducted on safety climate and safety culture included the role of the organisation and its many parts, providing some context to the adverse outcomes. The literature reviewed provided information about individual pieces in a very complex puzzle, which together created the system truck drivers operated in. Many have noted the complexity of this industry (Apostolopoulos et al., 2016; Thornthwaite & O'Neill, 2017; Hensher & Battellino, 1990; Rawling & Kaine, 2012). Newnam et al., (2017) write “Systems thinking based data collection and analysis frameworks are urgently required to help develop this understanding in road freight transportation” (p. 28).

This section begins by looking at the key studies that considered the wider influences on the health, safety, and well-being of truck drivers. The table below displays the included studies for this section. An expanded version with more detail about the studies included in the table below can be found in Appendix 2b.

Table 3.3: Summary of Articles that Took a Wider Perspective

Study Focus and Country (grouped by region)	Author and Year (chronological)	Scope of Interest of Paper (system level)	Key Findings
Understand the impact of deregulation on the trucking industry in New Zealand (NEW ZEALAND)	Bollard and Pickford (1998)	Regulatory	A lack of regulation has freed the industry from the burden of control, and the industry is seeing greater efficiency and service quality from price competition. Customers are more satisfied
Gain a deeper understanding of key issues wider than the individual, and OHSW outcomes (particularly health) (NEW ZEALAND)	Mackie and Moore (2008)	Governmental Industry Company/ Organisational Personal/Individual	The matrix of interventions suggested at various system levels
Report of Inquiry into safety in the long-haul trucking industry (AUSTRALIA)	Quinlan (2001)	Regulatory and regulatory bodies Industry	Commercial arrangements between parties have a significant influence on safety
Violence experienced by truck drivers (AUSTRALIA)	Mayhew and Quinlan (2001)	Industry Organisational Employment status Individuals	Violence is a risk to truck driver's safety, and underlying factors fuel the circumstances
The relationship between economic pressure, subcontracting and OHS outcomes for employed and owner-drivers (AUSTRALIA)	Mayhew and Quinlan (2006)	Industry Organisational Individual	Link found between economic pressure, contingent work and negative OHS. ODs under extreme stress levels
Show a link between pay and safety (AUSTRALIA)	Quinlan and Wright (2008)	Regulatory Industry Employment status	A payment system is required that allows for fair competition and efficiency without cutting corners
Coroner's death investigation files to understand the extent of fatal crashes (AUSTRALIA)	Brodie, Bugeja and Ibrahim (2009)	Physical-environment Occupational Individual	Limited information was found in the report about organisational factors. Underlying factors should be further considered
The lived experiences of truck drivers and the interrelationship of their networks (AUSTRALIA)	Karp (2010)	Regulatory Industry Organisational Managerial	Influence of economic factors and industry regulations on OHS. Legal, financial and business reasons prevent addressing of these issues

Examination of precarious work and its impact, also link between pay, safety and regulation. (AUSTRALIA)	Rawling and Kaine (2012)	Regulatory Industry Legal	The structure of the supply chain has led to poor OHS outcomes; low pay increases the dangers
Profiling contextual factors that influence OHS (AUSTRALIA)	Edwards, Davey, and Armstrong (2014)	Government Organisational Physical environment Individual OHS	A need to consider contextual factors because of their relevance to the culture within the industry
Contributions of contextual factors on work health and safety regulation (AUSTRALIA)	Thorntwaite and O'Neill (2016/7)	Physical environment Industry Organisational Personal/individual factors	Complex industry with a host of interdependent factors within organisations and across the supply chain that cause poor OHS for a small but significant group of workers
Whether coronial investigations identify contributory contextual factors (AUSTRALIA)	Newnam, Goode, Salmon, and Stevenson (2017)	Government and Regulatory Industry Organisational Road using public Physical-environment	Lack of inclusion of systematic contributory factors, reductionist approaches taken to interventions
Driver's work environment, including fatigue, and crash risk. (AUSTRALIA)	Meuleners, Fraser, Govorko and Stevenson (2017)	Organisational Individual	Truck type, shift times, break allowance and health impact the risk of a crash
Investigation of the underlying factors precipitating speeding behaviour (USA)	Hensher and Battellino (1990)	Macro Micro	Economic reward conditions play an important role in explaining on-road speeding behaviour. Must look beyond the symptoms
The effects of deregulation, de-unionisation, technology, and human capital (USA)	Belman and Monaco (2001)	Regulatory framework Industry	Income inequality has hit the earnings hard for truck drivers. Wages are lower for non-unionised drivers. Technology has increased worked intensification
Examines the link between pay and safety (USA)	Belzer, Rodriguez, and Sedo (2002)	Organisational Individual Physical-environment	As pay increases, the risk of a crash decreases. The two are linked
Role of human capital, occupational factors, and demographics in crash frequency (USA)	Rodriguez, Rocha, Khattak and Belzer (2003)	Organisational Individual	Occupational factors and human capital are better predictors of crash compared to demographics

Address safety from the perspective of the firm (USA)	Dammen (2005)	Regulatory Organisational Employment status	Firm characteristics appear to most influence accident rates. Owner-operators were found to increase safety due to their added incentive to remain safe
How commercial worksites impact opportunities for healthful eating and activity (USA)	Apostolopoulos, Lemke, Sönmez and Hege (2016)	Organisational Institutional Physical environment Individual	Structural barriers encountered at these worksites do not facilitate healthy lifestyles for truck drivers
Antecedents of unsafe behaviour and the impact of drivers' relationship networks (ISRAEL)	Peretz and Luria (2017)	Social network Family life	Frequent interaction is connected to safe driving behaviour through information sharing and sense of commitment
Analysis of the UK container haulage industry with a focus on ODs (UK)	Gregson (2017)	Industry Employment status	Confirms ODs' position in the precariat and shows how occupational factors requires drivers to "stretch time."
Health and safety issues in the road transport sector (GLOBAL)	Beaulieu (2005) International Labour Organisation	Global National Regulatory Industry Organisational Employment Family Individual	OHS concerns need to be addressed at the global level through tripartite action to promote decent work

The extent of the problems in the trucking industry is far wider than the individual drivers. To understand the extent of the problem, a wider perspective must be taken which includes societal influences, corporations, the legal influences, and financial factors (Murray et al., 2002). More specifically, Brodie et al., (2009) conclude that to design accurate and preventative measures to heavy vehicle crashes, "underlying or associated factors should be considered accordingly, and a broad systems approach applied" (p.563). Thornthwaite and O'Neill (2017) further add that if we are to ensure efficacy of our preventative measures for individual drivers, the underlying "competing pressures from upstream risk factors" must be considered and that efforts will need to first start by "addressing those upstream factors" (p.5).

A critical piece of work was written by Rawling and Kaine (2012), they explain how contemporary business practices have resulted in precarious work arrangements for truck drivers. There is a growing body of evidence to suggest that precarious work has consequences for adverse health and safety outcomes (Quinlan & Wright, 2008;

LaMontagne et al., 2012; Mayhew & Quinlan 1997; Quinlan & Bohle, 2009; Johnstone & Quinlan, 2006). Such practices include management techniques that replace full-time standard workers with casual, fixed-term or contracted workers (Quinlan & Bohle, 2009). From a wider perspective, Rawling and Kaine (2012) showed how intense competition in the industry, shifts in employment status, and a power imbalance in the supply chain resulted in unsafe pay rates, unsafe driving practices, dangerous fatigue levels, and intolerable pressure on the drivers. They concluded “the supply chain structure of the road transport industry has led to poor safety outcomes for road transport workers” (p.256). They add by saying that when attempting to address safety issues in the industry, underlying factors including remuneration schemes and economic pressures from clients at the head of supply chains must be considered.

Similarly, Mayhew and Quinlan (2006), considered as key authors in this area, discussed the relationship between economic pressures, subcontracting and the health and safety of truck drivers. They found that intense competition within the industry meant that drivers were accepting non-viable freight rates, working excessive and illegal hours, all of which resulted in chronically stressed and fatigued truck drivers. Their study highlighted some key differences between employment status and economic pressures suggesting that owner-drivers were much worse off. Among other reasons, they were more likely to experience occupational violence, work beyond their legal working hour limit more often, and have suffered a serious crash in the last 12 months (Mayhew & Quinlan, 2001). Although owner-drivers did not report more acute or chronic injuries, it was indicated that reporting bias due to economic pressure disallowed accurate results. Their results further showed the extreme stress that owner-drivers operated under. The poorest occupational health and safety outcomes were recorded among those owner-drivers who worked the most competitive routes, i.e. those under most economic stress.

More recently and in support of the above, Thornthwaite and O’Neill (2017) reported on the links between driver safety and a range of factors including “employment arrangements, remuneration methods, and working hours” (p.7). From the survey results of 559 heavy vehicle truck drivers, they noted and mapped out a collection of highly interdependent occupational health and safety factors showing a web of casual relationships. They suggested that most drivers “experience safe work practices at most

workplaces” (p.9) but the experience is more serious for a small but significant group of drivers:

“...substantial segments of its [transport industry] workforce remain at considerable risk of serious injury and illness. This risk is linked to a range of features of the work and labour market – including employment arrangements, remuneration systems, working hours, task variability, control and autonomy, access to training, and management policies, practices and resources. This is a complex phenomenon” (p.21).

Thornthwaite and O’Neill (2017) found some companies were working to ensure their drivers remained healthy and kept safe, however, there was an underclass of drivers who continued to experience unsafe working conditions.

From a slightly different approach, Karp (2010) sought to understand the social and cultural networks as a part of the context of work for truck drivers. The environment for long-distance truck drivers has often been described as one filled with autonomy and freedom out on the road, they suggested, however, their results showed a dichotomy between wanting workplace freedom and operating in a potentially unsafe work environment. Conflict was observed as resulting from an underlying desire the drivers had for freedom and new supervisory practices that included technological monitoring and surveillance. Additionally, the drivers in the study reflected on the economic difficulty and the conflict around wage negotiations. They found that individuals and organisations would, for a host of reasons including financial, fail to address serious issues within the industry.

A common theme throughout the literature in this section was the need for regulatory reform. Newnam, Goode, Salmon and Stevenson (2017) argued that any reforms that occur should be underpinned by a systems approach. They argue that efforts to address accidents and safety in the transport industry should be focused beyond the driver and seek to identify contributing factors at other levels. To apply this framework in their research, they conducted a study looking at Coronial investigations into road freight accidents and attempted to identify the contributing factors and the interrelationship between the factors. Their findings suggested that road freight crashes resulted from systematic issues which involved a host of interlinked, contributory factors and these factors were identified right across the system level. Therefore, they concluded, reductionist perspectives on crashes will not result in effective intervention or policy

development due to the highly complex nature of the road freight industry. The findings from this study were important as they supported the thinking that when an accident investigation is thorough enough, it is possible to “identify freight crash contributory factors all the way up to the level of regulatory bodies and government agencies” (p.35). This was a key piece of research that informed this study.

This was supported by the findings of a study conducted in 2014 by Edwards, Davey and Armstrong who found that upstream contextual factors had an impact on health, safety and behavioural outcomes for truck drivers. They cited the importance of considering elements such as management practices which included training, support, scheduling pressure, policies, monitoring, and enforcement as well as employment type, and payment structure. They also found that government departments, customer relations, and the physical road environment influenced a driver’s ability to remain healthy and safe. Although the focus of their study was safety culture and they were wary of the boundaries of that discipline, they acknowledged the importance of recognising how the underlying factors were relevant to the safety culture of an organisation.

The above studies have focused primarily on road safety, although some have mentioned health and well-being. Apostolopoulos et al. (2016) examined the environment of truck drivers in relation to opportunities for a healthier lifestyle. They noted the limited success of traditional workplace wellness programmes for truck drivers and suggested that the application of a systems methodology would increase the potential for more sustainable interventions. Using this methodology, they found that truck stops, terminals, warehouses, highway rest stops and areas were virtually void of exercise facilities, healthy food options, appropriate rest areas, and infrastructure that encouraged television watching and inactivity. They felt that these were all barriers for drivers to making healthy decisions and that targeting the individual should come once the environment had been addressed.

In a local example, Mackie and Moore (2008) looked at the lifestyle factors that contributed to the health and well-being of log truck drivers. Their findings suggested that the long hours of work resulted in poor work-life balance, exclusions from family and community activities, and their lifestyle contributed to poor health outcomes. From their two-phase study, they created an Intervention Matrix that identified issues and then presented recommendations at each level (Individual, Company, Industry, and

Government). The key issues they identified were driving hours and work-life balance, obesity that included nutrition and exercise, and workplace injuries that included hearing loss, musculoskeletal disorders and others. Suggestions made across the system included adjustments to the way drivers used their time, for the companies to reduce the hours and allow for job-sharing, for the industry to examine the supply chain and adjust where possible, and for the Government to adjust driving hour regulations (Mackie & Moore, 2008). They acknowledged that many of the smaller scale interventions had been initiated but that the macro level interventions had yet to be applied. This further highlighted the difficulty of and the urgent need for changes in the wider context and highlighted that as a society we have done little to understand intergenerational costs of exclusionary work practices that trap drivers.

The study conducted by Mackie and Moore (2008) highlighted how little we know in this area in New Zealand.

3.9 Conclusion for Section on Contextual Studies

It is clear from the literature that there are a plethora of issues with the working environment of a truck driver; many have been discussed in the previous sections of this chapter. Links have been proposed between the working environment of truck drivers and poor health, safety, and well-being issues (Meuleners, et al., 2017; Edwards, et al., 2014; Mackie & Moore, 2008; Rawling & Kaine, 2012; Rodriguez et al., 2003; Quinlan, 2001).

At the regulatory level, studies have highlighted that truck drivers perceive the industry to be over-regulated, suggesting they feel burdened by all the requirements (Kemp et al., 2013; Johnson et al., 2010; Karp, 2010). Further, other authors have commented that the current regulations, hours of work do very little to address fatigue among drivers (Lemke et al., 2017; Adams-Guppy & Guppy, 2003). There is anecdotal evidence to suggest that drivers frequently break the work-time rules. Despite this, Beaulieu (2005) argues that regulatory intervention is key to solving the problems within the industry.

The industry has been described as intensely competitive (Belzer et al., 2002; Quinlan & Wright, 2008; Rawling & Kaine, 2012; Lemke et al., 2017; van der Beek, 2012; Apostolopoulos et al., 2013; Heaton et al., 2008). Linked to deregulation (Belman & Monaco, 2001), the increased competition among operators has resulted in excessively

long hours where work is organised to meet the demands of the customers and the schedules that they set (van der Beek, 2012). Competition has also meant that there is essentially a race to the bottom as freight rates and payment schedules drop below a safe rate (Quinlan & Wright, 2008). Drivers are under a great deal of pressure and stress stemming from the intensity of the competition, economic stress, a lack of autonomy, and what Karp (2010) has described as managerial surveillance. Right throughout the industry are fatigued and unhealthy drivers, many of which are unsafe on the road as fatigue has been linked to accidents (Wioland, 2013; Dahl et al., 2009; Brodie et al., 2009).

Links have been made by authors between pay and safety in the industry (e.g. Quinlan & Wright, 2008). This has been a dominant discussion throughout the literature; it appears that little has changed since such information has been brought to light. Until the wider levels are addressed, there is limited range for economic adjustment. For this reason, and others, authors are calling for more systematic reviews and investigations when looking at the health, safety and well-being of truck drivers (Newnam et al., 2017; Apostolopoulos et al., 2016; Brodie et al., 2009; Beaulieu, 2005).

CHAPTER THREE CONCLUSION

The purpose of this study was to understand the role of underlying contextual factors that impact the OHSW of truck drivers in New Zealand. Chapter Two provided context to this study by introducing the system in which the truck drivers operate. Chapter Three furthered this by taking a closer look at the specific unit of focus (OHSW of truck drivers) and how previous studies have addressed the issue. This provided insights into what is to be gained by improvements in this area. This chapter has highlighted the nature of the problem and that if an individualistic approach is continually adopted, it is unlikely improvements will transpire.

The literature highlighted that OHSW is a significant problem for truck drivers globally. Deregulation, non-standard forms of work, industry practices such as long hours, pay structure, competition, and employment status, among other factors are systemic issues placing pressure on the different players within the system. International research has made connections between these systemic issues and poor health, safety, and albeit less frequently, well-being issues. Mackie and Moore (2008) have confirmed that there is little known about the role of these cultural, structural or organisational contextual factors on the OHSW of truck drivers in New Zealand and how they interact.

The following chapter considers the call for a more systematic review of the trucking industry and presents the design of the current study to address the gaps highlighted by the review of the literature and to answer the proposed research questions.

CHAPTER FOUR: RESEARCH DESIGN

This chapter outlines the research design and methodology for this study. An overview of the components that make up the methodology and methods – theoretical paradigm, research design, participant selection, and data collection and analysis – are discussed in relation purpose statement and research questions below.

4.1 Purpose Statement

The purpose of this explorative and qualitative, critical interpretive study was to discover the underlying contextual factors that impact the occupational health, safety, and well-being of truck drivers in New Zealand. Using a systems framework, this study looked specifically at the interaction of the contextual factors, and notably those concerned with the organisation of work, to explain what has been observed in the industry.

4.2 Research Question and Sub-Questions

What role do contextual factors play in the occupational health, safety, and well-being of New Zealand truck drivers?

Sub-Questions

- What are the underlying contextual factors impacting the occupational health, safety, and well-being of New Zealand truck drivers?
- What role do cultural, structural and organisational factors play in truck driver health, safety and well-being risk?
- How do the contextual factors interact with each other?

THEORETICAL PARADIGM

4.3 Introduction

A paradigm is “the net that contains the researcher’s epistemological, ontological, and methodological premises” (Denzin & Lincoln, 2005, p.22). An explanation of these three elements clarifies the paradigmatic view of the researcher, helps to lay out assumptions of the researcher and outlines what has shaped the research. The desire to elaborate at this level is an ethical stance regarded by most constructivist, interpretive and critical researchers as necessary for any piece of research (Lincoln & Guba, 2013). The choice to include this information supports the paradigmatic choice made by this researcher.

The underlying theoretical paradigms of this study were interpretivism and critical theory (Lincoln and Guba, 2013). Therefore the inquiry was a critical interpretive inquiry.

4.4 Interpretivism and Critical Theory

Each theoretical perspective embodies a way of understanding *what is the nature of reality* (ontology) and *what is knowledge* embodying a way of understanding what it means to know and how we know it (epistemology) (Creswell, 1998; Denzin & Lincoln, 2005; Crotty, 1998). Epistemological and ontological issues often arise together (Crotty, 1998), guiding the researcher to the methodology, which is known as the “strategy of inquiry” (Lincoln & Guba, 2013, p.86). The methodology includes assumptions made by the researcher, the guiding principles, and the procedures utilised in the study (Creswell, 1998; Denzin & Lincoln, 2005).

4.4.1 Interpretivism

In response to the perceived gaps of positivism, interpretivism was fashioned. Rather than measuring the facts as a positivist might do, an interpretivist proposes multiple interpretations of reality (ontology), withholding a ‘right’ or ‘wrong’ judgement of those interpretations. It is not the aim to reach a single truth about a subject (Denzin & Lincoln, 2005) more to replace the scientific notions of prediction and control with interpretive notions of “understanding, meaning and action” (Carr & Kemmis, 1986, p.83). The knowledge acquired is constructed and co-constructed by the study’s participants and the researcher (epistemology) (Lincoln & Guba, 2013) with both

contributing to the construction of meaning (Crotty, 1998). This encounter of the researcher with the participants “enhances new understanding of another person’s social reality” (Outhwaite, 1985, as cited in Smith, 1999, p.360). For this reason, an interpretive researcher must become aware of which values and beliefs constitute their stance (Smith, 1999). Gadamer (1975) reinforces this point suggesting, “...trying to eliminate one’s own concepts in interpretations is not only impossible, but manifestly absurd. To interpret means precisely to use one’s own preconceptions” (p.358).

The methods related to this paradigm are ones that seek to understand about the lived experiences of the researched (Smith, 1999) and allow the researcher to participate in the collection of the data. Denzin and Lincoln (2005) suggest that interpretivists will use qualitative methods for their research and that qualitative researchers are guided by beliefs and feelings about the world and how it could be understood.

4.4.2 Critical Theory

The number of critical theories is vast and the fact that they are continually changing and evolving (Kincheloe, McLaren & Steinberg, 2011) is a demonstration of the principles behind the discipline. Phases of the theory have often emerged parallel to the social movements that identify with the domination of humans in modern societies. A fundamental tenet of Critical Theory is summarised by Horkheimer’s definition, to seek “human emancipation” in circumstances of power abuse and domination. Further, “critical research can be best understood in the empowerment of individuals (Kincheloe, et al., 2011, p. 164) so any inquiry that aspires to sit within this space must attempt to confront injustice among a particular group within society and endeavour to be transformative. In this context, individuals are granted dignity regardless of their position within the system (Steinberg & Kincheloe, 2010).

Critical theory helps us to formulate a strategy and questions for exploring the complex and moral nature of everyday life; a critical approach allows for the acknowledgement of this complexity (Steinberg & Kincheloe, 2010). This has methodological implications. The ontological view is one “... shaped by social, political, cultural, economic, ethnic, and gender values” which are crystallised over time (Guba & Lincoln, 2005, p.168). Following on from this, the epistemological view is subjective and co-constructed by the researcher and the researched. The critical researcher typically adopts a qualitative approach (Creswell, 1998) allowing for dialogue of a reflexive nature. The

inquiry is more than value-laden; it is “prompted and guided by the researcher’s values” (Lincoln & Guba, 2013, p.89). “Facts can never be isolated from the domain of values” (Kincheloe et al., 2011, p. 164) therefore critical researchers often announce their partisanship for the striving of a better world.

4.4.3 Critical Interpretive Inquiry

“Paradigms are beginning to ‘interbreed’” (Guba & Lincoln, 2005, p.164) and often, a study or inquiry can be guided by multiple paradigms. Gioia and Pitre (1990) add to this by suggesting that the blend of two paradigms offers the possibility of creating new insights.

Each paradigm begins with different ontological and epistemological assumptions and can offer unique perspectives and produce views previously not thought of (Gioia & Pitre, 1990). Critical Interpretive inquiry is an example of the above. It was created in response to the interpretive approach stopping short of asking questions about what can be done to address the issues arising from the study (Carr & Kemmis, 1986). It is, therefore, the aim of critical interpretivism to carry out an inquiry with social change as a goal. This paradigm also suggests that human behaviour is embedded in context and time (Lincoln & Guba, 2013) and that it is of importance to the researcher that the researched are not marginalised in any way (Guba & Lincoln, 1981). With critical interpretive inquiry, the knowledge that is shared provides a vicarious experience that offers insights into the worlds of the researched (Lincoln & Guba, 2013).

4.5 Qualitative Research

The use of a qualitative approach for this research has been mentioned above given that it is aligned with specific paradigms, particularly interpretivism (Denzin & Lincoln, 2005) and to an extent critical inquiry (Creswell, 1998). The researcher’s ontology stipulates that the phenomenon under investigation is the manifestation of multiple realities which are shaped by social and contextual experiences. By entering the world of those being researched, the researcher then co-constructs the knowledge that results from the study. Given the explorative nature of this study the researcher engaged with participants who were industry experts to explore the underlying contextual factors, their nature and how they interact. Miles and Huberman (1994) along with Silverman and Marvasti (2008) explain that qualitative research aims to discover the essence of

people and situations, and the meaning they attach to it. Further, it allows the researcher to get as close to the phenomenon as possible to observe their reality, giving a dimension of depth to the data (Patton, 2002).

Co-construction by the researcher and the participants would be different as a daughter, sister, wife, partner, colleague, friend, or researcher (as examples) with the participant. Ideally, multiple co-constructs are needed however this was not possible for one PhD.

RESEARCH STRATEGIES

4.6 Introduction

Given that there was very little research on the contextual factors impacting the OHSW of New Zealand truck drivers, in-depth data was required to gain insights from those in the industry. From there it was necessary to understand, from their perspective, how much of a role the context played in the working lives of the participants, particularly the drivers.

Described below are two strategies (abstraction and abduction) the researcher employed to assist in the data collection and analysis, while using a systems approach. The level of abstraction was important to consider given the EST model gave scope to include a large number of different elements. The abstraction process further aided the researcher in drawing boundaries around the study; what was included and what was excluded.

Abduction allowed the researcher to step back from Bronfenbrenner's EST model to consider all the elements the participants were discussing and then return to it once more to provide structure. The abstraction and abductive approaches worked in unison to ensure as much data was included as possible, but results were useful and reasonable given the resource limitations of one PhD.

4.7 Abstraction

“Describing society is difficult, not simply because it is amazing, mysterious and complex, but because it requires abstraction” (McDonnell, 2016, p.8). Abstraction involves the creation of boundaries across space and time for the focus of the study in question.

It offers a way of viewing the problem by suggesting a unit of focus, which is sufficiently small enough to be understood and large enough to make connections and show the processes (McDonnell, 2016). Abstracting is not seen as a simple task, it involves the creation of a picture of a social system in which “the parts that one seeks to study appear” (McDonnell, 2016, p.6). The challenge, consistent with a systems approach, is to see each part as a network of relationships, actions and interactions and each part can only be understood as they appear in relation to one another. By way of organisation, these levels categorise thoughts of complex interactions that bring about a level of generalisation sufficient to conclude. Decisions concerning abstraction affect

the choice of vantage point (McDonnell, 2016); complex interactions require different vantage points to understand the problem. Using the EST model, allowed the researcher to collect a variety of vantage points. The recruitment for participants for this study included those that could elucidate on the OHSW of the drivers and the underlying contextual problems.

According to key author in systems thinking, John Wilson (2014), there are no real rules for how to draw the boundaries around the system other than be practical when acknowledging that efforts must produce something useful and be appropriate for the study in question. He further acknowledges that given the complexity of any system, the boundary for one may be different to another. The trucking industry in New Zealand was found to be very complex and consequently it was difficult to create the system boundaries. There were many elements directly and indirectly involved in the trucking industry and this was only discovered during the data collection process. Pilot interviews helped create the boundaries by raising issues previously not considered by the researcher. If other participants also raised similar issues during data collection, the element was considered for inclusion and explored during subsequent interviews. The sequential nature of the process further solidified the system boundaries. Vast amounts of data were collected; further boundaries were drawn during the analysis phase as repeated themes emerged.

Global markets, for example, were outside the scope of this study, given the unit of focus was the truck drivers in the New Zealand trucking industry. Global influences were relevant to consider initially given the literature around globalisation, however once interviews commenced, the participants concentrated on local industrial issues. Further, the economic climate, weather and environmental conditions, supply chain interactions, other transport modalities, and the conversation around automated trucks were deemed outside the scope of this study.

Family members were initially considered as participants to interview. Given the inclusion of well-being in this study, the support that they provided truck drivers was considered of relevance and this was backed up by the literature (Peretz & Luria, 2017; Shattell et al., 2010). However, in discussions with the AUT Ethics Committee it was deemed unsafe to include family members given the literature around family violence in similar communities and populations to truck drivers. Two participants included in the driver interviews were the partners of truck drivers. The researcher decided to include

these two because they were co-directors representing dependent contracting entities with information deemed relevant to this study.

The levels of abstraction were not completely clear at the commencement of the study, however, Becker (1998) proposed that studying society is an oscillation between looking at the world, digesting what has been seen, and then going back for another look. This is how the researcher used the abstraction process. What was found during the process were the clues to what to look for next. This linked to the Abductive approach used for this study of which allowed for continuous movement between the world of those researched and that of the EST model (Dubois & Gadde, 2002; Jenkins, 2017; Dubois & Gadde, 2014).

4.8 Abductive Reasoning

Induction and deduction are familiar modes of rational thought to the academic world (Schroeder, 1991). Peirce, an American philosopher, coined a third term to capture the imaginative act of hypothesis formation - abduction. Abductive reasoning, in normal English, is “intelligent guessing” (Schroeder, 1991, p.180) where a researcher follows a hypothesis because if it were to be accurate, then observed events could be explained.

Abductive reasoning, through this process, helps to determine what theories we should, therefore, pursue (Schroeder, 1991; Dubois & Gadde, 2002; Jenkins, 2017; Dubois & Gadde, 2014). Peirce’s idea of abductive reasoning has been compared to methods used in classic detective stories beginning with the collection of facts and then the formation of a story to explain the facts. Having developed an initial story, the investigator seeks additional information. The development of the story depends on what is being found (Dubois & Gadde, 2002) but the act of observation is itself determined by the story (Schroeder, 1991). “Abduction then is the art of asking good questions and making good guesses, which themselves are further questions” (Schroeder, 1991, p.181).

Through this process, abductive reasoning builds on the “refinement of existing theories” (Dubois & Gadde, 2002, p.559) rather than creating new ones with the intention of development and exploration. In this way the researcher is not constrained by existing theory; therefore, it is a useful approach if the objective is to discover new things and explore complex structures (Dubois & Gadde, 2002) as was the case for this study.

Given the highly complex nature of the trucking industry and the scarce information previously recorded, abductive reasoning allowed the researcher to consider the scope of the problem, capture previously unthought of contextual factors, and explore the interaction between the factors while consulting the EST model. Sharples (as cited in Shorrock & Williams, 2017) writes that an emergent theory approach:

“denotes the practices of allowing the theoretical implications and findings to emerge from the setting...leads to a more holistic approach to data collection and is very sympathetic to systems thinking” (p.410).

Further, it is explained that such an approach allows for the consideration of contextual factors. It focuses on capturing the richness of the work environment and then to observe patterns that are emerging which can be reintegrated into the existing framework (in this case the EST model). Additionally, an abductive approach ensures findings have higher face value with the participants ensuring common language is incorporated into the final framework. This was deemed particularly important as this study was problem-lead.

METHODS

4.9 Introduction

The theoretical underpinnings of any research project surmise the methodology; often developed within a specific discipline (Grant & Giddings, 2002). It is the methodology that justifies the methods chosen (McDonnell, 2016).

Very little was understood about the contextual factors impacting the OHSW of truck drivers in New Zealand. Therefore, the method chosen needed to be one that allowed the researcher to, together with the researched, explore suggestions as they arose when collecting the data thus aiming to uncover potentially unknown reasons for poor OHSW.

The methods chosen for this study were secondary data document analysis and semi-structured interviews and occurred across three phases. Data collection techniques typically employed by qualitative researchers include moderately structured, open-ended interviews (Sandelowski, 2000) because they have “the potential to generate rich and detailed accounts of the individual’s experience (Goulding, 2002, p.59). The researcher also kept a reflexive journal during the collection of data providing a written account of experiences through the research process (Samples included in Appendix 4). The study employed these methods to ensure a co-construction of information with the participants as an interpretive and critical theory researcher might likely do (Denzin & Lincoln, 2005; Creswell, 1998).

4.10 Research Phases

Each phase in this study was sequential. Below is an outline of the three phases and the methods used for each; the three phases will be discussed separately. **Phase One:** Analysis of Insurance Company Data related to truck driver OHSW; **Phase Two:** Industry Key Informant semi-structured interviews; **Phase Three:** Truck Driver semi-structured interviews.

4.10.1 Phase One: Analysis of Insurance Company Data Related to Driver OHSW

One of New Zealand’s largest Insurance companies identified the trucking and logistics industry as one of great concern, not only to them as insurers but also to related business operators and the general road-using public. In response, this particular insurance company acquired the assistance of an external consulting company to help address the

performance of transport operators specifically about their health and safety. Through their collaborative partnership, they developed a programme specifically focused on giving voice to all those in the transport company including the operators, the drivers, and all others available. Each in the transport company were given the opportunity to confidentially answer a set of questions and give detail on their views on the health and safety issues at hand. All identifying information was then taken out by the consulting company. Having built up a relationship with the lead managers on this project in the insurance company and the consulting company, the researcher was given a unique opportunity to code and present the data.

This data was not collected for academic purposes therefore key information that an academic researcher might record was not provided. Although initially this data was not going to be included, valuable information was acquired during the analysis process. The data provided an entry into the trucking industry in New Zealand; industry vocabulary was learned, and key issues were brought to the attention of the researcher. This data was not relied on for more than the introduction of key concepts as told by those in the industry.

4.10.2 Phase Two: Key Informant Interviews

Key Informants were interviewed to access a broad range of industry expertise and gather a wide variety of perspectives as representatives of various levels of the system. The purpose of these interviews was to gather enough information to understand the contextual factors relevant to the truck drivers. The content addressed in these interviews aimed to capture the Key Informants' perspectives on the state of the industry in relation to driver OHSW, relevant contextual factors and how they interact, but also the relevant cultural, structural, and organisational influences on truck drivers.

4.10.3 Phase Three: Driver Interviews

Contracted drivers and employed truck drivers were interviewed during this phase. The interviews were semi-structured (though less structured than with the Key Informants) in nature to obtain "descriptions of the life world of the subject with respect to interpretation of their meaning" (Kvale, 1996, p.124). This allowed for flexibility to ask further questions for clarification if necessary (Bryman & Bell, 2003). The experiences of the drivers were of greatest interest, and the interview structure was guided by their

insights (Kvale, 1996). The interviews for this phase aimed to capture the experiences of the truck drivers, their job characteristics, and the health, safety, and well-being issues faced. Points of discussion were based on the literature review conducted, and findings from both Phase One and Phase Two of the research.

4.11 Participant Selection

The participant recruitment processes for Phase Two and Phase Three are outlined below. Overall, 45 participants were interviewed for this study, which includes Key Informants and truck drivers.

4.11.1 Phase Two: Selection of Key Informant Participants Using Purposive Sampling

The Key Informants were selected based on purposive sampling; each participant had a direct and current connection to the trucking industry in New Zealand. The researcher ensured there were at least two representatives from each level of the system, thereby providing a breadth of perspectives from across the industry.

The researcher aimed to start with 20 interviews and then continue the process of contacting more Key Informants until the assessment of the data indicated no new information was coming to light (Lincoln & Guba, 1985). This indeed happened once the researcher had reached around 20 interviews; however, five more participants were encountered through snowballing during the process, and the researcher decided to include them. During this phase, therefore, 25 interviews were conducted in total, in two instances there were two interviewees interviewed at the same time. The characteristics of the participants are featured in Appendix 5. At this point, the researcher was confident saturation had been reached.

Purposive sampling is a method used to identify participants who are chosen with a specific purpose in mind (Neuman, 2000). With purposive sampling, the researcher does not attempt to pick subjects that represent the entire population; it is typically used in exploratory research where random sampling from a list cannot occur (Neuman, 2000). Subjective information (e.g. location, social groups, and conferences) and experts (e.g. government bodies, associations, and organisations) were used to identify a sample of Key Informants for the study.

The criteria for selection were as follows. The participants all had to be in or connected to the trucking industry in New Zealand.

- Be a member of a body or an organisation that represents truck drivers; OR
- Be a member of a body that employs or contracts truck drivers; OR
- Be a member of a body that regulates, enforces the law, or has other legal input into road transport industry; OR
- Be a contract manager of contractors in the trucking industry; OR
- Be a member of an organisation that ensures owner/drivers, contractors, or larger logistic companies; OR
- Be an academic, researcher, journalist, or author in the area of contractors/truck drivers.

The researcher did not attempt to generalise from a sample of this kind. However, it helped to clarify and set up for the driver interviews in Phase Three.

In the first step of carrying out the purposive sampling, the researcher began identifying the possible participants once Ethics Approval had been gained for this study. Using the structure of the EST model the participants were identified with the help of one or two industry contacts. Potential interviewees from each system level, e.g. government agencies, associations, and unions were enlisted and the researcher contacted them via email, over the phone, or, where possible, face-to-face. Again, Appendix 5 provides details and characteristics of the Key Informants interviewed and how they were recruited. This table also lists those people who were contacted and did not participate and why.

From the list of those that were not interviewed, seven people were not willing to participate in the interview or did not believe they had anything to offer, further, there were another ten who did not respond to either the emails or the phone calls, and lastly, there were five interviews conducted and not used. There were varying reasons why the interviews were not used. One interviewee was anxious and uncomfortable during the interview and was unable to answer the questions. Another two gave what was deemed irrelevant information by the researcher, and the last was helpful in connecting the researcher to helpful websites and other resources but was unable to give much information related to the study.

4.11.2 Phase Three: Selection of Drivers using Purposive Sampling and Snowball Sampling

Purposive and snowball sampling was used to recruit the drivers for interviews at this phase. The researcher first recruited drivers through the Key Informants to ensure a link between those spoken to in Phase Two and the drivers spoken to in Phase Three. This snowball sampling technique produced nine interviews from a total of 20 interviews overall. Snowball sampling is often used by social researchers because they are typically interested in connections and networks of people (Neuman, 2000). It does not mean that each person must directly know or interact or be influenced by every other person; rather it means that, taken as a whole, most are interconnected in some way (Neuman, 2000). However, relying on Key Informants meant the researcher had to go through a middle person which took more time than initially planned. Therefore, a new sampling plan had to be drawn to recruit drivers as no new interviewees were presented.

In the lead up to the data collection, the researcher had attended National Trucking Conventions, Association Conferences, had participated in meetings with the Women in Road Transport Board in New Zealand, and been accepted to join a private Facebook page for truck drivers in New Zealand. In another form of snowball sampling, the researcher sent a message out to all contacts from the above activities and the same message onto the closed Facebook page asking drivers to be in contact if they wanted to participate in the research.

It was stated clearly that they would have to private message the researcher to ensure confidentiality. This form of recruitment meant that the drivers were nominating themselves to be interviewed. The researcher was astounded by the response to this, receiving messages from another 20 possible interviewees. Snowballing can sometimes turn into an avalanche, and in other situations, it yields nothing. In this situation, snowballing worked well because the Facebook page was a previously set up forum for those who like to voice their ideas and thoughts thus producing participants willing and prepared to be interviewed.

Once the selection criteria were applied, the researcher was able to conduct another 11 interviews bringing the total interviews conducted in Phase Three to 20. The selection criteria for all the drivers were as follows:

- Contractor and Owner Driver/Operator or an employed truck driver as their [primary source of income or] full-time job, does not need to be currently working but have been in this role in the past five years
- Be contracted or employed to deliver products in and around New Zealand
- Be over 18 years of age
- Have worked in New Zealand for at least 12 months as a truck driver in the past five years
- Have a class four license or above

It is acknowledged that recruiting interviewees through self-selection processes such as those using the Facebook page could mean that the researcher gets a sample that misrepresents the population. However, and as mentioned above this study does not attempt to generalise, as it is an exploratory study.

The researcher was aware of the difficulties in recruiting potentially vulnerable workers, and that securing interviews with, for example, drivers with migrant status was going to be challenging. This was the case. On occasions, interviews had been scheduled only for (some of the more vulnerable) drivers to cancel at the last minute despite them being assured of complete confidentiality.

Of the 20 driver interviews conducted two were the business partners of the drivers as the drivers were unable to attend the interview. In both instances, the participants were co-directors representing a contracting entity, and after conducting the interviews and discussing the relevance with the researcher's supervisors, the information was deemed relevant. These two interviews were the exception to the criteria outlined above.

Those that were not interviewed either did not fit the criteria, were not able to fit an interview in with their schedule or did not make further contact after the initial message they sent. Appendix 5 outlines the driver interview details; their employment status and the way that they were recruited. It also includes those that were not interviewed and why.

4.12 Data Collection

The data collection for each phase occurred separately and in total spread over an 18-month period. The primary method of data collection was semi-structured interviews for Phase Two and Phase Three. Secondary data analysis was employed in Phase One.

Phase One occurred during May of 2015 with the next two phases beginning in June 2015 and April 2016 respectively.

The researcher felt saturation was reached when a number of contextual factors were identified, the nature of the factors was explained, and how they interacted was well covered. Saturation had been reached after approximately 80 percent of the interviews were conducted however the researcher continued past this point and collected more data for further confirmation. There is limited agreement over what saturation is for qualitative data methods; much is dependent on the size and nature of the study (Fusch & Ness, 2015). However, general agreement centres on saturation being reached when there is enough information to replicate the study (O'Reilly & Parker, 2012; Walker, 2012), when no new information has been obtained, and when further coding of the data is yielding no new results (Guest, Bunce & Johnson, 2006). The researcher used this as a guideline for data collection and interview numbers.

4.12.1 Data Collection: Key Informants and Drivers (Phase Two and Three)

Data collection for Phase Two occurred between June 2015 and April 2016. Additional participants were interviewed starting again in May and going through until August of 2016. The data collection for Phase Three occurred between April 2016 and December 2016. The method chosen for both Phase Two with the Key Informants and Phase Three with Drivers was semi-structured interviews. They are presented together below as there were similar methods employed in Phase Two and Three.

Semi-Structured Interviews

There are several types of interviews including the unstructured and interactive interview, semi-structured interviews, and structured interviews (Corbin & Morse, 2003). According to Corbin and Morse, the main difference between them is the degree to which participants have control over the process. In this study, the Key Informants and the drivers were interviewed using semi-structured interviews.

A semi-structured approach was deemed most appropriate when speaking with the Key Informants and the drivers. A more structured approach eventuated for the Key Informants because many of the participants were working in a professional capacity, and the researcher felt it was important to utilise their time and still elicit the required information efficiently. If the participant appeared rushed or did not want to elaborate,

the researcher had the security of questions to ask. Other Key Informants wanted to talk more freely, and so in these instances, the researcher was able to relax the structure of interviews. In such cases, the nature of the interview structure allowed the participants to tell of their experiences without too much constraint from the researcher. The interview questions were developed using the literature review and initial conversations with industry informants. A table displaying this information can be found in Appendix 6.

A more participant-driven conversation was important because, as mentioned above, the Key Informants were seen to be the experts. The researcher could follow up on topics of interest, gaining their view on the issues if it felt appropriate (Bryman & Bell, 2003). With the flexibility embedded in the interview, it was possible for previously unthought of ideas or themes to arise stimulating new questions and findings (Goulding, 2002) and allowing for reflection on the framework used (Dubois & Gadde, 2002).

With the drivers a less-structured approach resulted. Fontana and Frey suggest that if the study is explorative, this type of interview allows the researcher to become familiar with a particular topic or setting. Corbin and Morse (2003) add to this by suggesting interviews that are less-structured allow for shared experiences in which the researcher and the participants come together to create a context of conversation and intimacy where those being interviewed feel comfortable telling their story. Less structured interview methods attempt to “understand the complex members of society” (Fontana & Frey, 2005, p.706) without limiting the field of inquiry. This style of interviewing allows the researcher to “enter into the world of the respondent” (Leech, 2002, p.665).

The researcher realised that the drivers were not always able to follow the questions asked and it was somewhat intimidating for them to be brought back to the initial question. The researcher then trialled a less structured approach allowing the driver to tell more about their experiences. The researcher found this to be fruitful; the relevant information was collected, and information the researcher could not have predicted was discussed. Additionally, holding a rigid structure while in the cab of a truck, for example would have been untenable. Conversation and the opportunity to show genuine interest and empathy for the drivers meant that trust was formed allowing the successful collection of data.

In addition, deciding how to present oneself is very important according to Fontana and Frey (2005) because once the “interviewer’s presentational self is “cast” (p.707) it leaves an impression with the participant and can affect how well the interview proceeds from that point. This was the case when interviewing the drivers. The researcher decided to purposefully dress in casual clothes to associate less with academia and more with her ‘working-class’ background. The researcher was conscious of a comparable shift when talking to those in the various positions throughout the system. This was done with the intention of presenting herself as someone there to learn. The researcher believed this played an essential role in the success of the interviews.

Because the goal of the semi-structured interview was *understanding*, it is paramount to establish rapport with the participants so that the researcher can attempt to see the situation from their perspective and create an environment in which the drivers felt comfortable to tell their stories. A common criticism of interviewing is that trust boundaries can be broken. In response, Corbin and Morse (2003) suggest that it can be therapeutic for participants to talk to someone who is listening with genuine empathy and that when interviewing participants about sensitive topics they should be able to stop the interview whenever necessary and therefore have control over the situation. This idea is further supported by Kvale (1996) who suggests that the very act of talking with another person that shares an interest and is genuinely interested in your viewpoint can be a very rewarding experience.

To understand the context of the participants further and to keep up with current happenings in the industry, the researcher chose to spend time at Transport Industry gatherings, attend union meetings with drivers, sit in Court with truck drivers and trucking companies, and go out in the cab with drivers. Showing authentic concern and interest helped to gain the trust of, in particular, the drivers, and this was something that was deemed important by the researcher and, as it turned out, the drivers. As an example, the drivers appreciated when the researcher could talk about her favourite truck, what the cost of tyres were, and how irritating other road users were. It was understood that once trust was gained, it could just as easily be lost (Fontana & Frey, 2005).

4.12.2 Interview Protocol for Phase Two and Phase Three

At the start of each face-to-face interview, the researcher provided the participant with the AUTEK approved Information Sheet and Consent Form to sign (see Appendix 7) before starting the interview. The interview length ranged from 30 minutes to four hours, omitting one driver interview that was conducted during a 15-hour shift. The average length for the Key Informant interviews was approximately one hour, and for the drivers, they lasted approximately two hours. The Key Informant interviews were held in participants' offices, in a neutral location such as a café in two instances, or if no other alternative was available, over the phone. The researcher made every effort to travel to the location of the Key Informants that included trips to Wellington, outer Auckland regions, Christchurch, and within Auckland city itself.

The truck driver interviews were more challenging due to difficulty in securing a location, as their schedules were not always certain or within reasonable hours. The researcher travelled around the country to interview the drivers. Some interviews took place in the cab of a truck, others in the drivers' homes, some in a neutral location, and for some drivers, the only time they could talk was during a shift over the phone, while waiting or queueing or on their rest-breaks.

For each interview where the researcher was out of the office, an external person was notified of her location (confidentially), estimated time of completion and estimated time home. This person had the contact details of the researcher only and was instructed to make contact at the agreed time. This person in most instances was the researcher's partner or her supervisor(s). The drivers and other participants were not always known to the researcher and conducting the interview sometimes required time out on the road in trucks or in isolation with the interviewee. Safety measures were of high importance in this research design and are further outlined below.

Recording the Interviews

The interviews were recorded using Olympus Digital Voice Recorders. As a backup to the audio recordings the researcher also, when appropriate, took hand-written notes. The upside of taking notes was that the researcher could write down follow-up questions or points to query and in some instances, it gave the researcher time to pause and take a minute to think about what needed to be asked at that point. It also allowed the interviewee to collect their thoughts. For some interviewees, having the interview

recorded was uncomfortable, therefore, in these cases, only hand-written notes were taken.

Transcribing the Interviews

After each interview, the digital recording was transcribed by the researcher. Transcripts were typed verbatim and in full. Grammar was as the participant spoke it. The digital recording files were saved to the researcher's work computer and portable hard-drive under the unique Identifying Number given to the participant to ensure their confidentiality was upheld. When the name of a person or the name of a company was mentioned, it was replaced with [Name] or [Company Name] as explained in the findings section of this thesis.

4.14 Data Analysis

“Data analysis is not off-the-shelf” (Creswell, 1998, p.142) instead it is often custom-built to the study, revised along the way. Critics of qualitative research comment that it is mostly intuitive, and the results depend on the interpretations of the researcher. This is not denied by the researcher, instead embraced in line with the methodology outlined above. Analytic procedures have been followed to give the researcher guidance on how to deal with the volume of data in line with interpretive research (Braun & Clarke, 2006).

4.14.1 Phase One: Analysis of the Secondary Data

To analyse the data provided by the insurance company, descriptive content analysis was used. Descriptive content analysis is a technique most commonly used to characterise and compare qualitative documents (Manning & Cullum-Swan, 1994) and is recommended for eliciting themes from many documents and published material (Dixon, Bouma & Atkinson, 1987). It allows for the summarising of the data and a straight descriptive summary. Descriptive content analysis has been criticised for producing a lack of context around the data. However, for this phase of the study, little contextual information was available therefore a straight description was satisfactory.

Miles, Huberman, and Saldaña (2014) suggest a process for descriptive qualitative analysis based on the assumption that the data is processed, in word form, and ready to be analysed. “Codes are labels that assign symbolic meaning to the descriptive or inferential information” (Miles et al., 2014, p.71). Descriptive coding assigns a label to

sections of data that eventually provide an inventory of codes for categorisation. Once the data has been coded in this way, in that each relevant sentence has been summarised and coded with a keyword or words, the researcher is then able to extract all passages coded with a particular label and compose a more detailed catalogue to construct a narrative.

The method chosen to analyse the secondary data follows the above process. Each organisation's qualitative survey data was read separately by the researcher. The Word documents were set up so that the page had a 4cm margin down the right-hand side where the researcher was able to make handwritten notes of the codes. The survey was set up in such a way that the respondents were asked to comment on what was working well within their organisation and what was not. This elicited categories of information and particular codes became apparent. The respondents raised issues around fatigue, risk, poor pay, communication, and training for example. These were used as codes.

The researcher was then able to go back through the transcripts, note the information coded under each of the headings and write a summary for each of the themes. A draft of the summaries was given to the Consultants and the Insurance Representative to view. This document was a collection of ideas that represented and stayed close to the original dataset.

4.14.3 Phase Two and Phase Three: Analysis of the Key Informant and Driver Interviews

As recommended by Miles et al., (2014), data analysis should occur concurrently with data collection. It is suggested that the collection of data and the analysis can be seen as a stage in the analysis generating new questions to ask future participants and can assist in building on potential blind spots that the researcher may have.

The data collected from the Key Informants in Phase Two and the drivers in Phase Three were analysed using thematic analysis outlined by Braun and Clarke (2006) with adaptations from the researcher to incorporate computer-assisted analysis.

Familiarisation with the Data

The researcher transcribed the entire data set, verbatim, and this created familiarity with the data (Riessman, 1993). It gave the researcher an opportunity to take note of initial

ideas (Braun and Clarke, 2006) in the Reflexive Journal (discussed at the end of this chapter).

Generating Initial Codes

Systematically the transcripts were read through with each part given equal attention. The transcripts were printed with a 4cm margin down the right-hand side of the transcript. All data were given a code that was, in effect, a summarising word for the section in question. As a result, a list of initial codes was produced. The process of coding is a part of analysis (Miles & Huberman, 1994) as the data becomes organised into “meaningful groups” (Braun and Clarke, 2006, p.18). This phase is descriptive and produces a list of codes that can then be grouped thematically; interpretation then occurs.

Braun and Clarke (2006) suggest that the coding will depend on whether the study is driven by the theory or purely by the data. From an abductive approach, initial categories were envisaged based on the EST model, and the researcher began noticing where the data sat in relation to each level or whether new connections were appearing.

Searching for Themes

From the list of codes produced from the interview transcripts, broader level themes were identified. This process occurred as codes coalesced to produce an initial list of overarching themes. Relationships between the codes were noted, for example, a) the impact of the increasing number of contractors and b) business experience; c) the link between regulatory changes and d) government agency jurisdictions.

Reviewing Themes

Braun and Clarke (2006) suggest that this phase be a refinement of the themes; see how they fit together and ensure they represent the overall story from all the participants. Some themes might collapse into two, they suggest, and once this stage is complete, a final list of themes should emerge. A thematic map (Braun & Clarke, 2006) was created as a visual representation of potential links between the themes and codes within the themes. This process was used to set-up for the coding of the data in NVivo; each of the central themes was used as a node for analysis.

Managing Qualitative Data Using NVivo Software

The main themes and the corresponding sub-themes were used as nodes in the coding software NVivo. Each of the transcripts were uploaded to the programme and re-read by the researcher. As the transcripts were re-read, each sentence in the data was considered and placed into the relevant node. Some sentences or paragraphs were deemed relevant to more than one node and in such instances, they were placed in both. Using NVivo allowed the researcher to visually display which code had been assigned to each section of data, search for keywords, terms or phrases, and allowed a record to be kept of all relevant information selected for each theme (node) identified. NVivo allowed the researcher to print off the contents of each theme (node) and begin identifying prominent contextual factors, their nature, and how they interact. It was not used as a tool for analysis.

Defining the Themes

The printed contents from NVivo allowed the researcher to see the overall story under each theme. Sub-themes were created and solidified during this process, which gave structure to the larger and more complex elements. A hierarchy of the data occurred (Braun & Clarke, 2006), for example, ‘the nature of being a driver in New Zealand’ unsurprisingly received the greatest attention from the Key Informant data. This theme was broken down into subthemes namely: Employed Drivers, Owner Drivers, and General. The first two sub-themes listed here were complex and large so were broken down into further sub-themes. A full list of the themes can be seen in Appendix 8.

REFLEXIVE JOURNAL

4.15 Journal Justification

It has been suggested that maintaining a research diary improves the rigour of the study (Vaismoradi, Turunen, & Bondas, 2013). In keeping with recommendations made by Lincoln and Guba (1985), a reflexive journal was kept by the researcher before, during, and after the data collection phase. The diary process elucidated previously sub-conscious values held by the researcher and helped to bring to the surface how they may have been relevant to this study (Smith, 1999).

Journal entries were at times detailed, structured, and insightful and others incoherent, intuitive, and filled with frustration. Lincoln and Guba (1985) acknowledge that the idea of the journal is to be reflexive; meaning to refer back to oneself and to go back over what has been done, therefore providing additional information about the human instrument in the research process itself. They go on to suggest that the “journal provides information about methodological decisions made and the reasons for making them” (p.327) which lines up with the more value-laden methodology choices made by the researcher. The researcher felt the use of the journal assisted in the abductive nature of the research, as the data was collected, the thinking around and the use of the EST model changed leading to a reworking of how each system level was interconnected. The system looked different after each phase of data collection, and the reflexive journal allowed a record to be kept of this process.

4.16 Journal Exert

Below is one exert from the researcher’s Journal. Further samples with their analysis can be found in Appendix 4. They have been included in this thesis to give insight into the process, thoughts, and comments made by the researcher throughout the process. Names and identifying features have been removed.

October 2015

Spoke to KI9 today and ran a few of the findings from the interviews to this point past him. We spoke primarily about the [Name of the] conference, and which types of people were represented because the whole thing felt loaded on the side of the employers with no focus on the individual drivers and their concerns. I couldn’t make sense of it until I spoke with him. Also, it was good to put some of the previous

interviews into context for example, [Interviewee Name] interview. In my opinion that interview was difficult, and I felt I wasn't getting information that answered my questions. KI9 said that he had had dealings with [Name] and that this person in particular was a strong advocate for employers and transport companies and had little dealings with owner-drivers. There were clear conflicts there and that the [Company Name] were not totally open to the discussion around owner-drivers. The day prior to that, a large multi-Nat had paid [Company Name] \$25K to become a member. How can they not see the potential conflicts here?"

This excerpt has been included to show firstly how the researcher was able to make sense of some of the findings with a trusted group of advisors but secondly to show some of the ideas that begun to develop throughout the study. It was also a way to capture and test important questions outside the scope of the study at hand, but ones that could be relevant to subsequent researchers.

Interpretive and critical methodologies require researchers to be aware of what feelings, values, and beliefs constitute their ideas. A reflexive journal encouraged internal dialogue for analysing and understanding the issues related to the researcher's project (Smith, 1999). The process meant there was a kept record of the way in which thoughts were processed and this was highly valuable to the researcher.

MINIMISATION OF RISK TO THE PARTICIPANTS

A potential risk acknowledged before the commencement of data collection was that interviewed participants may experience discomfort when speaking about their work experience and conditions. Questions regarding their health, safety, and well-being may have focused their attention on any problems they were facing in their daily lives potentially causing psychological discomfort. Participants were also asked to comment on the employment practices of their organisations. In some cases, this may have been an unpleasant or risky topic for them to discuss. Based on the literature reviewed in previous sections, there is a link between employment practices and the increasing vulnerability of workers engaged in such practices. The trucking industry is one that is riddled with potentially vulnerable workers (Quinlan, 2013) and presumably not just those in driving roles. The researcher considered this before the commencement of data collection using guidelines from previous studies.

Researchers in this area have noted some issues to consider when conducting a study involving vulnerable workers and small businesses (Gravel, Legendre, & Rhéaume, 2013; Gravel et al., 2010; Lamm, Frick, Jamieson, Martin, & McDonnell, 2013). Vulnerable workers can be reluctant when asked to give information of their working conditions, in particular, those precariously employed. A possible solution when researching vulnerable workers includes taking the standpoint of the worker or the person interviewed and ensuring respect is shown. Māori and Pacific Island epistemologies have offered valuable insight (Cram, 2009). The following principles were included when the participants were approached: *Aroha ki te Tangata* is to show respect for people, allowing people to define their space and meet on their terms. *He kanohi kitea* places value on meeting people face-to-face. *Kaua e takahia te mana o te Tangata* requires us to not trample on the mana or dignity of a person. *Kia mahaki* is to show humility, to not flaunt knowledge and find ways of sharing it.

In line with the AUTECH Ethics Guidelines, the researcher made every attempt to meet with the participants in their space, at a time of convenience to them, and in this way, respect their terms for the interview. The researcher approached each interview not as an expert but as someone privileged to be given insight into the working experiences of each participant. Further, the participants were not required to answer any of the interview questions especially those that caused them to feel embarrassed or uncomfortable. Each participant was given the option to terminate the interview at any

time and to retract information. Permission was obtained in writing from each of the participants to record the interview; they could also request the recorder be turned off anytime during the interview also. Confidentiality of information the interviewees provided was guaranteed at the commencement of the interview to ensure no adverse consequences resulting from their participation in this study.

To maintain confidentiality, the researcher removed all identifying details from transcripts at the transcription phase. All transcripts were typed by the researcher alone. Contact details were not stored with the data provided. None of the participants retracted information, so no data has been destroyed yet.

CHAPTER FOUR CONCLUSION

The critical and exploratory nature of this study was designed to elucidate previously unknown contextual factors in the OHSW of truck drivers in New Zealand. This included the exploration of what the underlying factors were, the role of cultural, structural and organisational influences, and how these factors interact with each other.

This study was designed using a combination of interpretivism and critical theory (critical interpretive inquiry) and guided by the researcher's belief that to make headway with truck driver OHSW, the lived experiences of industry experts was required. The researcher openly reported the ontological, epistemological, and methodological views in acknowledgement of the role they played in the co-construction of the data. Gaining the perspective of multiple industry experts aligned with the use of a systems approach; the design of this study encouraged the co-construction of findings between the researcher and the participants as experts.

To effectively explore the nature of the contextual factors impacting the occupational health, safety, and well-being of truck drivers in New Zealand, Key Informants and truck drivers were interviewed over an 18-month period using a semi-structured interview format. The data from this three-phase sequential collection process provided the information to answer the study's research questions:

What role do contextual factors play in the occupational health, safety, and well-being of New Zealand truck drivers?

- What are the underlying contextual factors impacting the occupational health, safety, and well-being of truck drivers in New Zealand?
- What role do cultural, structural and organisational influences play in truck driver health, safety, and well-being risk?
- How do the contextual factors interact with each other?

The interviews were transcribed by the researcher and analysed using content analysis and NVivo. The researcher's process was documented and reflected on using a reflexive journal, which aided in the co-construction of findings presented in the following chapter.

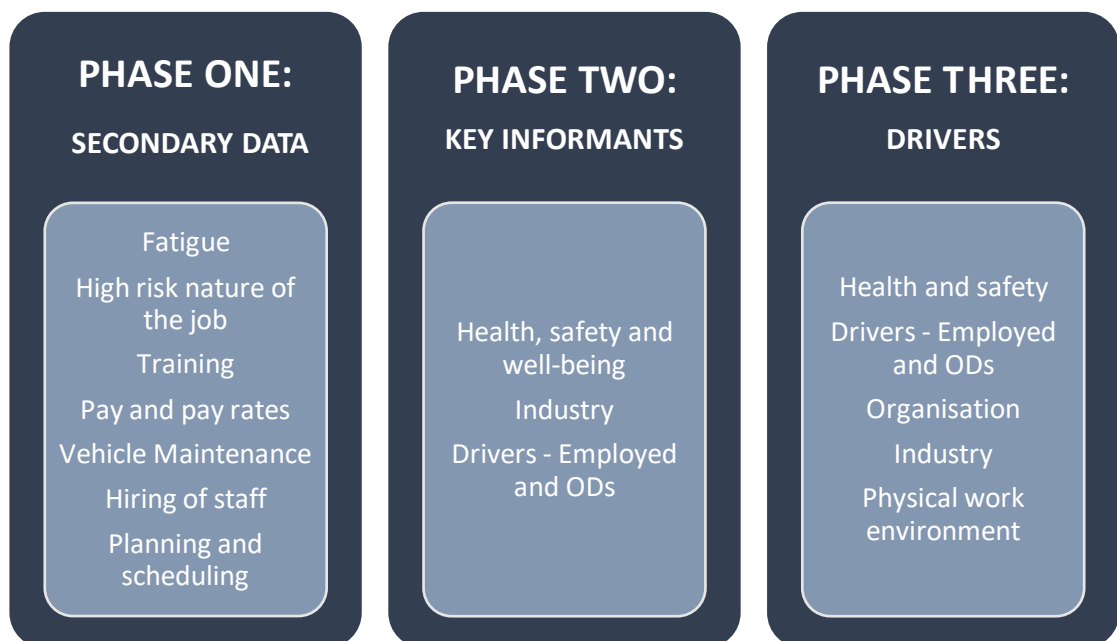
CHAPTER FIVE: FINDINGS

5.1 Introduction

The three phases of research were designed to gather multiple perspectives from various systemic levels to gain insight into the nature and role of the contextual factors and how they interact to impact the OHSW of truck drivers in New Zealand.

Phase One: An analysis of insurance company data related to driver health, safety and well-being, gave the researcher insight into the trucking industry including key concerns and industry vocabulary. **Phase Two:** included semi-structured interviews with industry Key Informants. **Phase Three:** included semi-structured interviews which allowed the researcher to collect data directly from the truck drivers and delve into the core issues as told by the individuals at the centre of this study. The key findings from the three phases are graphed below and listed in the order they are discussed in the upcoming chapter.

Figure 5.1: Key Findings from Each Phase by Theme



The presented order of the findings for Phase One reflects the most-spoken-about comments down to the least. The order of presented findings for Phase Two starts with the broader topics because the Key Informants represented the broader levels of the system and were, therefore, best able to provide information on systemic factors. Comparatively, the order of presented findings for Phase Three also reflects the position held by the participants. The truck drivers were best able to comment on their individual

experiences. Therefore, this section begins with a brief overview of OHSW and continues with the individual driver experience.

Across the three phases, similar themes arose especially from Phase Two and Three. Mindful of the participants' differing interpretations and views, and in line with the methodological stance of this study, the researcher purposefully chose to keep the findings results for each phase separate to ensure the views of each group were individually expressed and presented. In a similar vein, the findings have been presented thematically, and in a way that shows the level of attention given to each theme by the participants.

Throughout this chapter, Key Informants are referred to as (KI) with their unique identification number, e.g. (KI18). No attempts have been made to categorise Key Informants by their position within the industry, e.g. union representatives, given that some participants represented more than one role or could talk to previous experiences in which they held a different position.

Drivers were also referred to by their unique identification number, e.g. (D14). Initially, drivers were going to be identified by their employment status, e.g. owner-driver or employed driver, as it appeared relevant to the information they provided. However, for many drivers, their current position did not reflect previous experience, and some were or had been both. Therefore, they are referred to holistically as drivers and where relevant the researcher has pointed out further identifying features such as employment status.

Throughout this section, quotes have been used to illustrate further points made. Each quote has identifier number which correlates to the participant in question. All direct quotes are in italics within open quotation marks. In some cases, portions of the text were removed to reduce the quote to relevant data with careful consideration not to alter the intention of the statement. Where portions have been removed, ellipses (...) are used. Where the interviewee has used an identifying reference, a name, for instance, the researcher has replaced the name with [Name] and an organisation [Company Name]. The focus of this section was to present the findings without interpretation or analysis. Each phase has been visually depicted in a mind map detailing the interaction between the key themes elicited from the data.

PHASE ONE: ANALYSIS OF INSURANCE COMPANY DATA RELATED TO DRIVER HEALTH, SAFETY AND WELL-BEING

5.1 Introduction

Below is a tabled summary of the results from the analysis of the secondary data provided to the researcher by the insurance company and their collaborating external consultants. The results from this phase informed the upcoming phases but also supported the researcher in her desire to converse confidently with those in the industry. As noted earlier, gaining trust with the participants was of high importance and this data provided unique insight into the issues concerning a range of people throughout the system. The data has been tabled in a way that shows the order in which the themes were discussed (from most discussed to least).

Table 5.1 Phase One Data Summary

Theme	Summary from the Data
Fatigue	<p>Fatigue received the greatest attention from the participants, said to be caused by high stress levels, tight scheduling, and long hours. Some organisations monitored it closely.</p> <p>Many drivers felt exhausted, the drivers noted the dangers of working which fatigued but had accepted it as a part of their job. The shortage of drivers meant there were not adequate replacement drivers. Sometimes management and other staff members drove to fill in.</p> <p>Poor planning and scheduling meant time was not well spent and some drivers were doing overtime on a regular basis. Drivers were compelled to say yes to the work; low pay was cited as one reason. The impact on their family and home life was noted.</p>
High risk nature of the job	<p>Some organisations were, in their words, doing all they could to ensure the safety of their drivers. However, some drivers were reportedly driving beyond the hours they were legally permitted. Expectations were placed on the drivers to get the goods delivered but they felt they were given inadequate time for the run. The dangers of working under pressure were exacerbated by poorly maintained trucks – this they felt was a risk to them and the road-using public. This caused them discomfort and suggested the pressure they faced could make a reasonable driver act out of character.</p> <p>The fear of job loss or reprimand was a felt threat by the drivers.</p>

Training	<p>The drivers frequently noted a request for more training. Commonly mentioned by those from throughout the organisation was more OHS and induction training. Logistical difficulties were cited such as ensuring all members were together in one place given the variation in work shift times.</p> <p>A relaxed culture within the industry was noted – “She’ll be right” was mentioned a few times.</p> <p>Safety concerns were raised for new drivers and migrant drivers not trained properly, a lack of resources was cited as a primary reason for the improper training.</p>
Pay and pay rates	<p>It was suggested by many that the combination of poor pay rates and long hours were a contributor to the low morale and poor attitudes in the industry. If industry pay rates increased, companies would get a better standard of driver but this was a contentious issue. Doing a good job was seen as a direct conflict with getting the job done on time and making money for the company. “<i>Money dictates how safe we are</i>” (Organisation P).</p>
Vehicle maintenance	<p>Concerns were expressed around how thoroughly the trucks were being maintained. Commonly cited reasons for poor maintenance was a lack of resources such as time and money. Pre-run checks were reported as being highly important and should be better enforced among the drivers. Some organisations provided specialist people on site to assist with maintenance, it was recognised as a luxury not afforded by all. Response time after maintenance reports were logged varied among organisations, as did the willingness of drivers to report maintenance issues.</p>
Hiring of staff	<p>Some drivers expressed serious concern for other drivers who were, in their opinion, not adequately skilled to do the job. There was a call for more thorough employment checks to screen out those not capable of operating the machinery or coping with the demands of the job. Participants linked a lack of training to this issue; that it was difficult to find drivers adequately trained and organisations were not investing in enough driver training.</p>
Planning and scheduling	<p>It was reported by the participants that better scheduling might help to reduce risk-taking behaviour including logbook falsification to get the job done.</p> <p>Further, when drivers resigned they were not always replaced in a timely manner and sometimes not at all. That meant organisations were hiring short-term contractors to fill the positions. This led to an additional set of concerns, for example it was suggested that contractors and casual staff could walk on</p>

	<p>site with no induction, sign-in or training. Consistency in safety messages was difficult given the variety of people involved. This, some thought, required better planning and management intervention.</p>
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5.2 Phase One Conclusion

Multiple interactions between elements have emerged from this data. The participants focused on the industry, organisational, and individual (micro). This is representative of where they sat within the system.

Very few comments were made about the wider context, which includes the impact of regulations or government agencies. Mention was given to industry norms such as the relaxed “she’ll be right” attitude, and also the acceptance of long working hours, working while fatigued, and receiving low pay. Consequently, the impact was felt at the organisational level; evidence of this can be seen in the high stress felt by the drivers, the low morale, and the lack of skilled drivers. Additionally, at the organisational level, issues such as poor planning and unreasonable schedules manifested in long hours, increased work pressure, and fatigue. This was reportedly having an impact on the driver’s family and home life. Further, the high levels of fatigue, poorly maintained trucks, drivers’ pressure to meet deadlines, and low levels of training were not only compromising their safety but that of the wider road-using public also.

The system, as seen by the participants, is mapped out using the EST model in Figure 5.2 below and the interactions between the contextual factors in Figure 5.3.

Figure 5.2: Phase One Findings in the Ecological Systems Theory Model – The System as viewed by Insurance Data Participants

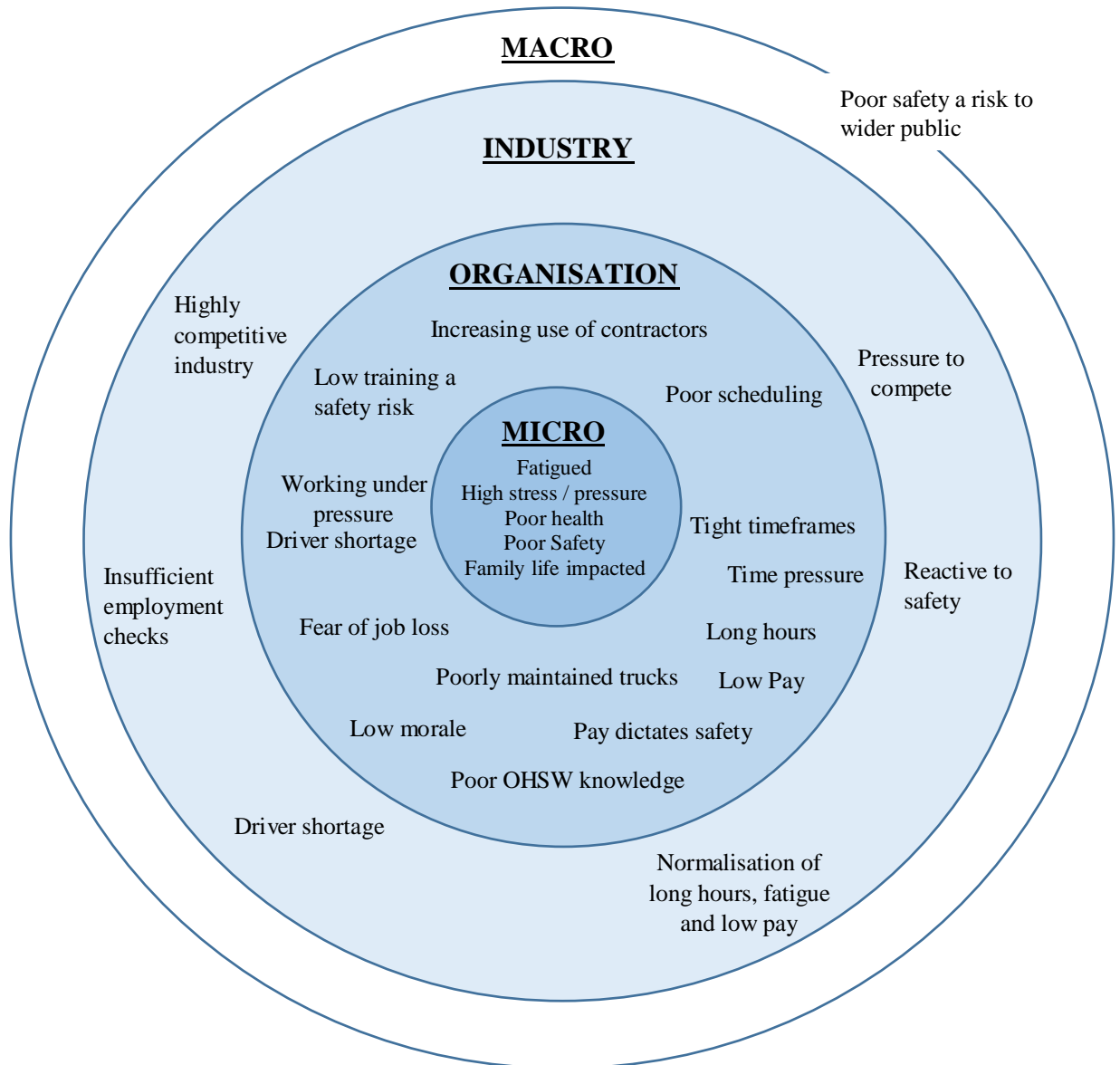
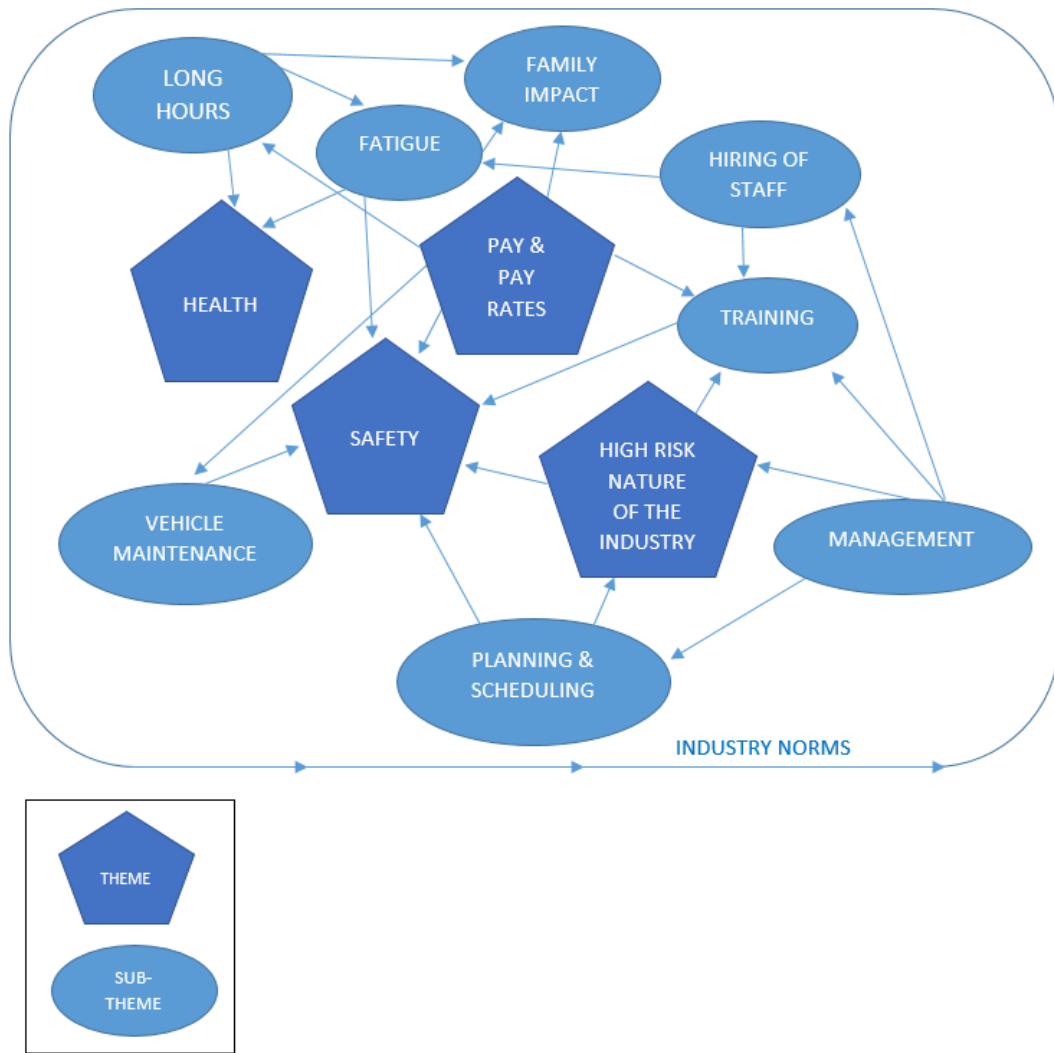


Figure 5.3 Phase One: Mind Map Showing Contextual Factor Interactions



PHASE TWO: KEY INFORMANT INTERVIEWS

5.3 Introduction

In this section, the findings from the Key Informant interviews are laid out thematically. These findings represent the views of those participants that sit predominantly in the outer rings of the system (Government and Regulatory, Industry, Organisation). The researcher had initially planned to present the findings based on a summary of what each group had discussed, i.e. Industry Representations or Associations. However, it was quickly apparent that many groups were discussing similar issues and therefore it made more sense to group the findings by theme. Where there were disagreements among the Key Informants, the researcher has attempted to represent this under each theme.

This section begins with the key OHSW points raised by the Key Informants, however then continues with coverage from the wider industry level followed by a more individual focus on the drivers.

5.4 Safety, Health, and Well-Being

Given that this thesis seeks to understand the underlying contextual factors impacting the occupational health, safety, and well-being outcomes in the trucking industry, this section will only briefly cover the conversation on OHSW to acknowledge that the issues that are in fact present – albeit as symptoms of deeper problems in the system. Below is a summary of the comments on the state of OHSW in the trucking industry in New Zealand from the Key Informants' perspective.

5.4.1 Safety

The safety culture of the organisations was discussed frequently by the Key Informants. Many believed the companies themselves were victims of an industry-wide culture that, for the most part, had evolved accept high levels of risk. It was believed that some organisations and the associations were taking steps to change the conversation about health and safety in the industry. However, unsafe practices have been occurring in the trucking industry for a long time, and it was felt by many that to undo or rectify this would take a great deal of effort.

“It is just an industry that has never been looked at, a whole lot of bad stuff that has been going on for a long time.” (KI4)

It was discussed that the practices in the industry were more reactive towards safety. There was a reported culture among the drivers of *“she’ll be right”* (KI11) and this meant that many safety incidents went unreported.

Some managers took the lack of reporting into their own hands. Those organisations and managers that had a proactive view of safety realised that safety breaches cost them money but also did nothing for their reputation. Sophisticated technology systems were used to monitor driver activity to ensure even the sub-subcontractors, in some cases, were monitored.

The challenge was that those managers and organisations that were prioritising safety were losing contracts to those who were willing to take risks and operate under unsafe conditions.

“[Company Name] ...they frequently lose contracts to third-tier operators who pay poor wages and don’t have the same health and safety standards.” (KI28)

It was mentioned that some running smaller trucking companies were competent transport operators, but their knowledge of health and safety was little. Other, more immediate issues were said to take greater priority even in a company where the safety culture was strong. This was supported by associations who mentioned that frustration and fear were evident around safety and around the new Health and Safety at Work Act from within the industry, especially from operators of smaller transport companies.

Speed and fatigue were of great concern to the Key Informants.

“That is the truth; speed and fatigue are the largest killers on our roads.” (KI6)

This concern was compounded by the increasing size of the trucks, with the introduction of the 50MAX vehicles which, according to the New Zealand Transport Agency (NZTA) allowed operators to carry increased volumes (NZTA: A New Generation of Truck, 2017). The benefits were communicated in such a way that it promoted less impact on the roads and suggested that fewer trucks were needed for the same amount of freight. However, according to some of the Key Informants, the increase in size has raised safety concerns. Not all drivers had the necessary skills to handle the size increase.

“... he delivered a brand-new truck up north for his employer and handed it over to a guy, and he said to the guy, what have you been driving? And he said, oh I have just been driving a four-wheeler for [company name]. So, a very small truck!” (KI28)

Headway was being made around safety in the industry, although there were still concerns about unsafe practices. There were high hopes for improvement after the introduction of the new legislation, and technology was making it more possible to monitor the activities of those who may have, in the past, been able to hide their unsafe activities. Despite this, safety issues were seen to be an easier target for transport operators, associations and enforcement agencies alike, at least for those who were interviewed. Addressing the health issues in the industry, however, was seen by some as outside their capacity. Further, it was believed by some that many of the unsafe practices were caused by poor health and exacerbated by personal choices in the driver’s lifestyle.

5.4.2 Health

Many of the driver’s health problems were related to the eating habits they subscribed to and their lifestyle factors, according to the Key Informants. Typically, the drivers were opting for food with high fat, high protein and high sugar content. It included the regular consumption of what many truck stops call “pie and can” deals; the pie served as something warm, easy to eat, and high in salt and protein and then a can of Coca-Cola or Energy drink to fulfil the desire for sugar and quick energy. It was mentioned that it was near impossible to find places to stop, especially the larger trucks and the places where it was easier to stop offered unhealthy food choices.

“It’s difficult for them to get food too because where you can pull up in a truck is very few places, so they are very limited ... a flask of black coffee and a couple half a dozen cans of V during a day is not a good way to go.” (KI10)

The infrastructure was not the only reason cited for the food choices drivers made, the levels of tiredness and fatigue meant that making a healthy decision was difficult. Having the energy drinks kept them alert for at least a short period during the long shifts they were working. It was suspected that even if healthier options were available, the uptake could be impacted by the need to stay awake and get more energy.

Long hours and shift work were also cited as contributors to the food choices made. Fatigue is a known issue in the industry; due to the extreme tiredness, it was suggested that many drivers did not feel able to exercise. Therefore, the issue is cyclic. Poor food choices reportedly caused fatigue and as such it was suspected to be challenging to make good choices, this led to an increase in weight which also led to fatigue.

From observations made by the Key Informants, the drivers did not have the time to stop, so drivers ate their food on the go.

“A lot of that is because they are eating crap foods, there is nowhere to park the truck...they are out there in the truck for 13 hours a day, and some of them only get out for comfort stops...the drivers get virtually no exercise... he comes home, finishes his 70-hour week... Sunday he is probably going to be flat out on the couch.” (KI23)

The conditions of the job and the job role itself were causing concern for those who saw the early ageing of many of the drivers. Diabetes and hypertension leading to heart problems were the most common health concerns noted by the Key Informants. Sleep apnoea, obesity, and bladder diseases including cancer were also seen in a high number of drivers.

“Diabetes is a big one; heart issues is a big one, obesity is big, blood pressure is big.” (KI11)

Some of the Key Informants were able to make links to certain elements of their job. It was reported that drivers were not stopping often, and this limited the amount of water they were drinking to avoid needing the toilet. This led to a host of issues including bladder disease, fatigue, and decreasing capacity to function. The hours drivers worked were a disincentive to get regular medical checks, this was further exacerbated by a “she’ll be right” attitude in the industry regarding health.

Some of the organisations and the health professionals had made considerable efforts to educate their drivers on healthy lifestyle choices, but before long, the drivers were falling back into old habits.

“...it is too hard for them to change even if the information is given to them about healthy living and food choices.” (KI14);

Examining the link between the working conditions and the driver health was proving to be challenging, especially for the Government agencies who recognised the urgent need to collect more information on the status of workers' health. One Key Informant suggested that it needed to be a collective approach where agencies were ensuring the right questions were asked, and the health professionals were asking more in-depth questions to discover the root of the many and varied health problems that affect the truck drivers.

“We’ve got a bit of a burning platform, mainly because we don’t really understand it.” (KI26)

5.4.3 Well-being

It was clear that stress, anxiety, burnout, and fatigue were present among the drivers. According to the Key Informants, the issues around driver well-being were not immediately noticeable which may indicate that the areas of concern are ingrained in the culture of the industry, in underlying issues that are not immediately obvious.

“So, you can see the stress builds up...you’ve got an operator who is running a bit behind time, so he is pushing it. The potential for an accident increases, stress, high blood pressure, heart attack... even in the younger guys.” (KI6)

Well-being issues among drivers were assumed to be worse than what was reported given the concerning state of driver safety and health. It is interesting that it does not get mentioned more throughout the interviews. However, it reinforces the importance of approaches such as the one utilised in this study that draws data together in various ways to get a breadth of contextual factors.

Fatigue

There was an awareness among the Key Informants that fatigue was symptomatic of deeper problems. They knew the drivers worked longer than they legally should but went some way in suggesting it was part of the job.

“It is an industry where a lot of people are working long hours, a lot of people work 70 hours a week some probably a bit more than that when they are not supposed to... you’ve got employers who push the boundaries.” (KI10)

It is suggested by this Key Informant that the role of the manager or employer is important to understand when considering the hours a driver works. At one end of the scale were operators and managers who invested into the management of fatigue; they showed concern for their drivers. Some of the larger companies had comprehensive fatigue management plans in place. It was suggested that within the culture of these companies it was not uncommon to have someone monitor the drivers and take them off their shift if they looked remotely tired.

“We have trialled all the new technology, we’ve trialled glasses, the latest trial we are actually running as a part of our business...But it has to be because fatigue is the biggest risk in our industry without a doubt.” (KI11)

Sitting in the middle were companies that, despite the knowing risks, explained that the long hours were simply a necessary part of the job and although they did their best to manage the risks, they felt they could not do much to avoid it.

“We need them to work those hours because they need to get the job done. You couldn’t survive.” (KI23)

At the other end of the scale were the operators that caused concern. They were the ones thought to be skirting the law on working hours. These, as explained by Key Informants, were the operators they wanted out of the industry.

“...the number of times I have heard the story of you’ve got to the end of your hours, but the dispatcher says, hey look, just drop this one over here. If you say, no it is out of my hours then they say well don’t bother coming back next week.” (KI4)

Frustrations were acknowledged by the operators when they had to admit that they were competing with those that did not always obey the law. Working the drivers to their maximum legal hours was something they often felt they had no choice but to do it and acknowledged that they were just joining “a race to the bottom” (KI28).

Long hours were taking a toll on the drivers as documented by the Key Informants. One Key Informant who had previously worked as a truck driver explains below:

“Beyond exhausted... I used to have both windows down, radio up and I would be slapping myself as I drove. I would be literally slapping myself to stay awake, and I would still fall asleep.” (KI9)

Some Key Informants were surprisingly unsympathetic. It was believed that symptoms of fatigue could be mitigated by making healthier lifestyle choices for example. It was believed by some of the Key Informants that there was no excuse for the drivers not to manage their nutrition.

“Everyone is responsible for their own nutrition, these days there is no excuse for going out and eating a meat pie for breakfast, lunch and dinner.” (KI4)

The level of fatigue in the industry was high taking a toll not only on their health but also their safety. One Key Informant explained how they saw fatigue lead to the destruction of immune systems, the disruption of circadian rhythms, memory loss and other similar issues which could lead to accidents.

The Key Informants were asked their opinion on why drivers were not contesting the long hours given the health risks they faced. One Key Informant said:

“He is working 13-hour days without a break.”

“Why?”

“He is given Hobson’s choice. Same old story. He is disposable.” (KI9)

There were mixed views on the current length of the driving hours. Associations in the past had lobbied for the longer hours however, many other parties thought they were too high. The lack of enforcement to ensure drivers were keeping to the legal hours was seen to be an equally concerning problem.

“Oh, it’s far too long. But the other thing too is the checking systems on log books is practically zero. Your chances of getting caught cheating on your log books are slim... There’s not enough enforcement.” (KI28)

5.4.4 Health and Safety from the Perspective of the Government Agencies

The health and safety of truck drivers in New Zealand was of concern for the Government agencies spoken to; well-being did not come up in the interviews. Although concern was shared among the agencies, some were attempting to cover the same issues, others were careful about not overstepping jurisdictional boundaries, and

for the most part, it seemed that a lack of inter-agency communication challenged attempts to work together.

This was not the case for all agencies; some were aware of where their jurisdiction lay and knew that when a serious accident occurred, for example, there were appropriate agencies to handle the situation. It is the broader picture, the collection and sharing of health and safety data, and the state of the industry as a whole that appeared to cause issues for the agencies. Transport was not deemed a category in and of itself when the agencies investigated; it was an industry that was threaded through other industries, such as construction and forestry. The trucking industry belongs everywhere and nowhere.

“We would see transport as one of those cross-cutting issues.” (KI26)

However, as mentioned by one Key Informant from another agency:

“To WorkSafe, the trucking industry is not a priority.” (KI16)

Memorandums of Understanding had been written up between agencies but in some instances had ceased without renewal.

“...it was the [Agency Name] who ran it so what we have is an MOU, sorry we did have an MOU with [Agency Name] ...so we kind of had a rough line as to who was going to be responsible for that.” (KI24)

In a similar thread, interest groups had been created in the past with representatives from the interested agencies but had almost all dissolved. The consequences of this were believed to be that the conversation around health and safety in the trucking industry was somewhat fragmented, allowing for no overall information on the state of the industry and the impact on the workers to be collected.

“Nothing interlinks... They don't communicate! That is the problem in our industry.” (KI13)

Those outside the agencies were quick to criticise the workings of the system and their interactions with the agencies with one citing that ACC was taking the responsibility off the employers because it was always going to be covered.

“We have an incident, and they go woooo! Watch out for this and this and this and we say oh well! ACC will take care of that. ACC is the worst problem.”

(KI11)

Attempts were being made to solve this issue with the agencies realising the high-risk nature of the industry. However, it was mentioned that progress was slow, and it was a long game.

“... there is a really strong desire in Wellington [NZ’s Capital] for agencies to work in a collaborative ...we can do much more together than independently.”

(KI26)

The specifics of the industry as a whole are explained in the following section. Given that the focus of this thesis was to understand the underlying contextual factors impacting truck drivers, it was thought best to explore the wider industry with the Key Informants. Below are their insights on the trucking industry in New Zealand.

5.5 Industry

The highly competitive nature of the industry, the shortage of drivers, and the need to encourage more females are elaborated on below as topics most discussed by the Key Informants. First, a general and brief overview of the industry from the perspective of the Key Informants is given.

The Key Informants realised that the trucking industry was often viewed in a negative light. Many saw it as their duty to clean the industry up as best they could and highlight more positive elements of their work. Some felt they were fighting a losing battle; long-standing issues plagued the industry and that the system was creating a number of problems for those working within it.

“If people aren’t paid enough to work safe hours they won’t work safe hours, and this whole industry is being run basically with a blindness, it is willful denial.” (KI1)

This Key Informant goes on to explain their concerns.

“I’m worried about the safety issues, but I’m also worried about the injustice of running a system where whole groups of people are completely vulnerable to exploitation, we are just completely ignoring it. It makes me ashamed.” (KI1)

As outlined by one Key Informant, even those that were trying to operate fairly and safely were unable to compete. They explain that one company they knew of, which was deemed a reasonably good employer, frequently lost contracts to third-tier operators. Rate pressures compromised their ability to adhere fully to the law. Once costs had been cut in the way of fuel saving, tyres, and insurance there was only one other avenue, and that was the driver's wages.

“...and they advance these theories around how to be profitable and successful in the marketplace whilst never acknowledging the fucking human tragedy that they cause along the way.” (KI9)

Profit-focused companies were looking for new ways to be more efficient. Just-in-time management (JIT) practices were adopted as well as increasing the sizes of the trucks to accommodate the increasing requirements for more efficient practices. Consumers were thought to be a part of the problem; requirements for next day delivery and the push for low-cost goods put pressure on the supply chain.

“It is probably a consumer push. We want everything for nothing!” (KI4)

One Key Informant was working tirelessly to uncover and expose an underbelly in the industry explaining that it is like a:

“...nasty little secret at the moment, isn't it? It's like the commonly known but unspoken abuse that is going on in that one house in the street that everybody drives past but nobody is going to knock on the door because they don't want to see what is behind it... well my whole experience is that is in large part, an analogy appropriate for the underbelly of the trucking industry.” (KI9)

5.5.1 Highly Competitive Nature of the Industry

Working in the trucking industry meant remaining competitive in any way they could.

“It's a lot of pressure because it is so competitive, it is filled with lying for contracts and the current thing among a lot of corporates is they'll say to the existing contract [holder], we expect you to take ten to twenty percent off it or we'll put it out to tender.” (KI28)

The pressure to remain price competitive was highlighted; undercutting on costs to retain customers and clients meant that organisations struggled, and middle managers

struggled. It was described as a cutthroat industry where many companies are just keeping their heads above the water. Companies were going bust trying to remain competitive, succumbing to customers' demands. This presented as a conflicting role for managers, in particular those in middle management positions.

Contracts with customers were not often in written format meaning little security for the operators. Retaining the customers was difficult and only added to the competitive nature of the industry.

“It is very competitive...there are not a lot of written contracts in the transport industry as far as work with your customers... you've only got your service and your rates to fight with so you've got to make sure they are right...that is about making sure that you are delivering a quality service up to the standard that they require or beyond and extended.” (KI23)

Companies did what they could to retain their customers, as mentioned above, however, sometimes that meant pushing their drivers to the limits. The drivers were working longer and longer hours, ensuring the trucks are being used to their full capacity.

In light of this information, the Key Informants were asked to help explain why, if the industry was so competitive, there was a driver shortage. One Key Informant gave this explanation:

“Yeah, you would think that with the market being so tight that they would have to pay drivers a lot more, but they just seem to get by and one of the reasons they can get by is by pulling drivers in from overseas.” (KI28)

Another Key Informant suggested that the industry norms including the acceptance of undercutting on prices and having to do long hours to remain competitive were all contributing to the driver shortage in New Zealand.

5.5.2 Driver Shortage

Reportedly there has been a driver shortage “problem for ten years” (KI6). The driver shortage was thought to relate mostly to experienced drivers, meaning some companies were having to use inexperienced drivers to fill positions. One Key Informant admitted that they were employing people without enough experience because the experience was simply not out there. Due to the shortage, some organisations were not doing

thorough pre-employment checks. The safety of the drivers and other road users is compromised when inexperienced drivers operate vehicles beyond their skill set.

The industry pay rates were cited as a reason for the driver shortage.

“... there is an issue with a shortage of decent, skilled people and unless you pay the correct amount or the amount the market is requesting you are not going to get them.” (KI4)

The process for a truck driver to become fully licenced was noted as time and money consuming, and younger drivers, for example, were not always willing to invest.

“It takes too long to get a heavy trade licence, starting from a car licence through to getting your combination licence you are looking at around four to five years.” (KI6)

Younger people were seen to be not entering the industry for a host of reasons. It came down to the cost of the licencing but also the stigma around truck driving as a profession. One Key Informant explained that they could not get drivers and they suspected it was because current drivers were saying to their children that they did not want them to become a truck driver. They believed that because truck driving was not seen as a professional job, young people were discouraged from entering the industry.

“... drivers are treated like shit by some of our employers, like shit from some of our customers, and they are treated like shit from some of the enforcement agencies.” (KI8)

The unsocial and long work hours, low pay, and poor work-life balance were also cited as reasons for lack of interest among the younger generations. At the Road Transport Forum Conference held in 2015 they talked about:

“... getting more women and more young people into the industry but the people they are trying to get in don't want to work 70 hours a week, they actually want to have a quality of life.” (KI10)

The requirement to work long hours, being away from home on a regular basis, working night shifts and weekend shifts meant the job was anti-social.

“Young people don't see it as their future. People don't see it as very healthy, they don't like the anti-social hours they drive, it's dangerous and the pay rate is

not good enough so if you are a young person you wouldn't see it as a future for yourself.” (KI27)

The experienced drivers are ageing which, in itself, warrants concern.

“The workforce is ageing and that impairs concentration and health so the drivers they do have will be pushed to work longer and harder, there is no replacements because young people are not coming into the industry.” (KI16)

The industry Associations were working to entice younger people into the industry. Initiatives such as education in schools and colouring-in books at kindergartens are all currently underway. They, along with other groups were also promoting the industry and specifically targeting women as a potential pool of candidates. The following section outlines the barriers to entry in the industry for women and how those currently working there already view the situation.

5.5.3 Women in the Industry

The introduction of more women into the industry was necessary for two reasons. Firstly, they saw it as a potential way of solving the driver shortage, but they also saw the potential positive impact that more females in the industry may have. This section has been included as it gives an alternative perspective on some of the underlying issues occurring in the industry.

Being a male-dominated industry presented challenges for many women noting that it was difficult being the only female in the company. Many of them felt they had to earn their place and this took time. Some of the female Key Informants spoke of ingrained sexism in the industry; a sexist comment was an “*easy-blow*” (KI15). The Key Informant explained that often the men felt threatened by the increasing number of women and that they were coming to the end of their careers, so they were attempting to protect their positions. Stereotypes within the industry were deep-rooted. Often women were assumed to be either the secretary or the wife of the business owner. In one case, the female applicant was not hired because it was assumed that because she was a mother, she would be “*here one day and not the next*” (KI22) and if she could ask for better work-life balance, it may be offered to the men as well.

Despite this, most if not all the Key Informants recognised the need to encourage more women into the industry with some even suggesting a level of urgency was required.

“One of the things that will probably make the single biggest difference in the transport industry with health and safety is the introduction of more women drivers.” (KI4)

It was thought female drivers displayed high levels of competency.

“One of the things that we found was that female truck operators and drivers were actually better at the job than the men!” (KI6)

It was explained that the women seemed to have an affinity with the equipment. Female drivers were often easier on the machinery and therefore did not use the breaks as much, used less fuel and were easier on the clutch as examples. For this reason, the Key Informants were welcoming female applicants. However, they were not seeing many apply.

“We don’t get a lot of women applying to come and work for us. We have an open-door policy on it; we don’t discriminate because of gender, I am happy to take on a woman driver.” (KI23)

Ideas were put forward on how to make the job and the industry more appealing to not only females but males as well. Action was required to clean up the industry; both literally regarding the facilities and the trucks but also attempts were needed to dissolve the stereotypes and increase the flexibility in the hours worked

“... he has got two ladies that share that job between themselves, so one starts at 4 am and finishes as lunchtime and the other one picks up at lunchtime and finishes at 8 pm. So instead of the one driver trying to do 14 hours a day, they’ve got two splitting it and doing 16 hours between them. So, it is that shortage that is forcing operators to think outside the square.” (KI10)

Women were not only being sought after for driving jobs in the industry. There were calls for dispatchers, operation managers, sales reps, health and safety managers, and many other roles.

“Dispatchers need to be multitaskers and deal with many, sometimes conflicting schedules and views and people. I believe women are naturally better at that... we can often be the calm voice of reason...it is about the way you communicate and that is something I think women are typically good at.” (KI15)

5.6 Drivers

This section of the findings houses the information directly related to the working conditions of the drivers. During pilot interviews with a select few Key Informants, it became apparent that the experiences of those who were employed were markedly different to those of contractors and owner-drivers (OD). This is supported by the literature, and so for these reasons, this section has been divided into sub-themes: issues about drivers in general, employed drivers, and contractors/owner-drivers.

5.6.1 The Working Experiences of Truck Drivers in General

Regardless of whether a driver was employed or contracted, they reportedly faced a host of different challenges. Truck driving as an occupation was seen, by the Key Informants as one vital for the upkeep of our country. Drivers had a great deal of responsibility ensuring the successful movement of goods up and down New Zealand while in control of large vehicles. The drivers faced continuous pressures in dangerous conditions causing some Key Informants to voice their concerns.

“...it is something that we worry about a lot... really they are the most lethal piece of equipment, forget being up a tree with a chainsaw, that is nothing compared to being behind the wheel of a truck.” (KI19);

Time pressure added stress to their job. Tight schedules set by customers meant that when and if something unexpected occurred that caused delay, there was little flexibility for the drivers. Tight schedules pressured many drivers to speed because if the deliveries were not made, potentially serious consequences occurred.

One of the areas with the highest number of truck drivers caught for speeding offences was said to be between Christchurch and Picton. The inter-island connection was noted a source of frustration for drivers because there was little flexibility in the ferry timetable.

Time pressure also came from larger companies that allocated specific delivery time frames for the drivers to deliver their goods. Unexpected occurrences such as longer than expected loading times, traffic, weather issues, or delayed ferry crossings meant the driver could potentially miss their delivery window time.

“...that driver has to actually be there within that time frame otherwise he gets turned away...and that’s putting a lot of pressure on the drivers too, they’ve got no control over it.” (KI8)

The Key Informant went on to explain that if a driver was running late, for reasons that may be out of their control, then the decision to stop and take a break is not an easy one to make.

“You have got to make the decision between taking the risk...there is only one decision legally but the people where you have got the booking don’t care that you have to abide by the law, as far as they are concerned, you’re late!” (KI8)

It was noted by some that having to make these types of decisions were all part of the job and that it required a driver with skill and professionalism to do the job safely and efficiently.

A further area of concern noted by the Key Informants was the infrastructure and the issues related to the physical environment drivers interacted with. The truck stops were only one part of the problem; there were stretches of road where there was no place for a truck stop. Key Informants explained that the state highways held very few truck layby areas.

“On the new Waikato Freeway, there is nowhere for the drivers to stop their trucks... I feel sorry for these guys.” (KI16)

Despite the issues the drivers faced, according to the Key Informants, there were elements of their job that they loved. It was the truck, the freedom, and the machinery that kept the drivers in the industry for so long, despite all of the challenges. One Key Informant explained that it is not a job it is a lifestyle. What they loved was the sense of freedom they felt when they are out on the road.

“He does it because he gets to see the country and it’s in his blood...they just love getting out on the road.” (KI8)

Key Informants repeatedly mentioned that driving was a passion for these individuals. Getting out on the road, out of an office with the perception of no boss overrode for many, the somewhat dangerous and difficult working conditions, even the issue of low pay and high pressure.

A number of the Key Informants mentioned that drivers could make a decent living, but had to work 70 hours a week to achieve this goal. Their current work hours are probably even more.

“... a truck driver might be making \$60-70 thousand a year, but they might be doing 90 hours a week.” (KI8)

The low rates were highlighted.

“We worked out that those guys were working for seven dollars something an hour when you boiled it down as a contractor.” (KI28)

In addition, some migrant workers were accepting low pay rates and working for as many hours and they could.

“...you get migrants that are coming from countries where the pay rates are really low so to work for \$18 an hour is like hitting the jackpot for them and of course they will work for as many hours as they can.” (KI27)

Long hours worked encouraged the falsification of logbooks. In some instances, drivers had one logbook to record actual driving hours; this one was used to pay them. The other logbook was to present to enforcement agencies. This falsification is illegal and concerning.

5.6.2 Employed Drivers

This section relates directly and specifically to drivers that are employed. Those who directly employed drivers were able to best comment on why they chose to employ their drivers instead of contracting out the work. However, those who were external to a company, for example, Occupational Health Professionals, Union representatives, and Associations also contributed.

It was an easy choice for some Key Informants to employ drivers over contracting out the work. One Key Informant made it clear that they were not going to work with contracted drivers because they were deemed unreliable. Others mentioned that it made sense from a work performance perspective to employ drivers, centred around the belief that if you offer them job security that will be reciprocated in dedication to the job.

“If you want to have a good man working for you, you’ve got to make sure he is secure, you’ve got to make sure he is happy, and you’ve got to treat him

fairly...expectation is that they will return it to us in their work standards.”

(KI23)

Security came in the form of guaranteed working hours, secure income, and consistency in their routes. This was not guaranteed for all employed drivers but mentioned as some of the benefits that employed drivers received. It was more likely for employed drivers to have contact with driver trainers, health and safety advisors, human resource (HR) managers that were able to offer specific support and advice. One Key Informant called them the “*Core drivers*” (KI22).

Organisations who hired employ drivers supposedly had more control in the form of pre-employment checks, interview processes and then with on-going drug testing for example. For one Key Informant, the pre-employment check was most important, and all new drivers went through this person and process. Another part of the pre-employment check was the screening for drugs and alcohol; it was explained that there was nothing to stop owner-drivers turning up to work intoxicated but with employed drivers they were able to screen them often due to the regular interaction they had with them. This they believed, was a considerable benefit of employing drivers, contributing to a safer and healthier workforce.

From the perspective of the Key Informants interviewed, those drivers who were employed by responsible employers enjoyed support in many forms. The next section expands on the relationship between the managers and the drivers and discusses further the role of the manager as a contextual factor within the system.

Management Interaction

The impact of managers has been noted as integral to the culture of the organisation and as a result on the drivers. There were managers who displayed commitment to the welfare of their drivers through safety, health, and open dialogue. Operating at the other end of the scale were those organisations with opposing actions to those mentioned above.

“...managers from top to bottom who are so bloody disconnected... they have developed such a sense of entitlement that they genuinely believe they can require anything of you.” (KI9)

As indicated in the above quote some managers were reported to believe they could ask anything of their drivers. Other examples were given outlining dealings with organisations in which managers abused their positions of power, requiring drivers to break the law.

“... rotten to the core. Things they were getting their drivers to do would be signing their logbooks here and the next time they would start their logbook would be somewhere else. They would pay their drivers an award if they travelled more than a thousand kilometres per week. The driver trainer who I was trusting to be teaching the drivers to do it the right way was teaching them how to make money.” (KI11)

Another Key Informant had fears for the drivers working under a particular owner and manager.

“That’s where the local bloody cowboy took over...he is the one importing the migrant workers and he has got them sleeping in like a shanty town in his depot... he is pretty powerful in this town.” (KI27)

Power and power abuse are covered in more detail later in the chapter; the previous quote is an extreme example of a manager’s abuse of position.

Problems arose with those in middle management positions. Key Informants with experience in larger organisations explained that it is often the ones who are trying to “climb the ladder” (KI6) that caused the grief for the drivers. Upon further investigation it seemed that middle managers were the ones that had most contact with and say over the working conditions of the drivers and therefore were seen to be the ones making the decisions that had the greatest impact on the drivers.

“Their position is to make money for the shareholders by whatever means, whatever cost. So, if you are a mid-range manager or a senior and you see an opportunity to take a short-cut or to take an opportunity and to rip somebody off without being held accountable for it, you’ll take it!” (KI9)

It appeared that the middle managers were also under pressure; those that were interviewed found themselves in difficult positions sometimes wishing they could just drive a truck.

“The amount of times I wish I could just get out of here and sit on my arse... turn the key of a truck, know that’s the only thing I need to worry about in the morning. I go to bed at night and think, did I lock the truck? Yep Sweet!” (KI11)

If good management practices were adopted, the experiences for the drivers were more positive. In turn, if the managers abused their positions of power, the impact on the drives was negative.

This concludes the section on employed drivers. The following section seeks to explore the underlying contextual factors impacting the working conditions of contracted drivers in New Zealand as compared to the aforementioned employed drivers. It is the intention to highlight the unique experiences of contracted drivers to understand how their employment status impacts their working conditions as highlighted in the literature.

5.6.3 Self-Employed Drivers

Contracting has been around in trucking forever. It doesn’t make it right, or safe, or a good idea.” (KI1)

Some Key Informants advocated for contracting, outlining how it gave drivers autonomy compared to working for a large organisation as an employee. This concept was challenged by those in the opposing camp who told stories of hardships faced by contractors, explaining how powerless they were.

Of concern to many was that there was little difference between a contractor and employee and the decision to contract out the work was of benefit to the Principal company, not the driver.

“The difference between a contractor and an employee is very small... I think if it went to court it would probably show up that they are in fact an employee because they are delivering to the company’s timelines, they are carrying the company’s freight and all the rules of the company apply to them.” (KI6)

A lawyer interviewed (KI1) explained the Bryson v. Three Foot Six Ltd case, which was a decision by the New Zealand Supreme court regarding the real status of a worker, either as an employee or independent contractor. The decision erred in Law determined that Bryson was an employee of Three Foot Six Ltd despite the company claiming he

was an independent contractor. For more details on this case see [Bryson and Three Foot Six Ltd [2005] NZSC 34] or Walker (2011).

A Key Informant explained that owner-drivers (ODs) were essentially buying a job, a run or a territory and they were also buying equipment (the truck belonged to them). All of this suggested the driver was a contractor with independence. However, the reality, as reported, was entirely different and it made the drivers more dependent on the one Principal company:

“They limit their routes, and they are manipulative, they pay very little, and they push the drivers into using their business model.” (KI16)

Over the past five years, it appeared that there was a “*move towards the owner-operator model*” (KI16). One Key Informant suggested that liability could be reduced when using contractors.

“We’ve actually seen companies that are now going the owner-driver way, offering a lot more of the contracts now because they have realised now too they don’t want the hassle. It is much better to offer it to their drivers.” (KI8)

However, the industry was reportedly running out of individuals willing to take the risk.

“I think they are running out of people who are prepared to mortgage their house to buy a truck. For a contractor, they have to renew [their contracts] every few years, so they don’t have many guarantees.” (KI28)

The cost of entry, running the business, and compliance was high. It was reported that contractors currently operating in this industry were already facing issues with high costs. Stories of individual hardships were told in the interviews. A Key Informant explained how one driver found himself in a situation where he could potentially lose everything.

“...we picked him up on the side of the road; he was on the verge of committing suicide, half a million dollars in debt, his parent’s property on the line. Four months with [Principal Company Name] where he is instructed to break the law twice, refuses twice and gets terminated.” (KI9)

Sadly, the Key Informant was able to tell more stories like the one above. These stories were supported by another Key Informant.

“I advised him to go and declare bankruptcy because he’d got that bad...he was in a floater fleet type arrangement, so he’d be away for ages, and when he did get back to his home base he was sleeping in the truck because he couldn’t even afford the fuel for his car to drive home. That is how bad it was; he couldn’t even see his family because he couldn’t get to them.” (KI10)

Key Informants were further asked about the circumstances that occurred leading up to incidents like the above. The conversation returned to the nature of being a contractor. Owner-drivers often had little power to negotiate.

“There is nothing like the recognition of power imbalance that there is in the employment relationship in these areas.” (KI1)

Another Key Informant suggested that the size of the organisations that they were coming up against put them in a powerless position. Independent contractors were being bullied into thinking they had no power.

“We see it time and time again, where an issue is raised by an individual contractor and bang! In comes the wolf-pack. Suddenly he is targeted.” (KI9)

Repeatedly they saw details in the contracts that gave rise to power imbalance. Unilateral power written into contracts was cited as a major concern. It was mentioned that if there was unilateral power, there was control. When asked why the drivers signed these contracts, one Key Informant suggested that if they did not, someone else would. If any of the details of the contract were contested, they often lost the work with that company, ending up with no contract.

One Key Informant explained their experience of being an owner-driver. After initially signing a contract which was deemed to be reasonable by the Key Informant, changes were made by the principal company rendering this individual’s business unprofitable.

“Having just invested one hundred and twenty thousand dollars into a business that I was going to be faced with losing at least thirty-five percent of the viability of it and it was no longer viable at that point, and I was going to lose my investment. I couldn’t afford to lose my investment, so it was either a case of fight or die.” (KI9)

ODs trucks were typically painted in company colours and the OD was required to pay for it. It was noted that there was very limited room to make a profit, all of this was

“*non-negotiable*” (KI6). One Key Informant explained how it was the intent of the parties which was most important to observe when deciphering how independent the contractor was. There are ODs who have written contracts, and there are ones that do not. The experience of the driver was dependent on the manager, employer, and the principal company.

“If the intent from the person or the firm who holds all the power in the relationship is good, then it will go well, but if it’s a rape and pillage of the people who are working for them, it is never going to work well.” (KI10)

KI9 sums up the realities faced by contracted drivers.

“To be truthful, I wouldn’t recommend owning an owner-driver business to many people. I think the risk versus return ratio is just too high... The contracts are oppressive; the cost models are vague and obscure.” (KI9)

The lines were blurred between employee and contractor but employees, in New Zealand, have more protection under the employment law than contractors. This was not widely commented on by the Key Informants, however for more information see Lamare et al., (2014).

Financial Circumstances

With the high costs of entry and on-going running costs, owner-drivers reportedly faced many financial risks. This was something concerning some of the Key Informants.

“You are actually better off on wages doing it without the hassle.” (KI10)

Members from the industry associations found themselves giving business advice and sometimes suggesting that the driver should be working as an employee or elsewhere. They have told drivers who have come with a cost model that they would be working very long hours for not a lot of pay. They advised some to declare bankruptcy because the loans were attached to their house.

The cost models, as seen by some Key Informants, provided little detail on how the drivers were paid, making it difficult to work out the running costs accurately. According to one Key Informant, the companies were meant to adequately remunerate the full recovery of the finance and interest costs and the other costs such as fuel, but

due to the lack of transparency, it was very difficult to work out how and what the ODs were being paid for.

“...so, they just give you an amount, and you have no idea how they have calculated their top up, isn't that a licence for them to underfund you? Of course it is! Does it go on? Of course it goes on.” (KI9)

It was further mentioned that the larger organisations requested access to the ODs books. Some companies were known to cut the driver's earnings if they were making more than what they thought they should have been. Moreover, if you made *“less than that it is your problem”* (KI1). However, one Key Informant offered a different perspective. This Key Informant realised the risk of not paying the drivers fairly and explained that:

“If you screw your contractors down on rates, they will skimp on service, they'll skimp on maintenance, they'll skimp on their RUC, they'll skimp on the amount of time they onboard new drivers or subbies or relief drivers, for instance. They'll be trying to do other work for other people in the time that the truck is off the road, while they're not working for you because they are going to want to afford the payments on their truck and the mortgage on their house and feed their kids.” (KI11)

Concern was expressed, especially by the industry Associations, over the way the businesses and trucks were financed. Some of the finance companies were lending up to one hundred percent which only increased the risk the ODs were faced with. ODs were putting loans against their houses despite being advised against it. Making repayments was not always easy when the rates were low. Some of the companies were not making money out of what they were charging their customers, they were making money out of the margins they took off the ODs. As a result, the rates across the industry were low.

It was often a lack of business knowledge and experience that saw many of the owner-operators, owner-drivers, and contractors struggle financially. They mentioned that some of the drivers were once employees and now out on their own and that driving a truck and owning a business were two very different things. They were seeing more individuals come in requesting assistance and advice over cost models.

Contracted drivers enter into the industry with high risk and often little business experience to support themselves. Although there was support available to them, if they were not members of associations or unions, this support was difficult to access.

5.6.4 Summary of Section on Drivers

There were notable differences reported between the working experiences of employed drivers and those of the contracted drivers. Employed drivers, despite having little control over their working conditions, were said to have higher levels of security and support in their work. The Key Informants' answers suggested that those that directly managed the drivers had the greatest impact on their working experiences. Although the employers were better able to monitor their employees and offer them support such as health programmes and participation programmes, this was because the managers had deemed it beneficial for both the drivers and the company alike. However, there were some employers whom Key Informants felt treated their drivers very poorly including requiring them to break the law. Equally, there were contract managers and Principals who, despite contracting out the driving work, apparently cared a great deal for the drivers and took similar care as if they were employees of the company.

Details in some ODs contracts were erosive of independence in many cases suggesting that the autonomy of owning their own business was an illusion. The power and control exercised by some of the larger companies was a point of concern for the Key Informants, and so for this reason, the following section explores the unequal distribution of power in the industry.

5.7 Power

The Key Informants noted that with the increasing use of contractors in the industry came the potential for the abuse of power. Many raised concerns about unfair contracts, exploitation of truck drivers, and a lack of resources for negotiation. This section relates in most part to contracted truck drivers as opposed to employed drivers.

It was noted that the unilateral nature of some contracts meant that drivers had little power for negotiation. It was the size and the availability of resources on the side of the principal companies that added further disadvantage. One Key Informant suggested that some of the larger, multi-national firms in New Zealand would be "*the worst ones for doing that*" (KI10). The reason the firms were moving towards the owner-operator

model was to get out of costs such as ACC payments and other compliance costs. However, it appeared that the reasons for the shift ran deeper than simply shifting the costs. It was suggested there was a desire for control over, in particular, ODs, by the companies.

“... your average truck driver just has not got any power. You have got a civil system that means if they are a contractor and they have a dispute, they are looking at a very expensive legal process to get through anything, and it’s doubtful they will because the rights in the contracts will be skewed towards the people they are contracting with.” (KI1)

Some argued that as independent contractors they should have the right to run their businesses how they saw fit, however, due to the unilateral power written into many of the contracts, the drivers had little control over, for example, pay rates and hours worked.

“The problem is that the contracts are set up so that they have got to drive those long hours... there is no flexibility in there for them to make any more money unless they drive the long hours.” (KI6)

The Key Informant goes on to say:

“They’ll put down that this is what we are going to pay you, which is non-negotiable.” (KI6)

Autonomy is eroded when the company restricts the contractor’s ability to make a profit. Problematically, the ODs were often dependent on the one company for all their work. The dependence was a disincentive to raise concerns about their working conditions. The dependency resulted in their trucks branded with the colours and logo of the principal company, commitment to strict delivery processes determined by the company, and little flexibility in other details of their working tasks.

“Then there is stuff in the agreement which is usually just highly erosive of any kind of independence.” (KI1)

A Key Informant was asked why the ODs were signing the contracts in the first place.

“Because they are desperate, because they want to not have to work for people, they want to believe, like most good scams, they get too far in and they want to believe whatever they are being told.” (KI1)

An additional disadvantage for the ODs was their inability to collectivise; in many cases, isolation and confidentiality were written into their contracts. This too decreased their power. It was suggested that there was no union for them because they were contractors and for that reason, it was very difficult to support them.

“They just feel bullied. They are scared to belong to a union because they would get singled out and fired, it’s really sad.” (KI27)

The challenging conditions ODs were operating under were further exacerbated by the fact that in some cases, they were migrants.

“You start more vulnerable, and you don’t necessarily have the same information, you don’t feel as comfortable with the institutions, and then if you do use them, you are less likely to be believed. So, you are starting at an enormous disadvantage culturally.” (KI1)

This was also mentioned by another Key Informant who further explained the situation:

“Well if you look at that industry for instance and there are mainly migrant workers in there and what they’ll do is they have the whole family driving the truck and the family helping. But what we uncovered was terrible wages, treated terribly and also not paying tax, putting the bald tyres on the inside because they didn’t earn enough money to put decent tyres on them.” (KI28)

Reportedly, for some organisations, the majority of their drivers were migrant workers.

“There is a contracting firm called [Company Name] – 90 percent of their drivers are Fijian Indians, and they won’t join the union, they are too frightened to join the union and they work terribly long hours for poor pay, so that’s where he gets his drivers from, he gets away from paying poor wages.” (KI28)

Power abuse was not uncommon within the industry; the Key Informants explained how some large companies used the contracts to ensure unilateral power in their favour, how negotiation was rarely an option, and how they were isolated due to an inability to collectivise. Further, the burgeoning use of migrant workers warranted further concern about the misuse of power with an already dangerous industry.

5.8 Support

This section outlines the different support options available to the drivers from the perspective of the Key Informants. The differing roles within the industry were

explained by the Key Informants including how unions were viewed and how they saw themselves, how the associations operated and the role of legal practitioners.

The role of the associations was seen to be one that provided advocacy, business advice, group purchasing benefits, education, and lobbying on behalf of the members. It was explained that there were different associations within the industry, each representing either a certain region or a particular group in the industry or both.

“We fill the gap between the regulatory bodies and the actual workforce.” (KI6)

The Key Informants who worked for the associations recognised the importance of their role. Sometimes they were simply a sounding board for frustrated operators who just needed to talk to someone.

“We are like Agony Aunts! ... we’ll get phone calls from some of our members and sometimes it is just an ear ... I hear about marriage problems, the financial problems, all sorts of things.” (KI8)

The lobbying power of the associations in the trucking industry in New Zealand was seen as effective by some Key Informants. The associations have lobbied over certain issues in the past, in particular, the introduction of the 50MAX vehicles and were able to “*get that one across the line*” (KI27). The political alignment of some members only strengthened their lobbying power.

Some were highly critical of the associations and the motivations behind their actions. This criticism was not applicable to all associations, but for some, their frustrations were made clear inferring that the associations, after receiving money from a large multi-national corporation were unwilling to hand over much-needed information.

“...to sit down one day and have them reasonably open to contributing data for the high court case only then to refuse access to any further information the following day having received a \$20,000 cheque from [company name].” (KI9)

This was supported by another Key Informant who said:

“I don’t even believe they represent the owners very well. I think they represent big corporations who want cheap transport.” (KI28)

Many of the associations’ representatives recognised the problems within the industry and were working hard to address the wider and more systemic issues within trucking in

New Zealand. However, they did not want to have their role confused with that of the unions. They were clear about whom they did represent and were clear about what they did not do.

“...we have the odd driver that will ask us a question, but we certainly won't get to the stage where we will take a driver's case against the employer. We are not a union.” (KI8)

Membership across the different associations was continuing to grow while trade union membership within the industry was declining. One Key Informant suggested that the decline in union membership was related to the increasing number of contractors in the industry who were unable to belong to unions and therefore unable to request their support.

“It is not possible to support them under the current structure. It is too much of an uphill battle, the groups that are trying to and are interested in this stuff haven't got any money, and it is against the law.” (KI1)

As supported by another Key Informant, the unions appeared to have very little power because of the way industrial law was set up as they could not bargain for ODs, *“the law does not allow us to collectively bargain for them”* (KI28). Even if there was a special union arrangement set up for contractors, as soon as they attempted to collectivise a flag went up, and they were blacklisted.

It was the belief that these practices in the trucking industry have eroded the presence of the unions. The increasing number of migrant workers in the industry had also meant that a fewer percentage of the drivers were unionised. Migrant workers were typically afraid to belong to unions.

“Well it is the underlying threats because the employer is the sponsor... they were staunch union people from Germany but when they came here they wouldn't join, they said we won't join until we've got permanent residence.” (KI28)

The erosion of unions in the trucking sector was also linked to the intensification of competition in the industry. Some of the companies that were somewhat union-friendly had requested amendments to their collective agreements in order to remain financially competitive.

“... what happens now is [Company Name] which is heavily unionised, they come to us and try to cut their wages to compete, they say, we can't compete!”

(KI28)

The lack of resources, financial in particular, inhibited individuals from using legal services. This painted a bleak picture for the contracted drivers if other forms of support were limited. When asked what support was available to contracted drivers in New Zealand, one Key Informant threw their hands up in the air out of frustration and said:

“I don't know of any. If I knew I would tell you but I honestly don't know of any.” (KI9)

The difficulties in this space were realised by others also.

“We need to humanise this space! Nobody is on their side; we need to give a voice to the voiceless.” (KI16)

The support available to drivers appeared to be dependent on their employment status, their industry sector, and the nature of the company they are employed by or contracted to. The associations offered support, but their services were limited to paying members, typically larger. For the smaller operators, there was little support due to the difficulties in their ability to collectivise. Advocate groups were working to represent some of the smaller parties, however, for many, this was too much of a risk. Flags were raised when contractors spoke out, due to their dependency on the one company, their business success may have relied on them keeping their heads down.

5.9 Phase Two Conclusion

This concludes the findings from Phase Two. The data collected from the Key Informants elucidated contextual factors from throughout the system and how the elements interacted. The interactions are summarised below.

At the micro level, the Key Informants explained how the drivers were under pressure, faced elevated levels of stress, and were concerningly fatigued. The fatigue was said to be caused by poor health, which was linked to a lack of exercise, unsupportive infrastructure, but the main culprit was the long hours. Drivers were, in some instances,

being pushed to their work-time limits, maximising the efficiency of the truck. This was reportedly necessary due to the competitive nature of the industry.

The industry culture normalised long working hours and to some extent, low pay. However, consequences of the organisation of work meant new drivers were not entering the industry and there was a driver shortage, especially among experienced drivers. Companies were said to be hiring inexperienced drivers and, in some cases, providing insufficient training. Safety concerns were expressed not only for the drivers but the road-using public.

The role of the manager was highlighted during these interviews. There was conflict for them between safety and making their organisation a profit. Customer pressure and intense industry competition are likely to be causing this tension. Further, it appears that the relationship they have with the drivers is more relevant to the working experience of the driver than employment status as suggested in the literature. Despite this, the ODs were found to experience worse working conditions compared to that of the employed drivers.

The increasing pressure faced by all in the industry is of concern. It is of most concern for the ODs as the union support experienced by employed drivers is difficult to provide for contractors.

The contextual factors identified by the Key Informants are placed in the EST model below (Figure 5.4); this is what the system looks like from their perspective. Figure 5.5 maps out the interactions between the factors.

Figure 5.4: Phase Two Findings in the Ecological Systems Theory Model – The System as viewed by the Key Informants

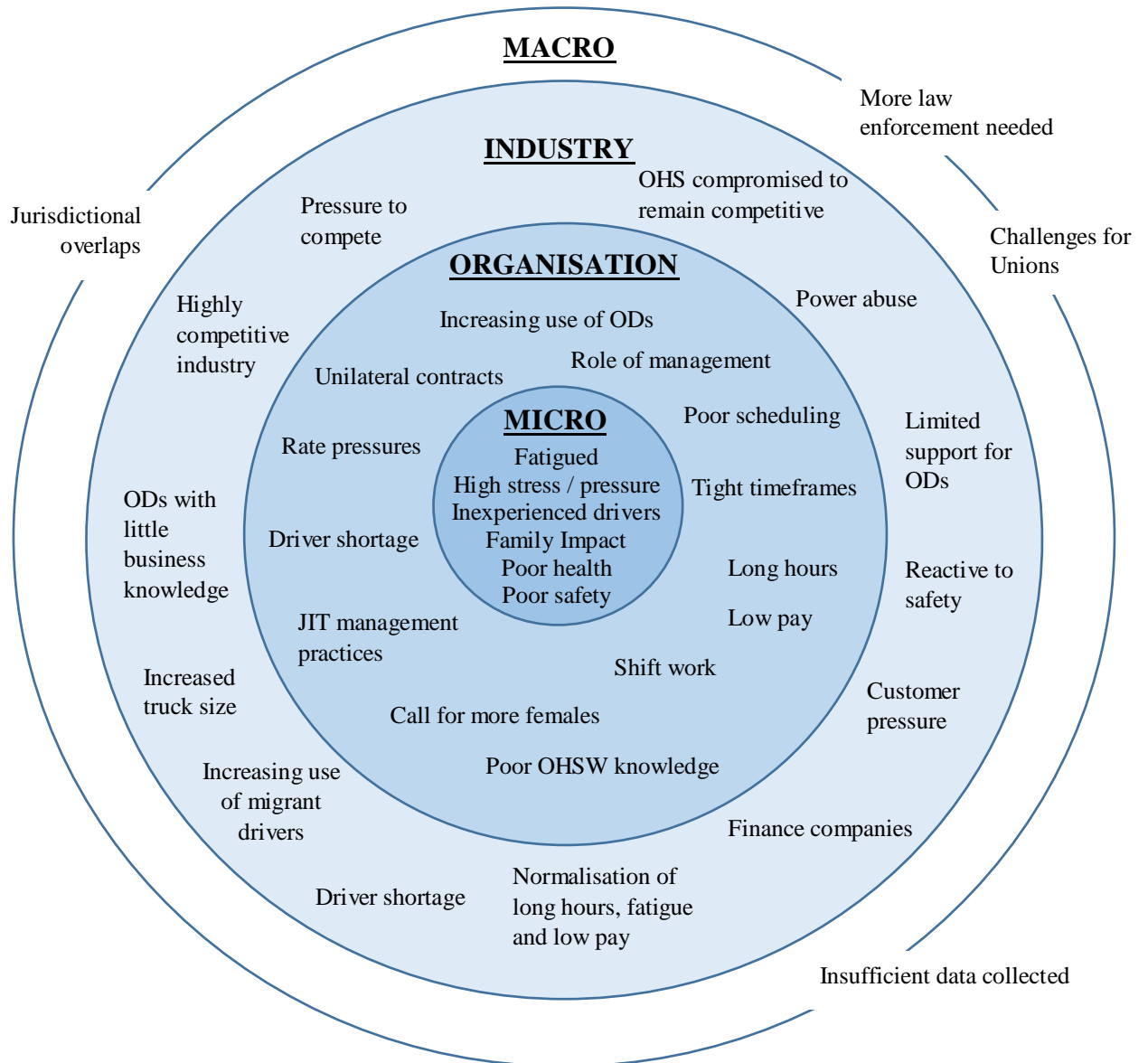
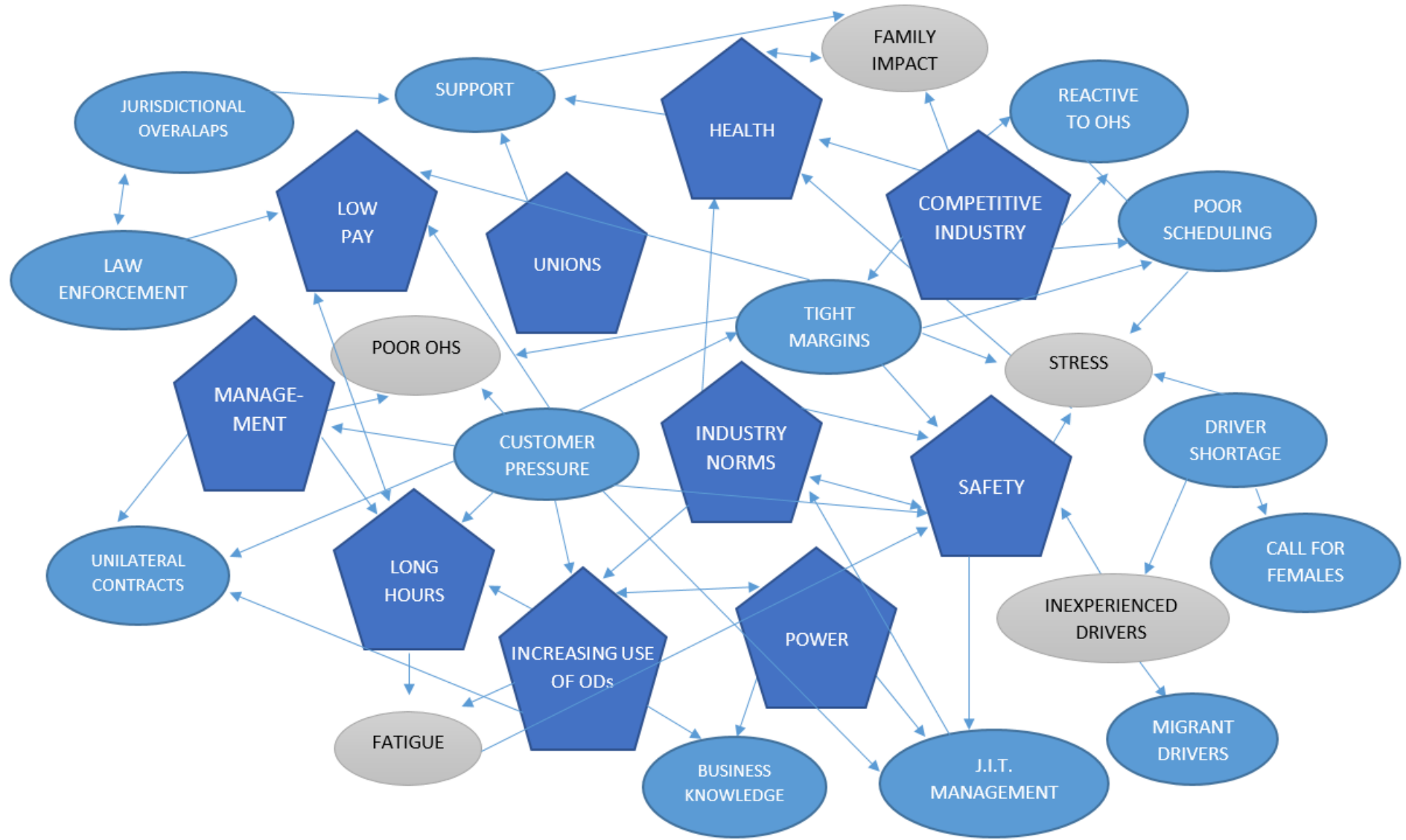


Figure 5.5 Phase Two: Mind Map Showing Contextual Factor Interactions



PHASE THREE: TRUCK DRIVER INTERVIEWS

This section is a thematic summary of the truck drivers' perspectives. These findings offer insight into the underlying factors that impact OHSW and how they interact from the perspective of those who sit at the centre of the system.

First presented is the data on the general OHSW concerns. It is noteworthy to point out that well-being issues were not widely discussed during the interviews with the drivers, producing too little information to warrant a section in the upcoming section on Health and Safety though fatigue has been included. A reflection on reasons why this may have been the case are provided in later sections.

5.10 Health and Safety

5.10.1 Health

Due to the long hours the drivers worked, they had little time to exercise, rest, sleep, or recover from the shift outside of working hours. In the past, many of the drivers played sports and engaged in other social activities but now a lack of time and energy, along with shift-work did not allow them to participate easily.

“People think truck drivers are lazy and all they do is easy rubbish food, but I never have time for exercise, and on my one day off I just want to sleep and do washing.”

(D10)

Additionally, drivers pushed through illnesses and injuries. Many of them failed to take holidays or to stay at home if they were sick because they needed to earn a decent wage. This led to poor recovery from illnesses and only exacerbated injuries. Many felt they were not as healthy as they would like to be, and smoked, drunk alcohol and ate food that they acknowledged was not beneficial to their health.

Additionally, while on the road, health-maintenance choices were not easy. It was reported that drivers were sometimes reprimanded if they pulled over or took a rest outside of the assigned rest breaks. This may have discouraged them from drinking water or stopping to eat meals.

“...and if they stopped the company would ring them up and ask them why they had stopped?” (D13)

Drivers were known to urinate in plastic bottles while they were driving.

“Some drivers I know are peeing in bottles instead of taking a stop to go toilet... they must have been under so much pressure to keep going they felt they had no choice.” (D12)

For some, they found that eating made them tired, so they did not eat, ate big meals either when they arrived at their destination or a truck stop or relied on substances such as energy drinks or in some instances drugs to keep them awake.

“Mostly they are using dope and P to keep them awake.” (D16)

These issues came together to create a dangerous concoction for the drivers out on the roads.

5.10.2 Safety

The pressure the drivers were under not only had health implications but caused safety concerns also. Pressure drivers were under sometimes meant they needed to speed to ensure the goods were delivered on time. This compromised their safety.

“...how am I going to get through that? So then on comes the pressure and away you go! You start cutting corners and working out ways that you can get through it.” (D1)

Drivers suggested that working with managers that required them to speed and break the law severely compromised their safety.

“I could see how dangerous it was to work for such a bad company, the bad habits could be linked to the terrible management practices, and I didn’t want to be a part of it.” (D13)

Some companies were seen to be promoting safety, but it was viewed by the drivers to be lip service, wanting to appear to be doing the right thing but not following it up in practice.

“...the OHS is all about pretty posters and looking like we are doing the right thing, but when it comes to actually spending money and putting things right they don’t want to know.” (D1)

However, in one organisation, they ignored safety issues altogether. This driver spoke of the Principal Company that they contracted to.

“WorkSafe had been to the site and fined the company, but that didn’t make any difference. They had been fined for safety breaches; nothing phased them, they think they are above the law.” (D9)

Drivers recognised that transport operators saw safety as an expense and the margins in the industry were too tight to consider what they deemed to be an additional expense. The tight margins were reportedly a result of the highly competitive nature of the industry.

“The rates would be set by someone based on doing it safely and properly, and then someone else would come in and undercut them.” (D3)

This had a flow-on effect to other safety-related issues; training was also seen as an additional expense for some transport operators which meant drivers were operating machinery they did not have the skills for. Drivers told of times when they were nervous to the point of feeling sick because they could not handle the vehicles they were operating.

“Sometimes I would get so upset before going to work because I was so nervous about making a mistake.” (D13)

The drivers commonly discussed that it was their responsibility to keep themselves and all other road users safe; they were professional drivers. However, a lack of training meant they had to learn this while out on the road.

Health and safety was used, in some instances, to threaten the drivers. If they complained about health and safety issues, circumstances at work were made difficult.

“Health and safety is used against workers; they will pull the drivers up on some minor health and safety matter and use it to get rid of them.” (D18)

A high turnover of drivers in the industry meant that drivers were often working on unfamiliar routes in trucks they were not always used to driving. This slowed the jobs down; being unsure added to the pressure.

“It is the unfamiliarity where you get a driver on a road that he has never driven before on a run that he has never done before in a truck that he has never driven

before, so he has got 20 other things to worry about over and above all the normal stuff. That is where things go wrong.” (D15)

When drivers found a company that they knew would not compromise their safety, they reportedly remained loyal.

This concludes the section on health and safety, as told by the drivers. The upcoming section begins with insights from the drivers about the nature of their work generally, and then the section is divided into experiences of employed drivers and owner-drivers.

5.11 Individual Drivers

5.11.1 Drivers Experience in General

The drivers felt a great deal of pressure and responsibility. They explained how there was often conflict between what was legally required of them and what management were asking them to do. Ultimately, they knew the final responsibility was theirs, especially the ODs who were responsible for any infringements incurred. In some instances, they felt they had little choice

“I was forced to take a load and was then caught by the cops for being overweight. I was fined \$1100 and had to pay it myself because ultimately it was my responsibility.” (D13)

Adding additional pressure was the feeling of being over monitored. GPS tracking and onboard cameras meant transport operators could see where the drivers were at any given time. Disguised as a safety tool, the drivers felt that this monitoring resulted in pressures to skip breaks and to speed.

“The employers want us to go over the work-time rules... They want to see in the data system, that at least I go over speed at least a couple of times. Sometimes I just go one over the speed or two and then I drive at 88km or 89km/hr to keep the job!” (D12)

Poor management reportedly led to dangerous working conditions in the industry. This is covered in more detail later in this section.

Drivers frequently mentioned low pay. It was a source of frustration for them as they knew the rate they were being charged out at and they knew what they were being paid.

“They know the rate it costs; the drivers also know, and they know they are being screwed because they know they are making the boss a shit tonne of money. When they earn \$18.60 an hour then of course they need to work time and a half. I know I am being exploited.” (D18)

The drivers felt that the pay they were getting was not commensurate with the level of responsibility they had.

“The problem with the transport industry is that the wages haven’t moved up with the responsibility with all this, you go from free and easy to high technology, but you’re still paid the boys wages for sweeping out back.” (D1)

Some were pleased with the pay they were getting at the end of the week, but when asked how many hours they had worked to earn that amount, they had worked more than 70 hours to get it. The low rate meant they had to do long hours to cover costs or earn a decent wage.

“The guys are so stoked when they get \$1000 in their hand at the end of the week, but they don’t work it out and see that the rate is low considering how high the hours are.” (D15)

Some spoke of extremely long hours worked.

“I’ve been working all night. Currently 25 and a half hours and counting with only 15 to 20 minutes sleep. By the time I knock off today and get to bed, it will be the second time this week going 30 plus hours with next to no sleep.” (D4)

These long hours were causing them to become emotional, sick and often meant that when they got home, they were too wired to sleep. There was little sympathy shown in the industry for the symptoms of long working hours.

“At the end of the week I was so fatigued, I asked for a day of lighter duties, and I was punished for asking, they gave me heavier duties instead.” (D13)

Training

The experienced drivers were critical of the training techniques used to train new drivers; many of them worked their way up from sweeping the yard, to the smaller trucks, to where they are now. They felt this was the only way to learn and that younger drivers were being asked to drive trucks before they were ready.

“...they are putting drivers in these big units and they are too young and don't have the experience.” (D11)

This was confirmed by some of the drivers who felt nervous and sick before shifts because they felt inexperienced and poorly trained. However, it was felt that the companies were not always willing to invest in training because it cost time and money and the workforce was seen to be transient. They also knew that the margins the transport operators were earning were so tight that they did not always have the money or extra resources.

“The margins that the employers earn don't allow for training.” (D20)

One driver spoke of a bad accident he had and how for a long time he blamed himself. He realised that he had not been trained well enough to do the task he had been asked to do. Companies were hiring in-house trainers to put the drivers through their licences quickly.

“They might hire a class two licenced driver and then train them up... the company simply wanted him to push the drivers through and give them a licence as quickly as possible.” (D13)

This was seen as a problem with potentially serious consequences.

Owner-Driver Experiences

This section outlines the experiences of owner-drivers (OD) from either their perspective or from the perspective of the other drivers. Some felt that being employed was easier than being an OD because as an employee you get holidays, annual leave, sick leave, bereavement leave among other protections. The level of risk assumed by the ODs was also a reason why the drivers felt being an employee was easier.

The financial risk involved with owning the truck added too much pressure to an already high-risk job.

“Owning the truck is the worst part because I don't really own it the finance company does...When the motor blew recently, I went three and a half weeks without any income.” (D10)

Employed drivers were seen by the ODs to be simply turning up to work, doing their shift and going home without further responsibility. Also, if something went wrong with

the truck, for example, the employed driver could call the transport company and get someone out to fix it. The ODs typically had only themselves to rely on, again adding to the pressure felt. The pressure continued after their shift as many went home to work on the administration side of the business. This did not come easily to all, and some of the drivers admitted to having difficulties with the running of the business.

“I have nearly been bust three times, I am not a business person, but I’ve learned the hard way.” (D10);

For legitimately self-employed individuals it is thought that the reward came later as when the business was sold. However, some found themselves involuntarily in this position unable to make it work in the short-term. Quick transitions from an employed driver to an OD meant there was a reported lack of business experience among some ODs.

“I was employed on Friday, and then by Monday, I was an OD. I asked for some help and support and they gave me none, “you got what you wanted now good luck,” they told me.” (D17)

This led some ODs into further debt because they were given poor advice, or they did not have the time to investigate their options. Large fines from the tax department were incurred by one driver because of bad accounting advice. This took a huge toll on their business but also their family life. High debt meant the truck needed to be running day and night to meet the financial repayments and their obligations.

The drivers were asked why they entered into agreements with principal companies at a low rate, but they explained that the rates shifted once the contract had been signed. Contract details were amended after they had been signed and individually they had little power to refute.

“The principal company have cut the base rates by \$1000, and they are continually cutting the rates.” (D5)

All the ODs spoken to were dependent on one principal company for their work. They were required to adhere to the company policies which included anything from compulsory uniforms, to the company’s scheduling system.

“When you contract to [company name] you have to adhere to all of their rules; you have to sign all that information over to them. I was the last one to sign the new contract; I didn’t want to.” (D10);

If the ODs did not adhere, often their jobs were threatened. The high cost of entry meant job loss was not an option. Drivers had mortgages for the business against their homes.

“If you don’t wear the uniform, they would kick you out for violating the contract, and too many of them had huge loans, owned the truck and it was too much of a risk. They were scared.” (D2)

When they were again asked, why did you choose to become an OD? They expressed their desire for freedom. To not work under managers they did not agree with, to own their truck and do things their way. This freedom was sold to the drivers before becoming ODs; but it was often short-lived.

“They only let the good drivers be ODs, so they think they are so lucky to be ODs, but it just means they can pull strings even more. If they earn too much, they can pull back on the amount of work that they give them to control their earnings. They know that they have to keep working to pay off the trucks.” (D2)

The freedom also came from being out on the open road, away from people and enjoying being on their own. However, with the increasing use of technology and the monitoring of their movements, even the ODs found their freedom slipping away.

“In the end, we just decided to sell up, and we came out a huge loss that we paid our way out of and [Driver name] went back driving for wages, and we just found that so much easier!” (D11)

Of the truck drivers interviewed for this study, no mention was made of individuals who had successfully transitioned into running and building up a business to the point that they could compete directly with other haulage or logistics companies, or small manufacturers. The drivers predominantly contracted to larger companies as ODs. There was a noticeable void of success stories at all, among the drivers spoken to.

The following section outlines the experiences of the employed drivers as a point of comparison for the information above on ODs.

Employed Drivers Experiences

Those who were employed drivers suggested they had more job security, using ODs as a point of comparison. They acknowledged the benefits they received such as holiday pay and sick leave, and somewhat more leniency. The employed drivers had their common frustrations but noted a polarisation between those who were employed and those who were ODs. It was thought that company staff favoured the employed staff and the company trucks.

“Most of them are employed drivers except for four who are ODs ... they are always grumbling about something. They think the dispatchers favoured the employed drivers and the company trucks.” (D3)

Some of the employed drivers were aware that the companies they worked for were moving more towards an OD model. When asked if they had considered becoming an OD most answered with a negative response due to the perceived pressure and risk.

“No way! Too many hassles and too much outlay and I would never become an OD with [Company Name] because they are like a dictatorship and they have a monopoly.” (D19)

They mostly appreciated being able to drive while someone else took care of the business side of the job.

“...it has its benefits being a company driver you hop out of the truck at the end of the day and go home.” (D14)

This also meant that unexpected events did not always add pressure to their day.

“...you have the guaranteed work and don't have to rush. If a herd of sheep holds up the road, then I can slow down, but ODs have to push through because it is money they are losing.” (D8)

What they wanted was longer hours so that they could earn a good wage at the end of the week. For some, 50 hours a week was not worth it; they wanted 70 hours work per week. In some instances, the companies gave them yard work to make up the hours if it was possible.

“There is always work. If there is no work out on the road then you always got work to do in the yard, you can wash your truck and polish if it gets quiet during the days.” (D7)

The employment status of the driver appeared to have an impact on the individual's working experience. However it also had an impact on their family lives. The ODs often told of how family members were involved in the running of the business and how setbacks for the driver was a setback for the whole family.

This concludes the section on the individual truck drivers from their perspective. What follows is the presentation of findings from the drivers about the organisation giving insight into its relevance as a contextual factor in their OHSW.

5.12 The Organisation

This section covers the findings specifically related to the organisation and the different related components. It begins with one specific component: the drivers' relationship with their immediate managers.

5.12.1 Immediate Managers

This section includes information from all the drivers who participated. This is noteworthy because, given the shared views and concerns the drivers had regarding managers, it highlighted that regardless of employment status, the drivers' relationship with their immediate managers was similar across the board. For this reason, the following findings have been included in the section on 'The Organisation' rather than in the various employment status categories.

"It all depends on the boss" (D12) was a common thread throughout the interviews. The attitude of the immediate boss to the drivers made a great deal of difference to their working experience. The drivers concluded that bad management led to bad habits throughout the organisation and a company with bad habits was dangerous. Bullying behaviour was widespread in some organisations, and it was suggested it started from the top. In other instances, drivers were pressured to come back to work after an illness even if they were not ready, were asked to work over their work-time hours and forced to take loads over the legal amount.

"If I rung the boss and told him they would often tell me to get on with it and take the extra load." (D4)

For those that did not comply:

"...if I had said no, they say: pack your bags and fuck off." (D13);

Operators who paid lip service to safety and did not follow through in practice were of concern to the drivers because it was their safety most often at risk. The drivers realised their vulnerability and acknowledged that if management were not safety conscious, there were very few other protections in place to keep them as drivers safe.

“Unless you can get a good boss you are pretty stuffed because there is no protection across the board.” (D1)

Customer pressure was thought to put the managers in a difficult position. In such instances, some drivers were asked to do more work in less time; often asked to push the boundaries.

“Management promises the customers the world and then puts the driver under pressure.” (D13)

Those drivers who had respectful managers wanted to remain loyal to them as they felt they were treated more like a family member than a number and realised how rare it was in the industry. The workforce in the trucking industry was seen as transient; the drivers went looking for operators that treated them right.

“Well I left [company name] because of management issues, just generally dicking around... So, I left them and went to another company, and they were worse, so I left them and went to another crowd which I will tell you is [company name] and the guys there are awesome!” (D1)

The drivers suggested that there was no driver shortage for the good employers.

“The driver shortage is only felt by those who are bad employers, those who treat their gear and their staff well never have a problem with getting drivers” (D13)

5.12.2 Monitoring of the Drivers

This section has been included because the drivers raised the topic of in-cab cameras and GPS monitoring. There were mixed views on this topic and it brought out strong opinions. Some of the drivers expressed an appreciation for the installation of cameras and monitoring devices seeing the benefits to them.

“I am in support of in-cab cameras because I know of instances where the truck driver had been blamed but it wasn’t their fault. The driver was able to show that it was the other person’s fault by showing the camera footage.” (D3)

However, with the increasing use of cameras and monitoring devices in the industry, those opposed felt as if it was another way for the company to apply pressure and exercise control.

“Monitoring where you are and what you are doing so you don’t feel you can stop and have a rest through exhaustion.” (D1)

They did not feel like they could stop and have a rest when they needed to, and they had to justify stops outside of their allocated rest times. Speed was monitored; the drivers were encouraged to keep their speed up around 90km per hour, which although is the speed limit for truck drivers in New Zealand, was not something the drivers felt they could always safely maintain. In other instances, if the drivers were caught going over the limit, they were reprimanded; it varied.

Some of the ODs believed that the companies they were contracted to were using the GPS footage to pay them less by monitoring their route and adjusting their rates accordingly. They argued that if they worked out a smarter way to cover the route, then it was their intellectual property as an independent contractor.

“I came up with the most efficient route, and they want to monitor me so that any savings in time or distance that I make they cut what they pay me.” (D9)

The shift to include automated equipment in trucks reduced the job satisfaction for some. Although these additions permitted optimisation and arguably influenced safety measures, it also came at a capital cost which acted as a barrier to ODs becoming competitive business owners. It further heightened the cost of entry.

5.12.3 The Principal Companies

Monitoring the drivers was one way the principal companies exercised control over the drivers. The level of autonomy that should be awarded to ODs was eroded by such practices, and it continued into other areas of their business also.

“The company only pays me cost on everything and the only extra money I can make is on wages of which they set at \$20. I am not a fucking employee! ... I should be able to make \$100 an hour if I want to.” (D9)

The drivers in these situations felt there was little they could do about it as they were viewed as incompetent, uneducated, and replaceable.

“These large MNC are bullies! You are just the little guy against the corporate giants” (D13);

“They are all about divide and conquer. They said that if you fight this, we will make your life hell.” (D17)

Trying to break into the market as a new company was reportedly difficult in the trucking industry. It appears somewhat unique compared to other industries, potentially because of the degree of control by some larger companies that is tolerated by regulators.

The ODs felt they had little power to negotiate, as they did not have the resources necessary to fight.

“...to stop them you throw a lawyer at them, and they throw four.” (D9)

The larger corporations were the ones setting the rates, and other organisations had to operate within those boundaries. It was reported that there was a lot of undercutting and unsustainable rates being set within the industry. The industry was reported as one run on tight margins.

“...the big corporates who can drop the rate and drop it to a point where it barely breaks even, it squeezes every last point out of their margin. Which then has a follow-on effect that they run everything right to the limit, in both the driver’s wages and the maintenance of vehicles.” (D15)

As mentioned above, the drivers noted how dangerous it was to work for, what they called “*bad companies*” (D13).

“The company owners are fascists; the definition is the application of autocracy and they are rewarded by the market for their actions.” (D18)

This concludes the section on the organisation and the relationships within them. What follows is a look at the wider industry from the perspective of the drivers.

5.13 Industry

Industry issues will be outlined in this section. Pay, high competition, lack of training and migrant drivers, were among the issues raised.

5.13.1 Pay

Pay was a topic that dominated many of the interviews with the drivers.

“...the wages for truck drivers in NZ are very, very dismal.” (D1)

Some drivers raised concerns over the rate at which they were paid, the pay structure, and the cost of living. Employed and contracted drivers alike felt they were not paid enough for the responsibility they had. Jokes were thrown around about paying peanuts and getting monkeys, but they were quick to note how safety was often compromised due to low pay and payment structures.

ODs were often paid by the kilometre or on a piece rate; if the wheels were not turning, they were not making money. Systematic rate cuts put a squeeze on all aspects of the business for ODs. Pressures also came in the form of loan repayments. For the owner-drivers, the finance companies owned their trucks mostly. Some owed up to 60-70 thousand dollars every month.

“Being an OD, it is the worst for money because you have to pay for the truck and there isn't often money left to pay yourself wages. It is because people just don't pay.” (D13)

They were required to get personal loans to cover the cost of maintenance for example and these costs were often high.

The big players in the industry set the rates and rates were being driven down to remain competitive, and drivers never talked about personally making a profit in the industry.

It all starts with the top. NZ has ten big transport companies including [Company name] and they set the rates, everyone has to work to that, they set it at around \$2.20 per km, no one ever talks about profit in the industry.” (D15)

There were loose suspicions about who was making money in the industry. Further investigation is required on this issue; following the money up the supply chain may shed light on rates and the link to OHSW outcomes. However, it was outside of the scope of this study.

5.13.2 Competition

Competitive pressures had an impact on many within the industry; larger players and operators were continually trying to undercut each other. The larger companies, whether they be logistics companies or transport operators, played a role. It was outside of the scope of this study to map out all the major players in the industry. Additionally, this thesis was not designed to be a name and shame exercise.

Annually, contracts went out for tender which meant those pitching for the work had to adjust their rates to remain competitive.

“Companies put the contracts out for tender every year, and so you have to remain competitive, there is no loyalty.” (D10)

The pressure was also felt higher up the chain:

“What people don't see however is the cut-throat world it is when it comes to cartage rates, so, unfortunately, the money isn't being made by the owners of the truck or trucks and therefore can't be passed onto the drivers.” (D15)

It is unclear how long this can be sustained because under such circumstances health and safety were not always a priority. Operators, ODs, and individuals were competing with operators that had no health and safety measures in place.

“The money also dictates health and safety; the companies avoid it because it doesn't allow them to be competitive and they are competing with other contractors who have no health and safety in place.” (D18)

The drivers explained how decisions came down to profit. The drivers felt that, as a result, there was no loyalty in the industry like there used to be. If someone was not willing or could not afford to do the job, someone else would take his or her place.

5.13.3 Migrant Workers

Migrant workers were hired to fill the driver shortage in the industry. However, it was the lower level jobs they were being given.

“Some companies are purposefully hiring migrant workers because they know they don't argue back; the kiwi workers wouldn't put up with the working conditions they were being asked to work in.” (D13)

It was pointed out that without the necessary training often the drivers were unfamiliar with the roads and not easily able to navigate their way around some of the trickier terrain such as those the log truck drivers drove daily.

Despite these conditions, the migrant drivers were apparently reluctant to refuse the work because often it was tied to their visas.

“[company name] are one of the worst for taking on and violating the rights of migrant workers, mostly they are Fijian Indians and they are given accommodation on the yards, though they pay rent. They keep them for two years and 9 months and then send them back.” (D18)

Some migrant workers were being housed in yards behind locked gates and high fences by their employers. This is said to be the case for at least two prominent transport companies in New Zealand.

The stories of the poor treatment of migrant workers were spread throughout many sectors in the industry. Aside from the issues above, some of the other drivers spoken to were inherently racist and spoke of a ‘them’ and ‘us’ mentality. They believed the migrant drivers were taking their jobs, driving down the rates, and making the roads unsafe. They found themselves having to back trucks up for drivers who were not trained properly, and they felt this was not only very dangerous but highly irritating also.

5.13.4 Unions

Many of the drivers believed that the unions had little power in the trucking industry. Some of the older drivers spoke of how successive governments had eroded the power of unions and dirtied their reputation.

“...they have been destroyed, and someone was in your corner to bat for safety, and they were good at it. This Government has finally absolutely destroyed that so there are no wages, increased reg[ulation]s and nothing to protect the driver... If you haven’t got a union, you are stuffed.” (D1)

They felt that the Associations were more on the side of the transport operators and the industry corporations, not the individual drivers. Some sectors the industry had to de-unionise to remain competitive, which was worsening the conditions for the drivers.

“The unions were squashed... There is no time and a half anymore, no overtime and no such thing as an 8-hour day.” (D16)

Observed trends such as diminishing union presence, the increasing use of migrant workers with restricted visas, low pay and high levels of competition were reported as contributing to a challenging working environment for all involved.

This concludes the section on the issues raised by the drivers about the industry. The next section takes a further step outward in the system and briefly presents the views from the drivers about the physical working environment.

5.14 Physical Working Environment

The drivers spoke of the difficulties they faced out on the roads, and many of their concerns were linked to other road users and the conditions of the roads they were driving.

5.14.1 Other Road Users

The participants believed that most motorists had no idea how to drive safely around trucks and for this reason, the truck drivers had to be continuously alert. Other road users were reported to speed up behind the trucks and take over in dangerous conditions.

“You’ve got to drive with everyone else’s safety first before your own. A lot of the action that we take as drivers, it’s not so much to put ourselves in the right position it is more to put ourselves out of the way of everyone else.” (D15)

Many of the drivers had both seen and been involved in serious accidents, the smaller vehicles and their participants always came off second best. They were consistently on the lookout for what they called “*suicide drivers.*” (D19)

Media coverage of truck accidents often painted the truck driver to be at fault. In the fatal accidents, the drivers said that the media, the police, or the investigators could not blame those who were deceased (in most cases it was the car occupants) so they went after the ones who survived (in most cases the truck driver).

“That wasn’t anything to do with my driving, but they tried to put it on me. He automatically thought I had caused the accident.” (D6)

For the ODs there were significant costs to being involved in an accident. However, it was not only the financial toll that cost the drivers but the emotional and psychological toll as well.

5.14.2 Road Conditions

When the drivers were tired and needed to stop, they found it very difficult to find appropriate places to pull over. The number of places to pull over was believed to be reducing. Across all sectors, the trucks they were driving were getting larger, and the loads were getting heavier.

“The road conditions in New Zealand are shocking; they are not wide enough. With the bigger units sometimes, you have to go over the centre line. The size of the roads and of the load are a problem.” (D16)

Different parties were shifting responsibility for maintaining the roads, and the drivers felt that more needed to be done to maintain higher standards of infrastructure.

“The [Name] don’t always want to pay for the roads to be maintained, and that is difficult because it is really important that the roads are kept safe.” (D8)

The physical working environment for the drivers was reported to be challenging and required full concentration. This is difficult to maintain when fatigued and under immense pressure.

This concludes the brief section on the physical working environment and also the findings from Phase Three of this study.

5.15 Phase Three Conclusion

This concludes the findings from Phase Three. The data collected from the drivers elucidated contextual factors from throughout the system and how the elements interacted. The interactions are summarised below.

Very few success stories were shared among the participants.

At the micro level, drivers suffered poor health and safety. Physical exercise was difficult, recovery from work shifts was not always possible, and lifestyle choices only

exacerbated poor health. Long hours and shift work were also contributing to poor health. The long hours prohibited them from engaging in a healthier lifestyle.

The long hours were a result of several elements within the system. Given the pay rates were low, drivers were asking for longer hours to earn a decent wage. The long hours were also required to remain competitive, ensuring maximum efficiency was gained from the trucks. The managers played a vital role in either protecting the drivers or further exposing them to the risks inherent in the industry. Tight margins meant managers or employers often had very few resources to operate with. Intense industry competition put pressure on many elements within the system.

The intensity of the competition resulted from powerful corporations setting the rates in the industry, driving them down so far that no one talked about profit. The tight margins meant health and safety, training, wage increases, union membership among other elements, were seen as luxuries not afforded by those striving to remain competitive. Essentially a race to the bottom has resulted; the system is unsustainable.

Figure 5.6 below maps out the system as viewed by the drivers interviewed. Figure 5.7 then maps out the interaction between the elements.

Figure 5.6: Phase Three Findings in the Ecological Systems Theory Model – The System as viewed by the Drivers

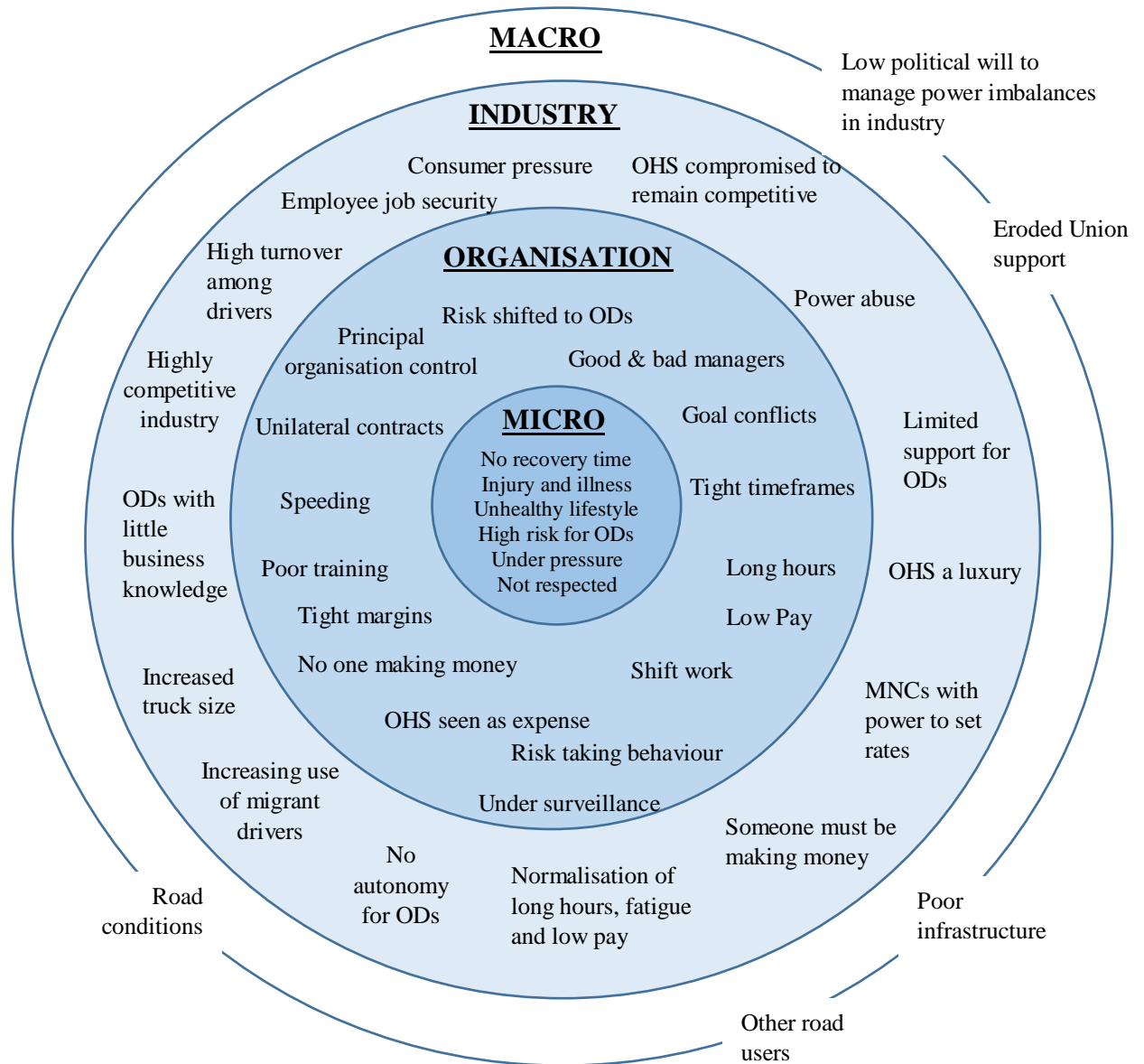
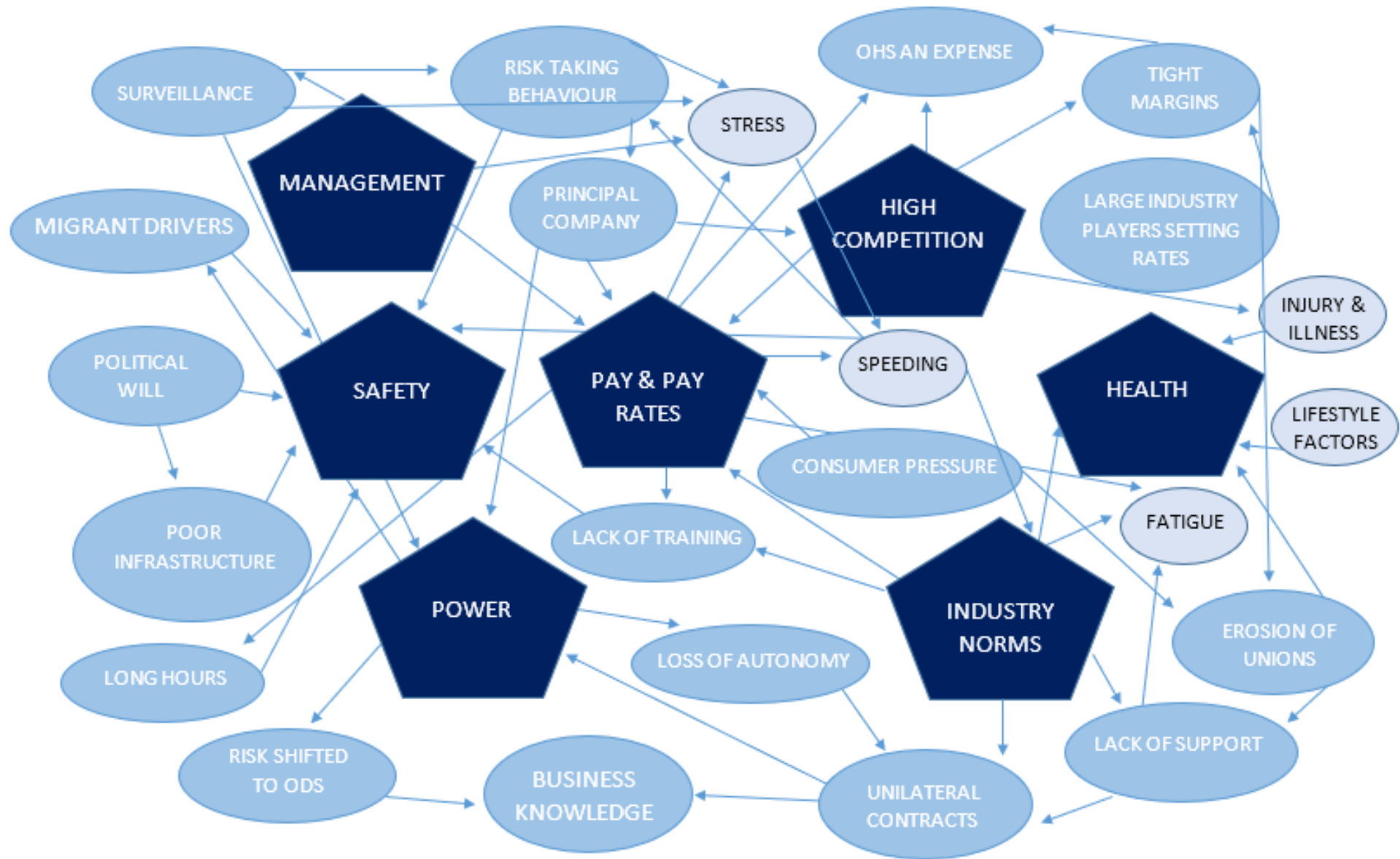


Figure 5.7: Phase Three: Mind Map Showing Contextual Factor Interactions



CHAPTER FIVE CONCLUSION

The purpose of this chapter was to present the findings from the participants included in this study to uncover the extent of the OHSW issues in the trucking industry. It was found that underlying contextual factors such as the organisation of the industry, increasing competition, industry norms, managerial practices, and pay structure, among others, played a role in the OHSW of truck drivers in New Zealand.

Commonly noted throughout the three phases of data collection were the long hours, low pay, tight time frames, and high levels of competition. Fatigue, stress, felt pressure, poor health, and compromised safety were resulting. Noteworthy was the lack of discussion among the participants regarding their well-being though issues such as stress and pressure have been noted. Mentioned throughout phase two and three was the role of the manager; good and bad (as classified by the participants) management practices were impacting the drivers. For example, the use of JIT management practices were seen as decisions made by management in response to the competitive nature of the industry. Such practices were found to be negatively impacting the drivers. Additionally, it appeared that the increasing use of ODs was also in response to industry-wide competition and this too was impacting the individual drivers. The ODs faced greater risk, received less support, and were discouraged from taking leave or holidays – even when desperately needed. The impact of rate pressures, pay structures, and the pressure to remain competitive was worsened by the dependence on one principal company for work. Any form of autonomy normally awarded to a contractor was eroded by details in a unilateral contract designed to keep the ODs compliant. This outlines only a few of the contextual factor interactions discovered in this study.

The participants further shed light on unexpected information and provoked further questions. The researcher found that what was not said also was relevant to this study. For example, very little was mentioned regarding examples of drivers who had set up and run a successful haulage business that were able to compete with the bigger companies. The power exercised by the larger players within the system may or may not be different to other industries, but the reported lack of regard for the drivers OHSW may suggest a lack of regulatory concern and enforcement and questions about the political will for change.

However, not all Government Agencies were able to be reached for an interview. This also showed up as potential gaps in the findings, for example, what was missing was a response from NZTA regarding the state of the roads and the road conditions.

The following Discussion Chapter combines the findings from each of the three phases and together with the literature provides answers to the research questions proposed for this study.

CHAPTER SIX: DISCUSSION

6.1 Introduction

The purpose of this exploratory study was to gain an understanding of the nature and interaction of underlying contextual factors impacting the occupational health, safety, and well-being of New Zealand truck drivers. The research questions proposed for this study were formulated to address this aim.

What role do contextual factors play in the occupational health, safety, and well-being of New Zealand truck drivers?

With the sub-questions:

- What are the underlying contextual factors impacting occupational health, safety, and well-being of New Zealand truck drivers?
- What role do cultural, structural, and organisational influences play in truck driver health, safety, and well-being risk?
- How do the contextual factors interact with each other?

This discussion chapter allows for an examination of the extent to which the research questions have been answered. Some research questions were answered fully and some partially, however, the research questions facilitated discussion that resulted in many more questions that needed to be answered before changes can occur within the industry. Moreover, change, based on strong evidence, is needed. This chapter signifies the implications of the findings for those who stand to benefit most but also highlights the scale of this study and the complexity of the industry.

This study is interpretive by design. The findings from each phase were mapped out, compared, discussed and linked to the literature. Eventually five key discussion points resulted from this process; they are the product of the co-construction of information created by the participants and the researcher. The constructivist nature of this study made a single discipline approach unworkable.

Each of the five key discussion points covered in this chapter were written to be broad enough to capture the wide range of contextual factors raised by the participants but specific enough to be useful and informative. The research findings from this study and how they link to the literature, headed under each of the five discussion points, can be found in Appendix 9.

A Discussion Table has been created (as explained and presented below) to show how each chapter from this thesis has resulted in the five discussion points that are used to structure the main body of this chapter. The table is long and detailed, however; this reflects the nature of the systems approach which facilitated the collection of wide-ranging data from varied and multiple sources. Many gaps were identified. There is evidence that this information has not been collected in the New Zealand trucking industry before.

Following the summary of the table, there is an in-depth exploration of each of the five points. Conclusions are then drawn and the knowledge gaps identified. The next steps required if we are to collectively improve the OHSW of truck drivers in New Zealand are then suggested.

6.2 The Discussion Table

The findings from the initial literature search which focused on the existing knowledge on OHSW in trucking locally and globally are first presented in the table. At this point in the research process, an initial decision was made to use a systems approach given the surprising number of studies that selected individual variables when considering OHSW in the trucking industry and from this, the Research Questions were formulated.

The findings from the three phases of data collection are then presented, listed in the order of most-discussed to least. The secondary data (Phase One) provided a foundational understanding of the current discussions from within the trucking industry in New Zealand and proved valuable in this sequential data collection process due to the cross-section of participants that were included.

Informed by Phase One, in Phase Two Key Informants (KI) were interviewed from throughout the system. As industry experts, they were asked about issues facing the drivers, from their (KI) perspective. Phase Three generated the greatest volume of data; as drivers and the unit of focus for this study they could provide insight into the contextual factors most impacting their OHSW. From the three phases of research findings and in consultation with the literature the five key themes resulted. They are presented in turn with short explanatory bullet points, followed by which research questions are answered by each theme.

Adding to the discussion, and found in the last column of the table, are the gaps that resulted from this study. Questions arose during the research process that were either outside the scope of this project or unable to be answered by the participants. The issues that were unable to be addressed by the participants were considered relevant, and interesting findings and have therefore been included. The list of unanswered questions is longer than the sections of findings. The empty cells that result visually depict how much we still have to address before changes might be seen in this industry.

Table 6.1: Summary of the Research Process Resulting in the Discussion Themes and Gaps

LITERATURE	FINDINGS			DISCUSSION	
Background and Literature Review <i>Global and local literature</i>	Phase 1. Findings <i>Analysis of Secondary Data</i>	Phase 2. Findings <i>Key Informant Interviews</i>	Phase 3. Findings <i>Driver Interviews</i>	Themes <i>Problem areas that arose from the findings of this study.</i>	Gaps <i>Including obvious questions/issues not being addressed, recognised or asked.</i>
<ul style="list-style-type: none"> • De-regulated market • Highly competitive industry • The organisation of work is changing from standard to non-standard work across different industries • Increase in flexible work practices • Restructuring, downsizing, outsourcing, market fragmentation • Poor health and cumulative effective • High stress • Fatigue • High pressure 	<ul style="list-style-type: none"> • Fatigue • Excessive hours • Perceived low pay • Poorly maintained trucks • Shortage of skilled drivers • Poor training • Exceeding legal driving hours • Goal conflicts for immediate managers • Poor work/life balance • Low pay rates necessitate longer hours 	<ul style="list-style-type: none"> • Competitive industry • Fatigue • The vulnerability of ODs due to weak negotiating position • High debt for ODs with low-level business knowledge • Pressure from customers, management, and other road users • The dissonance between drivers and managers • The low return rate • Payment structure 	<ul style="list-style-type: none"> • Poor health - the cumulative effect of this • The combined impact of pressure from home and work • Management practices • Cumulative pressures to speed including from managers, clients/customers • A profit-focused industry • Pay and payment structure • ODs not paid if wheels not turning • ODs dependent on one company for all work • Drivers' desire for freedom, business 	<p>1. The Organisation of the Trucking Industry in NZ</p> <ul style="list-style-type: none"> • Long hours, work intensification, pay rates, and high competition and the relationship to OHSW outcomes • How that leads to fatigue, poor health, compromised safety • Anti-competitive practices keeping ODs subjugated <p><i>RQs: This theme collates the individual, underlying contextual factors mentioned throughout the findings and discusses how they interact to influence the OHSW of truck drivers in NZ (RQ 1&3)</i></p>	<ul style="list-style-type: none"> • Do we have a power imbalance between customers wanting services and people driving trucks? • Is that power imbalance extreme to the point of an unhealthy race to the bottom? • If so, at what point would the industry react? At the point that even the larger transport operators went into liquidation? Do the bigger customers have the power to destroy them or is it in their interest to let them bleed but not die? • Who pays for the indirect social, family, and community costs? How much are we subsidising industries that hurt individuals? • Big customers such as the supermarkets are in a situation to dictate rates due to their power

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<ul style="list-style-type: none"> • Poor work-life balance • Pay and payment structure • Incentive payments • High demands • Unsafe interactions with other road users • Lack of organisational data collected after accidents • Shortcuts in maintenance • De-unionisation • Driver lifestyle factors • The highly complex industry with many competing players • Supply chain pressures • Need for regulatory reform • Road conditions 	<ul style="list-style-type: none"> • Higher pay attracts better-skilled drivers • Pressure to say yes to work • Money dictates safety • Poor scheduling leading to tight timeframes • Fear of job loss • Maintenance as a priority for some, not for others • Low pay and long hours lead to low morale 	<ul style="list-style-type: none"> • Poor health – lifestyle factors • Difficult to change driver behaviour • Driver shortage • Low female representation • Dependent contractors • Infrastructure design • JIT management • ODs inability to collectivise • Declining union membership • The relationship between transport and Govt. Agencies • Scheduling pressures resulting in speeding • Time pressure normalised (customers, managers, 	<p>ownership, and for the industry</p> <ul style="list-style-type: none"> • Shift to the higher execution of automation of vehicles and tasks, e.g. GPS monitoring • Larger players in system setting the rates and often the conditions • A race to the bottom, collectively spiralling • Shortage of experienced drivers, positions filled by migrants and inexperienced drivers • Mistreatment of migrant drivers further highlighting the toxic nature of the industry • The danger of uneducated other road users • Drivers were seen as culpable by the Police for infringements 	<p>2. Managing competing priorities – the role of the manager</p> <ul style="list-style-type: none"> • Conflict felt by managers caused by demand for profit and their responsibility to the drivers • Good management and poor management practices leading to OHSW outcomes for drivers <p><i>RQs: This theme addresses management as a contextual factor impacting the OHSW of truck drivers in NZ (RQ1 &3). Additionally, how managers impact the cultural, structural, and organisation of work in the industry (RQ2) through varied influences is discussed.</i></p> <p>and size. Are we, as a society, subsidising the supermarkets?</p> <ul style="list-style-type: none"> • Lack of industry cohesion to resist ‘race to the bottom’ by accepting lower mileage rates from supermarkets. • Lack of legal case knowledge or enforcement in industry. • Trying to break into a new market is not always easy, but what makes trucking a special case? The degree of control tolerated by regulators and the authorities? • How long can the industry sustain such tight margins and low pay for drivers? • What does a sustainable trucking industry in NZ look like? • How could agencies such as the NZTA prioritise spending to ensure the roads and infrastructure are safer and better suited for the increasing use of bigger trucks? • Is there a lack of baseline knowledge at the public health level of specifically truck driver health and their family health and how it compares to other males with similar demographics?

LITERATURE	FINDINGS			DISCUSSION	
<ul style="list-style-type: none"> • Precarity linked to forms of non-standard work • Pay linked to compromised safety outcomes • Unsafe driving behaviour an antecedent to accidents • Injury occurring from unsafe worksite and interaction with the cab • Managers and drivers cite differing causes of accidents • Management commitment to safety related to safety outcomes • Safety training linked to positive safety outcomes • Safety climate a strong indicator of safe driving behaviour • Truck drivers value their independence, and tight control is logistically difficult 		<ul style="list-style-type: none"> unexpected delays) • Fatigue normalised • Acceptable risk • Competition compromises safety • Time pressure leads to health issues • Unable to compete if OHS adhered to • She'll be right attitude • Undercutting for contracts • Management practices impact organisational culture • The organisation of work (increasing use of contractors) leading to compromised OHSW • Unilateral power written into contracts 	<ul style="list-style-type: none"> • Undercutting and unsustainable rates • Normalised working through illness, commitment to the organisational 'family.' • Companies paying lip service to safety • Poor management – required to compromise safety • 'Good managers' treated drivers like family members • Industry normalising/requiring long hours • Pay rate necessitated long hours • Transient workforce not seen as worthy of training investment • Low margins don't allow for training • Lack of training meant inexperienced drivers on roads • Contract details changed, reducing the rate 	<p>3. Role of the Employment Relationship</p> <ul style="list-style-type: none"> • Non-standard forms of work and OHSW outcomes • Allocation of risk to the drivers • Dependent contractors working as both labour and capital (worker and owner) <p><i>RQs: Employment status (organisation of work) was found to be an underlying contextual factor having a detrimental impact on the OHSW of truck drivers in NZ (RQ1 & 3). The increasing use and normalisation of work organised in this way are also further discussed in this theme (RQ2).</i></p>	<ul style="list-style-type: none"> • Regulatory failure observations: Lack of Government Agency knowledge of entire industry due to lack of specific data collected. Noted that trucking was thread through other industries or clumped with Warehousing and logistics'. How much does this limit targeted interventions? • Other relevant factors should be considered when addressing the health of drivers such as the communities they are raised in. and in comparison, to other family members. Be careful to pin it solely on truck driving as a profession. • Also, if the industry paid more, would it attract individuals from a more varied socio-economic group? • What is the spill over into the lives of the families? What are the (in)direct intergenerational costs? • The literature is thin on successful small business operations in the trucking industry, during literature search for this study there were very few studies in support of small business success in the industry.

LITERATURE	FINDINGS			DISCUSSION	
<ul style="list-style-type: none"> • Challenging to run a sustainable business in the industry • Inconclusive evidence about the link between employment status and OHSW outcomes in the industry • Long hours leading to a host of health issues • Drivers struggle to improve health due to limited options • Health promotion programs target the individual drivers and fail to consider industry complexity • Fragmented and erratic schedules in response to customer demands • Work-time regulations ineffective for drivers and do not adequately prevent fatigue 		<ul style="list-style-type: none"> • Health and safety impact of fatigue – lifestyle factors and working conditions • Long hours made lifestyle choices difficult • Pay – safety link, long hours to earn money • Customer demand increased competition, low security, price drop, driver pressure • Driver shortage leads to inexperienced drivers on the road • Driver shortage consequence of challenging working conditions • Poor business decisions leading to corner cutting • Not charging clients enough to 	<ul style="list-style-type: none"> • Requested longer hours to increase take-home pay • Changing vehicle slows jobs and adds pressure on employed drivers • GPS/monitoring reduces self-reliance and consequently job satisfaction for some drivers • OHSW, not a priority because it does not allow companies to remain competitive • De-unionisation has left individual drivers vulnerable • Long hours leading to fatigue and associated health concerns • Margins tight leading to limited investment in safety • Drivers monitored, potentially leading to added pressure/stress • Lack of business experience lead to 	<p>4. Industry Norms and Driving Culture</p> <ul style="list-style-type: none"> • Autonomy of the drivers (perceived and actual) • Why the drivers remain in the job • Industry norms as a barrier to change • How those norms are detrimental to the OHSW of truck drivers in NZ <p><i>RQs: This theme outlines how the industry norms (RQ2) are enhanced by and are a product of the contextual factors (RQ1) within the trucking industry (RQ3). How these translate into OHSW outcomes for drivers is also discussed (RQ1,2&3).</i></p>	<p>This was further supported by the data collected in this study.</p> <ul style="list-style-type: none"> • The point above is relevant to this study because the NZ culture encourages self-employment, recognising it is as something to strive for and be proud of. There is a romantic view of self-employment which is in contrast to the findings of this study of which survival as a small business appears near impossible. • In a similar vein, a common rhetoric among the self-employed is that no-one makes money working for someone else but again, this may not be the case for ODs. • Specialist areas of fatigue could be further developed to collect data. Human Factors research provides tools in response to this question, though outside the scope of this study. • How are business support trainers facing/dealing with the difficulties of working with dependent contractors? • Given the high level of competition within the industry, it would be interesting to compare the supply/demand balance with

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<ul style="list-style-type: none"> • Occupational violence • Reporting bias due to economic pressure and job-loss threats • Competitive pressures lead to tight delivery timeframes which can lead to speeding, improper use of safety equipment exacerbated by lack of training • Pay levels have decreased in the industry with the increased competition with operators pitching for work, resorting to the use of sub-contractors to keep costs low • Driving while fatigued, speeding, driving errors increased the severity of the injury and crashed involvement 		<p>cover costs – low pay for drivers</p>	<p>failed businesses/added pressure</p> <ul style="list-style-type: none"> • Involuntarily becoming ODs, without business advice they accrued higher debt. High debt necessitated longer hours to earn more • Management promises the customer and transfers pressure to the driver • Rates dropped to barely breakeven which has a flow-on effect on drivers' wages and vehicle maintenance • Automation/GPS increases capital costs which act as a barrier for ODs to become competitive business owners. Heightens cost of entry. 	<p>5. Challenges of OHSW reform in the trucking industry</p> <ul style="list-style-type: none"> • A failure in systems thinking has meant previous efforts to improve OHSW have been fragmented and do not consider the complexity of the trucking industry <p><i>RQs: This theme concludes the discussion chapter and attempts to collate the information above (OVERALL RQ) and link to the upcoming conclusions and recommendations section.</i></p>	<p>that of the taxi industry given the introduction of UBER</p> <ul style="list-style-type: none"> • What is the extent of compromised OHSW for other industry members, apart from the drivers? e.g. managers, transport operators, OHSW trainers/managers, associations. Psychosocial factors could potentially be a serious problem given the high pressure, complex nature of the industry. • Well-being is not well considered or understood in the industry and not always combined with occupational health and safety. • Different definitions of occupational health, safety, and well-being were used among participants • How does change happen in the industry? Who champions it? Is the Government in power relevant? Whom is the evidence base provided by? • The new drivers are poorly equipped, and there are people who cannot get jobs because there is an alternative supply of cheaper labour

LITERATURE	FINDINGS			DISCUSSION
<ul style="list-style-type: none"> • Non-functioning regulatory system, lack of enforcement, therefore, cannot guarantee level playing field – a race to the bottom. • Lifestyle choices leading to fatigue and therefore increased the chance of accidents • Obesity linked to fatigue and therefore more likely to be involved in safety-critical incidents • Industry competition lead to acceptance of low rates, which necessitated longer hours, leading to stress and fatigue 				<ul style="list-style-type: none"> • Follow the money up the supply chain and identify those responsible for the conditions. • This is a labour-standards problem; the incentive needs to be taken out of the model. If we are always chasing precarious workers, we will never have enough resources • Create a commission into low pay, wage theft – broaden the debate • How good are agencies really if they cannot deal with those on multiple or sub-contracts? • Have labour standards across society completely collapsed? • There is still a lack of protection for those who stand up, i.e. whistle-blowers • Companies need to be required to report what is happening, not what they are doing • The role of the unions is not diminishing, and there is strong evidence of positive associations between the presence of a trade union and OHS outcomes in many sectors • Contracting and other forms of non-standard work are difficult to measure because it merges with

LITERATURE	FINDINGS			DISCUSSION	
					<p>the informal sector – how accurate is the picture of the transport sector?</p> <ul style="list-style-type: none"> • What is the extent of the bullying problem in the industry? • Regulatory interventions appear too weak to combat the well-established norms in the trucking industry. The diversity and complexity of the industry mean regulators can only target a small sample – typically those out on the road, i.e. the drivers. • Is there a widespread lack of capabilities among managers and workers regarding OHSW knowledge in the industry? • Is the sector going to be under the microscope in a similar way to the coal-mining sector and pressured to shrink? With a push to use more locally and to re-think supply chains, it is not a given that the industry will continue in the same way it has in the past.

6.2.1 Discussion Table Summary

In each of the five themes, the Research Questions were answered but with much more evidence than was expected. This reinforced the complexity of the industry and highlighted that further investigation is needed if OHSW is to be addressed in the New Zealand trucking industry.

Sub-RQ 1 (underlying contextual factors) facilitated the uncovering of the contextual factors and some of them unexpected. Sub-RQ 2 (role of culture, structure, organisational factors) highlighted the extent of the impact and how far-reaching the impact was throughout the industry. Sub-RQ 3 (interaction of contextual factors) again highlighted the complexity of the issues and how they interacted across time adding a further dimension when attempting to solve the OHSW issues presented.

The five themes reflected the complexity of the industry and the intertwined nature of the responses given by the respondents (hand drawn mind-maps depict this, see Appendix 10). Below is a summary of the themes before the presentation of a full discussion on each.

1. The organisation of the trucking industry: Included in this theme is an outline of the trucking industry in New Zealand and how its organisation exposes drivers to OHSW risks. This theme is by far the most complex as it hosts a large amount of information and attempts to provide connections between long hours, work intensification, low pay rates, industry-wide competition and anti-competitive practices keeping ODs subjugated. This theme utilises the systems approach to capture the components in the wider industry that are most impacting the OHSW of the drivers. Included in this theme were the central roles of management and workers, as reflected by the participant's positions as Key Informants or Drivers. Thus, leading to the following section on the position of managers specifically.

2. Managing competing priorities – The role of the manager: The inherent conflict felt by managers caused by the demand for profit and their responsibility for the welfare of drivers is the central tenet of this theme. Labour process theory helped to explain how the managers interviewed were symbolically capital but materially labour and how this was leading to the degradation of work in the trucking industry. The degradation of work and the role of the manager helped to explain how management practices were increasing the risk for greater exposure to OHSW for drivers. The managers were considered an important element interacting with other elements within the system.

3. The Role of the Employment Relationship: Included in this theme is a discussion on the allocation of capital risk to the owner-drivers who are supposed to be capital but are operating under the restrictions of labour. In other words, as independent contractors they are promised commercial freedom – the power to make decisions – however, are as dependent as an employee would be with few of the benefits.

4. Industry norms and driving culture: Many dangerous practices are normalised within this industry. Questions are not asked because of an industry-wide acceptance of practices including long hours, high fatigue, and a loss of autonomy for those who are legally self-employed. A core issue in this theme is that of autonomy; what the drivers aspire to, what they perceive is possible, what they are offered and how this has changed and continues to change.

5. Challenges of OHSW reform in the trucking industry: This concluding section explains how a failure in systems thinking has meant that previous efforts to improve OHSW have been fragmented and do not consider the complexity of the trucking industry.

Each section begins with a direct quote or story from one of the participants. The researcher felt it was important to begin with the voice of a participant to give the reader not only the context of the findings but also a sense of the frustration, loss of job satisfaction, and other aspects of the emotional context discovered. The theme is then discussed including the findings from this study and the literature. Each theme section finishes with a conclusion and a table outlining Knowledge Gaps and Next Steps. The Chapter concludes with the presentation of the developed EST model, which includes the findings from this study, and also a mind map showing the detailed interaction between the identified contextual factors.

ONE: THE ORGANISATION OF THE TRUCKING INDUSTRY

As we climbed into the truck for the interview, he asked me if I was comfortable relocating his knee joint if it dislocated during the shift. It did that often, especially when he was in a hurry. He was always in a hurry, he told me. The tight schedule for his 15-hour shift, starting at 10 pm, meant he had no time for any anomalies of any kind. One supermarket had already called to change his delivery window; he could say nothing – this meant two extra hours of work today – illegally. Waiting for him at home were piles of paper work. He had already lost a business, in fact already lost a home, a wife, and a truck. Lessons had been learned the hard way. During this 15-hour shift, he did not stop to eat. He did not go to the bathroom. With very little sustenance and a heavily bandaged knee, he dragged 100kg crates across uneven surfaces, in the dark, checking around him constantly. He had been robbed a few months back and was punished by the company he contracted to for this.

The conversation between us never dried; his long, long days meant having a family or friends was impossible. What was left from his pay went to the finance company for his truck or to his employees, one of which had just put a hole in the truck curtain. It was going to cost him. There was no money left to pay himself a wage, so he could not afford to take time off to get his knee repaired, and the company he contracted to had said no anyway. He desperately wanted to sell his business but was blocked by the Principal Company insistent on controlling every part of his business. Regardless, he was only paid when the wheels were turning, so he kept the wheels turning – no matter the cost.

By examining the issues featured in this story above, it may be possible to shed light on the elements in the drivers' job that were contributing to the poor OHSW they faced and how they interact. Many of the negative outcomes faced can be linked to four central aspects of the job: industry-wide competition, long hours, time pressure and low pay. These are the underlying factors that this study has concluded are most exposing the drivers to poor OHSW and are intertwined through the discussion below.

Although these issues do not present as new findings, there is supporting evidence that the organisation of the industry is causing harm. Decades ago, in the US Hensher and Battellino (1990) outlined how speeding, fatigue, and traffic violations were symptoms

of underlying issues such as scheduling pressure, unpaid waiting time and excess hours. More recently, Friswell and Williamson (2013, 2010, 2008) pointed out that working hours and tight deadlines were found to be strongly associated with occupational injury. Quinlan and Wright (2008) concluded from their own Australian inquiry that “overwhelming weight of evidence indicates that commercial/industrial practices affecting road transport play a direct and significant role in causing hazardous practices” (p.7). It appears the same is happening in New Zealand.

6.3.1 High Competition

It was explained that the pressure felt by the drivers came as a result of the competitive intensity of the industry. To keep up with demand and remain competitive, organisations were found to be adopting Just-in-time (JIT) management practices and High-Performance Work Systems (HPWS) to ensure maximum efficiency from the trucks. In a logistics context, the aim is to minimise storage costs by having stock arrive and go straight to the floor. It appears this has prompted an intensification of the deadline and punitive consequences which the drivers were weakly placed to resist or moderate.

Delbridge, Turnbull & Wilkinson, (1992) have argued that in such circumstances labour is largely overlooked in a process that looks to get 60 minutes of work out of every hour from every worker thereby leading to a more efficient extraction and surplus for capital. JIT management and HPWS would be considered, under Labour Process Theory, another form of managerial control and a way to effectively manage the performance of labour (Beale & Hoel, 2011). Such managerial strategies to gain increased effort can lead to work intensification (Harley 2002; Godard, 2004) resulting in potential stress and burnout (Macky & Boxall 2008). These practices, although they may make economic sense, largely ignore the impact on the individual workers and evidence of this presents in the current study. Newnam et al., (2017) explain why, confirming that HPWS predispose drivers to unsafe conditions. Kemp et al., (2013) points out that JIT management gives the driver little flexibility and low control over the pace at which they drive. If the main aim of logistics companies is to maximise profit, delivery times will be tightly scheduled, and maximum efficiency from the truck and the driver aspired to (Reiman et al., 2015).

JIT management strategies are designed to increase productivity through streamlined efficiency and the eradication of waste in any form in search of continuous improvement (Delbridge et al., 1992). It is of little surprise then that they have been linked to the increasing use of contractors; cutting the number of permanent staff ensures organisations carry no reserves on their books and can then increase labour to cover fluctuating demand (Standing, 2009) geared to meet the needs of the customer (Delbridge et al., 1992). It has been surmised from this study that industry competition has impacted organisational level decisions to increasingly use contractors and JIT management strategies. Both of which are negatively impacting the individual drivers. The increasing use of contractors will be discussed in theme three of this chapter.

The drivers felt the impact of the ever-tightening schedules because it did not allow for any variations or anomalies in their day to occur. Drivers spoke about traffic, breakdowns, or weather events that could unexpectedly and did frequently slow them down. This only intensified the pressure they felt and for this reason, many of them chose to drive at night if they had the option. Findings from the literature confirmed the heightened risk of night driving and irregular schedules under high strain (Lemke et al., 2017; Meuleners et al., 2017; Anderson et al., 2017). Night driving further compromised the drivers in this study to fully recover from a shift and spend time with friends and family. The culmination of these elements meant the drivers faced increasing levels of stress.

The competitive nature of the industry placed pressure on different elements of the system requiring managers to make decisions on how to be most streamlined and efficient. Being efficient meant extracting as many hours as possible out of the truck and out of the driver which inevitably had an impact on their OHSW.

6.3.2 Long Hours

As told by the participants of this study, the long hours worked can be linked to many symptoms experienced by the drivers. Driving at night, driving while fatigued and the extended periods away from family and friends caused stress for the drivers. It has been noted by Peretz and Luria (2017), that occupational stress among truck drivers was worst for those who spent long hours away from home and those who were cut off from vital support networks. This was confirmed by the participants in this study who often found maintaining a family life and friendships very difficult. The long hours working

meant that when time was spent at home, the driver needed rest leaving little time for family interaction or physical exercise, among other activities. This was notably more difficult for the ODs who had the additional tasks of running the business.

Long hours worked contributed to fatigue. Fatigue has been noted many times throughout this study and it is of little surprise given the tight schedules the drivers must adhere to, the long hours often with few opportunities to take a break, and the additional pressure of driving through the night for some. Braeckman et al., (2011) and earlier, Beilock (1995) confirmed that unrealistic schedules most contributed to fatigue among truck drivers in their respective studies. Adams-Guppy and Guppy (2003) found an association between driver fatigue and management systems of break-taking and route scheduling. There is plenty of research to link fatigue with poor health, safety and well-being and was confirmed by the participants in this study. Drivers were required to have full concentration at all times; this was difficult to maintain when fatigued and under immense pressure. The tiredness was reportedly impairing their ability to drive safely, and it was said that many near misses had occurred because of the micro-sleeps and extreme fatigue they felt.

6.3.3 Consequences of Time Pressure

Not only were the hours long, but during those hours the drivers were under time pressure. Of the 20 drivers interviewed, 17 of them explained the relentless intensity of the time pressure they felt during their self-described long shifts. This was backed up by the secondary data (Phase One) where drivers said they were working too many hours. In the story above, working under time pressure added to the driver's injury through rushed entry and exit of the truck, running while on site, and not always using proper equipment.

Profit motives that result in corner cutting are arguably more important determinants of injury than the more frequently blamed, individual characteristics of workers across many different industries (Quinlan, Bohle, & Lamm, 2010). As found in this study and supported in the literature, for the truck drivers, the poor state of many of the customer's sites only heightened the potential for risk, dangerous customer sites were confirmed by Friswell and Williamson (2010) as contributing to the hazards a driver faces. Hanowski (1999) confirms that working under time pressure increases the risk because improper equipment is used, and care is not always taken to undertake tasks safely. Further, stress

has been linked to back pain in the trucking industry (Robb & Mansfield, 2007; Quinlan, 2001) and this is something drivers in this study suffered from.

Of those interviewed, only three drivers felt they had a reasonable time to do the work they were required to do and were never asked to break the Hours of Service (HoS) regulations. Others accepted work in the last few hours of their shift knowing they could not legally do the job. On further investigation, some participants suggested that if they did not accept this work, their jobs would be under threat.

Particular Key Informants, especially those representing the unions and employee advocacy groups spoke of drivers who had refused to work beyond their hours and consequently had contracts terminated for disobeying. Job loss was considered a serious and extreme consequence which did not always eventuate. However, the drivers explained that threats were often thrown around. The use of job threats in the industry was confirmed by Quinlan and Wright (2008) in their report that outlines the underlying causes of unsafe practices in the road transport industry in Australia.

6.3.4 Low Pay

It is clear from the literature that payment structure and pay rates are a predictor of truck driver safety (Belzer, et al., 2002; Quinlan & Wright, 2008; Williamson & Friswell, 2013; Rawling & Kaine, 2012). It is reported that the competitive nature of the industry has intensified over previous decades and subsequently rates have continued to decline. Quinlan and Wright (2008) explained that the intensity of the competition has meant that operators, both large and small, were unable to operate safely because the low freight rates encouraged shortcuts in maintenance, extended working hours, and speeding. Transport operators pitching for work resorted to unsafe behaviour to meet the demands of the customers (Rawling & Kaine, 2012). Participants from this study explained how difficult it was to remain competitive when other operators who did not engage in OHSW practices were bidding for the same work. Attempts to get out of union agreements were also witnessed; participants explained that they could not remain competitive if the collective agreements were adhered to.

Evidence collected by Quinlan and Wright revealed that freight forwarders or loading agents were negotiating rates with clients that were very low. They were then contracting out this work at an unviable rate. Consequently, transport operators were not making enough to pass on pay increases to the drivers. Participants from this study

produced similar findings and further shed light on how this affected the contractors specifically. The ODs were not able to negotiate rates as would be expected by those operating an independent contracting entity. Rawling and Kaine (2012) suggested that smaller transport operators, such as ODs, had even less bargaining power to negotiate safe rates, and the ODs in this study expressed this concern also.

However, the low rates were not only impacting the ODs but had negative consequences throughout the industry. For example, a lack of training was a common complaint in the secondary data and from the interviews with the drivers. It was felt that training was an additional cost, but a lack of it was causing accidents. Drivers explained how they were required to drive trucks they were not trained to drive. This caused them distress.

The consequences of a lack of training was problematically exacerbated by the low pay attracting unskilled drivers. Participants felt this was impacting the negative public perception of drivers but was also an additional safety risk. One Key Informant expressed their frustration over not being able to afford to pay highly skilled drivers what they were worth and said many of their good drivers had migrated to Australia. Drug tests and pre-employment checks were being overlooked as Key Informants cited that if thorough checks were used, they would have no one left to hire. Migrant drivers were being hired to fill the driver shortage however, it was believed by the drivers and the Key Informants alike that migrant workers were vulnerable to exploitation accepting meager wages. There was shared concern among those spoken to for the welfare of migrant workers in this industry. Stories were told of migrant workers being housed in sheds in trucking yards and were suspected to be working well beyond their legal hours. Many drivers were exceeding 65 - 70 hours a week to earn a wage they felt was decent. The employed drivers requested the longer hours citing economic reasons and suggesting that a 50-hour week was not worth it to them. Some companies were able to give the drivers off-road work such as yard-work to make up the hours, but for many of the drivers, these hours were made up on the road. The ODs accepted the long hours as part of making their business work.

The pay structure typical within the industry such as by distance or at a piece rate was found to contribute to unsafe driving behaviour such as speeding and driving over the regulated Hours of Service limits by Quinlan and Wright, (2008). Incentive payments were found to cause a host of issues, those who were unpaid for waiting time or loading

time were most like to experience fatigue (Williamson & Friswell, 2013) meaning they drove for longer to compensate for the lost hours. Further, Quinlan and Wright (2008) document that the incentive to work longer hours is not out of economic greed but a necessity to forge a living in their occupation. This provides an economic disincentive to engage in safe behaviour and provides explanation for the behaviour witnessed in the New Zealand trucking industry.

6.3.5 Managers' Perspective

Consideration was not given to contextual factors by some of the participants spoken to. For example, some managers did not see any reason why their drivers were breaking the law (most often referring to HoS and worktime regulations) or why they felt under pressure. Commonly this was expressed by managers working for larger organisations that had regimented guidelines for working out the drivers' schedules.

There was a notable discrepancy between the views of the managers and that of the drivers in this study, a notion also discussed in the literature (Reiman et al., 2015; Spielholz et al., 2008). Reiman et al., for example found that drivers and managers listed different factors when asked what caused exposure to occupational hazards. This was earlier supported by Spielholz et al., who found that over 40 percent of drivers studied said they regularly felt pressure to work long hours, and a similar percent felt pressure to work faster. This, the drivers believed, was contributing to their ability to operate safely. However, the managers believed that it was the driver's lack of risk perception and the driver's behaviour that was the most relevant barrier to operate safely. Drivers and managers both in this study and in the literature share little agreement about where the problems lie. Responsibility is shifted to the opposing party.

It was evident during the interviews that there was a barrier between management and the drivers. Although this will be explored further in the upcoming section, it is of relevance here because it was potentially resulting in a culture of under reporting. Chen et al., (2015) confirmed the widespread underreporting that goes on in the industry. Quinlan and Mayhew (2006) found a discrepancy in workers' compensation claims and the reporting of injuries in the industry. If the drivers are not reporting near misses and injuries, then managers may have an even less accurate picture of what occurs out on the road.

Problematically, drivers, as cited in the literature and this study, trivialised the risk they faced and saw it as an acceptable part of the job – an explanation for not fully reporting near misses, injuries, minor accidents and other forms of exposure to risk. Additionally, drivers reported a motivation to play such situations down as they had limited time for paperwork and extra administration. The explanation may not be as straight forward. Chen et al., (2015) went on to highlight, as also found by Quinlan and Mayhew (2006), drivers feared reporting any OHS issues for concern they would be reprimanded or disciplined. Similar sentiments were recorded in this study.

Explained above are some ways in which the organisation of the trucking industry is causing concern, particularly for the safety of the drivers. However, working arrangements are also impacting the health of the drivers.

6.3.6 Impact of the Organisation of Work on Truck Drivers' Health

The long hours were taking a toll on the drivers' health; a sentiment reiterated by the health professionals, the drivers, the employee advocates and union representatives and well supported by the literature. The drivers explained how difficult it was to eat well while out on the road and that truck stops typically provided unhealthy options.

Apostolopoulos et al., (2010) points out that working conditions for truck drivers encourage unhealthy behavioural patterns. In a study conducted by Boeijinga et al., (2017), it was found that some truck drivers indicated their motivation to live a healthier life but were unable “to convert their intention into action due to the obstacles encountered with the work and personal environments” (p.540). Many of the drivers in this study explained that when they came home from work, there was very little time to exercise or cook; sometimes they were even too tired to sleep. Many commented on how difficult it was to make improvements in their health; they were simply too tired.

Drivers were reportedly not stopping to eat proper meals, nor stopping to go to the bathroom, or stopping to take proper rest breaks. One driver explained how he went toilet either into a bucket or a bottle in the cab suggesting there were very little places to stop, or that break times were specified and monitored, or if he was under pressure he did not have the time to stop. He said the company he worked for monitored his GPS data and if he stopped, they rung him to ask why. He felt this was having an impact on his health.

Despite the above, drivers in this study commented on how healthy they believed they were, however when probed further they listed off illnesses and the medication they were taking to manage it. This finding was consistent with a study conducted by Apostolopoulos, et al., (2013) who discovered that 75 percent of the drivers described their health as good despite 83.4 percent being overweight, 56.3 percent had chronic fatigue, 70 percent were at high risk for sleep apnoea, and about 40 percent had cardiovascular concerns. Stevenson et al. (2013) explained that drivers concerns about health issues affected their ability to keep their jobs and thus influenced their willingness to acknowledge the problem.

For many of the drivers in this study, sick days were not an option. Taking sick leave meant, in some cases, they did not get paid – in particular for the ODs. The financial obligations the ODs faced meant they rarely had the time to take days off to recover from illness or injury. This meant many of the drivers were working with serious health problems. One driver moved gingerly throughout the interview and when asked why he explained he had just come out of hospital having had kidney stones removed. His boss had rung him and requested he return to work (prematurely his family suggested). Moreover, he did. He explained he did not have time to be sick nor did people take time off unless they were very unwell. This driver commented on younger drivers not being tough enough for this industry. These kinds of comments reinforced that those left in the industry were a survivor population and that there is an industry-wide acceptance of poor health.

The health professionals interviewed for this study expressed great concern for the health of truck drivers in New Zealand. Two Key Informants interviewed explained that the solution was not simple and that going into workplaces and giving seminars about heart health or diet suggestions did not have the desired effect.

6.3.7 Health Promotion Programs

There were a few Key Informants in managerial roles who showed concern for the health of their staff and explained how they had encouraged drivers to participate in health programs. They had provided healthy food at the yard and had encouraged involvement in healthy eating campaigns. These managers saw the drivers aging prematurely and smoking a great deal. Some managers had invited the Heart Foundation and other guest speakers to visit the yard. Some had contracted the assistance of

Occupational Nurses as they knew many of the drivers did not take the time to go to the doctors. They had limited success - most felt they were fighting a losing battle because improvements were short-lived. This is well explained in the literature.

Health promotion programs were widely discussed in the literature with very few studies producing the desired response. Proposed solutions were targeted at the individual both in the literature and in this study. Interventions that target individuals fail to recognise the complexities inherent in the world of trucking when trying to monitor fatigue, educate about healthy eating and encourage more exercise, for example. Apostolopoulos et al. (2016) conclude that worksite health programs “underestimate this systemic complexity and the complexity of the causes of driver health problems; hence, interventions have generated merely disappointing and unsustainable results” (p.92). Interventions that target the structural barriers in the trucking industry are non-existent and ongoing efforts are “slow, superficial, uncoordinated, inadequate, and ultimately ineffective” (Apostolopoulos et al., 2016, p.91)

Workplace health interventions are typically small scale, based on the behaviour of the individual and restrained by the resources of the transport operator. This is problematic because, as mentioned above, tight margins do not always allow for such concern. It has been shown that health promotion initiatives such as these are not reducing the health problems for truck drivers (Boeijinga et al., 2017).

6.3.8. Well-Being

It is suspected that the organisation of the trucking industry is having an impact on the well-being of truck drivers in New Zealand. One study included for review showed a link between the stress truck drivers face and depression (da Silva-Junior et al., 2009). However, the impact on driver well-being has only been surmised from observations made by the researcher. It was especially difficult to discuss matters related to well-being with the drivers. It was clear they felt pressure, stress, and had concerns over work-life balance however when pressed further for reasons why, many suggested it was a widely accepted part of the job. Those that could not withstand the pressure left, and those that could, survived. Like the discussion regarding their health, well-being issues were trivialised by the drivers.

Frustrations were shared by the participants about the lack of time spent at home, time with friends and in the community. Without a support network, it could be construed the drivers' well-being was impacted. This has been confirmed by Peretz and Luria (2017) who found that that occupational stress among truck drivers was worst for those who spent long hours away from home and those who were cut off from vital support networks.

Further, the Phase One data highlighted how the low pay in the industry brought low morale among their work peers. The drivers interviewed shared this frustration adding they believed they were not respected for the level of responsibility they had. Many frustrations were shared, and again it could be surmised that poor well-being may result.

This requires further investigation and exploration.

6.4 Theme One - Conclusion

The highly competitive nature of the industry increases the pressure to remain price-competitive. Consequently margins are tight, and pay is low. Low pay necessitates long hours. The long hours are compromising and contributing to the poor OHSW witnessed. Long hours, intense time pressure, and low pay in a highly competitive industry are underlying contextual factors that interrelate and are impacting the OHSW of truck drivers in New Zealand.

6.5 Theme One - Knowledge Gaps and Next Steps Required

The above information is a reminder of the complexity of the trucking industry in New Zealand and the many numbers of parties that are implicated. There are indicators that the system is unsustainable, but we are still unaware of what this unacceptable situation is costing not only the industry, but the families, communities, public health system, and society. This is both a gap and a next step.

This first theme, compared to the following four, presented the most gaps and points for future research.

Knowledge Gaps	Next Steps
<ul style="list-style-type: none"> - The extent of the power imbalance between customers wanting services and people driving trucks - The consequences of the power imbalance and its link to an unhealthy race to the bottom - At what point does the industry react? Would it take for one of the larger transport operators to go into liquidation? Is it in the interest of the bigger customers who reportedly have the power to maintain the status quo despite the unsustainable nature of the industry? - The extent to which government agencies, the public system, society, communities, and families 	<ul style="list-style-type: none"> - Investigate the direct and indirect costs to society, family, community. - Ascertain who is subsidising the industries that are hurting the individuals. - What does a sustainable trucking industry system look like? - Map out the legal case knowledge and enforcement in the trucking industry in New Zealand. - Government agency involvement in the prioritising of funding for improved infrastructure including safer and accommodating roads for the increasing use of bigger trucks.

<p>are subsidising those benefiting from the current industry practices.</p> <ul style="list-style-type: none"> - The consequences of poor cohesion in the industry around acceptable mileage rates, for example. - How long can the industry sustain tight margins and low pay for drivers? - The extent to which the regulators and enforcers failed the trucking industry in New Zealand. What is the lack of cohesion between agencies costing the industry and the individuals? - The extent of the spill over into the lives of families and the intergenerational (in)direct costs. - The extent to which the trucking industry compares to other industries such as the implications for competition in the taxi industry with the introduction of UBER. - Well-being is not well understood or discussed in the trucking industry in New Zealand. 	<ul style="list-style-type: none"> - Collection of baseline knowledge at the public health level specifically for truck driver health and how it compares to others with similar demographics. This may help to understand how much is specifically related to truck driving. - Regulatory failure observations: Lack of Government Agency knowledge about entire industry due to lack of specific data collected. Truck driving is threaded throughout other industries and grouped with Warehousing and Logistics; this was thought to limit targeted interventions. - Investigation of pay levels and whether increasing rates would attract drivers from other socio-economic groups. - What is the best guess on what New Zealand could save by addressing these issues – what do we have to gain?
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TWO: MANAGING COMPETING PRIORITIES – THE ROLE OF THE MANAGER

The previous section charted the organisation of the trucking industry and highlighted how elements such as low pay resulted in poor OHSW for the drivers. This section takes a closer look in exploring the role of the manager as one element of the system. It asks whether management practices influence OHSW outcomes for drivers.

When this manager explained his job role, he described it all in relation to his loyalty to ‘the family’ – not the company. The family have a zero tolerance for unsafe behaviour and harm to our drivers, he tells me. He suggested his role was vital in achieving this goal for the family. He talked me through every safety system, piece of monitoring equipment, tool box-meeting checklist, technological implementation and safety database for which he was responsible.

The role of manager came with a great deal of responsibility; to the drivers, the road-using public, and to making a profit for the family: *“It is not worth the risk. “He’ll kill someone. And on top of that we’ll lose the family half a million bucks”* (KI11). Sometimes he wished he could just be a driver. *“The amount of times I wish I could just get up out of here and sit on my arse ...turn the key of a truck knowing that’s the only thing I need to worry about”* because the industry is highly competitive and dangerous, and he is ready and expecting the worst each time he hears his phone ring.

The story above is that of one manager who worked in a large organisation, at a senior level. There were other managers interviewed whose stories were similar in that they were personally loyal to the company they worked for. The companies were large enough to house a host of managers including driver trainers, HR practitioners, and specialised administration workers and knew that their job was twofold – driver welfare and profit. Similarly, these managers referred to their company as a family. They explained how they felt like family members and the drivers were family members too. This, according to the managers, translated into thorough health and safety practices out of care and concern for the drivers. However, the concept of family is not always a supportive one. It can be a common setting for abuse and violence.

The content of this section highlights the disparity in views between mid-managers, owners, and the drivers. This has been documented in the literature (Spielholz et al.,

2008; Reiman et al., 2015) and mentioned in the previous section. It must be noted that the term manager can represent different roles in different sectors within the industry and can change over time or in different organisational arrangements. For example, in the Logging sector it is the dispatchers who are the point of contact, and in other sectors it may be the company owner/director, driver trainer, or the contractor manager.

Labour Process Theory has been used in combination with the EST model for this section. LPT acknowledges the role of the manager and managerial practices on the workers, in this case the drivers. Notably, it also highlighted how managers possess little economic or occupational agency despite being positioned as capital (compared to labour).

6.6.1 The Manager's Impact

It was expressed by the drivers that their experience at work was dependent on management intention, suggesting it did not matter which company they drove with or what contract status they had, it was the manager that had the greatest impact. The role of the manager was suggested to be of high importance to the drivers. The literature on safety climate supports this notion that managers, especially those that have the most contact with the drivers, influence the safety outcomes in the organisation (Huang et al., 2017; Newnam et al., 2017; Zohar, 2008; Swedler et al., 2015).

Huang et al. (2017) and colleagues found that as lone workers, the manager played a vital role in the forming of the safety climate as the drivers took cues from the managers on how to make decisions while out on the road. Safety climate is a strong predictor of safety outcomes, and their studies have shown that the lowest accident rates were found among companies with clear safety standards. Zohar (2008), as supported by Swedler et al., (2015), explain that management commitment to safety is an important, if not the most important factor affecting worker perceptions of organisational safety climate. Mooren et al., (2014) adds to this by suggesting that in addition to management commitment to safety, the drivers also had to trust managers if safety was to be improved from the top down. Swedler et al., (2015) concludes by suggesting that drivers are more likely to obey the law if their managers also do. It is clear how important the role of the manager is in the safety experience of the drivers, let alone their health and well-being.

The drivers uniformly explained how ‘good’ managers were those that never asked them to compromise their safety, showed concern for them as individuals, and unsurprisingly treated them like family. The managers displaying these attributes sought to hire drivers that were in line with their safety values. Some managers interviewed for this study expressed that when drivers did not line up with their safety values, they made attempts to move them out of the organisation. Notably, a manager’s intentions towards safety, not necessarily health and well-being, was the criteria used to determine how ‘good’ or ‘bad’ a manager was. The exclusion of health and well-being concern may reflect the reactive rather than proactive nature of the industry.

In this study, there were managers who understood that their investment into the drivers paid off. There was sympathy among some managers, with one acknowledging that trust, honesty and respect for the drivers would be returned to the company in high work standards. This was not the attitude of all the managers interviewed and these sentiments were common among the managers who worked for a company whose brands were well-known to the public and knew that law-breaking would be reflected poorly on their company name. The larger companies were thought to have the incentive and the resources to better attend to the needs of the drivers, but they also had corporate reputations to protect.

The safety systems the larger companies had in place were to manage the vast number of drivers that they employed or contracted. Regardless of the employment arrangement, the drivers were required to adhere to these safety procedures. This insight was shared by the drivers; it was initially thought that a drivers’ employment arrangement (i.e. employee or contractor) had a greater bearing on their exposure to safety risks. However, according to the Key Informants and especially the drivers, employment status was less important than the safety attitude of the managers. This will be further discussed in the subsequent section; however, it is relevant to note that the ODs that had a positive experience of their work suggested that their managers treated them as a part of the organisation, not as an outsider.

Comparatively, the ODs who worked for a manager requiring unsafe practices faced both the risk of being in precarious work and the consequences of poor management. In other words, according to the individual drivers interviewed, those that felt their managers cared about the safety – never asking them to take unnecessary risks – did not

experience the vulnerability that the literature suggests might be present as a result of their contractual status.

6.6.2 *Competing Priorities*

It appeared there was an inherent tension between safety and profit. It was noted by Cole (2005) and Newnam (2017) that safety goals could sometimes conflict with organisational goals, and this is well supported by Quinlan (2013) and colleagues (Nichols & Walters, 2013). Some managers interviewed for this study were able to reflect on this tension but ultimately concluded that if they were not making money, they were not going to be in business. The managers saw themselves in the middle; between the owners or upper-management and the drivers. According to Huang et al., (2017) the direct supervisors have to compensate for any lack of safety awareness at the top. Without a safety conscious supervisor, the drivers may not get the training and support that they need. Conflicted between the welfare of the drivers and the direction of the owners, it is possible that the managers also felt the intensification of pressure inherent in the industry. These managers found themselves conflicted in a space between labour and capital and at the mercy of the highly intense pressure inherent in the industry.

6.6.3 *'Bad' Managers*

Stories were told of the managers labelled “*cowboys*” (KI11) and “*bullies*” (KI9) in the industry. The information about such managers came second-hand through Key Informants, the Drivers, and from the analysis of the secondary data but still gave some insight into where the interviewees attributed responsibility for the exposure to risk. One Key Informant shared grave concerns for the drivers of certain Multi-National Corporations. He explained how these large organisations felt they were above the law and explained that it was their job to make money for the shareholders, in his view, at whatever the cost. The tension between profit and the welfare of the drivers surfaces again and such concerns were shared by the Union representatives, legal experts, some Government Agency members, and members of the Police.

The literature highlighted that drivers were more likely to obey the law if their managers did (Swedler et al., 2015; Quinlan, Bohle & Lamm, 2010) – a potential breeding ground for a culture that disregards safety. This study highlighted that managers who did

compromise drivers' safety, showed poor commitment to employment checks, did not invest in training and proper inductions, set up reward schemes that encouraged law-breaking and used drivers – particularly migrant workers – to maximise the use of the truck with reportedly little regard for the human impact. Consequently, the drivers under these types of managers felt ill-prepared for the work, stressed and under pressure, unsafe, exhausted, and unable to stay above the law. Some drivers saw this as incentive to seek work elsewhere, a reason given for the transience within the industry.

Profit-Focus

“If one recognises, as of course Marx and later Braverman did, that exploitation of labour is necessary to generate profit and that a conflict of interest between workers and employers pertains, management needs to develop methods and systems for the control of labour to bring this situation about” (Beale & Hoel, 2011, p.9). For those managers whose apparent modus operandi was profit maximisation, it is easier to see that their alignment was to the economic survival of the firm.

The focus on profit maximisation manifest in the tightening of management control, devaluing the skills of the driver, and the reduction of wage. According to the information collected in this study, to such managers, the drivers were simply bums on seats – they were replaceable. Problematically this translated into an inflexible management approach. For example, there was little accommodation for flexible hours, job sharing or consideration of driver's family or medical needs.

Other drivers that wanted or needed to work longer hours to earn more money, for example, would be rewarded under such managers. Braverman would explain this as a degradation of work (Braverman, 1998) where management have minimised the power of the drivers who find themselves indebted to the company even if it compromised their welfare. This was of concern for the ODs who were often financially indebted to the firm.

Presumably, many managers were keen to not find themselves in court as this too would hit their bottom line and reputation. Therefore, potentially this is a question of priorities and what the drivers accept. However, ignorance of the law and the lack of resources to take a legal approach meant the intent of the law was not met or enforced. The legal context is relevant because it was still mostly unknown whether the companies were exceeding their rights on employees or workers. More importantly, when are the drivers

accepting work where the law is on their side, but they are unaware? This gap needs to be addressed by future research.

6.6.4 The Conflict for Managers

Quinlan and Wright (2008) have explained that due to the competition within the industry, operators – of both small and large companies – are struggling to run sustainable businesses and that the low rates encouraged shortcuts in safety. Here lies the inherent conflict for some managers, in particular those who also felt a level of responsibility for the welfare of the drivers. Managers who showed concern for the welfare of drivers were often conflicted by the need to make a profit for their firm.

Comparatively, those managers that aligned themselves more with the “neoliberal enterprise” (Lordon, 2014, p.60) were contributing to the degradation of work in the industry and therefore compromising the OHSW of the truck drivers. Some truck drivers felt they had little choice but to remain under these managers because they were often indebted to the company in some form.

“Étienne de La Boétie reminds us how the habit of serving leads to losing sight of the very condition of servitude. It is not that people ‘forget’ the unhappiness caused by servitude; but they endure its misfortunes as a destiny over which they have no choice, or even simply as a way of life to which one eventually becomes accustomed” (Lordon, 2014, p.8).

The managers have been able to capture the efforts of their subordinates and enlist them in the service of the firm. In a capitalist society no desire is more commanding than the need for money, and consequently, no hold is more powerful than that of enlistment through employment (Lordon, 2014). The manager finds in this worker the essential resource for the expansion of capital – or profit for their firm (Braverman, 1998). However, possibly unbeknown to them, they too possess very little independence as lower ranked supervisors or managers (Standing, 2009).

Their condition of work is affected by the need for top management to have loyal subordinates, those that exercised control, so that top management do not have to confront the hostile mass (Braverman, 1998). However, their positions as managers were further affected by the position in the hierarchy. A higher position within the firm,

in that they held managerial positions, granted them independent powers of decision making and made them the personification of capital who have control over the labour.

Middle managers typically have power above them and a mass of labour beneath them in which they help to control. Their pay level is important to consider because not only is it an exchange of their labour power but more so than the drivers, a share in the surplus produced by the firm and therefore attaches them to the success or failure of the firm which gives them a “management stake, even if a small one” (Braverman, 1998, p.280). Their conditions of employment, depending on their place within the hierarchy, exempt them from the worst features of being a member of labour. Significantly higher scales of pay and possibly, greater employment security would be theirs so long as they continue in a way that aligns with senior management. Feeling the possible insecurity in their roles, it therefore becomes imperative that the managers do what they can to ensure the survival of the firm. This may include the pushing for extra loads at the end of a driver’s shift – maximising profit in ways deemed to be unsafe. Evidence was uncovered in this study of the impact on the drivers. Managers expected loads delivered in unrealistic timeframes; immense time pressure and unrealistic timeframes were mentioned frequently by the drivers. Payment structure is also worth noting here, if the drivers or even the company were paid by the load, then there is financial incentive to disregard HoS regulations. However, it is the driver that is going to lose their license if caught.

The truck drivers appeared to have done more than just adapt to their job, at times they appear to derive satisfaction from it and saw themselves as important members of a family and that translated into loyalty. The use of the term family by the Key Informants and then the drivers suggests a notion of care and concern “*Most of the bosses they treat me like their own family*” (D12) but if the OHSW is as poor as the literature and findings from this study present then it appears that it very rarely translates into improving the welfare of the drivers. Lordon explains the art of ruling: to make the dominated happy, to entrench loyalty, so they forget their domination.

The loyalty of the drivers to ‘the family’ was impressive despite the direct pressures they faced as a result of working under particular managers. It appeared that the drivers had normalised their circumstances and gone one step further, to show dedication willingly. The concept of exploitation is perturbed by managerial tendencies to promise

fulfilment at work, and it seems to be winning the support of some drivers (Lordon, 2014). But not all.

6.7. Theme Two - Conclusion

Those managers that attempted to improve OHSW in the trucking industry were conflicted by the need to ensure the survival of the firm – of which keeps them in work. To ensure the firm survives, attempts were made to generate profit, however, the competitive nature of the industry made this difficult. Consequently, shortcuts were taken, and rates were cut while the work of the driver intensified. Based on the findings of this study management practices, in part, explain the OHSW risks faced by drivers. The highly competitive nature of the industry was an underlying factor, which has been shown in this study to interrelate with management practices resulting in a potentially damaging effect on the OHWS of truck drivers in New Zealand.

6.8 Theme Two - Knowledge Gaps and Next Steps Required

Arguably, the managers faced the consequences of a highly competitive industry; in conflict between profit and OHSW, the managers were reported to be making decisions that compromised the welfare faced by drivers. However, little was discussed about legal and illegal practices, and how often trucking operations and consequently, managers were operating within or outside the law. Additionally, much of the focus was given to safety over health and well-being when discussing the role of the manager.

Knowledge Gaps	Next Steps
<ul style="list-style-type: none"> - The willingness of trucking companies to undercut each other and pass on the risk to the single drivers in the form of multiple goal conflicts sits at the head of this issue. - If all those running trucking operations in New Zealand stood up to the customers (Supermarkets, for example) there would not be an issue – or would there still? What role would the Government play in this scenario? - The extent and impact of the power imbalance in supply and demand and the extent to which that power trickles down from the top of the 	<ul style="list-style-type: none"> - Are new trucking operations being formed and remaining in business to become established? Has this stopped or are some people successfully doing this? - The role of government agencies and the associations, together with the industry to better inform and enforce legal requirements in the industry, however, first to seek clarity in the law regarding chains of responsibility. - Seek examples of successful trucking operations from overseas and how, if possible, they maintain ‘good’ management

<p>system down to the managers within transport operations and then on to drivers.</p> <ul style="list-style-type: none">- How much knowledge and enforcement of the legal requirements exist in the trucking industry in New Zealand- The extent to which trucking operations, companies, managers and other relevant organisations are either breaking or operating within the law in New Zealand- What do the free-market supporters suggest as a solution to the poor OHSW in the New Zealand trucking industry?	<p>practices while remaining competitive.</p>
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THREE: THE ROLE OF THE EMPLOYMENT RELATIONSHIP

There are similarities between this section and the last; above, the interviewed managers personified capital but were essentially labour, a part of the same payroll as the drivers. However, their position in the hierarchy privileged them the exemption from the worst features of being a part of labour (Braverman, 1998). Comparatively, owner-drivers (ODs) and owner-operators, as independent contractors, held the responsibility of capital but enjoyed little of the privilege of position. The ODs were capital, seen as labour, enduring the difficulties from both. As the story below explains, despite being business owners, ODs were not able to enjoy the benefits that self-employment is supposed to allow. The literature links non-standard forms of work, such as contracting, with poor OHSW outcomes, and this study supports these findings.

He had been an Owner-Driver since 1992, and it had cost him and his family a great deal – financially, emotionally, and physically. *“We weren’t in debt, but now we are in debt”* (D2). He and his wife had received poor accounting advice and consequently owed the tax department two hundred thousand New Zealand dollars, they asked the company he was contracted to for advice and support, but they replied with a threat to end his contract.

They had to take personal loans for repairs *“because we are not paid enough for maintenance”* (D2). Ironically, when they needed to hire a truck from the Principal Company they had to pay extra to cover maintenance, but the company never factored that into the cost model provided to him as an OD. This was typical of the relationship he had with the company he was exclusively contracted to. He explained how they controlled every aspect of his business; *“If we earn too much they can pull back on the amount of work that they give me to control my earnings. They know that we have to keep working to pay off the trucks...They have too much control, they have got you by the balls, and so many of the guys are walking around on their knees”* (D2). The burden of the mortgage scared him and kept him working long hours all year round; it also kept him quiet. He knew that if he spoke up, they would threaten his contract even though they did not always stick to their side of the agreement *“There is no penalty for not fulfilling their side of the contract”* (D2). Over his time with this company, there had been a series of rate cuts. He explained how the company

was charging the client more, but none of that flowed on to him, despite the RUC (Road User Charges) going up “*It was passed onto the customers it was \$160 at first then 180, then 220, then 370 but it was never passed onto us*” (D2). He felt he was treated so badly – “*I am an OD by name, everything else makes me an employee*” (D2), and he could not see the worth in remaining an OD. So, at 64 years old he decided to, despite the huge financial loss, sell the truck and become an employee – he thought being an employee was fantastic, “*... as an OD I had to work every weekend, holiday, and the day after Christmas. As an employee, the uniform is free!*” (D2).

Work arrangements in the trucking industry were divided into employed drivers, owner-drivers/owner-operators, contracted drivers/relief drivers, and drivers employed by contractors, among others. This section focuses on owner-drivers and employed drivers as they are the two broad categories that the interviewees for this study fell into. However, in some instances the other categories were referred to by the interviewees and so are briefly mentioned.

There is a considerable body of literature that supports the connection between non-standard forms of work and poor OHSW outcomes (Underhill, Lippel, & Quinlan, 2011; Quinlan & Bohle, 2009; Sverke, Hellgren, & Näswall, 2002; Quinlan, 2013; Johnstone, 2016; Johnstone, Quinlan & Walters, 2005; NIOSH, 2002; LaMontagne et al., 2012; James, Johnstone, Quinlan, & Walters, 2007). Despite much of this work sitting outside the transport sector (for exceptions see: Mayhew & Quinlan, 2006, Mayhew & Quinlan, 1997), similarities can be drawn.

The shift from employee to contractor is indicative of a management pattern that is used to maximise profit and to pay those who were once employees much less (Lamare et al., 2015; Standing, 2009). The principal sets the remuneration and conditions for the contractor and often ignores risks, including the health, safety, and well-being risks, associated with low pay rates (Lamare et al., 2015; Quinlan & Wright, 2008).

Uncertainty and a lack of control are inherent aspects of precarious work arrangements (David et al., 2011; Quinlan, 2012; Underhill & Quinlan, 2011).

As contractors, ODs typically have ongoing uncertainty over how long the contract will last or whether another contract will follow. Many drivers face fluctuating remuneration as well as working irregular, unsocial hours, often at long stretches (Quinlan, 2012).

These findings have also been found in this study. In short, these contracted drivers were the sharp-end of vulnerability (Sargeant & Tucker, 2009).

According to Quinlan et al. (2010) and Lucarelli and Boschetto (2011), contractors experience greater vulnerability than permanent employees. They rarely have union representation, have limited support, and are more often exposed to hazards. They also tend to have low involvement in OHSW and are without vital OHSW information, frequently work long, arduous hours, and have limited access to social security support (Barrett & Sargeant, 2011; Underhill & Quinlan, 2011). Due to incentive-based reward, the work is competitive and uncertain (Walters & James, 2011). This competition drives many workers, and even organisations, to cut corners, in particular in the area of health and safety. This is of concern in high-hazard industry sectors such as transport.

Employment arrangements were considered a relevant element in the system of the New Zealand trucking industry when considering the OHSW of truck drivers, due to the extensive literature available.

6.8.1 Financial Risk

The interviews with the ODs and the Union/Employee Advocates gave most insight into the workings of being an owner and a driver. Many of the employed drivers did not want to be ODs citing the high level of risk and responsibility in an already dangerous industry.

Some drivers had given considerable thought to moving from an employee to an OD. However, realising that ODs were reliant on the wheels turning to make money, with the addition of maintenance and other costs, drivers realised the financial risk. The ODs noted the high financial risk they took by becoming an OD; some had large mortgages on their houses, others had taken loans, and the running costs for the business were high. If the truck was not on the road, it was not making money, and this kept the ODs working long hours and sometimes working days without rest. It was not uncommon for some of the ODs interviewed in this study to be working six or seven days a week, with one noting he commonly did ten days on the road without a day's rest.

Relief drivers were an expensive and unreliable alternative, and the ODs explained how it cost them too much and was too risky to put another driver in the truck for a day – it was more cost effective to do the work themselves. There was not always money left to

pay themselves; it was rare for the ODs interviewed to say no to work, and they were reluctant to take time off even if they were very unwell or fatigued.

As directors of independent contracting entities, ODs should typically be awarded daily autonomy, multiple choices of clients, various sources for loans, and the freedom to sell or make changes to the business. These factors could offset any financial risks if they were truly independent contractors. The elements of their job designed to offset the financial risks incurred are eroded by their dependence on the Principal Companies they contracted to. This study has highlighted that in reality, the ODs have limited freedom to make financial decisions, limited ability to sell their business to a buyer of their choosing, find themselves working longer hours to earn a decent income, have very little sick leave or holiday while having no opportunity for alternative employment. The elements in the role of a dependent contractor are increasing the OHSW risks faced by ODs in the New Zealand trucking industry.

6.8.2 Company Control

The dependence of the ODs was controlled in various ways by the Principal Companies. Cost models were typically set by the company and the OD was required to use it to operate their business. Transparency in the workings of the cost models was a stumbling block for some ODs as they were complex and difficult to decode. Frequently the ODs spoke of how rates were agreed on at the initiation of the relationship but were subsequently cut with little warning. If concerns were raised about adjusted rates by the ODs, it was implied that as contractors they could choose to accept it or not. This was not an option for most of the ODs spoken to as their trucks were painted the company colours, some had modified the truck specifically for the job, and in some cases, the loan to buy the truck came from the Principal Company.

There was little opportunity for the ODs to make a profit. Often, the Principal Company paid cost on all the parts of the business. Money to be made on wages disappeared when the company also set the wages rate. One OD noted that his wages were set by the company at \$20 NZD, and that when he worked out a more efficient way to do the route they monitored him and subsequently paid him less. The company had full control over his business and he was not in a position to negotiate. There was one OD out of the nine that were interviewed that felt they had a good working relationship with the company they contracted to. The reality was different for others.

The fear of losing the contract with the company they contracted to impacted many of their decisions and was a disincentive to raise concerns. Any attempts to challenge the company were met with threats, and the drivers could not take that risk. All the ODs were dependent on one company for all their work.

Conflict is inherent in the capitalist system, where power over a worker lays with the employing or contracting company. “The only legitimate voice that employees have is trade unions, and the only counterbalance to the employers’ power is collectivism” (Quinlan, Bohle, & Lamm, 2010, p.129). However, the arrangement of work in this industry makes the job of representation very difficult given the isolation inherent in an ODs contract.

6.8.3 Employed Drivers

The experiences of the employed drivers were somewhat different. As mentioned earlier, many employed drivers expressed that they would not like to be an OD. Two younger employed drivers said they had thought about buying a truck and setting up a business but needed to do more homework before making that decision.

The employed drivers explained how they were mostly offered security over their hours, income, and the routes “*I feel financially secure with them*” (D3). If they rung in sick (which they explained was rare), they knew there would not be serious consequences. They appreciated that they had sick leave available to them, but many felt they were a part of a team and did not want to let the others down by taking a sick day. The ‘team’ mentality was spread throughout the business, with some of the Key Informants referring to their employed drivers as core drivers and the contractors were seen as outsiders. Some of the Key Informants suggested it was easier to run OHSW campaigns, for example, with the drivers they had more regular contact with and they felt they had more of a responsibility to care for them too. Not all experiences for employed drivers were positive. Some worked under exploitative managers and were asked to work illegal hours.

Despite the notable differences between the two categories of drivers, some managers (Key Informants) explained how they held their contracted owner-drivers and their employees to equal standards. Additionally, there was mention of one company who, despite having a mix of contract drivers, owner-drivers, and employed drivers ensured full transparency in their operations to all the drivers.

6.8.4 Employment Status and OHSW in the Trucking Industry

Despite there being a host of evidence linking employment status and poor OHSW, as outlined in the opening paragraphs of this section, there are some inconsistencies in the literature on the trucking industry specifically about whether the status of employment is linked to worse OHSW outcomes for truck drivers. Some authors confirm the above, for example, Quinlan and Mayhew (2006) explained how ODs reported worse OHS, in general, citing economic pressures. Hensher and Battellino (1990) found that ODs were earning lower rates and found that they were doing seriously long hours compared to employed drivers, this influenced speeding and fatigue. Mayhew and Quinlan (2001) found that ODs often suffered from extreme levels of stress.

Economic stress for ODs was explained by Quinlan and Wright (2008) who suggest that transport operators used sub-contractors in the transport industry to secure a job at a lower rate and that price competition is something imposed mostly on ODs by freight forwarders and shippers. They went on to explain, and as said above, the rates were non-negotiable because there were others willing to do it for a lower price. However, Cantor et al., (2013) found that ODs were associated with more vehicle-out-of-service violations but compared to employed drivers, ODs experienced fewer crashes. Dammen (2005) explains this suggesting that the use of ODs significantly lowered the accident rates because they owned their machinery and therefore had more incentive to engage in safe driving. This, however, is refuted by Mayhew and Quinlan (2001) who found that ODs were more likely to have experienced a crash in the past 12 months.

This study, although not quantifying direct links between employment status and poor OHSW, found ODs as contractors faced additional risks and seemingly increased pressure. The risks stemmed from the financial pressures associated with ensuring the survival of their company; often at the cost of their health, safety, and well-being. Although the industry is one of high risks, the employed drivers faced less risk because the employer absorbed much of the financial pressure. Despite saying this, the employers were also under the mandate to ensure the survival of their firm, which often meant the drivers – whether employed or contracted – were pushed to their limits. The notable difference is that the ODs assumed the responsibility of this risk without enjoying the benefits associated with the commercial freedom of self-employment. In other words, they are capital without the privilege of security, position, or income. Thus, adding to the vulnerability of these workers. Standing (2009) suggests that this is

a management trend increasing the precariousness of workers who “bear the brunt of the systemic insecurity” (p.111). He explains that the objective under such circumstances is to cut core employees and replace them with those from “the precariat” (p.111) who were prepared to work for much less money and without employment security and although many of their income levels would put them above the poverty line, they lack the sources of income security which modern society has come to expect as the norm for decency. For JIT management systems to live up to its name, the cutting of permanent staff makes sense because it means that organisations are not carrying reserves on their books and can hire and fire staff to meet demand. These drivers are employees on paper but with little of the security (Standing, 2009).

The legal separation between employee and contractor is relevant to consider but difficult to enforce. Certainly as ‘dependent contractors’, some ODs saw little difference between themselves and the employed drivers. There is little evidence that formal contracts exist in this industry therefore, it appears that a meeting of minds – between the driver and the Principal Company – is more important. In an industry where the management strategy can be exploitative, this is of concern. Unilateral contracts, constant rate cuts, and unkept agreements rendered the ODs into a powerless position.

Initial figures and models provided by the principal companies made the offer to become an OD appealing. However the drivers were often lied to, and with the financial burden of loan repayments, they became trapped. The “central imperative of management derives its force from the unending quest for profitability which requires as its basis a continual reduction in unit wage costs and the relative cheapening of labour” (Braverman, 1998, p.xix). There is a conflict between safety and profit (Quinlan, 2013; White, 2014) and it creates problems when the ODs do not get the work done because they then are not paid so they will work longer hours and try to take shortcuts to get the work done quicker. Their ability to comply is compromised because they take these shortcuts to get the job done (Quinlan, Johnstone & McNamara, 2009) and this is an example of the connection between work arrangements and poor OHSW in the trucking industry.

6.9 Theme Three - Conclusion

The arrangement of work into the categories of contractor and employee was found to have potential consequences for the drivers. Under high economic pressure, the ODs did what they had to do to ensure the survival of their firm. Without union support, and isolated by the nature of their contract, much of the responsibility to uphold OHSW standards was on them as individuals and they could not always afford to prioritise it. Employed drivers reported a more positive experience, and for the most them, were content with being employed. Employment status is an underlying factor that is affecting the OHSW of truck drivers in New Zealand.

6.10 Theme Three - Knowledge Gaps and Next Steps Required

This section raised questions again about the sustainability of the industry; regarding specifically whether there were any stories of success among the self-employed. It appeared there is still confusion over legal status and law enforcement regarding the self-employed and the employed.

The literature thoroughly discusses the connection between employment status and poor OHSW outcomes. This was undoubtedly the case in the findings from this study, however, possibly the role of the manager – regardless of the driver’s employment status – had more of an impact on OHSW outcomes.

Knowledge Gaps	Next Steps
<ul style="list-style-type: none"> - Trying to break into a new market is not easy but what makes trucking a special case? Is it the degree of control tolerated by the regulators and authorities? - The literature is thin on success among small businesses operating in the trucking industry, especially in New Zealand. - The extent to which the cultural expectations in New Zealand play a role in drivers making the decisions to own their own business. - The extent to which employment status negatively impacts OHSW 	<ul style="list-style-type: none"> - Success stories of ODs either locally or internationally. - Find out from business coaches and trainers about difficulties of working with dependent contractors. - Explore further the link between self-employment and OHSW outcomes in the trucking industry in New Zealand and what the relationship to management is in this.

<p>compared to the impact of the manager and their decisions.</p> <ul style="list-style-type: none">- How good are agencies if they cannot deal with those on multiple or sub-contracts?- Have labour standards across society wholly collapsed?- There is still a lack of protection for those who stand up, i.e. whistle-blowers	
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FOUR: INDUSTRY CULTURE

“Once the guys start realising that they are being treated so badly they do something, but they don’t have enough time to investigate anything or to talk with people, the companies keep them working such long hours that they cannot do anything about it. If drivers worked 40 hours a week, there would be a revolution because they would realise something is not right!” (D18)

This section cannot be easily summarised by one story; the premise of this section is based on the combined stories and the shared beliefs of the drivers who are given the chance to tell their version of why they do this job and how they see the culture within the industry. This is supplemented by the views of the Key Informants.

This section highlights what is normalised and accepted in the industry. The quote above hints at the concept of what Lordon (2014) calls the “endurance of misfortune” – the drivers have become so accustomed to the status quo that they endure the poor OHSW outcomes citing that they “love the job” (D12). Data from the drivers indicated they had been in the job for a long enough period of time that they reportedly felt they had little choice to do anything else and made attempts to rationalise staying. But as in Mackie and Moore (2008), when asked if they would want their children in the role, the response was frequently: definitely not.

The culture within the trucking industry in New Zealand is deep set and as a result, the drivers do not question it, nor do they believe it is possible for change; they are a survivor population. It was explained that being a truck driver was not a job, but a lifestyle and for those that did love it, they put aside the difficulties.

Despite the difficulties faced, many of the drivers showed an intense passion for their job. Many of them left school early knowing they were destined to drive trucks. Nothing beat being out on the open road on a sunny day, they explained, and nothing felt better than the power of a truck beneath them with no one telling them what to do. Out on the road they were free. This contradicts the previous section in which drivers spoke of their lack of freedom and this section discusses this paradox.

The industry has successfully attracted these drivers in, and once they are in, they stay there, they become part of the family. The concept of family arises here again, and the

drivers use it to explain a sense of belonging within the industry. Truck driving was a part of their identity, they could not imagine doing anything else.

6.11.1 Industry Norms

Once they were a part of the industry, the drivers appeared to perpetuate that sense of belonging by defending fellow truck drivers and even defending industry-wide practices. It was understood that the job was one of high risk but was written off as “*just the nature of the industry*” (D3). Poor OHSW outcomes were passed over with the same judgement, for example, fatigue was considered an unavoidable and inherent part of the job.

The “she’ll be right” attitude inherent in the industry contributed to the disregard given to dangerous practices. This attitude may also explain why it was not always the drivers that expressed the greatest concern but the union representatives, the employee advocates, the lawyers, and the health professionals that were able to see the issues from an external perspective. Those attempting to make changes in the industry felt they were fighting a losing battle because issues were long-standing and deep-set.

The norms presented in this study may provide explanation for the slow pace of change seen in the industry. Fatigue, long hours, poor eating habits, and lifestyle choices were among some of the elements of the job that were normalised by the drivers. Previous sections of this chapter have highlighted that low pay, inadequate infrastructure, and management practices were linked to the symptoms of fatigue, long hours, poor eating, and lifestyle choices. The literature supports this notion highlighting the difficulties in changing the behaviour among truck drivers. Sendall et al., (2016) and McDonough et al., (2014) explained that the organisation of work in the industry meant drivers found it difficult to make changes, especially regarding their health. The drivers wanted to live a healthier life, Boejinga et al. (2017) report, but again, it was suggested that the work system presented too many obstacles. It is therefore surmised that the drivers were perpetuating the industry norms and have little agency to make change.

6.11.2 Once They Are In, They Stay In

The drivers have done more than adapt to the workings of the industry; they appear to “derive real satisfaction from it” (Lordon, 2014, p.9). The industry has successfully created a culture of belonging and from this gained loyalty. They have been recruited in

service of the industry goals regardless of the cost to their OHSW. This seems especially prevalent for the ODs. Based on the interviews conducted for this study, it appears that for most of the ODs they were either: given a set of initial figures that made the business look viable and therefore entered into the agreement under the illusion of a good business decision; or were given little choice but to go out as contractors to the same business they were once employed to. Their investment, financially and otherwise, was high enough to tie them into the industry and to the company. As mentioned above, no hold is more powerful than that of enlistment through employment (or contract) when the individual is in such high amount of debt. The desire for money can be narrowed down to the desire to remain employed (Lordon, 2014). The ODs, in particular, may imagine themselves to be autonomous business owners but there is little evidence to suggest any such freedom.

6.11.3 Autonomy

The need for autonomy in the job was an important element for both the employed and the contracted drivers. However, the drivers' freedom was compromised by the increasing use of technology to monitor the actions of the drivers. The researcher finds it contradictory and remarkable that many of the drivers were entrusted with expensive machinery and loads but could not go to the toilet or take a break when they saw fit. Drivers were reportedly observed by surveillance equipment, in-cab cameras, and other similar equipment, with the data monitored by external companies or the principal/employing company. For some of the drivers, the camera footage was seen as favourable when it was directed towards the road because often there were incidents in which the truck drivers themselves were not at fault and the footage from the camera confirmed this. However, it was the cameras that were facing towards them and the monitoring of their speed and GPS data that some of the drivers expressed concern over. One employed driver spoke about his manager ensuring he drove a consistent speed for the entirety of a shift and he was rewarded if this occurred. An OD refused to have a GPS installed – as requested by the Principal Company – because he felt the route was his intellectual property and that they were going to use it to justify paying him less. In such instances, the drivers felt it was another way in which management tightened their grip and exercised their control. However, some managers explained their frustrations over drivers' underreporting of near misses and incidents. They explained how they

were using the data to monitor fuel usage and driving skill, so they could both save money for the company and monitor those drivers who were causing unnecessary wear to the vehicles.

The literature is supportive of the managers on this topic. Fatigue management technology, for example, was seen as a way of effectively collecting information and sending warning signals to drivers when they became dangerously tired (Meng et al., 2016). However, the literature also highlighted that drivers appreciated their independence and autonomy – being able to make decisions for themselves (Grytnes et al., 2016; Swedler et al., 2015). It appears there is a conflict for the managers between awarding that freedom and leaving the drivers alone to the potential detriment of their safety. Huang et al. (2013) and Grytnes et al., (2016) point out that drivers are lone workers by the very nature of their tasks; Edwards et al., (2014) further suggests that control over the drivers is logistically difficult because of the nature of the job. Edwards et al., go on to explain that to successfully manage the safety of lone workers, the nature of the job and the workers must be better understood so that interventions are more realistic. As such, there is a good reason for the installation of such technology as ultimately it is designed to improve their OHSW. It is when this tool is used to increase the tight grip of management that it becomes problematic. An explanation of this follows.

Standing (2009) points out that tools for surveillance are used in JIT management systems to improve regimes by “instilling discipline and enhancing control” (p.218). Using such management techniques in combination with surveillance ensures labour discipline is achieved, efficiency is established, and minute control is possible (Delbridge et al., 1992). The desired outcome is to minimize divergence from expected behaviour and management-defined goals. The responsibility for the actual work is that of the individual, and the strategic control is centralised. Klein puts it like this: “Remember how we’ve always been told that free markets and free people go hand in hand? That was a lie. It turns out that the most effective delivery system for capitalism is actually a communist-style police state, fortified with American “homeland security” technologies” (2008, p.6).

6.11.4 Industry Norms

The intention of this section on the theme of Industry Norms has been to highlight the normalisation of certain practices in the industry. Elements of their job such as fatigue, long hours, low pay, poor health, and high pressure are acknowledged as dangerous but normalised among them. It is suspected that many remain in the job, absorbing the risk of poor OHWS, because they feel a sense of loyalty to the industry, which they believe to be like family. Right throughout, there is a sense of family and membership deeply embedded into the culture of this industry. This keeps them loyal and it keeps them trapped. The use or misuse of the loyalty is again dependent on the intention of the employer and the manager.

It appears the drivers remain loyal to the industry because they love their job and have an obvious passion for it. Many expressed it was in their blood. Part of what was most enjoyed about the job was the perceived freedom while out on the road. This freedom appeared to be an illusion; there was a dislocation between the perceived autonomy promised to them and how it played out in reality. The increasing use of surveillance and monitoring has reportedly eroded their freedom, as have unilateral contracts and the increasing use of dependent contracting. It is suspected that the loyalty to the 'family' is blinding the drivers to the practices that may impinge on the part of the job they enjoy the most - their ability to autonomously run a business. In other words, they do the job because they love the freedom, but the freedom is not there.

The structure and agency debate has aided in explaining the normalisation of practices in the industry. Agency might normally be assumed by those running an independent contracting entity, in which decisions could be made about how best to run their business. Given that most of the ODs interviewed were dependent on one principal company for their work, much of the agency they might have experienced was eroded by the nature of this relationship. Even for those drivers who were employed, agency would be assumed by the very nature of their job tasks. As lone workers, the literature suggests that they must make decisions independent of a manager while out on the road. This study showed that the agency promised to them was eroded by managerial practices to further exercise control. Managerial practices are an element of the system that are impacting the agency of the drivers. The drivers expressed their enjoyment of feeling free out on the road, it is therefore assumed that desire for agency is sought.

The structure is being reinforced by the normalisation of industry practices. As the drivers normalise poor OHSW, the structure is strengthened, and change becomes more difficult. However, the structure is also strengthened by the reference to the family. Drivers reportedly spent very little time with their actual family – for those that did have one – and the industry therefore became a pseudo family. Their loyalty kept them in the phase of reinforcing the structure, again making change difficult.

6.12 Theme Four - Conclusion

The industry norms are a barrier to change and are keeping drivers working under sub-optimal conditions. The drivers believe they have autonomy, but they are closely monitored and controlled. Some managers use monitoring and surveillance for the benefit of the drivers, others take advantage of it and abuse this power.

The norms are enhanced by and are a product of the contextual factors at play within this industry in New Zealand. The factors discussed above interrelate and produce norms that are detrimental to the OHSW of truck drivers in New Zealand. They are also reducing the drivers to powerless individuals, costing them their autonomy.

6.13 Theme Four - Knowledge Gaps and Next Steps Required

The norms within the industry were irrefutable, given that so many of the participants relayed similar sentiments. The norms were well established and ingrained however, were found to be a barrier to change. Next steps from this research may consider and further explore the lack of agency that the structure implores.

Knowledge Gaps	Next Steps
<ul style="list-style-type: none"> - What is the extent of compromised OHSW for other industry members given that they also operate within this system? e.g. managers, transport operators, OHSW trainers/managers, associations? - Psychosocial factors could potentially be a serious problem given the rhetoric among drivers, perpetuated by the norms in the industry. - To what extent are the drivers alienated from themselves and what implications does that have for OHSW? 	<ul style="list-style-type: none"> - How the norms within the industry have evolved and to what extent they are perpetuated within the system. - Interventions that address the system-wide issues instead of the more commonly used interventions that target the easiest issues first. - How does change happen in the industry? Who champions it? Is the Government in power relevant? By whom is the evidence base provided? - Again, what is the spill over into the families?

FIVE: CHALLENGES OF OHSW REFORM IN THE TRUCKING INDUSTRY

Efforts to address OHSW in the trucking industry have widely ignored the complexity of the problem. A failure in systems thinking has meant that little attention has been given to the interconnectedness between the organisation of the industry and poor OHSW outcomes. Although some studies have considered the contextual factors (e.g. Thornthwaite & O'Neill, 2017; Edwards et al., 2014), the majority take an individual approach targeting interventions at the individual. The previous sections have shown that the organisation of the industry cannot be ignored; it is inextricably linked to the poor OHSW experienced by the drivers. This section, which is structured slightly differently to the previous, gives a brief outline of examples of the individualistic approaches suggested by the literature and interviewees. What then follows is a discussion on government agencies and their role in OHSW reform. It is suggested that they have a unique position to collect the necessary information to provide a more holistic picture of the trucking industry however they too are plagued with gaps in information about this highly complex industry.

Mooren et al., (2014) found that many studies used individuals or the vehicle as the unit of focus and that the narrow focus made it difficult to understand whether the problems observed were systemic or could be attributed to the individual. Newman et al., (2017) adds that focusing on the individual's level of compliance is unlikely to produce the reductions in work-related injuries for truck drivers. This was not only found in the safety literature but also the literature on health. Individually targeted health promotion programmes did little to reduce the health problems of truck drivers (Boiejinga et al., 2017; Aspostolopoulos et al., 2016).

The section in the literature review highlights numerous solutions for health improvement such as education for the drivers on the risks of poor health, online training courses and for organisations to provide more opportunities and spaces for drivers to exercise (Dahl et al., 2009). However, barriers to good health are the result of complex interactions, and such health promotion programmes fail to reach the drivers in a meaningful way because they are not easily translated into their everyday working environment (Hill et al., 2015). Figures regarding truck drivers' poor diet, lack of activity, and absenteeism have not improved (Boiejinga et al., 2017). Apostolopoulos et al. (2016) state that "worksites health programs underestimate the systemic complexity

and the complexity of the causes of driver health problems; hence interventions have generated merely disappointing and unsustainable results” (p.92). They go on to say that efforts to target structural barriers in the trucking industry are “slow, superficial, uncoordinated, inadequate, and ultimately ineffective” (p.91). This is supported by local researchers, Mackie and Moore (2008) who found that micro level interventions were first to be implemented and were easier to address. However the macro issues are proving more complex and difficult.

Solutions to the OHSW problems in the trucking industry require an understanding of the complex interactions of the system. Collection of that data can be difficult and does not often occur (Brodie et al., 2009) for possible reasons such as limited resources, a lack of incentive, or that there is a lack of common understanding about whose responsibility it is. Below is a discussion based on the findings from the Key Informants who were members of the Government Agencies. Their comments elucidate the difficulties they face in attempting to understand the complexities of the industry, the complications around jurisdictional overlaps, and how the Agencies collaborate to influence OHSW in the trucking industry in New Zealand.

6.14.1 Those in a Position to Understand the Industry Holistically

Members of Government Agencies expressed the urgent need to collect more information about the trucking industry. It was thought that different agencies should be asking more questions of the industry to get to the root of the problem but as one admitted “*we just don’t really understand it*” (KI26). A lack of inter-agency communication was highlighted, and concerns were expressed over jurisdictional boundaries, information sharing, and inter-agency communication. Working groups had been set up in the past which included the relevant agencies, but that had since disbanded.

The siloing off of the different agencies meant there was some confusion over whose responsibility it was to monitor, enforce and collect information on these truck drivers. It was suggested that the trucking industry presented a unique situation because it was thread throughout many other industries and was not a static workplace. It meant there were grey areas when it came to where the responsibility lay. Members within the agencies noted that there was an increasing pattern of vehicles featuring heavily in their injury statistics and that truck driver issues were across many different sectors.

There was confirmation of a desire for agencies to work more collaboratively but it was important to be clear on jurisdictional boundaries. Not duplicating the work of other agencies was mentioned by the participants at this level, some suggesting others were better placed to address the concerns in the industry.

It was commonly discussed among the government agency Key Informants that the industry, the drivers, the occupational physicians and the relevant agencies need to be able to better articulate the connection between poor OHSW and the working conditions of truck drivers in New Zealand. Further, longitudinal studies were required but the obvious challenges of time and resources were cited. The agencies wanted the industry to recognise the issues first and then be more willing to accept and support the interventions suggested. Gaining industry involvement was part of their agenda, but they may have a little way to go.

6.14.2 Challenges to Reform

The literature confirmed that individually targeted interventions were not having the desired effect of reducing OHSW. This was attributed to a lack of consideration given to the complex nature of the industry and that any intervention that did not consider such factors would not easily be translated into the working lives of truck drivers. Consequently, the working lives of the truck drivers must be considered before interventions are planned and if there is little information being collected by those who oversee the industry, then it is of little surprise that the industry is ill-informed in their efforts to address the poor OHSW. The data from this study has highlighted some of the barriers to effective data collection and agency collaboration in New Zealand. These obstacles may inhibit the collection of data required to paint a more holistic picture of the system. Sympathy is offered because to undertake a study that includes wider issues takes time and resources and can produce a very complex set of data reflecting the very nature of the industry. Herein lies the contribution of this study. The challenges to reform are due to a lack of insight and consideration of the complex system of the trucking industry in New Zealand.

6.14. Theme Five - Conclusion

The OHSW of truck drivers has not improved to a standard in which the drivers are free from harm because a failure in systems thinking has meant that efforts are fragmented and ineffective and are therefore not easily translated into their working environment.

6.15 Theme Five - Knowledge Gaps and Next Steps Required

This study has demonstrated that the quick fixes (sadly) are not enough. It is time for more substantial parts of the system to be looked at; there is strong evidence that current attempts are not working.

Knowledge Gaps	Next Steps
<ul style="list-style-type: none"> - Current regulatory interventions seem too weak to address the well-established issues seen in the trucking industry in New Zealand - Focusing on vulnerable workers is only further depleting resources, how can the incentive to exploit be taken out of the model? - How can we encourage transparency and ensure organisations within this industry are reporting on what is happening not what they are doing? - What is the extent of the impact on families and community if these wider, systemic issues are not addressed? 	<ul style="list-style-type: none"> - A multi-agency approach over a prolonged period to coordinate resources and focus efforts on the poor OHSW of truck drivers in New Zealand - Clarification of inter-agency jurisdiction - Longitudinal monitoring of policy impact on the industry including generational impacts - How can transparency in the reporting provide more leverage for unions? - Multi-stakeholder forums are needed of which families and community members are involved

6.16 Development of EST Model and The Ecological Industrial Systems Model

The nature of this study has been problem driven: to address the poor OHSW experienced by truck drivers in New Zealand. Previous narrower attempts to address OHSW have made little headway, arguably because they fail to consider the complexity of the interactions occurring in the industry. This study provides a systematic display of the contextual factors relevant for consideration and how they interact to produce the symptoms of poor OHSW in the trucking industry in New Zealand.

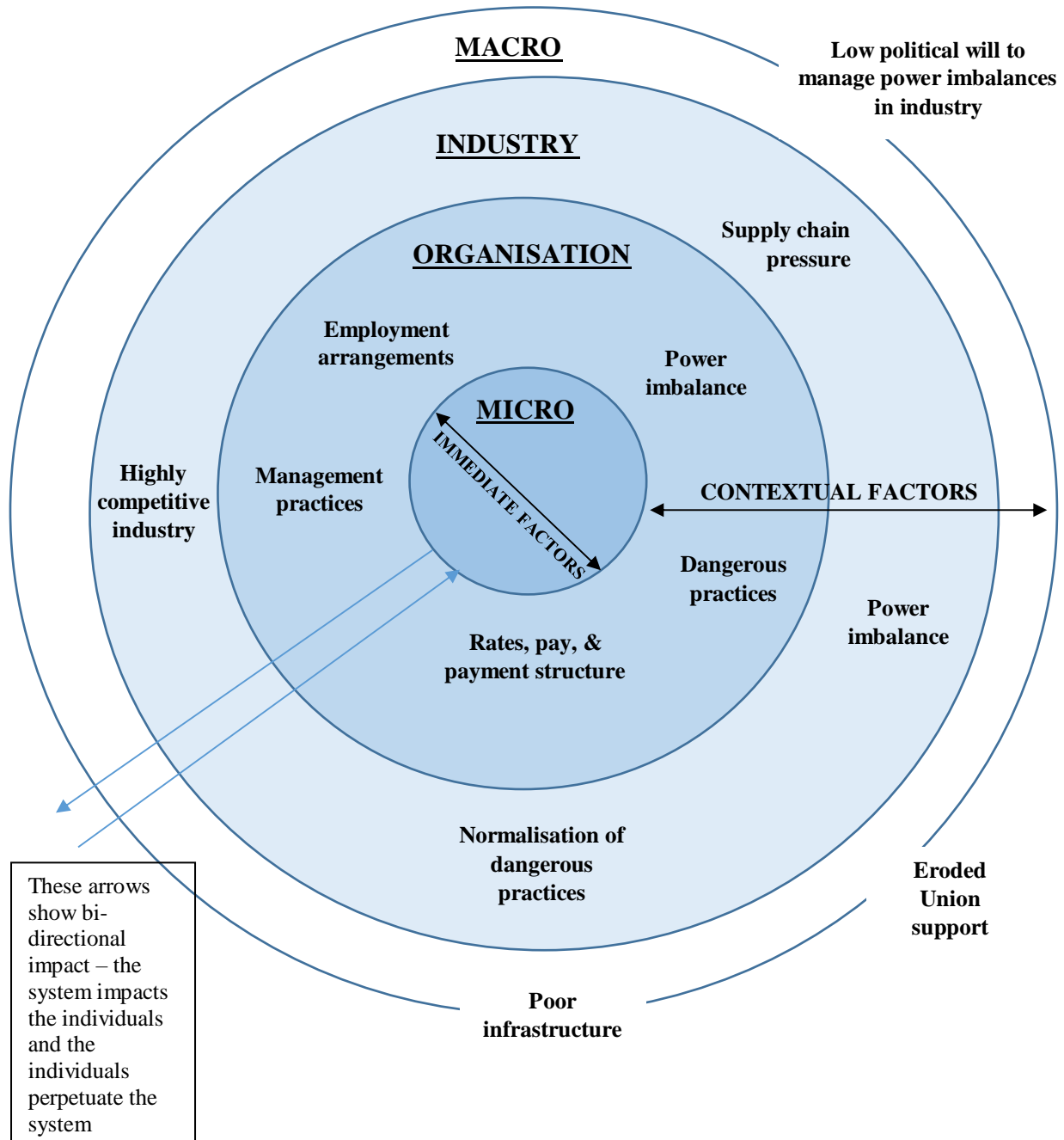
Bronfenbrenner's EST model allowed the researcher to consider a wide range of contextual factors impacting the drivers, however stopped short of industrial-specific factors, given the educational setting it was developed in. The findings from this study have therefore facilitated the development of the EST model to include factors such as those relating to the organisation of work in the industry, managerial practices, employment relationships and arrangements, and industry-specific norms. The interaction of these factors were found to be a barrier for change.

The purpose of a System is important to consider when applying previously formed frameworks in a different setting to that in which it was developed. The New Zealand trucking industry, as a system, has a purpose specific to its nature and context. Although the purpose of this system may be similar to trucking industries elsewhere, the New Zealand-specific context has driven the development of this EST model. The purpose of this system was to move goods with minimal damage and maximum return. An analysis of this system produced evidence of a highly competitive industry which then resulted in the current organisation of work, for example the deregulation of New Zealand markets leading to more flexible working arrangements and an increasing use of dependent contractors.

In its current form, the EST did not sufficiently include industrial or socio-political contextual factors which is understandable given the context of its initial development. Figure 6.1 below illustrates the adaptations made to the EST model using the findings from this study. This version, named the Ecological Industrial Systems (EIS) Model can be used to better explain the industry-specific problems witnessed.

The contextual factors featured in the EIS model below are the thematic summary of the findings from each phase of data collection and the figures that resulted (see Figure 5.2, 5.4 and 5.6) and represent the key findings discussed in this chapter.

Figure 6.1: The Ecological Industrial Systems Model with Principal Contextual Factors Plotted



IMMEDIATE FACTORS:

The driver status e.g. physical and psychological status including mental health, injury, and illness etc. This also includes the immediate working environment such as truck cabs.

CONTEXTUAL FACTORS:

Forces external to the driver and their immediate work surroundings (i.e. truck cab) but which had an impact on their OHSW. Immediate factors, such as poor OHSW were not considered contextual factors but symptoms of interacting contextual factors.

CHAPTER SIX CONCLUSION

There were five critical findings from this study. They each elucidate contextual factors that play a role in the OHSW of truck drivers in New Zealand but also highlight gaps and next steps that need to be addressed. Below (Figure 6.2) is a mind map that depicts the major themes identified in this chapter and shows the interactions between the identified underlying contextual factors.

This chapter facilitated discussion on how the contextual factors identified in this study interact within a highly complex system. The interconnectedness of the contextual factors highlighted patterns over time which were found to lead to undesirable outcomes for the drivers and the industry, but for society also. The conclusions reached give us the ability to predict outcomes from repeated scenarios identified in this explorative study and ensures future decisions are made using a strong evidence base.

The **first key finding** discussed the highly competitive nature of the trucking industry in New Zealand which is reportedly placing pressure on many players along the supply chain. The pressure to remain competitive resulted in low margins and consequently low pay. Drivers were working longer hours per week, some beyond the work-time rules to earn a necessary amount. This is consistent with the literature reviewed for this study.

The role of the manager was the **second key finding** discussed. The pressure to remain competitive meant the increasing use of JIT management practices, for example placed added pressure on the drivers. Tasked with the survival of the firm, in some cases, their *raison d'être* reflected a profit focus with seemingly low regard for the individual consequences to the drivers. Given the tight margins in the industry, compromises were observed, and shortcuts were taken. Under the guise of efficiency and economic advantage, organisations were increasingly using contractors (ODs) to replace employees. This shift, as reflected in many other industries, denotes a strategic move to transfer the risk to the individual drivers only heightened by their dependency on that one firm.

This links to the **third key finding**, the role of the employment relationship. The owner-drivers had to also ensure the survival of their own firms, but the risk was higher and survival difficult. Very few success stories were told. The financial loans and pressure to remain viable coupled with the isolation (by nature of the job and the contractual

status) only further increased their exposure to OHSW risk because sometimes it was expensive to prioritise. And not only that, it appeared that to an extent poor OHSW was normalised within the industry. The industry norms and culture were the focus of the **fourth key finding**.

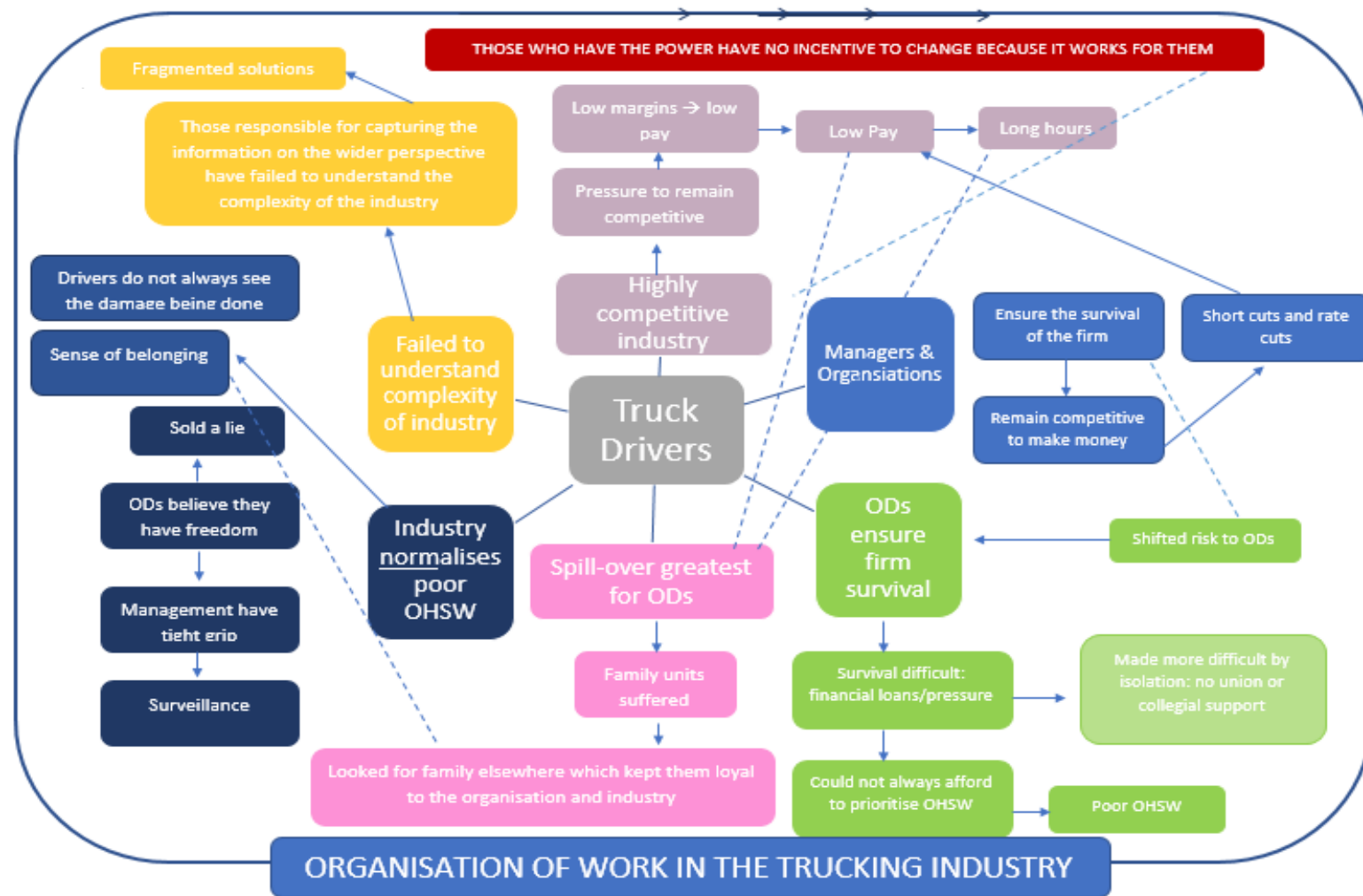
Drivers told of the poor OHSW they experienced but for them, the industry and the organisation were like a family and their sense of loyalty and belonging was strong. Given the isolating nature of the job and the long hours spent away from home, this was unsurprising. However, it is feared that the loyalty to the industry was alienating them from the reality of their working conditions. Many drivers believed in the autonomy of their job, especially those ODs who took pride in self-employment, but many of the cultural, structural, and organisational practices occurring in the industry stripped them of this, giving them very few actual benefits that self-employment should bring.

Those responsible for capturing information on the wider perspective have seemingly not been able to grasp the complexity nor see it as a standalone industry requiring urgent review. As a result, responses have been fragmented and individual in focus – this is the **fifth key finding**. Additionally, those in power throughout the supply chain had little incentive to invest in change because it was reportedly working for them. Someone needs to follow the money.

Using this study, the EST model was developed to include industrial factors relevant to the trucking industry in New Zealand and the poor OHSW experienced by truck drivers. The EIS model reflects the purpose of the specific system it has been developed to explain and displays the findings from this study.

The findings discussed in this chapter provide a platform for the upcoming conclusions chapter which sets out the key contributions this study has made. The findings presented and the gaps discovered in this chapter offer an evidence base to those able to facilitate change in the industry. The implications for industry, society and practice feature in the following chapter.

Figure 6.2: Mind Map Detailing the Interactions between Contextual Factors



CHAPTER SEVEN: CONCLUSIONS

7.1 Thesis Conclusions

Given the complex nature of the industry in addition to the complexity and amount of data collected from varied sources in this study, the following section provides a simple but structured overview of the full story told in this thesis.

7.1.1 Scale and Nature of the Problem

As noted throughout this thesis, truck driving is a dangerous job, and the immediate risks are well documented. Driver behaviour is often the narrow explanation for the poor health, safety, and well-being symptoms that present. Details of the wider, systemic contextual factors are not often considered nor are they well documented in New Zealand and it is resulting in fragmented and individually-targeted efforts to solve OHSW outcomes.

There were insufficient research and data which understood the interaction between wider contextual factors at a macro level such as the organisation of work and at the micro level, employment status and high debt levels. For this reason, a systems approach and a system-wide data collection design was adopted for this exploratory study to capture and understand the nature and role of the contextual factors impacting the OHSW of truck drivers in New Zealand.

Unravelling this complex problem begun with understanding the system in which the truck drivers operate. Of note was how the push for a more deregulated market increased flexible work practices designed to respond to market fluctuations and global competition. This resulted in the increasing use of ODs. However, the individuals more reflected dependent rather than independent contractors. Trends such as this, as well as a driver shortage, ageing workforce, and New Zealand's high dependence on road transport, highlighted the need for a system-wide review in which the interaction of these contextual factors were documented and analysed thus supporting the methods for this study.

7.1.2 Approach and Methods

The literature was reviewed to outline the nature of the problem relating to OHSW of truck drivers globally and locally. It established that it is necessary to adopt a new approach to the problem. There were very few, if any studies, that adopted a systems approach when attempting to address the poor OHSW outcomes in New Zealand. This is also felt globally. “Systems thinking based data collection and analysis frameworks are urgently required to help develop this understanding in road freight transportation” (Newnam et al., 2017 p. 28).

The industry was presented as complex with multiple parties expressing varied views. The research design, therefore, needed to capture the complexity of the responses and systematically present them. The design facilitated the co-construction of the data with the participants given the exploratory nature of the study. This furthered industry co-operation and trust which was twinned with a robust research methodology.

7.1.3 Findings

The findings revealed underlying contextual factors such as increasing competition, industry norms, managerial practices, and pay structures among others, which were resulting in fatigue, poor health, goal conflicts, driver shortages, excess driving hours, and poor work/life balance and many more symptoms. The interaction of the contextual factors identified in this study presents a concerning and complex picture.

Five key areas of concern arose from the findings of this study. The organisation of the trucking industry, as one of those areas, collated the contextual factors relating to industry practices and how they interacted leading to concerning OHSW practices. The role of the manager was identified as the second area of concern, addressing managerial practices as a contextual factor relevant to the OHSW of truck drivers in New Zealand. It was found that managers have an impact on the cultural, structural, and organisational environment in the industry. However they too felt conflicted by some of the industry practices and supply chain pressures revealed in the first area highlighted above. The role of the employment relationship, as identified in the literature, was also found to be an underlying contextual factor impacting the OHSW of truck drivers in New Zealand. The normalisation of work organised to shift the risk to the individual was of concern. The fourth area of concern outlined how the industry norms were perpetuated and produced by the contextual factors within the trucking industry. Industry norms were

found to be a barrier to change, and only further highlighted the challenges still yet to address for OHSW reform in the trucking industry.

While this study has contributed to the body of knowledge in this area and has identified underlying contextual factors and how they interact, it has also raised many more questions. Gaps were identified when obvious questions were not answered and issues not addressed, recognised or asked. Over 25 of these questions, gaps, and future research ideas were generated and presented in this thesis with the intention that not only future researchers but Key Informants throughout the industry will note what still needs to be done if future changes are to emerge from a reliable and sufficiently exhaustive evidence base.

CONTRIBUTIONS TO THEORY AND KNOWLEDGE

While prior research in this area has contributed much information about the poor health and safety of truck drivers and is beginning to consider their well-being, few studies have considered the highly complex nature of the industry in which they operate. A lack of consideration has been given to contextual factors which may have serious implications for the OHSW of truck drivers.

Research on the trucking industry has been heavily focused on addressing the immediate issues for drivers, such as their poor health or truck-related safety possibly because there is a short-term urgency to reduce the impact from these issues. However, as has been highlighted by this study, the organisation of the industry including the industry pressures, management practices, employment structure, and industry culture and norms are increasingly inhibiting change. Without consideration of such factors, attempts to make a change may be in vain. This study has highlighted external factors that may previously have been overlooked when considering solutions to the poor outcomes witnessed; the level of abstraction is unique.

Studies have shown a link between non-standard forms of work and poor OHSW outcomes (e.g. Quinlan & Bohle, 2004; Standing, 2011) however, very few have looked specifically at the trucking industry (with the exception of Mayhew & Quinlan, 2006) nor has there been much integration of these outcomes with other contextual factors. At the time of publishing, there were no studies identified in the literature review that considered employment status and other wider, systemic issues when looking at the OHSW of truck drivers in New Zealand.

A theoretical and conceptual contribution of this study is the extension of the EST model to include industrial factors that Bronfenbrenner's work did not need to accommodate, including employment status and wider structural and cultural issues. The developed version of this model has been named the Ecological Industrial Systems model.

This study is the first to apply critical interpretive inquiry and Labour Process Theory (LPT) to the problem of truck driver OHSW. The combination of a sociological lens, operationalised through interpretive critical inquiry and LPT, and the EST model is also an original feature of this research and provided an effective conceptual framework for investigating, analysing and understanding OHSW risk in the sector. The use of a

critical lens requires us as researchers to examine the structural determinants in society that are having the greatest impact. The use of a systems framework allowed for the exploration of those structural determinants.

7.2.1 Methodology and Methods

Given the centrality of co-construction in this approach, the researcher believes replication of this study would not be identical. The systems framework, however – as a road-map for data collection – provides a guide for future researchers on what to include when considering OHSW in the trucking industry. The methodological contribution is, therefore, the creation of a systematic framework that can be used as a pathway for complimentary co-construction studies with facilitated sample selection, question formation, and analysis and interpretation that would collectively build a richer understanding of OHSW in trucking.

The methodology developed paves the way for a subsequent mixed methods study that looks beyond the drivers to the families and communities picking up the indirect costs of failure.

7.2.2 Contextual Factors

This study has provided a fuller understanding of the complexities of the industry from the perspectives of those within it. Very few studies globally have considered the highly complex nature of the contextual factors (with a few exceptions, e.g. Edwards et al., 2014; Mayhew & Quinlan, 2006) let alone in New Zealand. Although the New Zealand trucking industry has some unique features such as the geographical layout and the high dependence on trucks for goods delivery, many of the external factors considered in this study could be usefully investigated in overseas studies.

7.2.3 Combined Private and Public-Sector Data

This study included a unique set of data from the private sector and did not simply rely on publicly available information such as ACC data for example. The inclusion of the data outlined in Phase One of this study was the compilation of integrated multiple perspectives and showed how different members of the system interacted.

7.2.4 Evidence-Based Weaknesses

Additionally, this study has provided an extensive identification of knowledge gaps and crucial questions. Without the answers to these questions, the industry would struggle to build an evidence-based action plan.

7.2.5 In-direct Costs to Families and Communities

Initially, the researcher had included in this thesis a section on family impact. This is an under-researched area especially within the trucking industry and among those who are dependent contractors, however, was deemed to be outside the scope of the primary study. This area requires urgent focus, as the limited data points strongly to families and communities paying a high price for the trucking industry to remain operating in the way that it currently is.

LIMITATIONS AND STRENGTHS OF THE STUDY

7.3.1 Limitations

National-Level Parties Not All Represented

Not all related and relevant parties were involved in this study, for example, certain government agencies were absent. This has presented a gap in the study due to a lack of reply and sometimes, only one side of the story represented. The system's approach invited a large sample size, but due to the resource availability and restrictions of this study, lines had to be drawn.

Not All Driver Sub-Populations Covered

In a similar vein, the trucking industry is, as previously acknowledged, highly complex and is host to many different types of truck configurations across many different types of sub-sectors including log truck drivers, long-haul, short-haul, urban delivery, milk/petrol tankers. This study was a general overview based on those drivers and Key Informants that were available and accessible, and as a result, the conclusions cannot be applied to every sub-sector and truck configuration within the industry.

Availability of Participants

The sample was impacted by availability and accessibility of the interviewees. Truck drivers are essentially shift workers and therefore were often difficult to contact and interview. This influenced the type of drivers and Key Informants that were interviewed.

Contradictions in Data

The drivers and the Key Informants alike acknowledged that those still driving were potentially a 'survivor population' meaning those that could not cope had left. This has implications when considering the views of the sample interviewed.

Internal contradictions in data from individuals could only be tested so far by one researcher. In a larger study, multiple complementary co-construction would advance this.

Well-being Not Understood Enough

As one component of OHSW, well-being was not given equal focus by the participants when compared to health and safety in this study. Arguably stress and fatigue, for example, are well-being issues but the emotional toll was not well understood or explained by the participants within the industry, among the drivers, and throughout the literature. Future research could provide a better understanding of what well-being means in the trucking industry and what is to be included under the term, and what is not.

Secondary Data Gap Analysis

There was limited opportunity for gap analysis in the secondary data provided by the insurance company. Very little detail was given to the researcher about the participants of the data for confidentiality reasons. Additionally, the data was not collected for academic purposes. The data may have been skewed depending what was being funded by the insurance company or the participating organisation's relationship with the insurance company. Given the researcher was going into the industry for the first time with very little knowledge of the situation, the data was analysed without much critique. Further studies could use similar data sets to understand mismatches in claims and occurrences.

*7.3.2 Strengths**Findings*

The systems approach was ambitious but generated multiple targets for potential interventions – both at single levels (e.g. driver or regulator) or more commonly as packages spanning multiple levels.

Method

The co-construction approach yielded richness that would not otherwise have been obtained and provided a workable model for other researchers wishing to generate complementary data sets here or overseas.

It is the hope that the findings will have more impact as they were co-constructed with the end-users and the industry. The engagement of the participants meant the research

happened with them not to them, therefore, increasing their potential buy-in and ensuring the outcomes better translate into their working environment.

Approach

This study brought together private sector and more publicly accessible data – not previously achieved in trucking and is very rare in any sector of industry in New Zealand.

Additionally, the value of the systems approach is the ability to simulate making the changes and then registering the overall impact – its positives and negatives. The depth of understanding built by this thesis goes a long way in anticipating previously unthought of consequences and outcomes.

IMPLICATIONS FOR INDUSTRY, SOCIETY, AND PRACTICE

7.4.1 Evidence Base

The final column in the Discussion Table (Table 6.1) concerns weakness in the current evidence base used by the sector; it lists questions to be answered if improvements are to be seen in the space of OHSW in the trucking industry in New Zealand. This table has been designed to assist in the process of compiling a system-wide action plan.

7.4.2 A Move to Greater Inter-Generational Responsibility

New Zealand Government Agencies have very recently shown greater interest in longitudinal monitoring of policy impact, including across generations (for example see the work of Boston, 2016; Personal Communication, 2018). Boston, a New Zealand based researcher, suggests good governance requires the ability to anticipate tomorrow's problems, to protect the long-term public interest and consider "systemic risks" (p.11) over extended timeframes. Further, Boston stresses the importance of the interconnected nature of various dimensions while acknowledging the dynamic state of the system. This type of governance is proactive and values prevention over cure-based evidence. It is vital for the trucking industry in New Zealand that tomorrow's interests are "actively considered – and properly represented – in today's decisions" (p12).

7.4.3 Multi-Agency Co-operation Needed

The industry has presented as one with the tendency to downplay risks and underestimate future impacts. It is one with a high tolerance risk culture and confusing regulation. Many of the problems are out of sight for enforcers and government representatives; such agencies are often faced with many urgent problems and demands. This is a difficult industry to police. Given the downplay of the risks, there may be little pressure from the public who somewhat benefit from the current industry set up. Such issues cross many boundaries and therefore require coordinated responses from several tiers throughout the government in co-operation with the industry and organisations.

This is made more difficult by the siloed nature of government departments and agencies. Each agency has different mandates and challenges with funding which are not always aligned. Jurisdictional overlaps require urgent clarification, and so a more collaborative approach can result. "To be effective, many policies require sustained

effort over lengthy periods and major changes in mass behaviour or social institutions” (Boston, 2016, p.15). The kind of regulatory interventions seem too weak to address the well-established issues seen in the trucking industry (Thorntwaite & O’Neill, 2017).

7.4.4 Labour Model Review

This thesis highlights a labour standards problem, not an individual worker problem or a migrant problem. Chasing the workers will inevitably deplete resources rapidly, with seemingly little payback. The option to exploit through dependent contracting needs to be taken out of the model and out of the industry. The industry needs to be reporting on what is happening not what they are doing. This may further empower unions and remove contextual antecedents of exploitation.

The damaging outcomes identified in this study have multiple causes and lack complete or definitive solutions currently. This is further agitated by perceived significant trade-offs to the industry; costs are seen to outweigh the benefits, though this only further highlights the short-sightedness. Lack of knowledge about indirect family and community costs means there is no voice for those absorbing the consequences of the current industry set-up in New Zealand. Multi-stakeholder forums are urgently needed in which families and community members are encouraged to participate so that the true costs in loss of all forms of capital become clear enough for the right decisions to be made.

The overall conclusion of this thesis is that a lack of understanding, measurement – and probably political will – have resulted in an unacceptable situation with heavy indirect costs being borne. Inter-generationally informed change is urgently needed.

This thesis is an urgent call to action.

FINAL REFLECTIONS

This concluding section is offered as reflections on the research process and experience.

I now more fully understand why the transport sector has been largely overlooked in New Zealand. The industry is tightly controlled and has closed borders and a transient, shift-working workforce, woven through various other sectors that spread to the far corners of the country, and is given little attention politically. Mackie and Moore's 2008 study of the health of log truck drivers using a systems approach highlighted an urgent need to critically examine the wider trucking industry in New Zealand.

Problem-led Focus of the Study – Multi-disciplinary Approach

This study was driven by the need to address the poor OHSW of truck drivers in New Zealand. It did not sit tidily in one discipline meaning there were several ways in which the problem could have been approached and there were many bodies of literature that could have been consulted. The discipline range in which this study sat expanded throughout the research process and in the end, what was included was based on the response of the participants, reflecting the problem-led nature of this study. This resulted in challenges but also unexpected positive outcomes.

Relying on any one discipline would have narrowed the data included and would have only replicated the research this study critiques. The multi-disciplinary nature meant unexpected findings could be included which was of importance given the exploratory, constructivist nature of the study. Additionally, the co-construction approach of this research did not really allow for a single disciplinary approach. Space had to be given to allow all possible answers from the participants to be included. Once all the evidence was laid out, it became clear which was the strongest theoretical approach to be used to place the data in context and not be bound by arbitrary discipline boundaries.

The multi-disciplinary approach yielded a large amount of data because interviews with participants covered a variety and wide range of topics and at times resembled life stories rather than structured interviews. The nature of the topics discussed in the interviews meant that at times participants were upset, angry, derogative, and aggressive and at other times were deep in thought, reserved, and frequently sought answers. As the researcher, dual concern was required. Firstly, to respond as a human and react with

genuine empathy. Secondly, to respond as a researcher, there to complete a task and ensure the successful collection of data. The latter required explanation.

Having the ability to show genuine empathy to the participants meant that barriers between us were broken down and trust was respectfully gained. Responding as a researcher, however, required the establishment of trust first and then gentle guidance at appropriate times back to the topics being discussed. This was especially important because evidence from Facebook posts and anecdotal information showed a disdain and distrust of researchers among the trucking community. Physically going to the participants for the interview when possible and developing relationships with them was central to overcoming the barrier between researcher and participant.

A level of credibility also needed to be earned to overcome the barrier between researcher and participant. Time was spent at trade shows, union meetings, truck stops, and in courtrooms to help establish familiarity with the industry. Knowing industry-jargon, who the key players were, the internal politics, and the types of people I would be collaborating with, I believe, was essential in the successful co-creation of data presented in this thesis. The tight-knit nature of the trucking community also meant that my reputation with the key players was important to protect and understanding the industry from within was vital.

Well-being

Despite awareness of their challenging conditions, it was often difficult to facilitate conversation with the participants (drivers in particular) about their well-being. This is reflected in the lack of informed discussion possible on well-being due to the lack of data. Further research is required in this area however, it is suspected that the male-dominated culture within the industry meant very few felt comfortable discussing issues related to their mental and emotional health. This is of course a generalisation.

There are potentially additional explanations. Firstly, safety was at the forefront of the minds of the participants – albeit the safety of others road users, not necessarily the safety of the drivers. Secondary to safety, participants were able to identify the health problems in the industry but offered very few solutions on how to address it.

Understanding health in the industry would require more long-term strategies and it is suspected that many in the industry would not have the available resources. Discussions

about well-being may have been seen as a luxury not yet surfaced due to more immediate and pressing issues. This is arguably an industry focused on the short-term.

Secondly, the ODs in particular did what they needed to do to ensure the survival of their firm. This appeared to manifest in actions ensuring short-term survival, making long-term well-being less of a priority. Not completing the paid work today guarantees low well-being next week and even poorer well-being in the long-term if the job is lost.

Why Families Were Excluded

Informal conversations conducted with the family members which offered more insight into the physical, mental, and emotional state of the truck drivers were not included in the final write-up of this thesis. Ethical approval was not granted to include family members in this study due to research on family violence among similar communities. It was suspected that topics of a fragile nature would arise and that a considered, specific research design would have to be created to ensure all participants and members of the family were protected. It must be noted that two participants included in the driver interviews were partners of the truck drivers. They were included in the write up of the findings because they were co-directors representing a dependent contracting entity and were therefore able to provide as much insight into the interaction with the clients, the running of the business, and the principal company relationships as any of the drivers. Caution was taken to ensure the safety of these two participants; the first was the wife of a driver who had recently passed away and the second came instead of her truck driving husband, with his consent. In these two instances, I made a judgement based on the reading of the literature on violence in these communities and concluded that the interview was safe to conduct and that the information collected was worth including.

Given the insight offered informally by truck drivers' family members, the strong presence of family businesses, and the indirect impact the industry was having on the family unit, there is an urgent need to follow this line of inquiry using methods that would safely elicit the data from this currently unspoken-to community.

Female Drivers

Very few female drivers came forward to be interviewed. Some were involuntarily offered forward by other participants, but the female drivers unanimously said they felt they had little to offer. Sadly, this meant no female drivers were interviewed. Female Key Informants were interviewed; their perspective provided valuable insight into the

strong gender norms entrenched in the industry and how these norms inhibited more females taking up roles. It was out of the scope of this study to discuss the role of gender. Given many participants discussed the need to recruit more females, further research is needed on how to overcome the barriers deterring them from applying for the jobs.

System Boundaries and the Qualitative Approach

The role of gender was one of many lines of inquiry that could have been followed. Boundaries around the scope of this study needed to be drawn to ensure the focus remained on solving the problem of poor OHSW of New Zealand truck drivers. Apart from Mackie and Moore (2008), whose study was focused specifically on the Log Truck Drivers, no other research could adequately inform which contextual factors to include and exclude. Therefore, the starting point had to be about gaining an understanding of the system, which a qualitative method facilitated. This approach, in line with my methodology, meant that boundaries of the system were co-created by me as the researcher and the participants. Boundaries shifted throughout the process to include new findings, which I could then apply to discourse in the academic literature and the findings from other interviews.

It was unusual for some of the participants to be involved in a qualitative study of this kind as many tended to be people who thought in numbers and therefore provided numerical answers despite the question asked. The qualitative approach gave space for the participants to respond in their own language, using jargon and industry terms.

Formalised quantitative approaches would have required prior knowledge about relevant variables and this information was not available. A quantitative approach was deemed unfeasible in this study due to many reasons and time spent in the industry prior to data collection provided this information. The drivers would be disinclined to fill out surveys given the low trust for academics, potentially poor literacy skills, and the long hours they work. Additionally, as mentioned above, personally establishing rapport with the participants was key to trust building and securing a successful interview.

Safety Risk to Researcher

In some instances, a great deal of effort was required to get interviews and I felt honoured to be finally allowed into the homes, offices, and truck cabs of the participants. There was only one instance which I prioritised my safety and terminated

the interview. On reflection, there were instances in which possibly I was at risk, however given the difficulty of securing many of the interviews, stopping them at any point was not considered desirable. The safety of an interviewer should be given considerable attention when designing future studies of this nature as well as training in how to assess risk and manage it onsite and afterwards.

Very Little Goes Right by Design

Consideration given to wider systemic factors meant that the employment arrangements within the industry were examined and discussed. Practices such as dependent contracting highlighted patterns of risk shifting and hinted at an ever-growing power imbalance in the industry. In light of the findings, it appeared that such practices were dragging the progress of the industry backwards.

Attempts to use the Safety II approach (the study of why things mostly go right) in the trucking industry would yield interesting results. On the face of it, more should be going wrong, and based on the findings from this study it is a surprise we are not seeing more truck accidents. It is suspected, therefore that the drivers bend the rules, compromise their OHSW and absorb much of the potential risk. Work-as-done, therefore, is very different to work-as-envisaged. An investigation on what actions are undertaken to ensure things go right most of the time warrants further investigation because it is suspected the drivers are paying for it in the long-term. As an example, if 10 hours of work time is sustainable, and the drivers are required to work 14, then to get through the final four the drivers may rely on unhealthy food choices (e.g. energy drinks, foods high in fat, or even drugs) which may ensure the load is delivered but in the in long-term causes them ill-health. Again, the short-term survival is the priority.

Developing a Model

Developing the elements and relationships that are plotted in the Ecological Industrial Systems (EIS) model was an important contribution of this study because the model was designed to specifically accommodate the forces impacting the OHSW of New Zealand truck drivers. The purpose of the New Zealand trucking industry is different to that of the industries analysed by different researchers who adopt a systems approach (e.g. Wilson and the UK Rail Network; Perrow and Nuclear Plants). No one system framework accommodated the contextual factors discovered in this study, however Bronfenbrenner's work provided an initial framework and allowed for the inclusion of

all relevant contextual factors. He looked at all contextual factors impacting children's learning in classrooms posing questions related to why some succeeded and others did not. Comparably this study treated the truck drivers and their immediate working cab environment as Bronfenbrenner treated single pupils with learning materials and looked at all interaction of relevant contextual factors impacting the drivers' OHSW beyond the immediate control and display driving task.

The Benefits of a Systems Approach

The health, safety and well-being of the truck drivers were impacted by system weaknesses. More often than not, addressing these requires major changes or adjustments in each aspect of the system because the knock-on effects may not all be desirable. The nature of a systems approach allows for simulations when making proposed changes and then registering the overall impact – the positives and the negatives. The depth of understanding built by this thesis goes a long way in anticipating all the ripples.

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APPENDICES

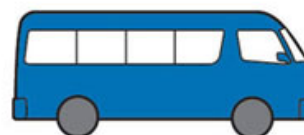
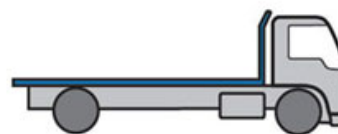
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Appendix 1: Heavy Vehicle configurations

LR – Light Rigid

LR vehicles include:

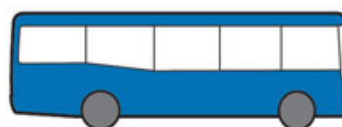
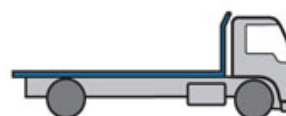
- Small trucks with a gross vehicle mass (GVM) up to 8 tonnes. Any towed trailer must not weigh more than nine tonnes GVM
- Buses that seat more than 12 adults including the driver and a GVM up to 8 tonnes



MR – Medium Rigid

MR vehicles include:

- Trucks and buses with a GVM more than eight tonnes and two axles
- Any towed trailer must not weigh more than nine tonnes GVM.



HR – Heavy Rigid

HR vehicles include:

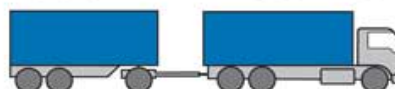
- Trucks and buses with a GVM more than eight tonnes, and three or more axles
- Any towed trailer must not weigh more than nine tonnes GVM
- Bendy buses. Even though these vehicles are articulated, they're treated as rigid vehicles.



HC – Heavy Combination

HC vehicles include:

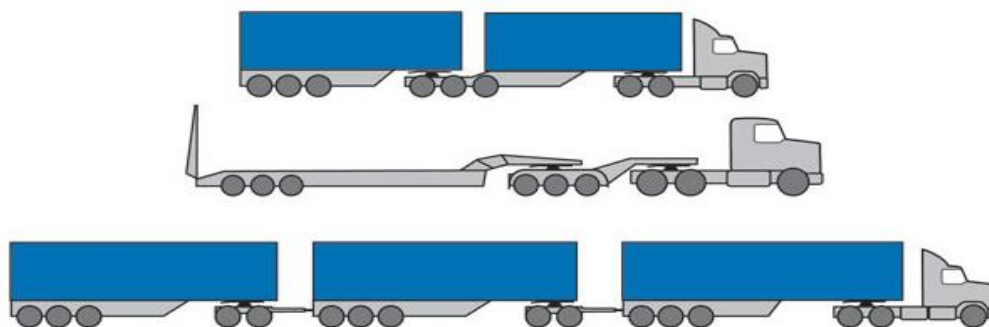
- Articulated vehicles with three or more axles
- Heavy rigid vehicle trailer combinations including unladen dolly, with three or more axles
- Any towed trailer with a GVM more than nine tonnes.



MC – Multi Combination

MC vehicles include:

- B-doubles
- Prime mover, low loader dolly and low loader trailer combinations
- Road trains.



Sourced from: New South Wales Government: Transport, Roads, and Maritime

Services: <http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/licence/index.html>

Appendix 2(a): Table featuring a summary of articles that took a wider focus (Refined Version)

Study Focus and Country (grouped by region)	Author and Year (chronological)	The scope of interest of the paper (system level)	Key Findings
Understand the impact of deregulation on the trucking industry in New Zealand (NEW ZEALAND)	Bollard and Pickford (1998)	Regulatory	A lack of regulation has freed the industry from the burden of control, and the industry is seeing greater efficiency and service quality from price competition. Customers are more satisfied.
Gain a deeper understanding of key issues wider than the individual, and OHS outcomes (particularly health) (NEW ZEALAND)	Mackie and Moore (2008)	Governmental Industry Company/Organisational Personal/Individual	The matrix of interventions suggested at various system levels
Report of Inquiry into safety in the long-haul trucking industry (AUSTRALIA)	Quinlan (2001)	Regulatory and regulatory bodies Industry	Commercial arrangements between parties have a significant influence on safety.
Violence experienced by truck drivers (AUSTRALIA)	Mayhew and Quinlan (2001)	Industry Organisational Employment status Individuals	Violence is a risk to truck driver's safety, and underlying factors fuel the circumstances.
The relationship between economic pressure, subcontracting and OHS outcomes for employed and owner-drivers (AUSTRALIA)	Mayhew and Quinlan (2006)	Industry Organisational Individual	Link found between economic pressure, contingent work and negative OHS. ODs under extreme stress levels.

Show a link between pay and safety (AUSTRALIA)	Quinlan and Wright (2008)	Regulatory Industry Employment status	A payment system is required that allows for fair competition and efficiency without cutting corners
Coroner's death investigation files to understand the extent of fatal crashes (AUSTRALIA)	Brodie, Bugeja and Ibrahim (2009)	Physical environment Occupational Individual	Limited information was found in the report about organisational factors. Underlying factors should be further considered
The lived experiences of truck drivers and the interrelationship of their networks (AUSTRALIA)	Karp (2010)	Regulatory Industry Organisational Managerial	Influence of economic factors and industry regulations on OHS. Legal, financial and business reasons prevent addressing of these issues.
Examination of precarious work and its impact, also link between pay, safety and regulation. (AUSTRALIA)	Rawling and Kaine (2012)	Regulatory Industry Legal	The structure of the supply chain has led to poor OHS outcomes; low pay increases the dangers
Profiling contextual factors that influence OHS (AUSTRALIA)	Edwards, Davey, and Armstrong (2014)	Government Organisational Physical environment Individual OHS	A need to consider contextual factors because of their relevance to the culture within the industry
Contributions of contextual factors on work health and safety regulation (AUSTRALIA)	Thornthwaite and O'Neill (2016)	Physical environment Industry Organisational Personal/individual factors	The complex industry with a host of interdependent factors within organisations and across the supply chain that cause poor OHS for a small but significant group of workers
Whether coronial investigations identify contributory contextual factors (AUSTRALIA)	Newnam, Goode, Salmon and Stevenson (2017)	Government and Regulatory Industry Organisational Road using public	Lack of inclusion of systematic contributory factors, reductionist approaches taken to interventions

		Physical environment	
Driver's work environment, including fatigue, and crash risk. (AUSTRALIA)	Meuleners, Fraser, Govorko and Stevenson (2017)	Organisational Individual	Truck type, shift times, break allowance and health impact the risk of a crash
Investigation of the underlying factors precipitating speeding behaviour (USA)	Hensher and Battellino (1990)	Macro Micro	Economic reward conditions play an important role in explaining on-road speeding behaviour. Must look beyond the symptoms
The effects of deregulation, de-unionisation, technology, and human capital (USA)	Belman and Monaco (2001)	Regulatory framework Industry	Income inequality has hit the earnings hard for truck drivers. Wages are lower for non-unionised drivers. Technology has increased worked intensification.
Examines the link between pay and safety (USA)	Belzer, Rodriguez, and Sedo (2002)	Organisational Individual Physical environment	As pay increases, the risk of a crash decreases. The two are linked.
Role of human capital, occupational factors, and demographics in crash frequency (USA)	Rodriguez, Rocha, Khattak and Belzer (2003)	Organisational Individual	Occupational factors and human capital are better predictors of crash compared to demographics
Address safety from the perspective of the firm (USA)	Dammen (2005)	Regulatory Organisational Employment status	Firm characteristics appear to most influence accident rates. Owner-operators were found to increase safety due to their added incentive to remain safe.

How commercial worksites impact opportunities for healthful eating and activity (USA)	Apostolopoulos, Lemke, Sönmez and Hege (2016)	Organisational Institutional Physical environment Individual	Structural barriers encountered at these worksites do not facilitate healthy lifestyles for truck drivers.
Antecedents of unsafe behaviour and the impact of drivers' relationship networks (ISRAEL)	Peretz and Luria (2017)	Social network Family life	Frequent interaction is connected to safe driving behaviour through information sharing and sense of commitment
Analysis of the UK container haulage industry with a focus on ODs (UK)	Gregson (2017)	Industry Employment status	Confirms ODs' position in the precariat and shows how occupational factors requires drivers to "stretch time."
Health and safety issues in the road transport sector (GLOBAL)	International Labour Organisation (2015)	Global National Regulatory Industry Organisational Employment Family Individual	OHS concerns need to be addressed at the global level through tripartite action to promote decent work

Appendix 2(b): Table featuring a summary of articles that took a wider focus (Extended version)

Endnote Ref no.	Paper Authors + Date	Journal or publication	Aim	The scope of interest of paper (system level)	Conclusion	Interview questions (some have too new date, e.g. 2017 / link to the current study)
442	Meuleners, Fraser, Govorko & Stevenson (2017)	Accident Analysis and Prevention	To determine the association between a heavy vehicle driver's work environment, including fatigue, and crash risk	Organisational: type of truck driven; driving-shift time, break times Individual: Health - Sleep apnoea testing	Associations found between a driver's work environment, fatigue-related outcomes, and the risk of crash. A safer work environment is called for.	
439	Edwards, Davey, & Armstrong (2014)	Accident Analysis and Prevention	To examine previous health and safety research regarding heavy vehicle operations to profile contextual factors which influence health and safety.	Government departments, transport organisations, customers, physical road environment – both health and safety outcomes were considered	They noted that there are many external factors that influence heavy vehicle operations and they noted the importance of considering these issues using a cultural framework to understand and make improvements in this area.	What is the role of the regulatory system on individual truck drivers? Which management practices encourage or deter health/safety outcomes?
545	Newnam, Goode, Salmon & Stevenson (2017)	Accident Analysis and Prevention	Examination of whether Australian Coronial investigations into road freight	Government bodies, regulatory bodies, organisations and clients, heavy vehicle companies,	There was a lack of evidence to suggest an understanding of a systematic based	

			crashes identify contributory contextual factors and their interrelationship	drivers and other actors at the scene of the crash, equipment/environment/ Meteorological conditions	reform. Reductionist based interventions showed a poor understanding of the complexity of the system of factors. Different actors across the system have to work together to develop prevention efforts.	
473	Apostolopoulos, Lemke, Sönmez & Hege (2016)	American Journal of Health Education	Examines how the environmental attributes of commercial trucking worksites influence truck drivers' opportunity for healthful eating and active living	Organisational: truck stops, trucking terminals, warehouses, and highway rest areas along key transport routes (they called what they found "institutional barriers")	These worksites are severely burdened by structural barriers, and comprehensive interventions are needed to address these barriers because they have far-reaching and serious health ramifications for truck drivers. Traditional worksite health programs have had limited success, the application of complex system methodologies has increased potential for change	What institutional barriers are present that are inhibiting healthy living for drivers?
109	Mayhew & Quinlan (2001)	Current Issues in Criminal Justice	The exploration of violence experienced by truck drivers as a	Working conditions: isolation, schedule pressure, intense	Violence is a risk to drivers' safety. Underlying factors	Do drivers feel unsafe? If so, why? How can

			part of a broader study that looked at truck driver's health and safety.	production pressure, violence a normal part of the culture. Economic pressures, unpaid waiting time. Customer interactions causing violence Individual: violence and attacks, abuse Employment status: self-employment, owner drivers by comparison to employees. Precarious employment Community: other road users	fuelled violence in certain circumstances including waiting time spent loading and unloading which are often unpaid hours for the drivers, excessively tight schedules, unsafe expected trip times, and competitive low freight rates. Improved regulation and enforcement of speed and working hours could reduce some tension in this industry	these feelings be traced through the system? What is the role of the new CoR legislation? What are the unrecognised consequences of high competition and poor working conditions?
419	Mayhew & Quinlan (2006)	Employee Relations	To analyse the relationship between economic pressure, multi-tiered subcontracting and occupational health and safety outcomes for employee and owner/drivers in the long-haul trucking sector	Individual: injuries, psychological distress, fatigue and drug use Organisational: violence, crashes, hours of work and employment status	There is a connection between economic pressure and the expansion of contingent work and negative OHSW outcomes. Truck crashes were highest among those with the longest hours and the greatest economic stress. Owner-drivers were found to be under extreme stress.	

525	Mackie & Moore (2008)	44 th Annual Human Factors and Ergonomics Society of Australia Conference, 2008	Firstly, to learn about the operations and requirements of the job of a lock truck driver. Secondly, to gain a deeper understanding of key issues such as hours of work, work-life-balance, and health issues such as MSDs and obesity.	Micro: obesity, hearing, sleepiness, fatigue, MSD, job satisfaction, WLB, stress Macro: Long hours and family impact. Governmental Industry Company/Organisational Personal/Individual	The inter-relationships between workplace hazards and injuries, health and well-being and employee human resource issues are being recognised therefore a matrix of interventions were suggested at various system levels.	
521	Karp (2010)	The International Journal of Interdisciplinary Social Sciences	To gain an understanding of truck drivers' lived experiences of their working lives including market pressures, dealing with government regulations, connection with family and community and working conditions such as long hours of driving. The aim was to give the drivers a voice.	Regulatory: increasing regulatory systems, lack of flexibility. Industry wide: economic survival and financial stress, intense competition. Organisational: workplace freedom, conflict and wage negotiation, workplace sub-cultures. Managerial: surveillance	The results provided a greater understanding of the influence of economic factors and industry regulations concerning health and safety. Drivers are under a great deal of economic stress. Individuals and organisations will fail to address serious issues for a range of legal, business, and financial reasons.	The paradox between commercial freedom and management practices of surveillance
356	Thornthwaite & O'Neill (2016)	A Summary Report found in TEACHO Ltd January, 2016	Looks at the contribution that contemporary modes of Work Health and Safety (WHS)	External factors: weather, climate, infrastructure, time of the day or night. Governance factors: Customer demands,	Analysis of the literature and WHS data revealed a collection of highly interdependent WHS	Talk to the drivers about employment arrangements, remuneration systems, working

			<p>regulation make to the health and safety of drivers in this industry. They also looked at the perceptions and experiences of truck drivers.</p>	<p>remuneration arrangements, management quality, suppliers Workplace factors: Driving conditions, personal factors, cultural factors, schedules and time pressure. Immediate factors: fatigue, speed, drug usage. Loss of control: driver error WHS outcome: fatality, injury, illness, near miss or damage</p>	<p>factors that exist within organisations and across the supply chain. The complexity of the web of casual factors offers an array of points for intervention. They concluded that there are segments of the workforce that are at considerable risk of serious injury and illness. These risks are linked to a range of features including employment arrangements, remuneration systems, working hours, task variability, control and autonomy, access to training, and management policies, practices and resources. The system is very complex.</p>	<p>hours, task variability, control and autonomy, access to training, and management policies, practices and resources and the impact they have.</p>
17	Rawling & Kaine (2012)	Australian Journal of Labour Law	<p>The authors examine a sub-set of precarious workers namely those working at the base of vertical supply chains</p>	<p>Regulatory structure: pay and safety issues Legal: limited legal protection for owner drivers. Implications for</p>	<p>The supply chain structure of the road transport industry has led to poor safety outcomes for road</p>	<p>Where does the pressure come from? Who are the key players in the supply chain?</p>

			in the Australian Road Transport industry. They looked specifically at the influence of commercially dominant clients and the control they had over the pay and conditions of the drivers engaged in the supply chain.	the employment status of drivers. Industry: Intense competition. Poor working conditions. Pay and safety connection, safe rates. Unpaid working time with limited negotiation power - imbalance of market power. Long driving hours, intolerable time pressure.	transport workers. Low pay drives hazardous work practices. Low remuneration and economic pressures emanate from clients at the head of supply chains.	Why is there so much pressure on truck drivers?
92/88	Quinlan & Wright (2008)	Report: National Transport Commission	To review the evidence demonstrating the potential link between payments and safety in the road transport sector	Regulatory framework. Commercial and Industrial practices that encourage unsafe practices such as long hours or speeding. Employment status including the impact on owner-drivers.	A payment system is required for drivers that allows the trucking industry to compete fairly on service and efficiency without needing to cut corners.	
80	Hensher & Battellino (1990)	Report: Papers of the Australasian Transport Research Forum	To investigate the underlying factors precipitating a truck drivers' speeding behaviour.	Macro: Competition between drivers, road conditions, price competition imposed on the owner-drivers by freight forwarders and indirectly by the shippers as a consequence of oversupply of trucks.	The study concluded that economic reward conditions of the industry play an important role in explaining causes of on-road behaviour. If the problem of on-road safety is to be addressed and solved it	

				Industry: Tight schedules, carrier type or ownership of the goods, distance travelled, waiting time. Micro: Less experienced drivers, driver fatigue, spill over into family units who need to supplement low income, drug usage	is important to “look beyond the symptoms of speeding, infringement of driving time regulations, and driver fatigue and consider the underlying causes which result in this behaviour” (p.553)	
332	Brodie, Bugeja & Ibrahim (2009)	Accident Analysis and Prevention	Describes the nature and extent of fatal heavy vehicle crashes using information about the nature of the crash, environment, driver, vehicle, occupational factors which were collected from the coroner’s death investigation file	Environment, driver, vehicle, occupational factors.	Associations between occupational factors and crash risk was limited and to improve safety for truck drivers requires the incorporation of such factors into crash investigations. Underlying factors should be considered, and a broad systems approach applied to the study of heavy vehicle crashes.	
397	Rodriguez, Rocha, Khattak & Belzer (2003)	Journal of the Transportation Research Board	Examines the role of human capital and occupational factors, as well as demographic factors in influencing crash frequency at the driver level	Human factors: demographics. Organisational factors: pay, time in the job, seasonal driving.	Results suggested that human capital and occupational factors such as pay, tenure, and percent of miles driven during the winter months have a	

					better explanatory power of crash frequency than demographic factors. Higher pay and pay rises are related to lower crash counts	
528	Gregson (2017)	Mobilities	Examines logistics in the UK container haulage industry with a focus on owner-drivers.	Industry practices and expectations. Employment status	Just-in-time management, 24/7/365-day delivery required by logistics purchasers is achieved through drivers displacing work, stretching time, and running out of time. The authors establish the position of owner-drivers in the logistics precariat as is the financial precarity of the circulation of containers in the UK logistics industry.	Establishes the connections between working conditions for these drivers and their position in the precariat.
90	Quinlan (2001)	Report of Inquiry into Safety in the Long-Haul Trucking Industry	Individual drivers and operators, community groups, industry organisations, insurers, government agencies, the TWU, family members expressed serious concern for the safety in the industry.	Industry and Commercial practices Individual Regulatory, regulatory bodies and enforcement	Commercial arrangements between many different parties have a significant influence on safety. Customer requirements on price, schedules, loading/unloading, and freight contracts, in	

			The Inquiry was set up to, among other things, investigate the link between commercial practices, including the role of customers and consignors, and safety.		conjunction with the high intensity of the competition in the industry, encourage problematic tendering practices, unsustainable freight rates, and dangerous work practices. Many of the operations were found to be economically non-viable.	
334	Belzer, Rodriguez, & Sedo (2002)	Report: Paying for Safety: An Economic Analysis of the Effect of Pay on Truck Driver Safety	Examines the link between truck driver pay and safety	Firm-level: pay, unpaid working time, bonus payments, time off, labour supply, the role of the unions. Individual level: demographics and seasonal variations in safety	As pay increases, the risk of a crash decreases. Carriers pay their drivers in line with their market value which is based on their personal employment history, driving record, training and education, driving skills, temperament, and other unmeasured factors. Firm size is most likely associated with greater driver safety.	
544	Peretz & Luria (2017)	Accident Analysis and Prevention	To understand the antecedents for unsafe road behaviour by looking at the driver's relationships with his	A social network including negative relationship network, friendship networks, and	Among other findings (they did not specifically focus on truck drivers but did include them) it was	Where does your support come from? How does that support impact your

			or her peers and networks.	advice networks (safety consulting).	found that because truck drivers are lone workers, it is important to have frequent interactions as this has a connection to unsafe driving behaviour. This increases information sharing about safety and also increases friendship ties within truck drivers' teams.	health, safety and well-being?
391	International Labour Organisation (2015)	Report: published by the ILO	Priority safety and health issues in the road transport sector: Report for discussion at the Tripartite Sectoral Meeting on safety and health in the road transport sector	National level Global supply chains: liberalisation and deregulation, reform. Transport operations: market pressures Organisational practices: non-standard forms of employment, intense competition, job insecurity, disregard work-time rules, overloaded vehicles. Individual level: stress levels, decreased wages, road accidents, violence, poor OHS Family: Poor WLB	OHS concerns need to be addressed at the global level by tripartite action to promote decent work in the road transport sector. The ILO has issued Conventions, Recommendations, and other tools on this subject.	

470	Belman & Monaco (2001)	Industrial and Labour Relations Review	Examine the effects of deregulation, de-unionisation, technology, and human capital on the working lives of truck drivers.	Regulatory framework: the impact of deregulation on the industry. Industry: Union membership, pay, employment status, high levels of competition, working hour violations	Income inequality has hit the earning of manual workers most hard, of which one of the largest groups are truck drivers. They suggest that deregulation accounted for one-third of the decline in drivers' wages and it had the largest impact on non-union workers. Satellite communication systems had a meaningful impact on drivers' earnings which rose as a consequence of superior efficiency and work intensification. Union members earned 18-21 percent more than their non-union counterparts.	The industry reforms including deregulation have had an impact on drivers' wages, working conditions and as a result safety. Union membership is important.
579	Dammen (2005)	Transportation Research Forum	Addresses motor carrier safety from the perspective of the firm, developing the theoretical framework for firm safety decisions. Also, they	Regulations: Deregulation of the trucking industry Organisation: firms should invest in safety practices and technology until the marginal cost is	Firm managers have control over the safety performance of their firms through management decisions. Firm characteristics appear to be some of	

			tested the impact of safety performance and safety practices, new technologies and firm marketing strategies.	equal to the marginal benefit of the reduction in the carrier accident rate. Employment status.	the most significant factors influencing firm accident rates. The most significant variables are safety performance of the firm, the use of owner-operators and unionisation. Drivers that own their truck have more incentive to engage in safety behaviour including maintenance.	
474	Bollard & Pickford (1998)	Journal of Transport Economics and Policy	To understand the impact of deregulation on the trucking industry in New Zealand	Regulatory	(Not specifically related to safety but state the outcomes have been positive). The industry moved from one of widespread government ownership and “stifling regulation” to one where all controls have been removed, and the government’s job has been to ensure an even playing field for all. They conclude that deregulation has increased competition, efficiency and service	

					quality. Vast improvements have been made in labour productivity, and pricing has been more competitive, and operators have been freed from regulation to tailor their services to meet the customers' demands and make the most of technological advancements to increase efficiency.	
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Appendix 3: Thematic Categories of Included Articles (colour key below)






THEME:													
Search no.	Psych/ Behaviour	Health	Fatigue	Stress	Injury/ accident	Context	Ergonomics	Training	MSDs	Pay	Regulation	Employment status	Safety climate
1.	430 (US) 434 (US) 438 (US) 550 (UK)	432 (US) 433 (US) 436 (CAN) 445 (DEN) 554 (CAN) 556 (US)	431 (US) 441 (CAN) 442 (AUS) 551 (NOR) 557(UK) 563 (AUS)	434 (US) 488 (AUS) 446 (US)	435 (US) 437 (US) 541 (US) 548 (FRA) 549 (DEN) 553 (AUS) 368 (AUS) 89 (NZ) 109 (AUS) 334 (US) 336 (AUS) 397 (US) 561 (NZ)	437 (US) 439 (AUS) 442 (AUS) 544 (ISR) 545 (AUS) 548 (FRA)	440 (US) 444 (DEN) 459 (FIN)	441 (CAN)	444 (DEN)	562 (AUS)		541 (US)	542 (AUS) 544 (ISR) 546 (AUS) 549 (DEN) 437 (US) 439 (AUS)
Existing Articles	373 (AUS) 381 (US) 389 (US) 85 (CAN)	130 (NZ) 133 (NZ) 386 (DEN) 374 (AUS) 459 (FIN) 457 (US)	399 (US) 84 (NZ) 89 (CAN) 390 (AUS) 514 (FIN) 641 (NZ)			356 (AUS) 17 (AUS) 332 (AUS) 80 (US) 92 (AUS) 334 (US) 391 (WW)			456 (NL) 513 (US) 448 (ITA)	88 (AUS)	17 (AUS) 69 (US) 70 (US) 73 (US) 76 (US) 331 (AUS)	17 (AUS) 261 (CAN) 109 (AUS) 579 (US)	79 (US) 280 (AUS) 560 (US) 562 (AUS) 374 (AUS) 492 (UK) 446 (US)

						397 (US) 81 (US) 90 (AUS)							
2.		451 (US) 453 (US) 452 (UK) 448 (ITA) 449(US)	452 (UK) 447 (NL) 449 (US)	455 (BRA)		559 (NZ) 281 (AUS) 109 (AUS) 397 (US) 336 (AUS)			448 (ITA) 450 (UK)		419 (AUS) 457 (US)		
3.		462 (JAP) 456 (NL) 468 (NZ) 473 (US)	463 +Drug use (AUS) 469 (CH) 456 (NL)	456 (NL)		457 (US) 437 (US) 456 (NL) 542 (AUS)	456 (NL)	441 (CAN)	459 (FIN)		471 (US) 470 (US) 474 (NZ)	472 (AUS)	460 (US) 461 (US)
4.		447 (NL)			475 (US)				476 (US) 477 (FIN)				

5.		479 (NL) 480 (AUS) 481 (CAN) 482 (CAN)											
6.		485 (BRA) 489 (ITA) 491 (NZ) 494 (JAP)	493 (AUS)		488 (AUS) 492 (UK)								484 (US) 486 (US)
7.	495 (US) 501 (SWE) 506 (US) 519 (FIN)	499 (US) 500 (IND) 505 (US) 509 (US) 516 (US)	497 (US) 502 (WW) 509 (US) 513 (US) 514 (FIN) 515 (US) 516 (US) 517 (AUS) 518 (US) 520 (US)		496 (US) 498 (US) 503 (US) 504 (TAN) 505 (US) 507 (US) 508 (US) 510 (US) 511 (US) 512 (US) 513 (US) 514 (FIN)	500 (IND) 501 (SWE) 503 (US) 504 (TAN) 514 (FIN) 518 (US)					502 (WW)		
8.						521(AUS)							

9.	522 (AUS) 525 (NZ) 527 (NL)	523 (BEL) 524 (NZ) 525 (NZ)	523 (BEL) 524 (NZ) 526 (SA)			525 (NZ)			525 (NZ)				
10.						528 (UK) 530 (AUS)					529 (AUS)	528 (UK) 529 (AUS) 530 (AUS) 531 (UK) 532 (UK) 533 (UK)	
11.	537 (US) 538 (US)			538 (US)		539 (GER) 540 (US)	535 (UK)				537 (US)		534 (US)

COLOUR KEY

-  Psychological
-  Health
-  Safety
-  Employment/Work
-  Context

Appendix 4: Samples from the Researcher's Reflexive Journal and Analysis.

The researcher heard participants explain 'backdoor deals' to, in some cases, undermine the individual drivers and then issues of power and power imbalance surfaced for the researcher. These thoughts were continued after interviewing another participant.

November 2015

K11 is talking a lot about how those that are buying the businesses are already vulnerable, interesting to find out what makes truck drivers vulnerable, the lack of education, power – even in numbers up against large organisations, the lack of legal resources, financial resources. Are the companies looking for vulnerable people or have they identified this vulnerability already and are taking advantage of it?

In this exert the researcher continues to develop ideas about vulnerability and asks questions about what the participants were mentioning most often.

November 2015

I am attempting to summarise data to send to [Name]. I am struggling. It is difficult to bring together so many different ideas - the industry is fragmented. Some side with the drivers/workers and others dam the drivers and believe they are lazy and need micro-management. The data will not be complete until the drivers are spoken to, that is obvious now. This needs to happen before any conclusions can be made.

Frustrations throughout the process were inevitable and came often. Writing in the journal helped the researcher process thoughts and certain conclusions were arrived at as a result. The researcher began to make connections in the journal about what she had heard anecdotally and what the participants were saying. As time progressed pieces of the puzzle were being filled in and a more holistic view of the system became apparent. The researcher's thoughts were led by what she was being told by the participants.

February 2016

It is my thought that the companies see the owner-drivers as the bottom of the heap and do not offer them the respect they deserve. They are also business owners after all. Without the drivers, the company would be screwed, and one driver said: "Who are they to tell me what to do, these middle managers? They just applied for the job, then got it, and then were paid. I have invested hundreds of thousands of dollars into this company. They cannot tell me what to do, whom do they think they are?" It is a good point he makes.

New ideas arose about how to explain the outcomes witnessed, and as they were explored, they were noted in the journal.

July 2016

The main points from this article include thinking about the relationship between the two (structure and agency), and they have suggested that it is crucial to explore the relationship between structure and agency from a dialectical approach. They argue that if a dialectical approach is adopted the agents have interests which reflect their structural position but interpret those interests in a way which is mediated by the ideas which they hold and to which they are exposed. When they act, they can (but do not always) change their structural position, which then becomes the context in which the agents act. I need to establish where I sit on the issue of ontological separation between structure and agency.

Appendix 5: Characteristics of the Participants – Key Informants and Drivers**KEY INFORMANT PARTICIPANT INFORMATION:**

INTERVIEWEES INCLUDED IN THE STUDY			
Interview Number	Identifying Code	System Level Position	Recruitment
1	KI 1	Legal	Worked as a legal informant to one of the Industry Informants that helped to draft the list
2	KI 2	Government Agency	Was known but one of the Industry informants to be an expert in the transport industry as well as employment issues
3	KI 3	Government Agency	Attended a trucking conference and was approached by the researcher, also known to be the transport expert in this agency
4	KI 4	Industry	Worked as a consultant in the transport industry for one of the Industry Informants
5	KI 5	Industry	Worked for a prominent goods company as an HR manager and was known to the researcher's supervisor
6	KI 6	Trucking Association	Worked closely with one of the Industry Informants for many decades in the transport industry
7	KI 8	Trucking Association (two interviewees interviewed)	Attended a trucking conference and was approached by the researcher
8	KI 9	Union	Was one of the Industry Informants and had been closely working with the research Centre the Researcher worked for
9	KI 10	Trucking Association (two interviewees interviewed)	Attended a trucking conference and was approached by the researcher
10	KI 11	Industry	Was known by one of the Industry Informants to be a leading Health and Safety expert in one of New Zealand's leading Logistics companies
11	KI 12	Trucking Association	Details were sought from the Association's website and was approached
12	KI 13	Industry	Attended a trucking conference and was approached by the researcher

13	KI 14	Industry Health Specialist	Was known by one of the Industry Informants as a leading Health Specialist working for a transport company
14	KI 15	Industry	Was known by the researcher to be a leading Health and Safety expert in a transport company
15	KI 16	Government Agency	Was known by one of the Industry Informants as a leading expert in the trucking industry in New Zealand
16	KI 19	Industry Health Specialist	Was known by one of the Industry Informants as a leading Health Specialist working independently but with truck drivers
17	KI 22	Industry	Was known by one of the Key Informants and recommended because of long service to the industry
18	KI 23	Industry	Was known one of the Key Informants to be a leading Health and Safety expert and driver trainer at a transport company
19	KI 24	Government Agency	A representative from this agency was deemed important by the researcher so a phone call was made to the agency and a name was suggested.
20	KI 25	Industry Health Specialist	Was known by one of the Industry Informants as a leading Health Specialist working for a not-for-profit organisation that works with truck drivers
21	KI 26	Government Agency	Was known by one of the Industry informants to be an expert in the transport industry as well as employment issues
22	KI 27	Union	This person was approached after publicly speaking out about the transport industry; they were also known to one of the Industry Informants
23	KI 28	Union	This person was recommended to the researcher by one of the Key Informants after the researcher requested clarification on Union related matters.

THOSE THAT DID NOT PARTICIPATE		
Interview number	System Level Position	Reason for not participating
24	Industry: Insurance	Not willing
25	Industry: Private consulting	Did not believe they could offer anything
26	Industry: Private consulting	Not willing
27	Industry: Private consulting	No response
28	Legal: Lawyer	Not willing
29	Union	No response
30	Industry: Insurance	No response
31	Industry: Insurance	Interview data irrelevant
32	Union	Interview data irrelevant
33	Government Agency	Interview data irrelevant
34	Government Agency: Local Council	Interview data irrelevant
35	Industry: Private consulting in Health	Interview data irrelevant
36	Government Agency	No response
37	Industry Health Specialist	No response
38	Academic	No response
39	Industry Health Specialist	Not willing
40	Government Agency	No response
41	Government Agency	No response
42	Industry Health Specialist	Not willing though gave many other useful contacts
43	Government Agency	No response
44	Government Agency	No response
45	Academic	Not willing

DRIVER INFORMATION TABLE

INTERVIEWEES THAT PARTICIPATED			
Interview Number	Identifying Code	Employment Status	Recruitment
1	D1	Employed Driver	Industry Key Informant (KI)
2	D2	21 years Owner Driver now an Employed Driver	Union KI
3	D3	Employed Driver	Industry KI
4	D4	Employed Driver	Industry KI
5	D5	Owner Driver's partner	Union KI
6	D6	Employed and Owner Driver	Industry KI
7	D7	Employed Driver	Association KI
8	D8	Employed Driver	Industry KI
9	D9	Owner Driver	Union KI
10	D10	Owner Driver	Responded to Facebook post
11	D11	Employed and Owner Driver's partner	Responded to Facebook post
12	D12	Seasonally Employed Driver	Responded to Facebook post
13	D13	Employed and Owner Driver	Responded to Facebook post
14	D14	Owner Driver	Responded to Facebook post
15	D15	Independent Contract Driver	Responded to Facebook post
16	D16	Employed Driver	Responded to Facebook post
17	D17	Owner Driver	Responded to Facebook post
18	D18	Employed and Owner Driver	Responded to Facebook post
19	D19	Employed Driver	Responded to Facebook post
20	D20	Owner Operator/Driver	Responded to Facebook post
THOSE THAT DID NOT PARTICIPATE			
Interview Number	Employment Status		Reason for not participating
21	Employed – long-haul		Could not schedule the time in
22	25 years' experience – (employment status not given)		No response after their initial message
23	Employed Driver		No response after their initial message
24	Employed Driver		No response after their initial message
25	Employment status not given		No response after their initial message
26	Employment status not given		No response after their initial message
27	Employment status not given		No response after their initial message
28	Contractor		Could not schedule the time in
29	Contractor		Could not schedule the time in

Appendix 6: Interview Questions and how they were derived from the literature

Chapter	The main theme from Literature:	Literature Suggests:	Examples of References:	Initial Interview Question Ideas:
Two	Organisation of work	The industry itself is defined by a highly competitive structure and organisation, with excessive scheduling, high demands and delivery pressures, and distance- or incentive-based payment structures	Apostolopoulos et al., 2013; Lemke et al., 2017; Chen et al., 2015; Rawling & Kaine, 2012	KI+DRIVERS: In your own words, explain what it is like to operate in the trucking industry in New Zealand.
Two	History of work	Deregulation has had an impact on the industry and changes have occurred since the market reform.	Herman, Brandt and Schulten, 2008; Dammen, 2005; Belman & Moncao, 2001; Bollard & Pickford, 1998)	KI+DRIVERS: During your career, what changes have you witnessed?
Two	Job role	A truck driver's roles vary daily, also due to different formations of truck and delivery type which each have unique risks.	Friswell & Williamson, 2010; Wioland, 2013; Shibuya, Cleal, & Kines, 2010; van der Beek, 2012 Williamson, et al. 2009	KI+DRIVERS: Explain your job role and daily tasks?
Two & Three	Employment Status	Workers engaged in non-standard work arrangements are the fastest growing group in the New Zealand market.	Spoonley, 2004; Cantor, Celebi, Corsi and Grimm, 2013	KI: What is the make-up of the workforce you are in contact with? (explore/ explain)

		It was suspected that owner-operators have poorer safety performance compared to that of employee drivers.		DRIVERS: What is the nature of your employment relationship?
Three	Management and direct contact with drivers/managers: relationships	The relationship with managers is said to have an impact on the driver's safety perceptions	Zohar, 2008; Swedler, Pollack & Agnew, 2015	KI: what is the nature of your relationship with the drivers? DRIVERS: what is the nature of your relationship with your supervisors/managers/dispatchers?
Three	Relationship with the unions	De-unionisation has been stated as leading to a host of issues including compromised safety and lower pay. Union representation is challenging due to the high number of contractors.	Quinlan & Johnstone, 2009; Bollard & Pickford, 1998; Belman & Monaco, 2001; Johnstone, Quinlan & Walters, 2005	KI: What is the nature of your relationship with the unions? What is your role as a union in the trucking industry? DRIVERS: what is the nature of your involvement with the unions?
Two & Three	Payment and Reward Structure	Piece-rate payment, low pay, and reward structures have been linked to long hours and poor OHSW outcomes.	(Quinlan & Wright, 2008; Rawling & Kaine, 2012; Williamson, 2007; Belzer Rodriguez, & Sedo, 2002)	KI: How are drivers typically paid in the industry? How do you pay your drivers? DRIVERS: How frequently are you paid? How is your pay calculated? Do you get the same pay each week?
Three	Safety + Accidents, injuries, fatalities	The industry exposes drivers to risks including accidents, injuries and	Brodie, et al., 2009; Häkkinen & Summala, 2001;	KI: Do you have any concerns about the safety of truck drivers? (explain/explore)

		fatalities. Accidents are said to be caused by a host of issues. Injuries are reportedly caused by poor worksite maintenance; improper equipment use and interaction with the cab and truck.	Sullman, 2002; Mayhew & Quinlan, 2006; Thornthwaite & O'Neill, 2017; Smith & Williams, 2013	DRIVERS: Do you have any concerns for your safety? (explain/explore)
Three	Safety Interventions and Safety Culture	Management commitment and safety training were the indicators most likely to have an impact.	Zohar, 2008; Huang et al., 2017; Christian, Bradley, Wallace & Burke, 2009; Newnam et al., 2017	KI: (where relevant) discuss the attitude towards safety in your organisation? DRIVERS: Discuss the attitudes towards safety in the organisation your work for or a contracted to?
Three	Health	Truck drivers notoriously have poor health. Links have been made to long hours, poor working conditions, and lifestyle choices. Fatigue is of concern.	Wiegand, Hanowski and McDonald, 2009; Dahl, et al., 2009; Mackie, 2008; Apostolopoulos, Lemke, Sönmez & Hege, 2016; Lemke et al., 2017	KI: Do you have concerns about the health of the truck drivers you have contact with? DRIVERS: Do you have concerns about your health? KI+DRIVERS: What impact does fatigue have on your drivers/you? (explore/explain to ascertain sources of poor health and fatigue)
Three	Mental health and stress	High-pressure situations cause stress alongside uncertain working	Shattell, Apostolopoulos, Sönmez, & Griffin, 2010; Saltzman & Belzer, 2003; Kemp, Kopp, & Kemp, 2013; Friswell &	KI: Explain the role of stress and pressure in the industry?

		arrangements and low pay.	Williamson, 2010; Mayhew & Quinlan, 2001	DRIVERS: How often does your work impact your life outside of work?
Three	Risk-taking behaviour	Drivers believe the risk is an inherent part of their job and often trivialise dangerous outcomes.	Sullman et al., 2002; Poulter et al., 2008; Swartz & Douglas, 2017 Kemp et al., 2013; Swedler, Pollack, & Gielen, 2015.	KI: Explore/explain the drivers' exposure to risk and their attitude towards it. DRIVERS: What is the nature of risk inherent in your role?

Participant Information Sheet



Date Information Sheet Produced:

19/05/15

Project Title

Riding Roughshod: The Working Experiences of Contracted and Employed Truck Drivers in New Zealand

An Invitation

My name is Clare Tedestedt George and I am currently undertaking this study as part of a Doctor of Philosophy degree. I would like to invite you to participate in my research project. This project aims to explore the working conditions of both contracted and employed truck drivers in New Zealand.

Your participation is voluntary. No personal information that can identify you will be collected. There are no conflicts or constraints with your participation; you can withdraw from this interview at any time prior to the completion of data collection.

The information you share will be kept anonymous. Any demographic information you give will be kept separately to your interview data. There will be no way that you or any associated organisations can or will be identified.

What is the purpose of this research?

The proposed study aims to explore the working conditions of New Zealand [contracted and employed] truck drivers, with particular focus on their health, safety, and well-being. It is the intention to explore the extent to which the contracting relationship contributes to outcomes in the context of the work role.

How was I identified and why am I being invited to participate in this research?

You were selected because you are someone associated with the trucking industry in New Zealand.

It is likely that you will have been identified as a potential participant through a third-party person who has had previous contact with you either through your work or through theirs. Their role has been to suggest participants for this survey based on their expertise in this industry.

What will happen in this research?

You will be interviewed by me as the researcher and, if you agree, the interview will be recorded. The information collected will be listened to and read only by me. The results will be presented in the form of a thesis. No organisation or participant will be identified or will be able to be identified.

What are the discomforts and risks?

I do not expect there to be any discomforts for you during this interview. Your participation will involve an interview lasting approximately 60 to 90 minutes. You can pause or stop the interview at any time. You will also be given an opportunity to view and comment on the interview transcript that will be typed up from the recording.

How will these discomforts and risks be alleviated?

Your anonymity is assured. You can withdraw from this study at any time during data collection. If you choose to do so all data pertaining to your participation will be destroyed. If you are uncomfortable, doubtful or adverse to any question you may choose not to answer it.

What are the benefits?

This research will contribute to a better understanding of the working conditions of truck drivers in New Zealand. Moreover, your contribution is an important part of my doctoral thesis.

How will my privacy be protected?

Your privacy will be protected at all times, it is very important in this study. The information gathered from you as a participant will be used for the purposes of my thesis. All information will be de-identified, and your personal data remain confidential. In order to achieve privacy and confidentiality, the interview and audio file will be identified only by a code. As mentioned previously, all of your information will be kept strictly confidential.

I am under no legal obligation to report any information that you discuss with me during the interview. If something is thought to be harmful I may be required to point this out to you, but it will not be discussed outside the interview.

What are the costs of participating in this research?

The interviews will take approximately 60 to 90 minutes of your time.

What opportunity do I have to consider this invitation?

If you are interested in participating, please contact me regarding your participation. You may contact me at any time with questions about this research.

How do I agree to participate in this research?

In order to participate you need to read this Participant Information Sheet fully and agree to it. If you agree to participate, you can reply to the email address of the Researcher at the base of this form. When I receive your email, I will arrange a suitable interview time and place with you. A consent form is attached and at the interview you will need to sign and hand it to me. Otherwise, please phone me on the number below to arrange our interview.

Will I receive feedback on the results of this research?

The final thesis will be available for the public at the AUT University library. If you ticked that you want to receive a copy of the research on the consent form provided an electronic copy of the research results will be sent to you.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Prof. Tim Bentley, tim.bentley@aut.ac.nz, +64 921999 ext.5446.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, +64 921 9999 ext. 6038.

Whom do I contact for further information about this research?

Researcher Contact Details:

Name: Clare Tedestedt George

Email: clare.george@aut.ac.nz

Project Supervisor Contact Details:

Name: Prof. Tim Bentley

Email: tim.bentley@aut.ac.nz

Phone: +64 9921999 ext. 5446.

**Approved by the Auckland University of Technology Ethics Committee on
20.05.15**

AUTEC Reference number *15/64*

Consent Form



Project title: The Working Experiences of Contracted and Employed Truck Drivers in New Zealand

Project Supervisor: *Prof. Tim Bentley*

Researcher: *Clare Tedestedt George*

- I have read and understood the information provided about this research project in the Information Sheet dated 19/05/2015.
- I have had an opportunity to ask questions and to have them answered.
- I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- I agree to take part in this research.
- I wish to receive a copy of the report from the research (please tick one):
Yes No

Participant's signature :

.....

Participant's name :

.....

Participant's Contact Details (if appropriate):

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 20.05.15

AUTEC Reference number 15/64

Note: The Participant should retain a copy of this form

Appendix 8: Thematic codes and Coding results from NVivo (Phase two and three)

PHASE TWO: KEY INFORMANT THEMES AND SUB-THEMES

	Theme (alphabetically)	Sub-themes	Sub Sub-themes	No. of Codes in NVivo
1	Drivers	Employed drivers	Management interaction	143
			Nature of being employed	45
			Working experience	7
		Owner-drivers/ Contractors	Business experience	30
			Contract details	23
			Financial risk	37
			Nature of contracting	113
General	159			
2	Family	Family Impact	23	
		Hours	6	
		Work-life balance	10	
3	Fatigue	Diet	7	
		Long hours	35	
4	Financial	Low pay	25	
		Pay and long hours	14	
5	Government Agencies	Assistance	23	
		Inter-agency relations	31	
6	Health	Diet	16	
		Disease	25	
		Drugs and Alcohol	12	
		Health leading to safety	11	
7	Industry	Competition	23	

		Driver Shortage	37
		Women	101
8	Power	Contracts	32
		Control	30
		Migrant workers	13
		Abuse	47
		Resource availability	19
9	Safety	Issues	147
10	Support	Associations	68
		Isolation	14
		Legal	7
		Union	25
11	Technology	Advancements and use	41

PHASE THREE: DRIVER THEMES AND SUB-THEMES

	Theme (alphabetically)	Sub-themes	No. of NVivo References
1	Family and community NVivo = 113	Community impact	16
		Family impact	97
2	Individual NVivo = 793	Drivers experience in general	225
		Employed driver	66
		Fatigue	88
		Health	91
		Owner-driver	219
		Safety	104
3	Industry NVivo = 265 (minus those not included)	Associations	6
		Competition	29
		CVIU	20
		Industry practices	35
		Migrant drivers	57
		Multi National corporations	23
		Pay	74
		Training	63
		Unions	22
			Legislation
Regulations	18		
4	Management NVivo = 249	Immediate boss	97
		Monitoring	30
		Principal companies	122
5	Working environment NVivo = 44	Other road users	31
		Road conditions	13

Appendix 9: Discussion themes by number: Literature and Findings

(Refined Version)

Key Finding	Literature	Results: Three Phases
1. Exposure to immediate risks are influenced by the organisation of work in the transport industry	High safety risk, stress, loneliness, pressure, tight schedules, fatigue, poor sleep, unpredictable conditions, violence, low earnings, long hours, emotional exhaustion and immense time pressure, underreporting, customer pressure, HoS regulations.	Fatigue, toxic culture, high pressure, tight schedules, poor health, poor pay, long hours, highly competitive, customer control, poor job security, driver shortage – low skilled, influx of migrants, females feeling unsafe, high stress, loneliness.
2. Management practices, impacted by industry pressures, contribute to the exposure to OHSW risks	Time pressure, employer cannot always control safety, blame-the-driver mentality, management commitment to safety is essential and impacts safety climate/culture, consistent communication, competition – unsustainable businesses, drivers loyal to good companies.	Managers have an important role in the OHSW of truck drivers. Those viewed as competent managers were awarded loyalty by the drivers. Those who pressured the drivers and compromised their safety were viewed as incompetent and were contributing to the poor OHSW drivers experienced.
3. Employment status impacts the experience of the drivers: contractors and employees	Confusion around whether ODs have better or worse safety. They are paid less therefore have more economic stress. Higher OHSW risk but not so clear from the literature.	The experiences of the drivers are in many ways different though they still experience similar frustrations from operating within the same industry. The experience for most of the ODs was intensified by their contractual status.
4. The system allows very little agency for the individuals; the individuals are perpetuating the system	Two parts: Conflict between being free, out on the road and left to their own devices WITH being closely monitored for safety/fatigue reasons. Might be sold a lie?	The systemic norms are deep seated and long standing – “she’ll be right”, reactive, long hours. Those higher up the supply chain have a lot of power, those at the bottom do not.

	<p>They are stuck in the system, cannot make changes to their health because it is too hard.</p>	<p>Those that are ‘stuck’ in the system accept the poor pay, long hours and behave in unsafe ways because they do not feel they have a choice. Stuck in the cycle of fatigue. Too hard to make a change, to fight back, to question.</p> <p>They take the job because they are promised freedom out on the road, to run their own business. The reality is different, they are monitored and controlled.</p>
<p>5. A failure in systems thinking means that efforts to protect the OHSW of drivers is fragmented</p>	<p>Individually-focused interventions ignore the complexity of the problem and do not allow the root cause to be understood or exposed.</p>	<p>Poor communication and collaboration between the system levels.</p>
<p>6. The job spills over into the family life of the driver</p>	<p>Very little found relating specifically to truck drivers and their families.</p>	<p>Spill over occurs in the trucking industry between work and family life.</p>

Appendix 9: Discussion themes by number: Literature and Findings

(Extended version)

One: Exposure to immediate risks are influenced by the organisation of work in the transport industry

Literature	Findings
<ul style="list-style-type: none"> • Culture of underreporting for fear of being fined, fired or disciplined • Improper equipment used • Unsafe customer worksites which are out of the control of the employers • Drivers under immense time pressure • Time pressure/high stress leads to increased injury • Tight delivery schedules, scheduling pressure. Breaking HoS rules. Speeding. HoS still allow for long shifts and poor sleep quality. Not enough enforcement. • Pressure to work longer hours and faster (HPWS adding to this). Long hours. Fatigue. Low rate → long hours. Shift work. Poor health. Obesity indirectly linked to long hours. Obesity linked to accidents. • Already fatigued – need to exert more energy to continue. • Fatigue linked to long hours, night driving, irregular schedules, high strain, incentive payments and long waiting times. • High turnover in the industry • Financial pressure. Unpaid waiting time. Reward schemes leading to excess hours. Not enough money for maintenance. • Payment structure – can discourage the reporting of injuries. Links shown to predict safety outcomes. On-road performance linked to economic reward. Incentive based pay. Economic incentive to skip break times. 	<ul style="list-style-type: none"> • Fatigue, leading to serious accidents. Techniques to stay away when falling asleep. Some working in excess of 18hour days. Punished for complaining about fatigue. • Culture within the industry – accepting certain risks e.g. fatigue, long hours • Under pressure to accept work • Tight schedules, inadequate time to do the job. Speeding. Serious consequences. Not taking breaks – toilet. Cutting corners and taking risks. Forced to take breaks outside of body routine – frustrating. • Poor pay, low rates. Need to work longer hours to earn decent wage. Mortgage and expenses pressure so ask for longer hours. Fines are the responsibility of the driver, adds more financial pressure. Never take leave. ODS owed a lot of money and customers rarely pain on time, no one talks about profit. • Rates are adjusted to match competitors – drivers expected to go beyond limits • Competition driving rates down. Drivers feel like “working poor”. Contracts put out for tender every year so have to remain competitive. • Undercutting to retain customers. Transport industry not charging customers, cannot pay high wages for drivers. No extra money for maintenance, rates dropped to match rates so barely at break-even point. Margins too tight to consider OHS.

- **Union** membership dropping
- SURVIVOR POPULATION
- Poor **infrastructure** – limited food options
- A reactive industry, not proactive. So labour intensive, does not allow for preventative care
- Working conditions encourage unhealthy behaviour
- Work organised to meet the needs of the **customers**
- Long periods away from home – loss of **social support**.

High safety risk, stress, loneliness, pressure, tight schedules, fatigue, poor sleep, unpredictable conditions, violence, low earnings, long hours, emotional exhaustion and immense time pressure, underreporting, customer pressure, HoS regulations.

- Long hours. Log book falsification. Poor **health**. Never take sick leave. Culture in industry.
- Poorly maintained trucks.
- Take risks out of fear for **losing their jobs**
- Not enough proper **training**. No time, no money, limited resources. Seen as an expense. Driver responsible for safety of others, learnt while on the road.
- Low skilled workers a danger. Driver shortage. **Unskilled** drivers put in trucks prematurely. Filling **driver shortage** with migrant workers.
- Driver shortage means inexperienced drivers filling jobs. Makes the roads unsafe. Making the drivers feel sick. Taking on drivers who don't always pass drug test or employment checks. Would be no one left. High turnover – unfamiliar.
- Difficult to pay good drivers what they worth.
- **Females** feel unsafe, male dominated, but seen as the solution to many problems
- **Stress**: management, customers, other road users
- **Low control**: road users, weather, delivery schedules, traffic. Large companies have delivery windows with little flexibility.
- Poor **infrastructure** – poor health
- Migrant workers are vulnerable, too afraid to join **unions**, visa linked to company – worse conditions for them.
- No **security**, contracts not always in written form.
- Poor job security. Drivers seen as replaceable or disposable, despite the driver shortage. Unions have little power – transport operators asking for amendments to

	<p>agreements, so they can compete – the good ones. Unions have little power, if you join you become targeted. Some had to de-unionise to remain competitive.</p> <ul style="list-style-type: none"> • If they don't turn up for work they are replaced. • Loneliness, isolation, especially while away from family <p>Fatigue, toxic culture, high pressure, tight schedules, poor health, poor pay, long hours, highly competitive, customer control, poor job security, driver shortage – low skilled, influx of migrants, females feeling unsafe, high stress, loneliness.</p>
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Key themes from both:

High safety risk, stress, loneliness, pressure, tight schedules, fatigue, poor sleep, unpredictable conditions, violence, low pay, dangerous pay structure, long hours, emotional exhaustion and immense time pressure, underreporting, customer pressure, HoS regulations, toxic culture, poor health, highly competitive, poor job security, driver shortage – low skilled, influx of migrants, females feeling unsafe, no extra money for training or maintenance.

System Level	Theme
Government/Regulatory	HoS regulations
Physical environment	unpredictable conditions – other road users, traffic, weather. Poor infrastructure leading to poor health.
Industry	pressure, low pay, dangerous pay structure, long hours, customer pressure, toxic culture, highly competitive, poor job security, driver shortage – low skilled, influx of migrants, females feeling unsafe
Organisational	pressure, tight schedules, immense time pressure, underreporting, no extra money for training or maintenance
Individual	High safety risk, stress, loneliness, fatigue, poor sleep, violence, emotional exhaustion, poor health

Two: Management practices, impacted by Industry pressures, contribute to unhealthy work

Literature	Findings
<ul style="list-style-type: none"> • Time pressure is constant • Employers could not always control the sites/safety for drivers • Employers and drivers believe there are different causes for accidents. Typically fault of the drivers according to mgt. • Poor management linked to added pressure for drivers • Management commitment to safety, training, leadership and trust – biggest impact on safety outcomes • Safety climate – linked to management commitment • Lowest accidents with companies that had clear standards, training, consistency in messages. Opposite is also true – no training, ambiguous rules, ineffective communication • Safety goals conflict with organisational goals • Supervisors and fleet managers had a different role. Fleet managers primary role to manage asset not driver behaviour • Direct supervisors compensate for lack of safety awareness at top level. Safety conscious supervisor is essential. • Lip service given to safety • Competition has meant many businesses, both large and small, are unsustainable – low rate of return, skip maintenance, encourage shortcuts, pushing working hours, speeding • Associations between fatigue and scheduling systems • Don't have resources to invest in drivers' health 	<ul style="list-style-type: none"> • Good managers: Some showed concern for the drivers – gave day off if fatigued/took off the road. Did not see need for pressure or risk taking. Good reporting and safety systems. Planning reduces risky behaviour. Good managers hard to find – drivers will stay loyal if found. Consistent messages to all about safety. “Zero harm”. Chose to employ drivers – understood loyalty goes two ways. Treated like family – invested in drivers. Contractors treated same as employees. Did not ask them to compromise safety. No driver shortage for good employers. • Bad managers: Poor planning – extra stress for drivers e.g. booked job late in day. Hired anyone, without proper checks. No training procedures for new staff, thrown in deep end. Poor planning unsafe and frustrating. No OHSW knowledge. No acknowledgement of human cost. Drivers treated badly by management and enforcement agencies. Reward schemes to push the legal limits, accepting falsified logbooks. Some seriously and illegally abused the drivers. Drivers felt unsafe under bad managers, prioritised the customer but when driver fails, they are penalised. Pressure drivers back to work after illness. Know that migrants will not fight back. Illegally housing the drivers on site behind high fences – abuse of migrants. Target you for joining union – paid to stay out. • Dictated by profit – not paid enough to care, slaves to the corporation. Large MNCs are

<ul style="list-style-type: none"> • Drivers obey the law if managers do • Drivers form loyalty to company and do not want to engage in dangerous behaviour to not disappoint. <p>Time pressure, employer cannot always control safety, blame-the-driver mentality, management commitment to safety is essential and impacts safety climate/culture, consistent communication, competition – unsustainable businesses, drivers loyal to good companies.</p>	<p>bullies, fight back – they give you hell.</p> <ul style="list-style-type: none"> • Industry wide culture – managers a victim of it. Underreporting, long hours, low pay. Pressure to be more efficient – JIT mgt. Tried to make changes but too hard to change. Need drivers to do long hours to move the goods. • Managers frustrated with underreporting • Those who cared about OHSW losing contractors to those who do not. Good managers competing with the bad ones • Competition – companies could not compete when adhering to OHS • Bringing in migrant workers • Middle managers caused most trouble – under pressure to save money • Unilateral power written into contract – power abuse. Intent of the person in power very important. Union erosion dangers in such situations. • Everything depends on the boss. Screwed without good boss, no other protection for drivers. No power in numbers for drivers – individual contracts or ODs. • Not always willing to invest in new drivers because transient workforce. • Drivers torn between management request and CVIU/regulations <p>Managers have an important role in the OHSW of truck drivers. Those viewed as competent managers were awarded loyalty by the drivers. Those who pressured the drivers and compromised their safety were viewed as incompetent and were contributing to the poor OHSW drivers experienced</p>
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Three: Employment Status impacts the experience of the drivers: Contractors and Employees

Literature	Findings
<ul style="list-style-type: none"> • Extra administration work • ODs less likely to seek medical assistance • ODs associated with more violations, but lower crash risk, ODs lower accident rate – own machinery therefore more incentive to drive safely • Safety performance is worse for ODs citing higher economic pressure • High turnover among Employees • Continuity is important for safety (both categories) • ODs earn significantly lower rates than employees which influences speed and they do seriously long hours • Intense competition – use of contractors to secure job at lower rate • Price competition mostly affects ODs – rates are non-negotiable. Always someone else to take the load • ODs experience more violence • ODs experience extreme stress <p>Confusion around whether ODs have better or worse safety. They are paid less therefore have more economic stress. Higher OHSW risk but not so clear from the literature.</p>	<ul style="list-style-type: none"> • Employed Drivers: annoyed with others using their trucks so did not miss work. Caused damage. Offered security in hours, income, consistent routes. Access to extra support staff. Referred to as core drivers. Regular contact with mgt. have less responsibility. Leave and holiday pay. Easier to take sick day. Can call someone if something happens. Felt like part of a team, not letting others down. Employed drivers seen to be favoured over ODs by the co. Do not want to be ODs. • ODs: Pay was lowest for contractors, rates already low in industry. Thought to be buying a job. No real independence. Risk shifted onto them. Not always contractor by choice. High financial risk. No money if truck off the road. Instructed to break the law – cannot say no. Limited resources to dispute or negotiate. Powerless. Reluctant to take time off. Under pressure. “Better on wages”. Difficult to work out costs – contract details are vague and are often changed after signing. Cannot make educated decision. Difficult to pay off loan when rates are so low. Co.’s making money off OD margins. Not making good business decisions. Once employees. Dependent on one company. Out on their own. Learned business the hard way – failed many times. Huge debt. Fear of losing their contract if in debt, disincentive to raise issues. Unexpected circumstances cost ODs. Co. only pays cost on all parts of business, no way for them to make money. Co. has full control over business

	<p>information. Paid on a piece rate/ by km.</p> <ul style="list-style-type: none">• Associations spending time helping with business models• Short term contracts do not attract best people• Little attention given to rehiring when one leaves• Casual staff rough with machinery with no discipline• Poor induction and training – problem for high turnover• Contractors not always aware of company policies• Contractors monitored “for safety”• Very little difference between contractor and employee. All company rules apply to ODs• Union membership – singled out/targeted if joining. Migrants particularly vulnerable.• Drivers on individual contracts or ODs – no power in numbers. <p>The experiences of the drivers are in many ways different though they still experience similar frustrations from operating within the same industry. The experience for most of the ODs was intensified by their contractual status.</p>
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Four: Industry and driving culture - The System allows very little agency for the individuals, the individuals are perpetuating the system

Literature	Findings
<ul style="list-style-type: none"> • Constant time pressure • Lone workers • Drivers share information, interdependent on each other • Relationships between each other influence safer behaviour • Drivers unclear about safety expectations – left to come up with their own • Drivers trivialise risk – cultural • See the management of safety, their responsibility • Truck drivers value their independence and autonomy – making decisions for themselves • Tight control over drivers is logistically difficult • Intense competition in the system • Contractors have little bargaining power to negotiate safe rates • Always someone who will take the job • Fatigue management technology • Drivers find it difficult to make changes to their health because of the organisation of work. They want to live a healthier life, but it presents too many obstacles • They believe they are healthy • Survivor population • Driver monitoring technology is advancing faster than driver behaviour • Long-distance driving job seen to have great autonomy – however, left alone to the point of compromised safety is dangerous. <p>Two parts: Conflict between being free, out on the road and left to their own devices WITH being closely monitored for safety/fatigue reasons. Might be sold a lie?</p>	<ul style="list-style-type: none"> • Forced to say yes to work even if they don't want to – poor pay rates • Reasonable operators feel they have to drive unsafely – fear of losing their jobs. Doing a good job is in conflict with getting the job done safely • She'll be right culture • Money dictates safety • Industry is reactive towards safety • Technology used to monitor safety – observed and controlled. Drivers felt GPS and tracking disguised under safety. Pressured to skip rest breaks. Monitored to see that they go over 90km/h. ODs felt this was their IP and it was just another way they could be controlled by the co. Could not argue – they felt they were replaceable • Some felt the cameras were a good thing – if an accident was not their fault. • Drivers bullied into silence about OHSW issues (norms within industry) • Cannot get out of the cycle of fatigue – poor health – more fatigue. Too hard for the drivers to make a change. Too tired to make better choices. • Some felt they were fighting a losing battle – industry plagued by long-standing issues • Injustice of running a system where groups of people are vulnerable to exploitation – ignoring it • Those up the supply chain dictated the rates • Customers demanding next-day delivery, push for low-cost goods

<p>They are stuck in the system, cannot make changes to their health because it is too hard.</p>	<ul style="list-style-type: none"> • Industry norms: undercutting, long hours, competition, fatigue • Drivers loved the sense of freedom, being away from people and out of an office • Need them to do these long hours, the job requires it • Current structure did not allow those most vulnerable to be supported • ODs felt there was freedom in running their own business – sold to them prior to signing • No resources to fight back, truck is branded, uniforms required, dependent • Stuck between the CVUI and management requirements • Associations were on the side of the transport operators and corporates not the drivers, they felt they had little support <p>The systemic norms are deep seated and long standing – “she’ll be right”, reactive, long hours. Those higher up the supply chain have a lot of power, those at the bottom do not.</p> <p>Those that are ‘stuck’ in the system accept the poor pay, long hours and behave in unsafe ways because they do not feel they have a choice. Stuck in the cycle of fatigue. Too hard to make a change, to fight back, to question.</p> <p>They take the job because they are promised freedom out on the road, to run their own business. The reality is different, they are monitored and controlled.</p>
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Five: Challenges of OHSW reform in the trucking industry - Failure in Systems thinking means that efforts to protect the OHSW of the drivers are fragmented

Literature	Findings
<ul style="list-style-type: none"> • Insufficient information collected at the time of accidents to ascertain the contributing factors • Individuals are the unit of focus – difficult to understand whether problems are systemic or individual • Focusing on the individual is not likely to see reductions in injuries • Individually targeted health promotion programs do not reduce health problems for drivers • Recommendations revolve around educating the drivers • Solutions require an understanding of the complex interactions of the system. Health promotion programs underestimate the systemic complexity and the complexity of the root causes • Few interventions targeted drivers in a meaningful way and do not consider their working environment • Health condition of truck drivers has not improved • Efforts have been “slow, superficial, uncoordinated, inadequate and ultimately ineffective. • Regulatory changes have made little difference, and in some cases made it worse • Fatigue management technology is an ambulance at the bottom of the hill • Micro interventions are easier to implement, macro interventions are very difficult and therefore require more investment <p>Individually-focused interventions ignore the complexity of the problem and do not allow the root cause to be understood or exposed.</p>	<ul style="list-style-type: none"> • Hard to show link between working conditions and poor health outcomes • Govt agencies recognise the urgent need to be asking the right questions to get to the root of the problem • Lack of inter-agency communication • ACC takes responsibility, so employers don’t have to • There is a ‘them’ and ‘us’ mentality – no one talks to each other! <p>Poor communication and collaboration between the system levels.</p>

NB: THEME SIX NOT INCLUDED IN FINAL VERSION OF THIS THESIS

Six: The job spills over into the family – this is an indirect human cost of the system

Literature	Findings
<ul style="list-style-type: none"> • Need to go back to this to see if there is any – there is some on fatalities and how that impacts the family, but none that I found which focused particularly on truck drivers. 	<ul style="list-style-type: none"> • Being tired all the time affects their home life. Stress was brought home. Hard to separate family life and business. • If wages increased could cut back the hours and have more WLB • Job sharing discussed but often dismissed • Can no longer support a family on their income – double income households making a difference to the truck drivers, used to be that partner ran all of house/family and supported driver • Partners felt like solo parents • Driving job had to come first • Drivers living away from their families • Hard to be around family when so exhausted • If they are not working they are sleeping • Many marriages broke up and family units failed • Partner seen as the main supporter of the driver – this also took a toll. <p>Spill over occurs in the trucking industry between work and family life. Having a profound impact on the family.</p>

2) MANAGEMENT PRACTICES, IMPACTED BY INDUSTRY PRESSURES, CONTRIBUTE TO THE EXPOSURE TO RISK (OHSW)

INCOMPETENT MGT

- MGT**
- POOR PLANNING - STRESS
- EMPLOYMENT CHECKS - TAKE 'ANYONE'
- NO TRAINING - NERVOUS DRIVERS
- POOR OHS KNOWLEDGE - HUMAN COST
- DRIVERS TREATED BRUTELY / ABUSE
- REWARD SCHEMES - INCENTIVES → WORK LONGER FASTER
- PRIORITISED CUSTOMER - POWER
- MIGRANT WORKER ABUSE - POWER
- TARGET UNION MEMBERS - DIVIDE - POWER

INDIVIDUAL

EXTERNAL PRESSURES (?)

PROFIT / MARGINS

- REASONS FOR MAKING DECISIONS

COMPETENT MGT

MANAGEMENT COMMITMENT TO SAFETY

IS ESSENTIAL

LAST PROP SUGGESTED...

- TIME PRESSURE
- HIGH COMPETITION
- LOW PAY
- LONG HOURS

POOR OHSW OUTCOMES
KF ①

IMPACT ON THE CULTURE OF ORGANISATION

DRIVERS AS LONE WORKERS TAKE CUES FROM MGT'S

(RESPONSIBILITY)

SAFETY CLIMATE

SOME DRIVERS...

STAY LOYAL TO SAFETY CONSCIOUS IF IT LINES UP W/ THEIR MGT'S VALUES (?)

OHSW OUTCOMES → DRIVERS

MGT 'VICTIM' OF INDUSTRY CULTURE?

'COWBOYS' - trying to get out of it!!
- chosen but follow the...

IT'S THE SAME THING AT DIFFERENT LEVEL?
- PRESSURE TO BE EFFICIENT
- LONG HOURS NEEDED TO DO JOB

FAMILY

looks like: DRINKS

- TIME OFF
- DIRECT CONTACT

- Do they want to be treated like family? what does that mean?
- Some don't want to be treated like family - just being a follow figure?
- How many?

Clearly laid out expectations - details are clear + the agreement is honoured → (Lins. to KF?)

IMPACTS THE EXPERIENCE OF THE DRIVERS...
RESPONSIBILITY ??

INDUSTRY HAS CHOSEN TO EXPOSE THEM: understand the expectation + work with it.

FAILURE TO TAKE RESPONSIBILITY → some just want to be truck drivers

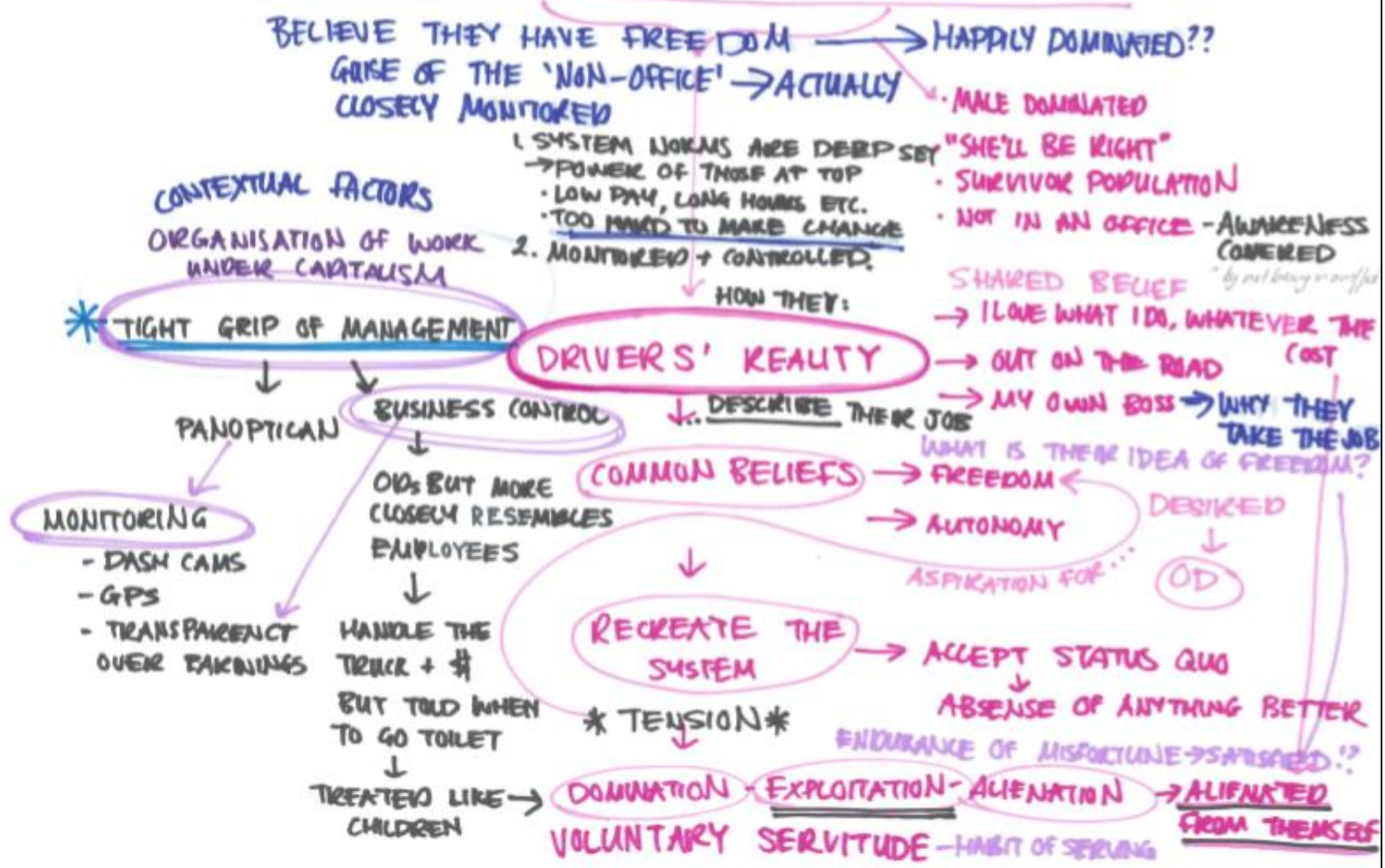
③ HOW DOES THE STRUCTURE + ARRANGEMENT OF WORK + THE ALLOCATION OF RISK (FINANCIAL) AFFECT OHSW FOR TRUCK DRIVERS?

LABOUR PROCESS THEORY

- WHO CONTROLS THEIR WORK?
- HOW THEY ARE PAID?



④ HOW DOES THE INDUSTRY CULTURE EFFECT OHSW?



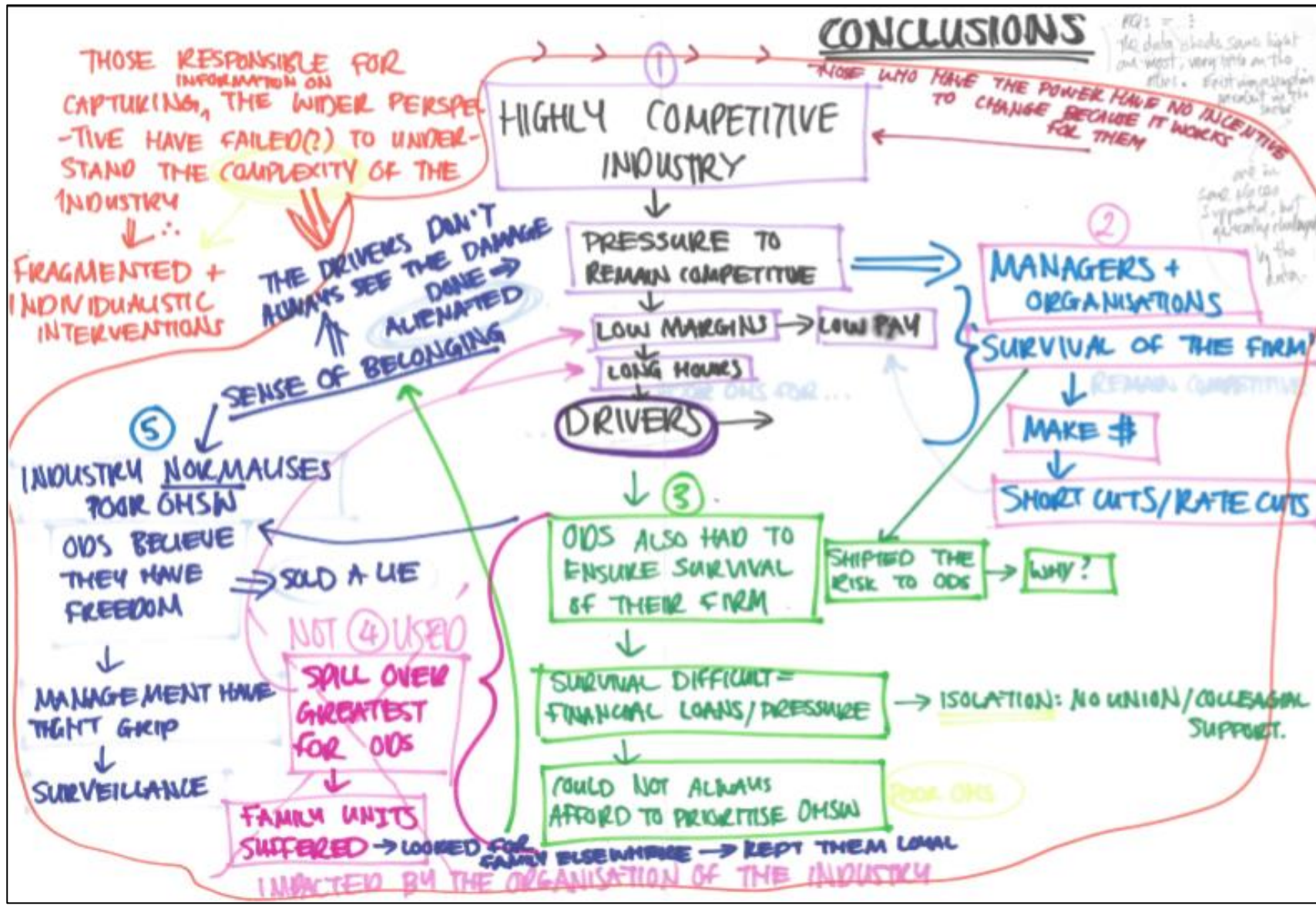
- ⑤ CHALLENGES TO OHS REFORM IN THE TRUCKING INDUSTRY - SO HARD TO MAKE CHANGE?
: LACK OF SYSTEMS THINKING
-

CONCLUDING SECTION

- ① LITERATURE - FRAGMENTED SOLUTIONS - INDIVIDUAL ROLES
- LOOK AT MACKIE + MOORE
-

- KPI ① - HIGHLY COMPLEX NATURE OF INDUSTRY - BIG PLAYERS/LOTS OF POWER
② - DEPENDENT ON MGT OF WHOM ARE ALSO VICTIMS OF THE ORG OF INDUSTRY
STUCK BETWEEN CAPITAL + LABOUR → SURVIVAL OF THE FIRM
③ - EMPLOYMENT STATUS: SHIFTED RESPONSIBILITY
④ - FAMILY:
⑤ - SOLD A LIE - THINK THEY ARE GETTING INTO ONE THING - WORKING IN FALSE BELIEFS AND A VERY WELL ESTABLISHED INDUSTRIAL CULTURE

⇓
ATTEMPTS TO ADDRESS → TARGET INDIVIDUAL BUT ↑!!
Those in the power have no incentive to change - waiting for them + shifted the responsibility - need to enforce but no resources



FINAL THOUGHT

The abstract below was written to explain the results from this study to truck drivers using their language and terms more relatable to them. Initial attempts to explain the results to some of the participants resulted in confusion. There was a perceived distance between the drivers and me as an academic. This abstract is an attempt to bridge that gap and provide an olive branch to all those in the industry that gave of their time for this study.

Abstract for Doug

Truckies are getting fucked up and dying young and their families and the rest of us are paying for all that one way or another – not the bastards benefiting from how hard they work. The drivers are being conned into carrying a shitload of the financial risk that they didn't used to back in the day. It all just adds to the shit.

So, we spoke to loads of those who know about all of this. Some important people who should have talked to us didn't – which tells you something about how little they talk to each other down in Wellington when it's inconvenient for them.

We were told that it's probably even worse than it looks, but no one is looking too hard because it's not in the interests of the people at the top to be having anyone looking.

So, nothing's going to change until we know how much it's really costing us, and in what ways; but if we did know, we'd be able to go to Government and tell them how much it was worth spending to fix. But first they need to be willing to hear the nasty little secrets.

Clare Tedestedt George ©