



# The gig economy and road safety outcomes

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## Abbreviations and acronyms

AI	artificial intelligence
ACC	Accident Compensation Corporation
CBD	central business district
CoF	certificate of fitness
DSI	death and serious injury
GPS	Global Positioning System
HSWA	Health and Safety at Work Act 2015
MBIE	Ministry of Business, Innovation and Employment
MTA	Motor Trade Association
NSW	New South Wales
OHS	occupational health and safety
PCBU	person conducting a business or undertaking
RMF	Risk Management Framework
SPSL	small passenger service licence
SPSV	small passenger service vehicle
TCR	traffic crash report
TSL	transport service licence

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## Executive summary

### Introduction

The 'gig economy' refers to work undertaken outside of the traditional employer–employee relationship, on an 'as and when needed' basis. Gig work is generally undertaken by contracted workers in response to a request for service, typically given in real time via a digital platform. Examples include passenger transport, food and grocery delivery, and courier delivery. As gig work has grown around the world and is increasingly becoming the primary type of employment for many, concerns are increasing about associated road safety risks for gig drivers and other road users. Overseas, concerns have in large part been driven by evidence that gig drivers/riders are experiencing death and serious injury crashes on the road. Identified risks include unsafe driving behaviours (such as using a mobile phone) while driving, fatigue, non-roadworthy vehicles, and insufficient use of personal protective equipment.

Waka Kotahi commissioned this research to address current knowledge gaps in relation to gig work and road safety in New Zealand. The research was conducted between January and December 2022. The purpose is to identify the socio-technical system factors that relate to the gig economy and road safety within the New Zealand context. The research addresses four main objectives:

1. Provide a summary of international and New Zealand research on the subject of road safety outcomes and the gig economy.
2. Identify the socio-technical system factors that influence the gig economy and road safety outcomes within the New Zealand context.
3. Highlight where additional types of data, other than those traditionally used in road safety, might be utilised to better understand the context.
4. Provide cross-sector recommendations of actions that could be taken to mitigate any negative impacts of the gig economy.

### Research framework

This research adopted a **socio-technical systems approach**. The socio-technical system refers to the social and technical structures and processes of work systems and the interactions between people and technology in workplaces. In this research, an adapted version of **Rasmussen's Risk Management Framework** was used to examine how global, regulatory, organisational, environmental, and worker factors shape how gig work is undertaken in New Zealand and how these contribute to road safety risk. Corresponding actions across the system to build system capability and to reduce road safety risk were identified.

### Research methods

A mixed-method research approach was used. A **literature review** was first undertaken to examine existing knowledge about gig work and road safety and to inform the final research design. A **key informant workshop** was facilitated with six participants to build understanding of the local context and to inform early mapping of the socio-technical system. **Key informant interviews** were then undertaken with 20 representatives from across the system, with half being from higher levels of the system (eg, government agencies) and half being gig drivers. A **review of Crash Analysis System (CAS) data** examined the nature and possible causes of crashes in New Zealand involving gig drivers. A **review of other data sources** examined where additional types of data, other than those traditionally used in road safety, might enhance understanding of gig work and road safety risk. An **online** survey of New Zealand gig drivers was then



conducted to provide further understanding of gig work and road safety. **Ethnographic research**, comprising in-situ observation, ride-along observations with four food delivery drivers, and reflective interviews with six gig drivers, provided further insight into the lived reality of drivers and road safety related risks. Finally, the findings from all methods were analysed and synthesised to inform the development of an **Actor Map** and **AcciMap** of the gig work socio-technical system. These maps show how actors and contributing factors across the system influence gig drivers' road safety risk.

## Literature review

Key findings from the literature review were as follows.

- 'Gig' is a rapidly changing form of work that is becoming exponentially more prevalent globally. This growth has been spurred by the COVID-19 pandemic and relatively easy access to this type of work.
- Gig work is different from typical independent contractor arrangements and must be considered as such. Part of this difference is the level of influence that gig platforms have over the work offered to workers.
- There are challenges and limitations in the extent to which current regulatory frameworks in New Zealand address the emergence of gig platforms and changing ways of working.
- International research has shown that gig drivers are at risk of adverse road safety outcomes. Many features of gig work, including the demographics of gig workers, can be linked to heightened risk.
- A range of data sources are used to make inferences about the size of New Zealand's gig economy and the extent of the road safety risks and outcomes for drivers; however, more robust data regarding gig work is needed.
- In response to the growth of the gig economy, other jurisdictions internationally have enhanced regulations and have implemented other measures to mitigate the risk of harm. New Zealand can learn from these responses.
- Researching and understanding gig work and its associations with road safety risk are difficult given the recent emergence of the sector and its nature as a grey area.

## Key research findings

While aspects of gig work are covered by existing regulation, effective regulatory control is challenging. Reasons for this include the legal employment status of gig workers, lobbying from platforms, the complex relationship between platforms and drivers for determining duty of care, the obfuscated nature of algorithmic work design, and the fact that most platform businesses are located offshore. The relative invisibility of gig work in current data systems makes it difficult to define and respond to gig work-related issues in New Zealand.

Key informants suspected the growth of gig work in New Zealand and the unique pressures of gig driving – for example, the need to work long hours and at pace – were likely to be road safety risk factors. However, they acknowledged that government agencies currently had relatively limited understanding of risk factors. Reasons for this were similar to those constraining understanding of the gig economy overall: the independent contractor status of gig workers, difficulty understanding and keeping pace with innovations, inherent complexities related to algorithmic control of gig work, and limitations in current data systems.

Gig drivers **interviewed** described working under stress and considerable mental load, although the extent of this appeared to differ by driver type. Drivers described a complex work environment comprising multiple demands. These included management of platform apps, the need to make quick decisions under pressure, other road users, potentially challenging customers, limited parking, roadworks, and other network disruptions. Many acknowledged that pressures within the job caused them to drive less safely at times. Drivers also described a relatively unsupportive workplace environment – an individualist, competitive

environment; limited access to platform support; and a concern that speaking out could lead to deactivation from platforms. Road safety risks reported by drivers or observed by the researchers included erratic or risky driving, distraction, illegal parking, driving for long periods of time, and driving while tired.

The **ethnography** provided further insight into the lived experience of gig drivers and implications for road safety risk. The physical driving environment – parking availability, road layout, road conditions, and other road users – was identified as a key risk factor. Reported or observed behaviours to manage the environment included U-turns, illegal parking, swerving, and rapid manoeuvres. Customer interactions could be another stressor; for example, customers failing to comply with safety requirements or pressuring drivers to drive less safely. Drivers managed interactions carefully to ensure positive service ratings and to mitigate the risk of abuse and threats. This acquiescence could mean prioritising customer expectations or demand over one's own or other road users' safety.

Mobile phone use is essential to gig work, and managing work tasks on the phone and using map applications were another potential distraction. Drivers had different levels of understanding about how algorithms assigned tasks and reported different levels of training on this. This further limited their control over the work environment and reportedly contributed to the pressure and stress they experienced. For some drivers, limited understanding of the platform apps also contributed to a sense of resentment and suspicion towards platforms.

The ethnography indicated that road safety risk may be experienced differently by different types of gig drivers. Those who were motivated to maximise their income, those who had high reliance on their gig income, and those who worked in central city areas appeared more likely to undertake risky driving behaviours. These drivers reported a pressure to work quickly and to minimise delays within a less than supportive physical environment (eg, lack of parking). Conversely, those who drove part time, those who were less dependent upon their gig income, and those who worked in more predictable suburban environments generally did not exhibit the same level of risky driving behaviour.

**Analysis of CAS data** identified 203 crashes between 2019 and 2021 involving a gig worker. Over half (67%) were classified as non-injury crashes, a quarter (27%) as minor, and 6% as serious. The majority of crashes involved gig drivers being hit by another vehicle. Gig driver at-fault crashes often involved gig drivers failing to stop at intersections. Written crash descriptions showed that some crashes were attributable to features of gig work; for example, U-turns made at the request of either the customer or the Global Positioning System (GPS), and rapid changes of direction in response to a new job. A number of incidents involving collisions with pedestrians were detected, with pedestrian intoxication a common factor.

**Four data sources** were reviewed to understand future potential for describing the gig economy and road safety risks: passenger (P) endorsements and small passenger service licences (SPSLs); Logmate (ie, electronic driver logging); platform-collected app data; and electronic transaction data. Key findings were as follows.

- P endorsements and SPSLs, which are required for rideshare gig drivers, may be useful in supporting estimates of the size of the gig economy. However, this dataset is limited in differentiating between gig drivers and other small passenger service drivers.
- Logmate collects driving hours for rideshare drivers; however, there may be privacy requirements that limit the ability to aggregate the data to understand driving hours across the sector. It may first be important to establish the number of rideshare drivers who are not driving under a platform's SPSL (ie, drivers who do not have systems in place for regular review of their logbooks).
- Platforms are required to collect and store customer complaint data and must notify Waka Kotahi of any incidents deemed 'serious'. Incidents investigated to date have largely been concerned with accusations

of inappropriate sexual behaviour by drivers to customers. The extent to which this dataset contains road safety related complaints is not currently known.

- In New Zealand, use of electronic transaction data has been limited to platforms reporting their economic impact. International studies have shown that electronic transaction data can also be used by researchers to estimate the size and growth of the gig economy and to estimate worker demographics.

Over half (53%) the respondents to the **online survey of gig drivers** ( $n = 197$ ) reported rideshare as their primary type of gig driving, and cars were the most commonly used vehicle type (86%). Work flexibility (71%) was a common motivation for undertaking gig work. The majority of respondents reported driving long hours to earn enough money and experiencing long periods of the same type of driving; both factors indicate the risk of tiredness during a shift. Two-thirds of respondents reported frequently checking app notifications while driving, indicating a risk of distraction. Other commonly identified road safety risk factors included exceeding the speed limit (33%), picking up and dropping off in unsafe or illegal positions (25%), and having a near miss with another road user (22%). Thirty-two respondents reported a road accident in the last 12 months, with eight reporting injury to themselves and five reporting an injury to someone else. Over a third (38%) reported experiencing physical pain or discomfort as a result of their driving, and close to a third reported mental or physical fatigue. Only one in five reported a sense of community with other drivers.

### Socio-technical mapping

An **Actor Map** was developed from the research findings to describe the person and non-person actors across the gig work socio-technical system. The position of each actor in the map illustrates the theoretical level of influence and impact each has within the system. Actors higher up the map have influence and exert control over actors at the levels below (those closer to day-to-day gig work). In turn, actors at the lower levels of the system provide feedback about the state of safety to those at the higher levels to inform their decisions and actions.

An **AcciMap** was also developed from the research findings. This map describes the influencing factors across the system, and the interactions and contributing pathways between the factors, identified as contributing to road safety risk and the potential for adverse outcomes.

The AcciMap is accompanied by **narratives** that highlight the major sources of influence across the system. These maps provided a starting point for the discussion in chapter 6, in which the interactions between the socio-technical factors and the resulting road safety outcomes are discussed.

The narratives are as follows.

- **A culture of convenience:** Platforms have emerged to satisfy consumers' need for fast and convenient service. Platforms tend to prioritise customers' experience and satisfaction over drivers. Drivers can be deactivated or terminated based on poor customer feedback and have limited opportunities to challenge such responses from platforms. This can result in pressure to work in ways that generate positive feedback; for example, speeding to deliver an order faster, or dropping off passengers in an unsafe, yet convenient location. These behaviours directly increase the risk of adverse road safety outcomes.
- **Regulating the gig economy:** Many features of gig work have resulted in regulatory challenges. These include the recent emergence of platforms in New Zealand and their innovative ways of arranging work, the overseas location of platforms, and the limited sharing of data between platforms, regulators, and other agencies. This has resulted in limited data regarding gig work and thus a limited understanding of its nature and its implications for road safety in New Zealand.
- **Employment status:** Most, if not all, gig platforms do not recognise their workers as employees, meaning they are generally labelled as independent contractors. This means workers have limited employment support from platforms, and each other, and are unable to collectively bargain or unionise.

This has implications for the overall conditions surrounding gig work, which in turn has downstream implications for road safety.<sup>1</sup>

- **Increasing cost of living:** The increasing cost of living (partially associated with the COVID-19 pandemic) has resulted in an influx of new gig drivers, which in turn has increased competition and reduced the earning potential of drivers. This increased financial pressure has also resulted in people taking on gig work in addition to other employment and working across multiple platforms (multi-apping). These factors can lead to gig drivers working increasingly long hours to earn enough money and rushing between jobs, with implications for hours of work, fatigue, mental overload, and road safety risk.
- **Road infrastructure:** The design of road infrastructure (particularly within central city areas) does not accommodate gig drivers and their need to park frequently, resulting in drivers often parking illegally. Platform apps were found to encourage unsafe behaviours; for example, by directing passenger transport drivers to pick up or drop off passengers on bus lanes or directing food delivery drivers to make unsafe manoeuvres including U-turns. These behaviours can increase road safety risk. General issues with poor road conditions and the unsafe behaviours of other road users contribute further to risk.
- **Occupational health and safety (OHS):** Gig drivers as independent contractors are categorised as a person conducting a business or undertaking, as are gig platforms. The respective OHS obligations of both parties appear unclear. Many drivers do not have access to the support needed to sufficiently understand their OHS requirements. Additionally, platforms renounce their responsibility for drivers' OHS and maintain their status as a facilitator of work, rather than as an employer. These factors have implications for workers' road safety. Of particular note are workers' long hours and the associated risk of fatigue.

## Recommendations

While this study finds limited evidence to date of serious harm related to gig work, there is a tangible prevalence of reported harm, and the work system comprises multiple risk factors. Gig work is increasingly becoming the primary type of employment for many people, and the proportion of all work that is 'gig work' is likely to continue to increase. For these reasons, recommendations for action are provided (summarised below, and then detailed in chapter 7).

Current silos within government are a factor constraining the identification and delivery of effective regulatory and other supports to the gig economy. Appropriate agencies should further investigate how other countries have established coordinated responses, with the view of establishing a similar response in New Zealand.

Uncoordinated and decentralised data systems limit understanding of gig work and the ability to develop effective road safety supports. Quality data is needed to inform and justify regulatory interventions. Key recommendations related to existing data sources include:

- a comprehensive review of the P endorsement and SPSL licensing dataset
- further examination of the feasibility and value of requiring driving hours data to be shared across platforms and other driving-for-work industries
- regular monitoring of CAS to identify and collect data for death and serious injury incidents and to encourage accurate recording of causal crash factors

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<sup>1</sup> Note, however, in 2022 the Employment Court of New Zealand ruled that four Uber drivers were employees (see section 3.3.1.3).

- an initial review of the complaints register dataset kept by platforms to identify what information is reported by customers about road safety related incidents, and to encourage platforms to report road safety incidents by both customers and drivers.

Given the uncertainty regarding employment and health and safety regulatory reform applied to gig work, relevant government agencies should consider the need to develop clear guidelines for regulating gig work. There are a range of international measures that may provide examples for New Zealand.

The design of app algorithms is largely unregulated, and it is difficult for regulators to keep pace with industry innovation. Relevant government agencies should examine whether design elements of the work can be regulated, independent of a worker's employment status.

Gig workers have strategic importance in cities, and government agencies should consider the further development of the transport network and infrastructure to better meet their needs. For example, designated pick-up and drop-off locations may promote safer and more predictable road user behaviour related to gig work.

There may be greater use of bikes, motorbikes, and e-scooters for gig work in the future as cities intensify and alternative transport modes continue to be encouraged. It seems important that city master planning accommodates this, considering the vulnerable nature of these modes.

Government agencies should explore opportunities to enhance drivers' access to road safety and health and well-being information at the point of entry to gig work. Alternatively, as a regulator, government agencies could require that this support is provided by gig companies.

This research indicates that exposure and responses to road safety risk and the likelihood of harm may differ by gig driver segments. Gaps remain in our understanding of how different driver characteristics interact with factors throughout the socio-technical system. A comprehensive driver segmentation study would help to understand how driver–system interactions either increase or mitigate road safety risk and the potential for harm.

## Abstract

As the gig economy expands locally and internationally, the type and incidence of associated risks may also increase. To date, there has been limited action in New Zealand to address potential risks, with the lack of understanding about the gig economy and gig work a reason for this. This research was commissioned by Waka Kotahi NZ Transport Agency to address current knowledge gaps in relation to gig work and road safety. The purpose was to identify the socio-technical system factors that relate to the gig economy and road safety within the New Zealand context and to examine where additional types of data, other than those traditionally used in road safety, might be better utilised to understand gig work. Data collection methods included a literature review and examination of non-traditional data types, an analysis of relevant incidents in the Waka Kotahi Crash Analysis System, a key informant workshop, interviews with key informants from different levels of the gig work socio-technical system, ethnography with gig drivers, and an online survey of gig drivers. Socio-technical methods were applied to map and understand the factors that contribute to and influence road safety risks for gig drivers in New Zealand. Based on the findings, cross-sector recommendations for actions in this sector are provided.

# 1 Introduction

## 1.1 Background

### 1.1.1 Defining gig work

*Note.*

- The term ‘gig worker’ is used to refer to all types of workers contracted on-demand by digital platforms, whereas ‘gig driver’ is used to refer only to gig workers using a vehicle to undertake services requiring driving (such as passenger transport, food/grocery delivery, and courier delivery).
- For brevity, the terms ‘gig driver’, ‘drivers’, and ‘gig driving’ are used and are inclusive of gig workers who drive or ride any vehicle to carry out gig work (unless otherwise specified).

The term ‘gig’ refers to a single professional engagement that lasts for a specific and typically limited period of time. Traditionally used by musicians to define a performance engagement, the term has more recently been used to refer to the growing range of work undertaken outside of the traditional employer–employee relationship, on an ‘as and when needed’ basis. ‘Gig work’ is generally undertaken by contractors in response to a request for service, typically given in real time via a digital platform (Riggs et al., 2019). These web-based platforms or apps act as an intermediary to arrange work and deploy ‘gig workers’. Gig workers are typically labelled by gig platforms as self-employed contractors rather than employees.<sup>2</sup> Many have multiple roles/forms of employment (including non-platform-based and non-driving work), and thus this population is heterogenous. Gig work includes an array of work types, with driving work such as rideshare/passenger service, food and grocery delivery, and parcel delivery currently the most common. Other types of gig work, outside the scope of this research, include online-only jobs (eg, performing tasks such as translation, design, copywriting) and caregiving work (eg, babysitting, dog-walking, support work). The ‘gig economy’ refers to the corner of the labour market occupied by gig workers and the associated platforms.

Gig work is growing rapidly across the world due to factors such as the rise of non-standard forms of work (Johnstone, 2016), the COVID-19 pandemic (Rawling & Munton, 2021), and the relative ease of becoming a gig worker (Healy et al., 2017). Between 2010 and 2020 the number of gig work platforms grew from 142 to over 770 globally (International Labour Office, 2021).

International and New Zealand research has raised concerns about gig work, including limited employment rights and protections, extensive working pressures, and minimal regulatory oversight (Christie & Ward, 2018; Senate Select Committee on Job Security, 2021). There is also evidence of a relationship between non-standard forms of work – such as contracting, on-call, and on-demand work – and poor health and safety outcomes for workers (Barrett & Sergeant, 2011; James et al., 2007; Mayhew & Quinlan, 2006; Underhill & Quinlan, 2011). Recent New Zealand research (Rosentreter & Miller, 2021) provided initial insights into the low pay of local gig drivers and their exposure to health and safety risks.

Legal action against gig platforms has followed in a number of countries,<sup>3</sup> typically seeking to give gig workers access to employment rights and protections and improve employment conditions. However,

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<sup>2</sup> Note, however, in 2022 the Employment Court of New Zealand ruled that four Uber drivers were employees (see section 3.3.1.3).

<sup>3</sup> See [https://en.wikipedia.org/wiki/Legality\\_of\\_ridesharing\\_companies\\_by\\_jurisdiction](https://en.wikipedia.org/wiki/Legality_of_ridesharing_companies_by_jurisdiction)

regulatory reform has been challenging due to the strength of neo-liberal economic theory within labour markets, legal loopholes, the slow pace of reform, and the continued growth of non-standard work forms, including gig workers (Cayla, 2022).

Platforms operating in New Zealand include:

- passenger transport/rideshare services, such as:
  - Uber
  - Ola
  - DiDi
  - Zoomy
- food delivery services, such as:
  - Uber Eats
  - Delivereasy
  - Menulog
  - DoorDash
  - HungryPanda
- courier/delivery services, such as:
  - Uber
  - Ola
  - DiDi Delivery.

### 1.1.2 Gig work and road safety risk

The road safety risks associated with gig work are attracting attention (Crain et al., 2020). Types of gig work undertaken within the transport sector include but are not limited to passenger service (rideshare), food delivery, and parcel delivery. Concerns about gig work and road safety have in large part been driven by evidence that gig drivers are experiencing death and serious injury (DSI) crashes on the road. For example, following the death of five food delivery riders in 2020, a Joint Task Force on gig work and work safety was established in Australia (SafeWork NSW & Transport for NSW, 2021). Previous research has identified risks for gig drivers, including unsafe driving behaviours (such as using a mobile phone), fatigue, non-roadworthy vehicles, and insufficient use of personal protective equipment (Christie & Ward, 2019).

The unconventional nature of gig work also means that standard data systems have limitations in measuring and describing gig work and the gig economy (Riggs et al., 2019). This has been another constraint on the development of interventions to better protect and support gig workers, including in relation to road safety.

## 1.2 Research purpose

As the gig economy expands locally and internationally, the type and incidence of associated risks may also increase. To date, there has been limited action in New Zealand to address potential risks, with the lack of understanding about the gig economy and gig work a reason for this.

This research was commissioned by Waka Kotahi NZ Transport Agency to address current knowledge gaps in relation to gig work and road safety. The purpose is to identify the socio-technical system factors that relate to the gig economy and road safety within the New Zealand context. A socio-technical approach allows for an understanding of how system factors beyond individual gig workers and their immediate environment interact to shape risk exposure, the type of risk, and resultant outcomes. This research also

examines where additional types of data, other than those traditionally used in road safety, might be better utilised to understand the context of gig work. Based on the research findings, recommendations are provided for cross-sector actions that could be taken to mitigate identified road safety risks.

## 1.3 Research objectives and key questions

The research objectives and questions addressed were as follows.

- 1. Provide a summary of international and New Zealand research on the subject of road safety outcomes and the gig economy.**
  - a. What are the road safety risks and outcomes for gig economy workers (internationally and locally)?
  - b. What is the potential size of the road safety problem involving gig economy workers in New Zealand?
- 2. Identify the socio-technical system factors that relate to the gig economy and road safety outcomes within the New Zealand context.**
  - a. What is the context (tasks, norms, management systems, policies, regulations etc) within which gig economy workers undertake driving-related work, and how is this context linked to road safety?
- 3. Highlight where additional types of data, other than those traditionally used in road safety, might be utilised to better understand the context.**
  - a. What are the opportunities, gaps, and limitations in current data sources?
- 4. Provide cross-sector recommendations of actions that could be taken to mitigate any negative impacts of the gig economy.**
  - a. How are other jurisdictions responding to identified gig economy road safety risks and outcomes?
  - b. What are the cross-sector recommendations for actions to be taken based on the research findings?

## 1.4 Research framework

The research design was based on a systems approach informed by contemporary health and safety and human factors theory (Goode et al., 2018; Salmon et al., 2022; Svedung & Rasmussen, 2002). A systems approach recognises that risk and harm do not have a single or root cause but rather result from interactions between multiple factors within a wider system (Tappin et al., 2008). A systems approach therefore describes the actors within the system and examines how policy, regulatory, management, environmental, and worker factors shape the design and nature of work and the potential for harm (Rasmussen, 1997).

The socio-technical system refers to the social and technical structures and processes of work systems and the interaction between people and technology in workplaces (Bauer & Herder, 2009; Rasmussen, 1997). In the context of this research, the socio-technical system refers to the myriad of global, regulatory, organisational, environmental, and worker factors that shape the system within and through which gig work is undertaken in New Zealand. A socio-technical approach is used to identify the systemic factors within the New Zealand gig economy that contribute to road safety risk for gig drivers and other road users.

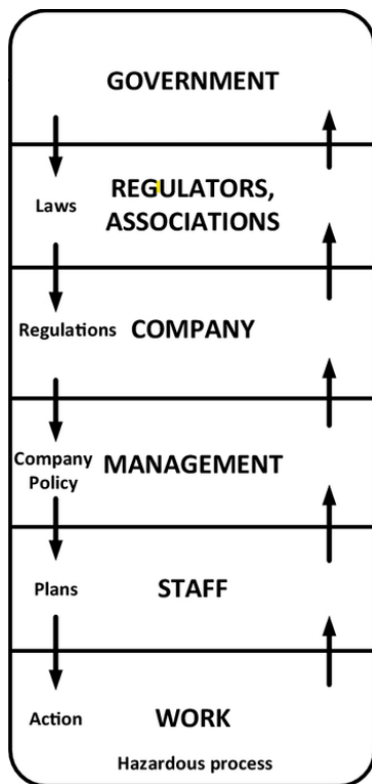
A core principle underpinning a socio-technical approach is shared responsibility for health and safety across the system. Rather than focusing on individual behaviour change in isolation, a socio-technical approach seeks to understand how the risk of harm can be mitigated by building capability at all levels of the system.

The socio-technical framework used in this research was based on Rasmussen's (1997) Risk Management Framework (RMF). Rasmussen originally described a six-level socio-technical system, from workers and equipment at the bottom of the framework through to government and regulatory factors at the top (Figure



1.1). The arrows between each level illustrate vertical integration within the system – that is, how factors at higher levels influence and control lower-level factors and how feedback flows from the lower levels back up the system. An adapted version of Rasmussen’s RMF was used in this research to provide a framework for the development of an Actor Map and AcciMap. Applying the AcciMap technique allowed for the mapping and examination of how factors at each level of the system interact to shape road safety risk. The Methodology section (chapter 2) describes the framework and how it informed the research approach and all methods.

**Figure 1.1 Rasmussen’s Risk Management Framework showing original system levels (adapted from Rasmussen, 1997, p. 185)**



## 1.5 Report structure

**Chapter 2** details the research design and the data collection, analysis, and reporting methods used.

**Chapter 3** presents the findings from a literature review examining current understanding about gig work and road safety in New Zealand and internationally.

**Chapter 4** details the findings from all the primary research undertaken – a key informant workshop, in-depth interviews with actors across the system, an online survey of gig drivers, and ethnographic research.

**Chapter 5** synthesises and presents the findings through a series of socio-technical maps.

**Chapter 6** discusses the findings.

**Chapter 7** provides recommendations for cross-sector actions.

**Chapter 8** details the limitations of the research.

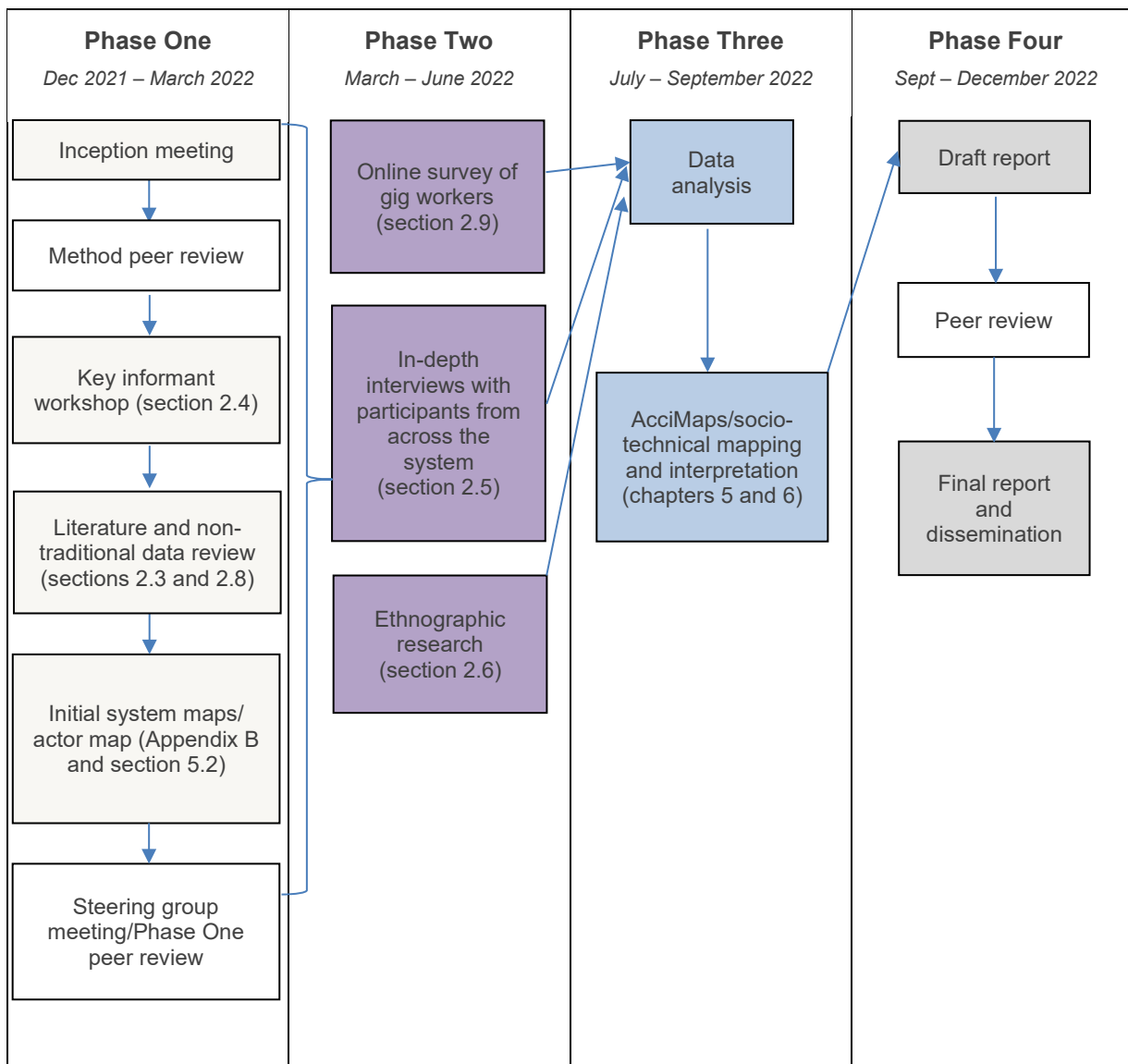
## 2 Methodology

This chapter details the research methodology. The research design is initially described, followed by detail on each of the methods used.

### 2.1 Research design

A mixed-method research approach, combining qualitative and quantitative methods and utilising primary and secondary data, was used. Figure 2.1 shows the four phases of the research and the main activities undertaken within each phase.

**Figure 2.1 Gig work and road safety research design**



As introduced earlier, an adapted version of Rasmussen’s RMF was used to provide the levels of the gig socio-technical system examined in the research (Rasmussen, 1997). The general themes of Rasmussen’s RMF were maintained; however, the levels were adapted to suit the context of gig work. For example, ‘Company’ and ‘Management’ were combined to form ‘Industry, Platform, Management’. An ‘Environment’ level was added above the ‘Worker’ level as gig drivers are heavily influenced by their surrounding environment (including the road environment and interactions with passengers/customers). A higher level, ‘Global context’, was also added. Table 2.1 shows the system levels adopted and the methods used to collect data from each level.

**Table 2.1 The adapted socio-technical system levels and data collection methods used**



## 2.2 Informed consent and participant protection

Gig workers may be a particularly vulnerable research cohort due to factors such as the precarious nature of their work, limited employment rights and protections, immigration status, and English language ability (Bracken-Roche et al., 2017). Strict attention was paid in this research to ensure that all procedures protected the rights and well-being of all the research participants, including key informants from across the system. All procedures were externally peer reviewed by a university-based advisor and fully specified within the research plan (Mackie Research, 2022).

The following procedures were adopted as appropriate within each of the primary research methods used:

- Clear and simple language was used in all tools to support participant understanding and to reduce barriers to participation.
- Information sheets and consent forms were used for workshop, interview, and ethnography participants (see Appendix A for an example). These materials provided essential informed consent information (eg, purpose of the research, requirements and rights of participation, data storage).
- Recruitment processes ensured that participants had sufficient time to consider their participation and to have any questions addressed.
- As far as possible, workshops, interviews and all ethnographic activities were scheduled to protect the anonymity of participants (eg, scheduling gig manager and worker in-depth system interviews as individual interviews).

- Data collection (eg, interviews, workshops) was only audio taped with participant consent.
- Various strategies were used to remove any identifying information from the primary data and to ensure that personal information was stored separately from the raw data.
- Strict attention was given to data storage and security (eg, password-protected access only).

## 2.3 Literature review

### 2.3.1 Purpose

A review of New Zealand and international literature was undertaken to explore current knowledge on the work context for gig drivers (eg, tasks, norms, management systems, policies, regulations) and associated road safety risks and outcomes. Actions of overseas jurisdictions in response to road safety risks, including grey literature and regulatory changes, were also examined.

### 2.3.2 Method

Two main searches were carried out (one in January 2022 and one in October 2022); however, relevant materials were collated and reviewed throughout the duration of the research. The Google Scholar and Google Search platforms were primarily used to identify and source documents, including journal articles, court rulings, union reports, and government documents (limited to documents written in English). Given the emerging nature of gig work and the gig economy, other relevant non-peer reviewed references were identified by members of the research team and wider reference group and were used to support the review. These included online articles, opinion pieces, platforms’ web pages, and news articles. The material reviewed included key summaries describing gig work, the nature of gig work that may lead to harm, and specific road safety risks associated with gig work.

Research abstracts or report summaries were initially read to identify relevant sources for full review. Key findings were summarised under the questions in Table 2.2 initially using paraphrases and direct quotes. This data was reduced further to key points summaries that were then grouped thematically.

**Table 2.2 Literature review dimensions and associated questions**

Dimension	Question
Defining gig work/gig economy	<ul style="list-style-type: none"> <li>• What is the definition of the gig economy and gig economy workers?</li> </ul>
Context of gig work and road safety	<ul style="list-style-type: none"> <li>• What are the factors (eg, tasks, norms, management systems, policies, regulations etc) that make up the context within which gig economy workers undertake driving-related work, and how do these factors act and interact to create road safety risk for gig economy workers?</li> </ul>
Gig work and road safety risks/outcomes	<ul style="list-style-type: none"> <li>• What road safety risks have been identified for gig economy workers?</li> <li>• What are the road safety outcomes for gig economy workers (eg, types of crashes, DSI statistics)?</li> </ul>
Responses by other jurisdictions	<ul style="list-style-type: none"> <li>• How are other jurisdictions internationally responding to identified gig economy road safety risks and outcomes?</li> </ul>
Gig work data sources/research measures	<ul style="list-style-type: none"> <li>• What data sources/dimensions are being used to quantify the size/shape of the gig economy?</li> <li>• What data sources/dimensions are being used to understand and measure driving-related dimensions of the gig economy and gaps and limitations in current data sources?</li> <li>• What methods and frameworks are being used to research and understand driving-related dimensions of the gig economy and road safety risk?</li> </ul>

The search terms used were:

- gig work/structure of gig work
- gig work platforms/apps/applications
- gig work/economy and road safety
- transport/safety risks/risk factors
- socio-technical systems
- regulating/regulations/legislation and the gig economy.

### **2.3.3 Output**

Given limited knowledge currently about the gig sector in New Zealand, the literature review constitutes an important data source in this research. The key findings, presented in section 3.1, informed the design of the research framework and an early AcciMap initially workshopped with key informants (see section 2.10.2 for method detail and see map in Appendix B).

## **2.4 Key informant workshop**

### **2.4.1 Purpose**

A key informant group comprising six members was established to provide initial insights about who was involved in the gig economy in New Zealand and the factors across the socio-technical system that impacted road safety risk. As far as possible, the key informants also assisted in identifying potential participants for later stages of the research.

### **2.4.2 Method**

A single workshop was held with the key informant group. The members were identified through initial research into sector stakeholders and through recommendations from the Waka Kotahi steering group. It was agreed with the steering group that the informant group would primarily comprise key informants from higher levels of the socio-technical system – that is, government, policy, regulatory, and sector stakeholders, including unions. The informants were from a range of organisations, including Waka Kotahi, WorkSafe New Zealand, the Ministry of Business, Innovation and Employment (MBIE), and FIRST Union. The small size of the group permitted full and in-depth participation from each member. It was agreed it would be more appropriate to involve gig sector management (ie, platform representatives) and drivers through later in-depth interviews, particularly to protect confidentiality. Key informants who were initially invited yet unable to attend the workshop were also invited to participate in an in-depth interview.

The workshop comprised a virtual ‘whiteboard’ exercise using the screen-sharing features of the Padlet platform. Key informants were asked to map out the socio-technical gig economy system, prompted by two questions, ‘Who has influence?’ and ‘Who is influenced?’ Following the workshop, the preliminary socio-technical map was refined by the research team, sent back to participants for feedback, and then developed further accordingly.

### **2.4.3 Output**

#### **2.4.3.1 Thematic analysis**

The findings from the key informant workshop were thematically analysed. Thematic analysis is a method by which a qualitative dataset can be robustly analysed. An adapted version of reflexive thematic analysis

(developed by Braun & Clarke, 2006) was utilised throughout this research and involved recursive engagement with the data. This process is outlined below.

The researchers initially re-read the data and discussed their initial reflections with the wider research team. Codes were then developed to capture features relevant to the research questions (see section 1.3). Relationships between the codes were noted, as were key quotes and initial interpretations. While the coding scheme did not undergo formal reliability testing, the research team carried out this stage of analysis collaboratively.

The coded data was analysed to generate initial themes. Using Miro software, the themes were arranged independently by data collection type and then colour-coded according to the corresponding system level. These themes were further refined to generate six overall themes that informed the write-up of the findings (chapter 4) and the AcciMapping process (chapter 5).

#### **2.4.3.2 Preliminary socio-technical mapping**

The completed map from the workshop provided initial description of the person and non-person actors within the gig work socio-technical system and how interactions between the actors shaped road safety risk. The map output is presented in section 5.2 and a copy of the whiteboard can be found in Appendix C. The data collected served as the basis for initial socio-technical mapping, particularly the Actor Map (method detailed in section 2.10.2). The data also guided the design of the in-depth system interviews and online survey of gig drivers.

Detail from the workshop transcript and the whiteboard also informed an initial socio-technical map (Appendix B) of the gig economy in New Zealand. The socio-technical map was created using both the key informant data and the literature to form initial hypotheses on how factors throughout the system shaped risk.

## **2.5 System interviews**

### **2.5.1 Purpose**

In-depth interviews were conducted with participants from different levels of the gig economy socio-technical system to further understand the system and road safety risks.

### **2.5.2 Method**

Twenty interviews were undertaken with people ('actors') across four levels of the gig economy socio-technical system framed in the research (ie, worker, industry/platform/management, unions/associations, and government regulations and policy).

Ten interviews were conducted with actors from higher levels of the system and ten with gig drivers, who described functions in lower levels of the system. Participants from higher levels of the system were recruited via key informant contacts, existing networks of the research team, and the steering group. Only one gig platform management representative was able to be recruited, given the lack of New Zealand-based managers and a lack of engagement by overseas managers invited to take part.

Gig drivers were recruited through private Facebook groups for New Zealand-based gig drivers, following the acceptance of a member of the research team into these groups. Snowballing was also used, with recruited drivers asked to identify other potential participants. All drivers interested in taking part completed a short screener survey (see Appendix D) to ensure eligibility and target interviews to information-rich cases (eg, drivers involved in a road accident). All gig drivers interviewed received a \$100 voucher.

Table 2.3 shows the number of in-depth interviews conducted at each level of the socio-technical system.

**Table 2.3 System level and affiliation of interviewees**

System level	Affiliation	Total
Government regulations and policy	Waka Kotahi	4
	MBIE	1
	Ministry of Transport	2
	Auckland Transport	1
Unions/associations	Union representative	1
	Taxi sector representative	1
Industry/platform/management	Platform representative	1
Worker	Passenger transport/rideshare gig work	4
	Food delivery gig work	2
	Courier delivery gig work	1
	Multiple gig work types undertaking	2
<b>Total</b>		<b>20</b>

All interviews were conducted using semi-structured interview guides (see Appendix E for an example). The semi-structured approach ensured that key areas were addressed while also allowing issues and insights raised by each participant to be explored. Questions were tailored to each actor type as appropriate. For example, gig drivers were invited to reflect on the context of their gig work, their work routines, the structure of remuneration and incentive systems, and their road safety related experience.

### 2.5.3 Output

With participant consent, each interview was audio recorded.<sup>4</sup> Each recorded interview was transcribed, and all written notes were digitalised. These outputs were then thematically coded (detailed in section 2.4.3.1) by assigning summarising codes to key passages of text (recorded in the right-hand column of each transcript). The derived codes were then transferred to an Excel spreadsheet, which was formatted to show each level in the socio-technical system. The codes were located in the appropriate system level and colour-coded to identify the participant (eg, gig driver, regulator) from whom they were derived. Table 2.4 shows examples of how the system levels were used to organise the codes and quotes from the data. The key findings informed the socio-technical mapping process, along with other data collected.

<sup>4</sup> Summary notes were taken by the researcher for the one interviewee who did not consent to be recorded.

**Table 2.4 Key point coding scheme for interview data**

System sub-level	Example of coding	Example of key point/quote
<b>Global context</b>	<ul style="list-style-type: none"> <li>Impact of COVID-19</li> </ul>	<ul style="list-style-type: none"> <li>COVID-19 reduced gig drivers' income and work opportunities.</li> </ul>
<b>Government</b>	<ul style="list-style-type: none"> <li>Legislation to reflect work as done.</li> </ul>	<ul style="list-style-type: none"> <li>Government consultation and legislative changes need to be based on conversations with gig drivers.</li> </ul>
<b>Regulators/regulations</b>	<ul style="list-style-type: none"> <li>Reactive regulation.</li> </ul>	<ul style="list-style-type: none"> <li>Regulation has been reactive rather than proactive.</li> <li>Platforms are innovative and difficult to regulate.</li> </ul>
<b>Unions/associations</b>	<ul style="list-style-type: none"> <li>Level of support for gig drivers</li> </ul>	<ul style="list-style-type: none"> <li>Gig drivers [as independent contractors] do not have the right to collectively bargain or strike.</li> </ul>
<b>Industry</b>	<ul style="list-style-type: none"> <li>Why people are getting into gig work.</li> </ul>	<ul style="list-style-type: none"> <li>Lots more people are starting gig work as a 'side hustle'.</li> <li>Perceptions of gig work as being 'easy' and 'flexible'.</li> </ul>
<b>Organisation/platform</b>	<ul style="list-style-type: none"> <li>Financial element of gig work.</li> </ul>	<ul style="list-style-type: none"> <li>Income has greatly reduced over the last few years for drivers working for [platform].</li> <li>'All [platform] cares about is their 25% plus GST.'</li> </ul>
<b>Managers</b>	<ul style="list-style-type: none"> <li>Algorithm management – dealing with a person/manager</li> </ul>	<ul style="list-style-type: none"> <li>Poor driver support (eg, language barriers when talking to [platform] call centre staff).</li> <li>[Platform] has quests (eg, complete X trips in Y time and receive a bonus of \$Z).</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>Difficult road environment</li> </ul>	<ul style="list-style-type: none"> <li>Roadworks, damaged roads, and bad traffic contribute to delays.</li> </ul>
<b>Workers/drivers</b>	<ul style="list-style-type: none"> <li>Self-management / dependence.</li> <li>Gig worker relationship to infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>Wary of losing licence, and therefore less likely to drive while tired. 'I cannot afford to be in a position where I cannot drive because everything is dependent on [it].'</li> <li>Difficulty finding parks, illegally parking on dotted yellow lines, loading zones, and double parking.</li> </ul>
<b>Tasks/vehicle</b>	<ul style="list-style-type: none"> <li>Hybrid vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Priuses are popular as they do not require safety fittings in the cargo area.</li> <li>Hybrids are popular.</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Road safety outcomes (positive and negative)</li> </ul>	<ul style="list-style-type: none"> <li>Hit a pedestrian while driving in bad weather. Was warned by Police.</li> <li>Had an at-fault accident due to fatigue and rushing. Was under-insured.</li> </ul>
<b>Connections</b>	<ul style="list-style-type: none"> <li>[If a link between factors is made by the interviewee]</li> </ul>	<ul style="list-style-type: none"> <li>Cost of living is so high that they need a second job to support their family.</li> <li>Worried that accidents can be caused by distraction when [platform] sends a ride request.</li> </ul>



## 2.6 Ethnography

### 2.6.1 Purpose

The purpose of collecting ethnographic data was to capture the lived experiences of gig drivers in situ and in real time. The ethnography enabled insight into the reality of what it is to be a gig driver in New Zealand (primarily Auckland) and, in line with ethnographic research principles, to draw on these insights when analysing and interpreting all the primary data collected.

### 2.6.2 Method

Ethnographic research traditionally involves studying the culture of a group of people within naturalistic settings over a sustained period of time (Preissle & Grant, 2004). However, ethnographic methods such as participant observation and in-depth interviewing can also be used effectively outside full ethnography. This research employed the techniques of a 'focused ethnography', an approach characterised by shorter periods of observation and engagement and the requirement for researchers to have some background knowledge about the context and phenomenon of interest before engaging in the research setting.

Three activities were carried out:

1. observations
2. ride-along observations of four food delivery drivers
3. reflective interviews with six gig drivers before and after their shift.

Observation was conducted in central Auckland, in areas of peak gig activity as previously identified by the research team and gig worker interview participants. Recruitment for the ride-along observations and reflective interviews involved an invitation to complete an initial short survey that was posted in private Facebook groups. The survey was similar to that used to recruit the system interviewees (example in Appendix D). Respondents to the gig drivers online survey who had indicated interest in future research participation were also emailed a link to the survey. Eighty-four respondents from the online survey of gig drivers (see section 2.9 for methodology) indicated interest in future research. Of these initial respondents, 48 completed an additional recruitment/screener survey. Of these 48, the 10 respondents selected to participate in the ethnography were all based in Auckland and had responded to further recruitment attempts by the research team. The ethnographic data was all collected in Auckland, predominantly in the central business district (CBD) and surrounding suburbs, and during peak times for passenger and food delivery gig work. Recognising that gig drivers would be a difficult-to-reach population, participants were offered attractive remuneration for their time (\$100 voucher for ride-along interviews and \$170 voucher for reflective interviews).

#### 2.6.2.1 Observations

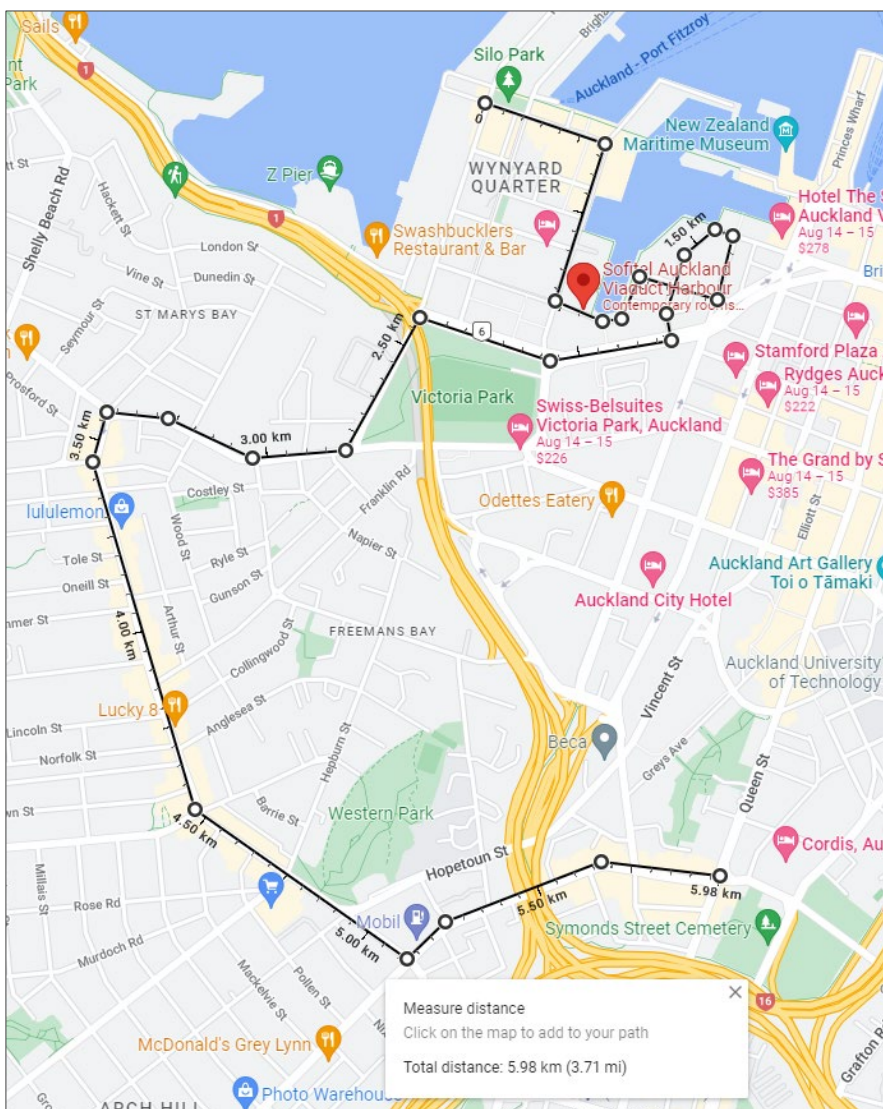
In-situ observations of gig work contexts were conducted in central Auckland on one evening in August 2022. Over the course of four hours (between 7 pm and 11 pm), two researchers observed the behaviours and interactions of gig drivers and other road users in the Wynard Quarter, Ponsonby, and Karangahape Rd areas. Figure 2.2 shows the observation route undertaken by foot. The researchers regularly stopped along this route in areas of high gig work activity to observe gig work. Gig drivers were identified by a number of cues, including child lock stickers on rear passenger doors, the transport service licence (TSL) on windscreens, use of mobile phone mounts, vehicle type, and relevant behaviours. The researchers discussed and recorded verbal descriptions of their observation, supported by written notes. These descriptions were prompted by a range of prepared observation categories (driver behaviour, physical environment, other road users, vehicle details, other; see Appendix G). Photos were also taken of

environmental features (such as parking signage) to assist description and to provide a visual record; however, no photos were taken of gig drivers or gig work vehicles. These photos were used internally by the research team and have not been published in this report.

Following the observation period, the two researchers discussed and wrote up their observations. Instances of obvious road safety risk, including traffic violations, were noted and examined. These observations were workshopped with the wider research team and further insights were extracted. The final dataset was coded and incorporated into the socio-technical maps.

The data collected comprised the researcher's notes, including those taken during the observation and developed further following the observation. The notes were thematically coded following the analysis process undertaken for the system in-depth interviews (detailed in section 2.4.3.1).

**Figure 2.2** Map of the ethnographic observation route



### **2.6.2.2 Ride-along observations**

Four Auckland-based food delivery gig drivers were recruited to participate in ride-along observations. All four had completed the online driver survey, and their answers were used to select a broad cross-section of drivers by gender, age, ethnicity, and working hours.

A researcher accompanied each driver for up to two hours on a typical shift. The researcher sought permission on where to sit (eg, in the front or back), whether questions could be asked (when safe to do so), and whether photos and audio recordings could be taken. Observations and questions were guided by a set of pre-developed prompts (Appendix G).

The data collected comprised the researcher's notes, including those taken during the observation and developed further following the observation. The notes were thematically coded, following the analysis process undertaken for the system in-depth interviews (detailed in section 2.4.3.1).

### **2.6.2.3 Reflective interviews**

Six Auckland-based gig drivers were recruited to participate in two reflective interviews, the first conducted prior to a shift and the second following and reflecting on the shift. The questions and prompts used in each interview can be found in Appendix G.

Five participants had completed the initial online driver survey, and their answers were used to recruit a cross-section of drivers by gender, age, ethnicity, and working hours. Four were passenger transport/rideshare drivers and two were food delivery workers.

The reflective interviews were designed and conducted to optimise ethnographic insights largely through open-ended questioning; encouragement of participants to use words, terms, and phrases of local meaning and relevance; and interviews being as proximal to actual gig work as possible.

The pre-shift interview took approximately 30 minutes and was focused on establishing the context to each participant's gig work, developing rapport, and providing instructions and tools to guide the data collection to be undertaken during the shift. Each driver was asked to record their experiences and observations during the shift relating to gig work generally and road safety specifically. Written notes, photographs, videos, and audio recordings were all suggested as possible data collection methods, depending upon preference and convenience. Each driver was also given an A4 sheet with prompts to assist their data collection.

The post-shift interview took approximately 30 minutes and examined each participant's observations and reflections over the shift. Each participant's recorded data as well as structured prompts within the interview guide were used to facilitate the discussion.

The interviews and driver notes were transcribed and then thematically coded following the analysis process undertaken for the system in-depth interviews (detailed in section 2.4.3.1). The initial stage of this analysis involved coding the data by assigning summarising codes to key passages of text (recorded in the right-hand column of each transcript document). The derived codes were then transferred to an Excel spreadsheet, which was formatted to show each level in the socio-technical system. The codes were located in the appropriate system level and colour-coded to identify the participant from whom they were derived.

## **2.6.3 Output**

The ethnography results are presented in section 4.3. The key findings were incorporated into and informed the development of the socio-technical maps.

## 2.7 CAS review

### 2.7.1 Purpose

To estimate the characteristics of crashes involving gig drivers in New Zealand, this report presents findings from a preliminary analysis of gig drivers using the Crash Analysis System (CAS), the national crash dataset administered by Waka Kotahi. The dataset provides access to traffic crash reports (TCRs), which provide contextual description of individual crashes. The dataset is useful for understanding the nature and possible causes of crashes and the road users involved, although it has limitations such as differing quality of information across different TCRs, inaccuracies in recording driver occupation, and inconsistent collection of fatigue-related information (eg, driving hours, sleep hours) (Hirsch et al., 2018; Thorne et al., 2020).

### 2.7.2 Method

#### 2.7.2.1 Case identification

For the CAS analysis of gig worker crashes, a dataset was constructed using filters that would *likely* include gig driver crashes (as gig work is not routinely identifiable utilising existing CAS filters – ie, you cannot filter the data by ‘gig worker’ crashes). All crashes between 2019 and 2021<sup>5</sup> that included ‘Taxi’, ‘Work travel’, ‘Work vehicle’, or ‘Other’ Vehicle Usage categories were downloaded to Excel. A keyword search was then conducted on the TCRs of each crash to identify any mention of the main gig platforms.<sup>6</sup> The keywords could appear in any section of the TCR where an attending police officer has filled in open-ended descriptions of the crash – for example, under ‘Occupation’, ‘Driver comment’ or ‘Why Crash Happened’ sections. TCRs with mention of a gig platform were then further analysed to confirm if a gig driver was involved in the crash.

This preliminary analysis of the CAS dataset utilises a modified keyword search approach outlined in an analysis of driving-for-work crashes recently published by the AA Research Foundation (Thorne et al., 2022). In the driving-for-work study, the keyword search methodology allowed for a more focused search of specific driving-for-work types; however, this was only conducted for fatal crashes between 2011 and 2018 (see section 3.5.2 for further discussion). For this report, the keyword search method has been modified by applying it to all crash severity types (ie, non-injury and injury crashes) and searching for specific mention of gig platforms in TCRs.

#### 2.7.2.2 Analysis

We identified 203 crashes between 2019 and 2021 that involved a gig worker (ie, where the TCR mentioned any of the main gig platforms and indicated that a driver was working for a gig platform at the time of the crash). Quantitative information was collected about:

- platforms mentioned and type of gig work
- severity
- year
- crash type
- driver contribution to crash
- location

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<sup>5</sup> Although gig work has been present in some form since 2012, 2019 was selected as the earliest date as this is when the ‘Vehicle Usage’ filter was added to and used consistently within CAS, allowing for a more targeted search for gig worker crashes.

<sup>6</sup> Uber, Ola, Didi, Zoomy, Uber Eats, Delivereasy, Menulog, DoorDash, HungryPanda, and Aramex.

- environmental factors (eg, speed limit, weather, road type)
- driving hours (when provided in the TCR).

Any additional qualitative description available in TCRs for the gig worker crashes identified were thematically coded to provide further insights about the nature of the crash.

### 2.7.3 Output

A discussion of the quantitative and qualitative analysis of the gig worker crashes identified in CAS is presented in section 4.4.

## 2.8 Review of non-traditional data sources

### 2.8.1 Purpose

This review examined where additional types of data, other than those traditionally used in road safety, might be better utilised to describe gig work and road safety risk in New Zealand. Potentially, future research and policy development can then utilise this data. The review examined the availability and accessibility of current data sources, data strengths and weaknesses, and the potential to enhance utility. Note that measuring the size of the gig economy was not the primary purpose of this research, nor was carrying out analyses using the datasets.

### 2.8.2 Method

The review covered four data types:

- passenger endorsements and small passenger service licences
- Logmate (ie, electronic driver logging)
- platform-collected app data
- electronic transactions.

The data reviewed for each source was drawn from a range of government, industry, and online sources. Other data sources (eg, parking violations, traffic offences, insurance) were also discussed by system actors interviewed in the research, and relevant findings are also reported.

The main data types examined are shown in Table 2.5 along with the key sources for each.

**Table 2.5 Non-traditional data types and sources**

Data type	Sources of information
Passenger endorsement and small passenger service licence	<ul style="list-style-type: none"> <li>• Discussion with key informants</li> <li>• Discussion with Waka Kotahi project lead</li> <li>• System interviews (regulators, data experts, gig drivers)</li> <li>• Online review of Waka Kotahi website</li> <li>• Review of application forms</li> <li>• Review of platform requirements</li> </ul>
Logmate	<ul style="list-style-type: none"> <li>• System interviews (regulators, data experts, gig worker, union/association representatives)</li> <li>• Online review of Logmate website</li> <li>• Review of platform requirements</li> </ul>

Data type	Sources of information
Platform-collected app data	<ul style="list-style-type: none"> <li>• System interviews (platform representative)</li> <li>• Ethnographic observation</li> <li>• Additional app observation</li> </ul>
Electronic transaction data	<ul style="list-style-type: none"> <li>• Online review of consumer-spending consultants' websites</li> <li>• Literature review</li> <li>• Review of platforms' economic impact reports</li> </ul>
Other data sources	<ul style="list-style-type: none"> <li>• System interviews (regulators, union/association representatives, gig drivers)</li> <li>• Online review of additional information (eg, parking fines, platform sign-up requirements)</li> </ul>

### 2.8.3 Output

The results of the review are presented in section 4.5. As far as possible, the following is described for each data source:

- a description of the data, including utility for gig economy and road safety risk estimates
- why, how, and by whom it is collected
- how the data is currently utilised, and its availability/accessibility for use to describe gig work
- strengths and weaknesses, including gaps, with respect to describing gig work and road safety
- identified potential for improving the quality and utility of the data source, and recommendations to further develop usefulness of the data source.

## 2.9 Online survey of gig drivers

### 2.9.1 Purpose

The online survey of gig drivers was undertaken to provide further understanding of gig work and road safety risks and outcomes, specifically at the 'Environment', 'Worker', and 'Industry, Platform, Management' levels of the socio-technical system. The survey enabled access to a wider group of drivers, beyond those taking part in interviews, and provided both quantitative and qualitative data.

### 2.9.2 Method

#### 2.9.2.1 Design/Scope

The survey was designed to examine a range of dimensions of gig driving work in New Zealand and road safety, including:

- type of gig work undertaken
- type of vehicle used to undertake driving gig work
- reasons for undertaking gig work
- preparation for undertaking driving gig work
- experiences as a gig driver
- road safety risk factors and outcomes
- personal health and well-being
- driver demographics (gender, age, location, education).

The survey questions (Appendix F) were initially drafted by the research team and then internally peer reviewed. The draft was then reviewed by Waka Kotahi members of the research steering group and later reviewed by all other members. Following further refinement, the final draft was pre-tested with four gig drivers who had previously participated in a system interview.

### 2.9.2.2 Participant recruitment

The survey respondents were recruited through a variety of channels, detailed in Table 2.6.

**Table 2.6 Survey recruitment channels and methods**

Channel	Method
<ul style="list-style-type: none"> <li>Eleven private Facebook groups totalling over 20,000 members</li> <li>New Zealand subreddits r/dunedin, r/Tauranga, and r/thetron (Hamilton)</li> </ul>	An invite to the survey explaining the nature and purpose of the research was posted alongside the survey link.
<ul style="list-style-type: none"> <li>Auckland Council’s People’s Panel</li> <li>Dynata’s research panels</li> </ul>	Panel administrators were contacted and asked to share a description of the research as well as the survey link with their panel members.
<ul style="list-style-type: none"> <li>FIRST Union’s gig worker network</li> </ul>	Our FIRST Union contact emailed a description of the research and the survey link to their relevant contacts.
<ul style="list-style-type: none"> <li>Snowball sampling</li> </ul>	Interviewees and ethnography participants were asked to share the survey link with any gig drivers they knew.

In recognition of their time and contribution to the research, all gig drivers who completed the survey to required standards (see later detail) were invited to enter a draw to win one of ten \$75 Motor Trade Association (MTA) vouchers.

### 2.9.2.3 Respondent eligibility

A number of initial screener questions were used at the front of the survey to determine eligibility to complete the survey (Table 2.7). As shown in the table, eligible gig drivers were 18 years of age or older who had undertaken any form of platform-mediated gig work in the last 12 months that required the use of a vehicle. Respondents not meeting these criteria were thanked for their time and were exited from the survey.

**Table 2.7 Eligibility of survey respondents**

Screener question	Ineligible answers
Have you done gig work requiring the use of a vehicle in the last 12 months?	‘No’
What type of vehicle have you used for the gig work that you have mostly done in the last 12 months?	‘I have not used a vehicle to carry out gig work in the last 12 months’
What type of gig work have you done in the last 12 months?	Non-driving or non-platform-facilitated gig work (eg, ‘gardener’)
How old are you?	< 18 years

A number of respondents completing the survey were also excluded from the final survey count after failing logic<sup>7</sup> and other quality checks applied to their answers, including the validity of open-ended responses.<sup>8</sup> The checks were systematically applied to all completed surveys, with cases reviewed by other members of the research team when necessary.

Table 2.8 shows that a significant proportion of people who first entered the survey either (a) were ineligible to complete the survey or (b) had not completed the survey to the required standards. The first line of the table shows the number of people initially entering the survey from each of the main recruitment channels. The second line shows the number from each channel that passed the initial screener questions (ie, were eligible respondents) and who completed the survey. The third line shows the final number of completed surveys that also satisfied the logic and quality checks conducted ( $n = 197$ ). The very low incidence rate achieved (4.23%) was a significant factor contributing to the low number of completed surveys achieved and the extended period of data collection required to achieve the final number.

**Table 2.8 Survey commencement, completion, and inclusion numbers**

Progression through the survey	Primary link	Dynata Panel link	Auckland Council Panel link	Total
Entered survey	123	3,078	1,448	<b>4,649</b>
Met eligibility criteria and completed the survey	107	184	40	<b>331</b>
Completed the survey and passed the logic and quality check process	105	59 <sup>a</sup>	33	<b>197</b>

<sup>a</sup> The higher proportion of exclusions from the Dynata Panel are due to survey satisficing and initial infiltration of internet bots.

### 2.9.2.4 Analysis

Survey results were aggregated and imported from SurveyMonkey into Excel. Multi-choice and other fixed-answer questions were analysed quantitatively. The survey results are not intended to be representative of the entire population of gig drivers. Furthermore, where additional analysis has been undertaken to compare results by the main type of gig work conducted by respondents (eg, rideshare vs. food delivery vs. courier/package/parcel delivery), these results were not tested for statistical significance and should be considered indicative only. Thematic analysis was undertaken on two open-ended questions, with individual responses grouped into either one or multiple themes when appropriate.

### 2.9.3 Output

The survey results are presented in section 4.6 in a series of graphs and tables accompanied by a discussion of the findings. References to additional analyses are made and these are presented in Appendix H. The key findings were incorporated into and informed the development of the socio-technical maps and overall findings and conclusions.

<sup>7</sup> For example, checking whether the platform worked for (eg, Uber Eats) matched the type of gig work (eg, food delivery) claimed to have been undertaken in the last 12 months.

<sup>8</sup> Invalid open-ended responses included answers completely unrelated to the question, and nonsense strings of characters.



## 2.10 Socio-technical mapping

### 2.10.1 Purpose

As previously introduced, this research was guided by a socio-technical approach and the premise that harm results from multiple interacting factors throughout the system. A primary goal was to understand how gig work is designed, managed, and undertaken, and how societal, government, and operational and environmental context contributes to harm. Rather than being used to pinpoint individual error or assign blame, socio-technical mapping methods are used to identify where components throughout the socio-technical system are underperforming. System-wide capabilities can then be strengthened to mitigate road safety risk and the potential for adverse events. The discussion and recommendations for cross-sector action, presented in chapters 6 and 7, are therefore informed by the maps.

An Actor Map (Svedung & Rasmussen, 2002) and an AcciMap (Rasmussen, 1997; Svedung & Rasmussen, 2002) have been used in this project to visually display the socio-technical system. An **Actor Map** (Svedung & Rasmussen, 2002) shows the person (eg, individuals, organisations) and non-person (eg, technologies) actors present in a system and helps to identify actor activity failures. The level of the system within which each actor resides illustrates the theoretical level of influence and impact of each actor.

An **AcciMap** (Rasmussen, 1997; Svedung & Rasmussen, 2002) involves the construction of a multi-layered diagram in which the various causes of an accident are arranged according to their causal remoteness from the outcome. These maps are useful for establishing how factors from across the socio-technical system contribute to and interact to produce an adverse outcome (Branford et al., 2009). The structure is based on Rasmussen's RMF and shows the system levels from top to bottom. While AcciMaps can be developed for a specific accident or incident (outcome), for the purpose of this research the AcciMap was developed to describe the overall system outcome; that is, road safety risk for gig drivers and other road users. A similar approach has been utilised in previous research (Salmon et al., 2022).

### 2.10.2 Method

The methods used to thematically code the qualitative data are outlined in section 2.4.3.1. This process resulted in a set of themes that represent the data relevant to the research questions. The qualitative data themes were combined with the other data sources (survey data, non-traditional data) and arranged according to system levels on a Miro online whiteboard. During the coding and arrangement of the data, themes that were supported by multiple datasets (triangulation) were identified and the relationships between the factors were noted. This formed the basis of the socio-technical maps, which were built and refined based on the methods of Branford et al. (2009) and Stanton et al. (2013) described below.

1. **Design the map framework:** A blank Miro online whiteboard was used to draft and refine system level labels. Rasmussen's RMF levels were adapted (as discussed in section 1.4) so that the eventual maps would suitably capture the data collected in this project. The final labels used can be seen in Figure 5.1 and Figure 5.2 down the left-hand side of the maps.
2. **Construct an Actor Map:** The researchers then identified all person and non-person actors from the data and placed them in the appropriate system levels. The Actor Map (found in chapter 5, Figure 5.1) illustrates the theoretical level of influence each actor has within the system and helped to identify where failures and errors were occurring throughout the system. The researchers could then begin to build the AcciMap (found in chapter 5, Figure 5.2).
3. **Identify the outcome(s):** The adverse road safety outcomes identified in the summarised data were placed at the lowest level of the blank AcciMap.

4. **Identify actor activity failures:** Using the Actor Map and summarised data, the errors and failures were identified and listed separately. The level at which the error or failure occurred was also identified.
5. **Identify causal factors:** Each error or failure was taken in turn and the researchers identified causal factors for each and related them to failures across other AcciMap levels. Causal factors are defined as factors that caused (or failed to prevent) the adverse road safety outcomes. The data was further reviewed to ensure all relevant failures or errors were included and any gaps explained.
6. **Check the causal logic:** The research team discussed and refined each factor and causal link in the AcciMap. This process occurred several times until the research team were satisfied with the wording of the factors, the logic of the causal links, and the completeness of the map.
7. **Refine the map:** The AcciMap was refined one final time to be more accessible and somewhat simplified for the purpose of having utility and value as a communication tool.

### 2.10.3 Output

The Actor Map and the AcciMap are presented and described in chapter 5.

## 3 Literature review

### 3.1 Summary of key findings

- Gig work is a rapidly changing form of work that is becoming exponentially more popular globally. This growth has been spurred by the COVID-19 pandemic and relatively easy access to this type of work.
- Gig work is different from typical independent contractor arrangements and must be considered as such. Part of this difference is the high level of control that gig platforms have over their workers.
- The current regulatory framework in New Zealand does not adequately address the emergence of gig platforms and the changing ways of working.
- International research has shown that gig drivers are at risk of adverse road safety outcomes. Of note are the deaths of five food delivery drivers over three months in Sydney, Australia, in 2020.
- Many features of gig work and demographics of gig worker populations can be linked to heightened road safety risk.
- A range of data sources are relied upon to make inferences about the size of New Zealand's gig economy, and the extent of the road safety risks and outcomes for drivers; however, more robust data regarding gig work is needed.
- In response to the growth of the gig economy, other jurisdictions internationally have made regulatory changes and implemented other measures such as commissioning investigations and developing codes of conduct. These various approaches can inform any future responses in New Zealand.
- Researching and understanding gig work and its associations with road safety risk are difficult given the recent emergence of the sector and its nature as a grey area.

### 3.2 Defining gig work and the gig economy

'Gig work' or 'on-demand work' refers to work undertaken on an 'as and when needed' basis by contractors responding to requests for work received in real time via a digital platform (Riggs et al., 2019). These web-based platforms or apps act as an intermediary to arrange work and deploy 'gig workers'. Gig workers are typically labelled by gig platforms as self-employed contractors rather than employees. Many gig workers have multiple roles/forms of employment (including non-platform-based and non-driving work), and thus this population is heterogenous. Gig work includes an array of work types, with driving work (rideshare/passenger service, food and grocery delivery, and parcel delivery) currently the most common. Other types of gig work include online-only jobs (eg, performing tasks such as translation, design, copywriting) and caregiving work (eg, babysitting, dog-walking, support work). The 'gig economy' refers to the corner of the labour market occupied by gig workers and the associated platforms.

Between 2010 and 2020 the number of gig work platforms grew from 142 to over 770 globally (International Labour Office, 2021). In Australia, the gig economy grew 900% from 2015 to 2019, increasing to capture more than \$6 billion in consumer spend (Senate Select Committee on Job Security, 2021). It has also continued to expand since the beginning of the COVID-19 pandemic, growing another 40% between February and October 2020. In Europe, the digital platform economy was estimated to have grown 500% between 2016 and 2021 (de Groen et al., 2021). It is estimated that 28 million people were conducting gig

work across Europe in 2021, with this number expected to reach 43 million by 2025 (Barcevičius et al., 2021).

In 2013, New Zealand-owned Zoomy began operating the country's first rideshare service, and in 2014 the international gig platform company Uber began operating in New Zealand. Other platforms followed, including Ola in 2018 and DiDi in 2020. Food delivery platforms emerged in New Zealand a little earlier, with Menulog beginning operations in 2012, followed by New Zealand-owned DeliverEasy in 2016. The number of gig platforms operating in New Zealand now numbers over a dozen.<sup>9</sup>

### 3.2.1 Unique characteristics of gig work

Gig work is uniquely characterised by the role of the intermediary platform, used to recruit workers as service providers and to connect them to customers. Platform companies have commonly defined themselves as providers of this facilitation software, rather than as employers of their workers. Various platforms have created their own terminology to keep this distinction clear (eg, Uber's 'driver partners' and DeliverEasy's 'partner drivers').

Unlike other independent contractors who operate or delegate all aspects of their business, gig workers' jobs or 'gigs' are facilitated and managed by platforms. This unique arrangement removes the responsibility of establishing and maintaining one's own clientele base and is a reason why gig work is considered by many to be a particularly accessible form of self-employment (Healy et al., 2017). Conversely, the restriction by gig platforms on gig workers to build their own client base can be seen as a barrier to true self-employment, as gig workers are fully reliant on individual platforms for facilitating the work available to them. Thus, gig workers have limited control over their working arrangements, including fee structure, compared to typical independent contractors.

As a type of service industry, the structure and management of gig work is understandably customer centric. However, this can result in passenger needs and rights being prioritised over drivers. For example, it has been noted that platforms may not validate customers' complaints before terminating drivers (Rawling & Munton, 2021). High ride acceptance rates and ratings and low cancellation rates may also dictate what work is made available to a driver (Convery et al., 2021).

Gig work is a relatively accessible form of work and therefore can be attractive to people who may face barriers to other types of employment; for example, due to their English language ability, or visa conditions that limit the number of working hours in traditional employment. However, previous surveys of gig workers have found that many would prefer other employment if available to them; for example, this was reported by over half of the respondents to a recent FIRST Union survey in New Zealand (Rosentreter & Miller, 2021).

## 3.3 Current regulatory framework in New Zealand

Due to its non-standard nature, various aspects of gig work (such as taxation and employment status) have been regulated internationally and have started to be regulated in New Zealand. This review focuses on non-road safety related aspects of gig work regulation as there is relatively less regulation concerning road safety (eg, vehicle safety/regulation, enforcement, and driver training). While work-related road safety is a core focus area of Road to Zero (Ministry of Transport, 2019), specific policy discussing gig work has not yet been published. The connections between non-standard work status and health and safety outcomes (detailed in

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<sup>9</sup> Including Uber, Ola, DiDi, Zoomy, Talixo, Blacklane, Menulog, DeliverEasy, Grubhub, HungryPanda, DoorDash, UberEats.

section 3.4.2.4) help to explain why many jurisdictions internationally have focused on employment legislation to regulate and control gig work.

### 3.3.1 Current regulation of gig work in New Zealand

#### 3.3.1.1 Employment status

Gig drivers are currently classified as independent contractors, rather than employees, under current employment legislation in New Zealand (however, an Employment Court case in 2022 successfully challenged this classification – see section 3.3.1.3). Under current legislation, independent contractors are not afforded the same minimum employment rights as employees, such as the minimum wage, guaranteed hours, leave entitlements, the right to unionisation, the right to challenge unfair dismissal, KiwiSaver contributions, and a written employment agreement (Employment New Zealand, n.d.).<sup>10</sup>

The employment legislation, as it currently stands, requires a case-by-case judgment for any grievances brought to court by gig workers against gig platforms. The court or appropriate authority is required to ‘determine the real nature of the relationship between them’ (section 6(2) of the Employment Relations Act 2000). Furthermore, in determining the manner of the relationship, the court or authority ‘is not to treat as a determining matter any statement by the persons that describes the nature of their relationship’ (section 6(3)(b) of the Employment Relations Act).

#### 3.3.1.2 Occupational health and safety obligations

In recognition of the broad range of work types and employment relations in New Zealand, the Health and Safety at Work Act 2015 (HSWA) establishes a broad scope of responsibility for occupational health and safety (OHS) in the workplace. The HSWA places the responsibility for OHS on a person conducting a business or undertaking (PCBU), rather than on an ‘employer’.

**Section 17(1)** states:

*...a person conducting a business or undertaking or PCBU—*

*(a) means a person conducting a business or undertaking—*

- (i) whether the person conducts a business or undertaking alone or with others;*
- and*
- (ii) whether or not the business or undertaking is conducted for profit or gain...*

**Section 36(1)** states:

*A PCBU must ensure, so far as is reasonably practicable, the health and safety of—*

- (i) workers who work for the PCBU, while the workers are at work in the business or undertaking; and*
- (ii) workers whose activities in carrying out work are influenced or directed by the PCBU, while the workers are carrying out the work.*

**Section 36(2)** states:

*A PCBU must ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking.*

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<sup>10</sup> Note that contracting can also provide workers with benefits, including flexibility in type of work and hours worked, and potentially higher earning potential (MBIE, n.d.).

Following their classification as independent contractors, gig workers are classified under the HSWA as PCBUs, as are gig platforms. While the PCBU classification ensures that OHS obligations are established for operations outside of a typical employer–employee relationship, the classification of gig platforms and gig workers both as PCBUs introduces some uncertainty regarding OHS responsibilities for gig drivers and, more broadly, the health and safety of passengers and other road users.

**Section 34(1)** states:

*If more than 1 PCBU has a duty in relation to the same matter imposed by or under this Act, each PCBU with the duty must, so far as is reasonably practicable, consult, co-operate with, and co-ordinate activities with all other PCBUs who have a duty in relation to the same matter.*

This section broadly establishes that PCBUs (eg, a gig worker and gig platform) must cooperate with each other regarding health and safety; however, the research suggests that many gig platforms are resistant to accepting the full extent of PCBUs' responsibilities.

### **3.3.1.3 Legal challenge to the status of gig workers as independent contractors**

Although technically classified as contractors, it has long been argued that in reality gig workers have more of an employer–employee arrangement with gig platforms (Aloisi, 2016). Internationally there have been recent examples of individuals and groups taking gig platforms to court on employment matters, with some escalated to the Supreme Court (Neaverson, 2022). In New Zealand, E tū and FIRST Union took Uber to the Employment Court on behalf of four drivers, claiming that the drivers were not self-employed contractors, but rather were employees and should be entitled due rights and protections (E tū, 2022). In October 2022, Chief Judge Christina Inglis ruled in favour of the drivers, a decision that is expected to generate further legal action and will have implications for New Zealand gig drivers in general. The decision overruled an earlier judgment by Judge Joanna Holden in December 2020 (Employment Court of New Zealand, 2020), which ruled that a driver was not an employee because the service agreement stated they were not one (seemingly contrary to the Employment Relations Act) and because they were able to determine their income (eg, by charging less than the quoted fare or by the driver reducing their related expenses such as their phone plan and car insurance).

FIRST Union (representing transport workers in New Zealand), has called for the government to develop 'fit-for-purpose' employment regulation to afford the same protections to gig workers as typical employees, such as sick, holiday, and annual leave; minimum wage; KiwiSaver contributions; and the right to unionisation and collective bargaining (FIRST Union, 2021).

Further discussion of various regulatory actions regarding employment status in overseas jurisdictions can be found in Table 3.1 in section 3.6.2.1.

### **3.3.1.4 Taxation**

In recognition of the growing gig economy within New Zealand, the government included changes to gig platform regulation in the recently announced Taxation (Annual Rates for 2022–23, Platform Economy, and Remedial Matters) Bill (No2). The bill proposes wide-ranging changes, including the introduction of GST to the services provided through gig platforms.

## 3.4 Gig drivers and road safety internationally

### 3.4.1 Road safety outcomes

There is increasing attention being paid nationally and internationally to the road safety risks experienced by gig drivers and other road users, due to the unique nature of gig work, the wider work system within which gig work occurs, and current knowledge gaps (Christie & Ward, 2019; Crain et al., 2020; Rosentreter & Miller, 2021). This section reviews the current New Zealand and international evidence on adverse road safety outcomes related to gig work and on road safety risk factors.

Recent literature has identified adverse road safety outcomes for gig drivers in other countries. Australia saw an exponential increase in gig driver crashes between 2017 to 2019 (Convery et al., 2021). Between 2019 and 2020 the New South Wales (NSW) Centre for Road Safety identified five fatal food delivery rider collisions. All these casualties were bicycle or motorcycle riders, making up 1.19% of all pedal cycle and motorcycle rider casualties (Senate Select Committee on Job Security, 2021). The five delivery drivers were killed while working in Sydney between September and November 2020, an average of one death every 11 days during this period (Zhou, 2020).

A 2020 Transport Workers' Union survey of Australian food delivery drivers found that nearly 47% of respondents had been injured at work or knew someone who had been injured at work (Rawling & Munton, 2021). A quarter of the respondents had experienced a collision while working, and one in eight had been injured in a collision, suffering injuries such as concussions, knee injuries, and fractures/dislocations.

Table 3.1 shows the number of incidents from Uber and Menulog. Deliveroo reported that 25% of incidents involving their drivers resulted in injuries requiring medical attention.

**Table 3.1 Incidents reported to the Australian Senate Select Committee on Job Security (2021)**

Platform	Time period	Incident	Injury	Serious injury
Uber	January – October 2020	74	–	–
Menulog	January – May 2020	647	85	4

Research in the UK surveyed and interviewed gig drivers. Many of those interviewed had experienced near misses (with one reporting daily near misses) and collisions. One worker described having experienced three collisions and having become accustomed to this risk. Forty-two percent of survey respondents reported vehicle damage as a result of a collision. When asked about injuries, 8% reported having suffered an injury, with riders of two-wheeled vehicles being most likely to report an injury (Christie & Ward, 2018).

Uber has published two Safety Reports regarding incidents and fatalities in the US in recent years. The first report stated that Uber vehicles were involved in 97 fatal crashes between 2017 and 2018, leading to 107 deaths (Uber, 2019). Of the deaths, 21% were drivers, 21% were passengers, and 58% were other road users. The second report stated that 59 and 42 people were killed in 2019 and 2020, respectively, in crashes involving Uber vehicles (Uber, 2022). Of these, 18% were drivers, 19% were passengers, and the remainder were other road users. Lyft also published a report sharing the number of fatal accidents involving their drivers in the US. There were 22 fatalities in 2017, 34 in 2018, and 49 in 2019 (Lyft, 2021).

## 3.4.2 Road safety risk factors

### 3.4.2.1 Fatigue

Fatigue is a significant risk factor for DSI crashes and other adverse road safety outcomes (Moradi et al., 2019). Previous research has identified fatigue as a particular risk factor for gig drivers due to long shifts and working during the night hours. A UK study conducted interviews and surveyed a number of drivers (Christie & Ward, 2018). When asked about fatigue, one worker said they often felt fatigued, both physically and mentally, and acknowledged this impaired their driving. They reported clipping kerbs and missing signage (even on familiar roads) and driving well under the speed limit on the motorway, as they doubted their ability to drive safely at high speed. Many drivers reported working long shifts, with some knowing of other drivers working upwards of 15–19 hours without a break. The survey results found that 16% of the 231 respondents sometimes struggled to stay awake while driving. Interviews revealed that many drivers were incentivised to work during night hours by the platforms' surge pricing – that is, they would be paid more for rides late at night (see further discussion in section 3.4.2.3).

A survey of Australian food delivery riders found that one in four frequently worked over 40 hours per week; some reported working up to 80 hours (Victorian Government, 2020). Researchers aggregated the findings from a number of gig work surveys and found that passenger transport/rideshare drivers worked a weekly average of 65 hours, and food delivery drivers an average of 59 hours (International Labour Office, 2021). Research by the Point to Point Transport Commission in Australia analysed drivers' app use over a two-week period. The commission found that 37% of drivers had logged at least one instance of 12 or more hours of continuous driving time during the sample period. Some drivers had even reached 17 hours of continuous driving time.

### 3.4.2.2 Pressure from gig platforms

Research has found that driver behaviour and road safety are directly affected by pressure from gig platforms. Delivery riders in Australia reported feeling like they risked removal from the platform if they were unavailable to work, worked less hours than normal, or declined jobs (Victorian Government, 2020). These drivers reported limited understanding of how algorithms worked to determine whether a driver would be removed from a platform. It has been suggested this lack of transparency may be intentional, with uncertainty about acceptable performance and the threat of removal used to drive performance (Convery et al., 2021). Other studies have noted that poor customer reviews or ratings can result in termination and with the driver unable to challenge the decision (Rawling & Munton, 2021). Research in Australia found that gig drivers were less likely to report adverse events (including injuries and near misses) for fear of having their hours reduced or their access to work impeded (Senate Select Committee on Job Security, 2021).

Research has shown that this pressure to work frequently and to high levels of performance can pressure gig drivers to work quickly. A submission to the Australian Senate Select Committee on Job Security (2021) noted that unreasonable deadlines set by platform apps contributed to hazardous driving behaviours and routine risk taking. Only 5% of food delivery drivers surveyed in one study reported 'never' rushing to deliver orders (Convery et al., 2021). Platforms have said that their delivery times are only an estimation; however, drivers in Australia reported that they consider them to be an expectation (Convery et al., 2021). These drivers believed that failing to meet delivery times could result in negative outcomes such as being offered fewer jobs in future, or even being removed from the platform. Gig drivers have also reported that app interfaces can be intrusive and distract their attention from the road. In one study, 40% of surveyed drivers reported that the platform app had distracted them at some point (Christie & Ward, 2018).



### 3.4.2.3 Financial stress

Research has found that stress can diminish drivers' hazard perceptions (Dorn & Brown, 2003), reduce their attendance to peripheral stimuli (Janelle & Singer 1999), disrupt performance, and impair road safety (Dorn & Matthews, 1995).

Research on gig work has found that stress, particularly financial, is common amongst gig drivers. In the recent FIRST Union survey of 95 New Zealand gig drivers, more than a third of respondents reported that their work was difficult or very difficult financially (Rosentreter & Miller, 2021). Over half estimated their average hourly income to be less than minimum wage; similar proportions reported not getting enough work on a regular basis and being dissatisfied or very dissatisfied with their income. More than a third anticipated their financial situation would worsen in the next year.

A survey in Australia found that rideshare drivers earned an average of just over A\$12 per hour after costs (minimum wage at the time was A\$19.84 per hour) (Rideshare Driver Network & Transport Workers' Union of Australia, 2020). The COVID-19 pandemic has also been particularly hard on gig workers financially. In one overseas survey, 48% of respondents reporting having deferred on a bill, 29% sought a loan from family or friends, and 13% had taken out a bank loan (International Labour Office, 2021). Some drivers reported their earnings had decreased by up to 50% over a few years; others reported it had become more difficult to meet criteria to receive bonuses and incentives. In the same survey, 79% of passenger transport/rideshare drivers and 74% of delivery drivers reported being stressed by their work and working conditions.

A survey of passenger transport/rideshare and food delivery drivers in the US found that 29% were earning below the applicable state minimum wage (Zipperer et al., 2022). In the month prior to completing the survey, 76% of the workers surveyed had found it difficult to pay their bills, 19% reported going hungry due to being unable to afford food, and 30% reported accessing a food stamps programme.

An exploratory analysis of Uber drivers in London found that the average gross weekly income of an Uber driver was £460, considerably less than the London average of £596 (Berger et al., 2019). Almost three-quarters of the surveyed drivers earned less than the London average.

Financial stress may be exacerbated for gig drivers as time spent waiting for jobs and enroute to jobs is unpaid. Research has shown a relationship between financial stress and increased likelihood to accept surge pricing incentives and drive during poor weather or late at night, both road safety risk factors (Christie & Ward, 2018).

### 3.4.2.4 Non-standard work

The organisation of work in previous decades has undergone rapid and profound change (Johnstone, 2016). A key feature of this has been the emergence of various forms of non-standard work, in large part driven by free-market discourse (Johnstone, 2016; Quinlan, 2013). Work forms such as contracting, sub-contracting, on-call or casual work allow organisations to externalise risk and increasingly structure work that is offered to workers on an on-demand or as-needed basis (Johnstone, 2016; Rawling & Kaine, 2012; Underhill et al., 2011). The non-standard nature of the work is what attracts many people to gig work, as evidenced by platforms such as Uber emphasising flexibility as a core part of their appeal to potential new drivers.<sup>11</sup> However, the nature of non-standard work also has implications for health and safety (Quinlan, 2013).

Researchers have identified elements of non-standard work that increase the health and safety risk to workers. In comparison to traditional employees, non-standard workers lack union representation; have limited organisational support, low supervision, and little training; and can experience high job turnover

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<sup>11</sup> See <https://www.uber.com/us/en/u/flexibility/>

(James et al., 2007; Mayhew & Quinlan, 2006). They can also lack access to health and safety information (Barrett & Sargeant, 2011; Underhill & Quinlan, 2011). Such workers receive typically lower and output-based pay (Walters & James, 2011).

Output-based payment schedules (including piecemeal work) have been linked to adverse health and safety outcomes. These pay structures can make it difficult to prioritise equipment maintenance (Johnstone, 2016) and often encourage quicker completion times and work intensification while working under the threat of a loss of tenure. This can result in longer working hours, working while sick or impaired, or corner-cutting on safety (LaMontagne et al., 2012; Quinlan, 2013; Reiman et al., 2015).

The risk of adverse health and safety outcomes is intensified by low visibility and complexities in the chain of responsibility (Johnstone, 2016). Maintaining high levels of health and safety for workers typically requires someone to assess, identify, and manage exposure to risk. For this to happen, is it necessary for this overseer to have visibility over the work. Problematically, workers in these forms of work (particularly gig workers) are often directly or indirectly discouraged from speaking out, particularly about unfavourable conditions (Quinlan & Bohle, 2004). It has also been reported that when insecure workers do report safety concerns, they are less likely to be treated seriously (Senate Select Committee on Job Security, 2021).

Some forms of non-standard work have adverse effects on health and safety due to the heightened potential for psychological distress. Working under pressure or the threat of job loss (as discussed above), at pace or in direct competition with others can generate work–life imbalance and non-compliance (Underhill & Quinlan, 2011). Further, the uncertain nature of the work can lead to high levels of anxiety and stress (Coffey et al., 2009), impairing a worker's ability to remain safe.

These connections between non-standard work status and health and safety outcomes help to explain why many jurisdictions internationally have focused on employment legislation to regulate and control gig work (detailed in section 3.6). Theoretically, this connection justifies changing employment arrangements to generate positive downstream effects on gig drivers' working conditions and ultimately road safety outcomes.

#### **3.4.2.5 Responsibility for occupational health and safety**

Due to the classification of gig workers and gig platforms alike as PCBUs, it is unclear where the duty of care lies regarding the OHS responsibilities associated with driving work. In practice, many gig platforms have distanced themselves from drivers in an effort to maintain the drivers' status as contractors, not employees (discussed in section 3.2.1).

Previous research has established that many workers have insufficient access to supports that would help them to stay safe while driving, including support from gig platforms (Christie & Ward, 2018). It has been noted that platforms are hesitant to take on any responsibilities that could blur the line between contractor and employee or that may have ramifications for the way they structure and delegate their work processes (Christie & Ward, 2018). It has been reported in Australia that gaps in drivers' OHS knowledge and practices have been exacerbated by the influx of new drivers into the market since the COVID-19 pandemic (Rawling & Munton, 2021) and rising unemployment (Convery et al., 2021).

When asked about the requirements of platforms before they began working, UK gig drivers reported needing to evidence appropriate licensing and registration but not having to prove the roadworthiness of their vehicles, knowledge of road rules, or driving skills (Christie & Ward, 2018). Drivers in this research felt that OHS was of token concern only to platforms. In fact, 63% of workers surveyed reported they were not provided with safety training on managing road risks upon starting the job, and 45% did not believe their company cared about their safety. Courier platform managers were also interviewed in this study and asked about the metrics monitored, including workers' hours, mileage, speed, number of deliveries, and any

notable events (eg, collisions). The platform managers were clear in their response; they only monitor the life of a parcel, not the well-being of their drivers (Christie & Ward, 2018).

A common theme from interviews with food delivery drivers in Australia was that they wished they were provided with comprehensive training, including defensive driving and riding, when they began working for the platform (Convery et al., 2021). Courier drivers interviewed in the UK were asked about what they would do to improve the platforms they worked for. Suggested road safety related improvements included a guide on keeping themselves safe, the supply of winter tyres, an established support line to report any problems, and in-app speed monitoring (with an incentive/penalty structure). Suggested improvements for pedal cyclist couriers included the provision of safety equipment (eg, lights, reflective clothing), monitoring of helmet use, assessing bike roadworthiness, a basic bicycle skills course and test prior to beginning work, and follow-up from the platform after an accident. Note that in relation to the final suggestion, the Transport Workers' Union in Australia found that many of the food delivery driver road deaths in Australia between 2019 and 2020 had not been reported to the relevant regulatory authorities by the platforms the drivers had been working for (Senate Select Committee on Job Security, 2021).

Because gig workers are not employees and are instead PCBUs (just as gig platforms are also PCBUs), they share responsibility with platforms for their own safety at work. Despite this, many gig drivers do not feel adequately protected from road safety risks while working. Adverse road safety outcomes for these drivers could manifest from lack of knowledge and limited access to training and educational supports, making it inappropriate to manage their own risks while at work (Horton et al., 2018).

#### **3.4.2.6 Worker demographics**

Gig work and other forms of non-standard work can be stressful to workers, with implications for health and well-being. Workers with limited control over their working arrangements may be more vulnerable to these effects and in turn at greater risk for adverse road safety outcomes.

Gig work is relatively accessible (Healy et al., 2017) and can therefore be attractive to workers who may face barriers to other types of employment (eg, students, migrants, people with disabilities). A survey of 14,000 Australians found that people with disabilities were over-represented in the gig workforce (Victorian Government, 2020). This same survey found that 7.1% of respondents were currently doing gig work and that these workers were predominantly young men from diverse backgrounds. Temporary residents were also three times more likely than Australian citizens to work in the gig economy, and permanent residents 1.7 times more likely. Another survey of more than 240 delivery riders found that 1 in 10 were Australian citizens, with most (80%) holding temporary visas and 40% preferring a language other than English (Victorian Government, 2020). Nineteen percent of drivers in a US survey spoke English as a second language (Zipperer et al., 2022). An analysis of a pool of Uber drivers in London showed they were overwhelmingly male immigrants, predominantly from Black, Bangladeshi, and Pakistani ethnic groups (Berger et al., 2019).

Workers who are not residents or citizens can be particularly vulnerable to exploitation as they may experience limited employment opportunities. In English-speaking countries, workers without English as their first language may not fully understand protections or supports available and may be reluctant to report road safety incidents; for example, due to a fear of jeopardising their immigration status or perceived risk of being penalised by the platform (Senate Select Committee on Job Security, 2021). All five food delivery drivers killed in Sydney in 2020 were foreign nationals, and at least three had moved to Australia to earn money to send back to their families.

While gig work can be accessible, gig workers can find it difficult to secure non-gig work, even if they wish to do so. A 2018 US survey found that 45% of gig workers felt stuck in their current employment, compared to 34% of non-gig workers (Edison Research & Marketplace, 2018). FIRST Union's survey of New Zealand gig

drivers found similarly; over half of their respondents reported a preference for permanent part-time or full-time work, if available and accessible (Rosentreter & Miller, 2021).

#### **3.4.2.7 Unsafe behaviours**

Previous research has documented a range of risky or unsafe driving behaviours, mostly self-reported by gig drivers. In summary, these findings help to build a picture of road safety risks associated with gig work, but not of the contributing factors across the socio-technical system. Behaviours identified include:

- using mobile phones while riding or driving (Convery et al., 2021; Rawling & Munton, 2021)
- working while fatigued (Convery et al., 2021)
- wearing dark clothing at night (Convery et al., 2021)
- riding at night without lights (Rawling & Munton, 2021)
- cycling on footpaths/other pedestrian-only areas (Convery et al., 2021; Rawling & Munton, 2021)
- weaving through traffic and pedestrians (Rawling & Munton, 2021)
- speeding or rushing (Convery et al., 2021), including 47% of drivers in one survey (Christie & Ward, 2019)
- ignoring traffic signals (Rawling & Munton, 2021), including 30% of drivers running red lights in one survey (Christie & Ward, 2019)
- overloading cars with packages and impairing visibility (Christie & Ward, 2019; Senate Select Committee on Job Security, 2021)
- large food bags and backpacks on bicycles and motorcycles impairing visibility (Christie & Ward, 2019).

Note that a recent Australian study (Oviedo-Trespalacios et al., 2022) compared the observable riding behaviours of food delivery and private bicycle riders to examine any differences in the prevalence and patterns of risky riding by each rider type. The study found that food delivery gig riders were no more likely to perform risky behaviours than private bicycle riders, and that other factors – including gig company, bicycle type, gender, time of day, and infrastructure – appeared to be more important determinants of behaviour. The findings pointing to the influence of wider determinants reinforce the importance of a socio-technical approach to examining and understanding system impacts on gig rider and driver behaviour.

#### **3.4.2.8 Safety culture**

Studies have shown that poor safety culture is an indicator of increased rates of accident and injury in the workplace (Huang et al., 2013; Huang, et al., 2017). While this research has focused on organisations and not necessarily gig work, it shows that low rates of accident and injury are associated with clear driving standards, comprehensive training, and clear, direct reporting policy, while higher rates are associated with no clear training, ambiguous rules, and ineffective lines of communication (Cole, 2005). Such factors indicate poor or weak safety culture and have also been noted as characteristics of how gig work is often managed (Christie & Ward, 2018).

## **3.5 Gig work and road safety risk in New Zealand**

This section reviews the evidence on the nature and extent of road safety risk for gig drivers in New Zealand. We begin by discussing current challenges in measuring the gig economy and then consider the current evidence in regard to road safety risk.

### 3.5.1 Measuring the size of the gig economy

The structure of gig work makes it difficult to measure the size and nature of the gig economy in New Zealand. For example, gig work represents a non-standard form of employment where, to date, workers have typically been labelled by platforms as self-employed contractors. This means they are not paid a salary in the traditional sense, nor are they entitled to typical employment benefits. Gig work is also often conducted in addition to standard employment or sporadically (Victorian Government, 2020). This can make it difficult to estimate how many people undertake gig work; for example, those who do gig work as a secondary job may not report this work in data collection methods that rely on self-reporting (Victorian Government, 2020).

Gig work includes a range of activities including platform-mediated work, self-managed online stores, online-only task completion, in-person passenger transport/food delivery using a vehicle, and on-call service provision. All of these gig work types are characterised by some aspect of non-standard working arrangements, and employment data is usually not collected at a level that differentiates between type of non-standard work. Relying on traditional employment datasets to estimate numbers of gig workers can therefore lead to the erroneous inclusion of all workers engaged in non-standard forms of employment (ie, non-gig work) (International Labour Office, 2021). Any research that provides employment data on this broader group of workers may not accurately represent the gig work force, nor the subset of gig work that requires driving.

#### 3.5.1.1 The gig economy in New Zealand

A comprehensive report (Riggs et al., 2019) recently highlighted the challenge of using traditional employment data sources to measure the gig economy in New Zealand. The report noted that previous estimates have typically been based on household survey data, government tax data, and private business data, each with various limitations. For example, household survey data, such as the Household Labour Force Survey, may not capture gig work undertaken as secondary employment and not reported as 'work'. Tax data is also limited as non-traditional contracting agreements may be underreported. Inland Revenue (2022) noted that non-compliance can occur when gig workers, who may have little business experience, are suddenly required to manage the complex tax obligations of sole operators. Inland Revenue noted the limited income information was received from digital platforms because many were based overseas.

Business data that can be aggregated from platforms is useful as a snapshot of the size of a particular platform. However, this data can lack information about the workers themselves and may not be able to provide an estimate for the whole sector, as gig workers often work across multiple platforms. Gig driving work also has high turnover (Urzi Brancati et al., 2020), and this can further limit available data.

Riggs et al. (2019) provided recommendations for enhancing the measurement of gig work in New Zealand. While it is beyond the scope of this research to report these in detail, selected examples help to illustrate potential improvements as well as the likelihood of ongoing measurement challenges. For example, the Household Economic Survey is identified as having potential as it records hobby, casual, and irregular income. Triangulating administrative confidential microdata with survey data may also assist in identifying likely conditions for gig work. Riggs et al. (2019) also note that further probing in the Household Labour Force Survey about the number of jobs held may help to identify non-traditional forms of employment such as gig work. However, the authors also recognise that respondents may not necessarily regard and report gig work as 'work'.

#### 3.5.1.2 Measuring transport dimensions of the gig economy

Following the above, the challenge of estimating the size and nature of different types of gig work and transport dimensions within each type become apparent. Current international estimates of the proportion of

gig workers required to use a vehicle have primarily come from large-scale surveys with participants recruited by panels and screened for respondents doing work mediated by digital platforms. For example, a national survey commissioned by the Victorian Government in 2019 (McDonald et al., 2020) ( $n = 14,000$ ) found that 7.1% were currently engaged in digital platform work, and 13.1% had at some time undertaken digital platform work. Of those currently engaged in such work, 18.6% were working in passenger transport or food delivery, and 13.9% were using cars and bikes. A 2020 report commissioned by the European Commission (Urzi Brancati et al., 2020) presented similar findings from a 2018 survey of respondents from 16 European Union (EU) member states ( $n = 38,022$ ). Approximately 11% of surveyed participants had engaged in platform work, with 1.4% reporting it as their main form of employment. While this report did not quantify the proportion of gig workers whose work involved driving or riding, a similar survey conducted in 2017 found around 15% of platform workers worked in transport-related gig work, and this proportion was found to have increased in 2018 (Pesole et al., 2018).

In New Zealand, there are no clear estimates currently of the size of the gig economy, nor of associated transport dimensions. The Survey of Working Life conducted in 2018 found that nearly 144,000 New Zealanders worked as self-employed contractors (Stats NZ, 2019), which represented 5% of employed people. The work type categories used in this survey do not allow for the specific identification of gig workers.

Data reported from gig platforms can be used to estimate the proportion of gig workers in New Zealand whose work involves driving or riding. Ola reported they had 10,000 drivers in a 2020 news article (RNZ, 2020); however, this figure should be treated with caution. For example, the article did not identify how the figure had been derived nor whether it referred to active drivers only or all who had signed up to the platform. Figures from Uber in February 2021 (Uber, 2021b) suggested 7,700 rideshare drivers. A 2021 survey of Uber rideshare drivers and Uber Eats delivery drivers in New Zealand (Uber, 2021a) yielded 7,000 respondents. These figures indicate an increase of at least 1,000 Uber drivers from an earlier report in 2019 (Shaw, 2019). While these are useful estimates for passenger drivers, they do not include other driving gig work such as food delivery. Current, up-to-date estimates are also challenging, if it is assumed that the growth of gig work in New Zealand is following global trends. Note also that current data provides limited understanding of the drivers themselves; for example, demographic profile and location. Nevertheless, knowing that individual gig workers are likely to work across multiple platforms and engage in multiple types of gig work, these figures are a useful starting point for estimating the amount of transport-related gig work in New Zealand.

An online survey of gig drivers in New Zealand undertaken by FIRST Union (Rosentreter & Miller, 2021) provided some description of workers, although the sample size ( $n = 95$ ) was limited. Respondents were predominantly male between 31 and 40 years of age and were Pākehā or Indian. Respondents were younger on average when compared to the labour market average. Close to half were based in Auckland and 60% had tertiary degrees. Passenger transport and food delivery were the types of gig work most commonly reported. Half the respondents reported gig work as their main source of income, while half reported that it provided additional or secondary income. This finding further illustrates the challenge of estimating gig work using traditional household survey and administrative data. The report also identified that workers experienced low pay, low job security, and low levels of management support.

### 3.5.2 Gig drivers and road crashes

While CAS has not previously been used to identify crashes involving gig drivers, a recent study published by the AA Research Foundation (Thorne et al., 2022) has examined system factors associated with driving-for-work crashes involving light and other selected work vehicles (ie, excluding trucks and other heavy vehicles in New Zealand). This study used CAS to identify a sample of 300 driving-for-work crashes that

resulted in an injury.<sup>12</sup> This dataset was analysed to identify the likely characteristics of driving-for-work crashes and determine Safe System factors associated with these crashes.

Further analysis of the sample of 300 driving-for-work crashes in the driving-for-work study found only three confirmed gig driver crashes. However, there are indications of the possibility of other gig drivers being present in the sample. Open-ended TCR fields related to driver occupation, vehicle usage, and contextual crash factors were often unspecific about the exact nature of driving work involved. For example, vehicles were often coded for generic 'work travel'. Similarly, while it might be noted that the driver was delivering food, reports may not specify whether this was for a gig platform or traditional restaurant meal delivery. The potential for rideshare drivers to be recorded as 'taxi drivers' was also noted. The sample contained contextual crash information noting the driver was on their way to pick up a passenger when the crash occurred but was unclear if this was a taxi customer or a rideshare customer. Further, all three confirmed gig driver cases within the sample had their vehicle usage listed as 'taxis'; however, driver comments indicated that two of these were Uber rideshare drivers, and one was working for Uber Eats. Differentiating between a gig driver or taxi driver may be challenging for attending police officers due to the similarity in vehicle types of taxis and rideshare drivers, or because a taxi driver may also work as a gig driver, leading to inaccuracies in recording which activity they were engaged in at the time.

The under-reporting of contextual crash information has also been supported by a study in the UK reviewing road safety risks for light vehicles driving for work (Ward et al., 2020). Interviews with key system stakeholders as part of this study reported that police-recorded casualty data had limited reliability in understanding nuances of gig work in particular, as there was not enough probing to confirm driver occupation or fill out journey purpose fields.

The driving-for-work study highlights limitations related to the way crash data is collected and reported in CAS that could pose challenges in identifying gig driver crashes. Datasets constructed to identify any crash involving a gig driver would potentially under-represent them due to often limited or incomplete TCR information available in any individual crash that would confirm the driver was working for a gig platform at the time of the crash. The quality and consistency of TCR information in this study was also found to diminish as crash severity increased, which could lead to a further under-representation in driving-for-work datasets of higher severity crashes. It is important to note that gig work was not a primary focus of the driving-for-work study, and there are opportunities to further develop methodologies within CAS to identify gig driver crashes. See section 4.4 for a preliminary CAS analysis conducted in this report to identify gig worker crashes.

## 3.6 Actions by other jurisdictions in response to gig sector growth

### 3.6.1 Background

The last few years have seen the rapid expansion of gig work both nationally and internationally (International Labour Office, 2021). Various factors have contributed to this growth, including the increasing preference for flexible work, challenges in effectively regulating the gig sector, and the COVID-19 pandemic. Many people who lost their jobs during the COVID-19 pandemic turned to gig work, and the demand for delivery services during this time grew significantly (Rawling & Munton, 2021).

As gig work has become more widespread, jurisdictions globally have begun to recognise the need for appropriate regulatory controls, other interventions, and worker supports. This brief review shows that some jurisdictions have been addressing road safety for some time, while others are only now beginning to do so.

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<sup>12</sup> The dataset was constructed to include 100 minor injury, 100 serious injury, and 100 fatal injury crashes.

As noted, the connection between non-standard work and adverse health and safety outcomes for workers has informed the focus of many jurisdictions on employment legislation. It could be expected that improved employment and working conditions for gig drivers would ultimately have downstream positive impacts on road safety; for example, by reducing the risk of driver fatigue.

Given the complex and diverse nature of gig work arrangements, it is important to consider the possibility of unintended impacts from changing gig work. For example, blanket rulings classifying all gig workers as employees may have unintended effects if these reduce the flexibility that attracts many people to gig work in the first place. Gig workers enjoying the flexibility of working across multiple platforms might be pigeonholed into working for only one platform if legislation enforces an employer–employee relationship (Senate Select Committee on Job Security, 2021).<sup>13</sup> Regulation forcing international platforms to consider their workers as employees may also result in platforms ceasing operations in the jurisdiction and moving their business elsewhere. Instances such as this can result in large proportions of the platform’s workforce being terminated (Senate Select Committee on Job Security, 2021; see Table 3.2). Cognisance must be given to such complexities when considering any type of road safety intervention.

Platforms’ responses to regulation proposals can also pose further challenges. For example, Uber’s CEO, Dara Khosrowshahi, published an op-ed in the *New York Times* in August 2020 calling for a new third worker class in the US (distinct from employees and independent contractors) (Khosrowshahi, 2020). Contrary to this assertion by its CEO, Uber spent five years fighting a class action lawsuit for a new worker category in the UK, even escalating it to the Supreme Court (where it was upheld in March 2021; UK Supreme Court, 2021). These responses suggest it may be difficult to anticipate the responses of platforms to any change proposals in New Zealand.

## 3.6.2 Actions of overseas jurisdictions

### 3.6.2.1 Regulation

With the rapid expansion of gig platforms, many jurisdictions internationally have sought to enhance regulatory controls in the gig economy in areas including taxation, worker status, and OHS.

Table 3.2 summarises a selection of regulatory responses, noting also the effects or consequences of these.

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<sup>13</sup> ‘Multi-apping’ is often necessary because a single platform does not offer workers sufficient work, and theoretically this need would be alleviated with better employment protections.



**Table 3.2 Regulatory responses and associated effects by jurisdiction**

Jurisdiction	Regulatory response	Effect
Australia	Uber operated illegally when it launched in Australia in 2012. Over the next few years rideshare platforms were legalised on a state-by-state basis.	Levies ranging from \$1 to \$2 per fare have been implemented in various states. These levies are being used to fund compensation packages for the taxi industry. NSW's fund started at \$250 million in 2015 but was increased to \$645 million in September 2022 (Transport for NSW, n.d.). The compensation aims to help taxi drivers adjust to the deregulation of the passenger transport industry.
	Point to Point Transport (Taxis and Hire Vehicles) Regulation 2017.	NSW has recently updated regulations applying to vehicles used to provide transport passenger services. The regulations cover a range of road safety related provisions, including those related to: <ul style="list-style-type: none"> <li>• safety standards and penalties for breaches</li> <li>• vehicle standards and maintenance</li> <li>• responsibilities for identifying and mitigating potential health and safety risks for drivers and passengers</li> <li>• vehicle insurance</li> <li>• notifiable occurrences.</li> </ul>
Switzerland (Geneva)	In September 2020 Geneva ruled that food delivery drivers must be contracted as employees with fixed shifts.	Immediate termination of 77% of couriers (1,000 people) (Senate Select Committee on Job Security, 2021). One year later Geneva had far fewer work opportunities for couriers and experienced a substantial decrease in demand for restaurant delivery services compared to other Swiss cities. The estimated financial loss of this change was €16 million for restaurants, €1.16 million for couriers, and €570,000 in tax (Elworthy & Stein, 2021).
United Kingdom	In February 2021 the Supreme Court upheld a class action ruling that a group of drivers should be classified as workers as opposed to independent contractors (UK Supreme Court, 2021).	A week after the ruling Uber classified all 70,000 of its British drivers as 'workers', affording them entitlements to minimum wage, holiday pay, and pension plans (Browne, 2021).
United States	In California, Assembly Bill 5 (AB5) (2019) required gig economy workers to be classified as employees, unless the hiring company could prove that they were an independent contractor.	In response, ridesharing and delivery companies invested US\$200 million into the Proposition 22 Bill (Prop 22) (2020) to exempt app-based passenger service and delivery work from AB5 (Marshall, 2020). Prop 22 was passed in November 2020 by popular vote, but by August 2021 it was declared unconstitutional by a California judge. Ongoing litigation and further appeals by gig platforms are expected.

### 3.6.2.2 Codes of conduct

Various charters/codes of conduct between platforms and other groups have been identified and summarised in Table 3.3. The key actions link to road safety both directly (eg, providing vehicle maintenance) and indirectly (eg, not pressuring drivers to accept jobs). Other key actions with no clear link to worker well-being and road safety have not been included but can be found in the original sources.

**Table 3.3 Codes of conduct and key actions for platforms by jurisdiction**

Jurisdiction	Code of conduct	Key actions for platforms
Germany	<i>Ground rules for paid crowdsourcing/crowdworking: Guideline for a prosperous and fair cooperation between crowdsourcing companies and crowdworkers</i> (German Crowdsourcing Association, 2017)	<ul style="list-style-type: none"> <li>• Assist workers in understanding and meeting their legal obligations (tax regulations in particular).</li> <li>• Pay crowd workers fairly and appropriately given the value of their work.</li> <li>• Motivate work by making the platform easy and intuitive to use.</li> <li>• Act respectfully; carry out mediation between crowd worker and clients in a conscientious manner.</li> <li>• Clearly define tasks and establish appropriate timeframes.</li> <li>• The non-acceptance of work must not have negative consequence for the worker or result in them being pressured by the platform.</li> <li>• Provide feedback to, support, and openly communicate with workers.</li> </ul>
International	<i>Charter of principles for good platform work</i> (World Economic Forum, 2020)	<ul style="list-style-type: none"> <li>• Be inclusive of diverse groups.</li> <li>• Have policies in place to protect and promote the physical and mental well-being of workers.</li> <li>• Allow workers to decline particular tasks or working times, though disincentives may be applied to workers failing to complete accepted tasks.</li> <li>• Maintain transparency regarding terms and conditions, grounds for deactivation, and algorithm usage.</li> <li>• Maintain pay transparency. Workers classified as employees should make at least minimum wage for their active working time (and accounting for reasonable expenses).</li> <li>• Collaborate with governments to ensure that workers have access to social protections and benefits as needed, including education/upskilling programmes supporting their professional development.</li> <li>• Provide workers with appropriate channels to provide feedback to platforms and resolve disputes in a timely manner.</li> <li>• Provide workers with an aggregated view of their performance.</li> <li>• Collaborate with organisations as appropriate to increase transparency, including sharing the number, demographics, and practices of workers.</li> </ul>
Bologna, Italy	<i>Charter of fundamental rights of digital work in the urban context</i> (Riders Union Bologna, 2018)	<ul style="list-style-type: none"> <li>• Pay workers a fixed hourly rate at least equal to minimum wage.</li> <li>• Provide workers with fair compensation for overtime, public holidays, and work undertaken during bad weather.</li> <li>• Provide insurance for workers covering accidents and illness at work, including during the time spent travelling to and from work.</li> <li>• Provide bicycle riders with compensation for maintenance.</li> <li>• Guarantee workers' freedom of association and right to strike.</li> </ul>

### 3.6.2.3 Inquires and recommendations

A number of Australian jurisdictions established enquires into gig work and road safety following fatal crashes involving food delivery workers. These enquires have relevance to New Zealand, and key recommendations are summarised in Table 3.4. Some recommendations address the precarious nature of

gig work (which has been indirectly linked to road safety) while others directly discuss measures that could mitigate associated road safety risks. Other recommendations that do not directly or indirectly link to road safety risk have not been included but can be found in the original sources.

Note: The numbering of the recommendations corresponds to the numbering in the original sources. Recommendations with direct applicability to road safety have been highlighted in **bold**.

**Table 3.4** Inquiries and recommendations (by jurisdiction)

Jurisdiction and inquiry	Key recommendations
<p><b>Victoria, Australia</b>  <i>Report of the Inquiry into the Victorian On-Demand Workforce.</i>                      (Victorian Government, 2020, pp. 189–206)</p>	<ol style="list-style-type: none"> <li>2. Victorian Government to pursue legislative options to improve choice, fairness, and certainty for gig workers if the Government does not act.</li> <li>4. Governments to consider the costs of changes to individuals, businesses, and regulators (without stifling innovation).</li> <li>5. Governments to fund surveys and evidence-based research to inform policymakers.</li> <li>6. Governments to codify the status of gig workers in legislation.</li> <li>7. Governments to align definitions of terms associated with work status across work laws.</li> <li>8. Establish advisory services for gig workers seeking to resolve disputes or resolve their work status.</li> <li>9. Establish a streamlined support agency to assist gig workers with resources, advice, disputes, and understanding their entitlements, protections, and obligations.</li> <li>10. Establish a fit-for-purpose, inexpensive, and informal body to provide a mechanism for accessible and fast work status resolution (while working in coordination with the streamlined support agency envisioned in recommendation 9).</li> <li>13. Platforms to maintain transparency with workers, regulators, and customers regarding their worker contracts.</li> <li>14. Governments to establish a Fair Conduct and Accountability Standard to underpin gig work arrangements.</li> <li>15. Australian Government to remove legislative barriers preventing collective bargaining and adequate representation for gig workers.</li> <li>16. Fair Work Commission to work alongside relevant stakeholders to ensure fit-for-purpose, fair arrangements that are suitable for gig workers.</li> <li>17. Governments to clarify, enhance, and streamline remedies for unfair contracts.</li> <li>18. The streamlined support agency (envisioned in recommendation 9) to provide effective support to self-employed gig workers and prioritise actions against unfair contracts.</li> <li>19. Strengthen provisions to counter sham contracting.</li> </ol>

Jurisdiction and inquiry	Key recommendations
<p><b>NSW, Australia</b>  <i>Joint Taskforce: Food Delivery Rider Safety.</i>                      (SafeWork NSW &amp; Transport for NSW, 2021, pp. 12–13)</p>	<ol style="list-style-type: none"> <li>1. <b>Distribute data analysis of notable incidents to key stakeholders on a quarterly basis.</b></li> <li>3. SafeWork NSW to produce user-friendly guides to working in food delivery for platforms and riders.</li> <li>4. NSW Better Regulation Division to consider future improvements to OHS legislation to ensure that the necessary regulatory tools are available.</li> <li>5. <b>Transport for NSW to implement an Industry Action Plan to target rider visibility/road safety knowledge and undertake enforcement and maintain infrastructure.</b></li> <li>7. <b>NSW Police to make a deliberate effort to enforce road rules with food delivery riders.</b></li> <li>8. SafeWork NSW to test compliance with Improvement Notices under section 191 of the Work Health and Safety Act 2011.</li> <li>9. <b>Transport for NSW to develop guidance on delivery bag design (eg, fluoro colours and reflective strips).</b></li> <li>10. <b>Transport for NSW to provide information to food delivery platforms to ensure drivers'/riders' vehicles are up to standard.</b></li> </ol>
<p><b>Australia</b>  <i>First interim report: on-demand platform work in Australia.</i>                      (Senate Select Committee on Job Security, 2021, pp. ix–xii)</p>	<ol style="list-style-type: none"> <li>1. The Bureau of Statistics to expand its Labour Force Survey to capture quarterly estimates of the number of gig workers.</li> <li>2. <b>The Australian Bureau of Statistics to enhance its Work-Related Injuries Survey to capture specific information on incidents involving gig workers.</b></li> <li>3. <b>SafeWork Australia to enhance its national data collection process to capture specific information on DSIs of gig workers and officially recognise road crashes involving gig workers as workplace incidents (and record/investigate them accordingly).</b></li> <li>4. <b>SafeWork Australia to develop meaningful guidelines on how the Work Health and Safety Laws apply to gig platforms, without classifying workers as PCBUs. The guidelines should focus on practices that incentivise unsafe behaviour, as well as enforcing compliance with safety rules and obligations.</b></li> <li>5. Australian Government to clarify and regulate which persons or entities owe a duty of care.</li> <li>6. Australian Government to work with state and territory governments to lead the reform of state-based workers' compensation schemes so that they extend to gig workers.</li> <li>7. Australian Government to extend definitions of 'employment' and 'employee' to cover gig work arrangements (and anticipate future evolution of alternative work).</li> <li>8. Australian Government to investigate options for empowering a regulator to request data from gig platforms.</li> <li>9. Australian Government to give the Fair Work Commission broader powers to resolve disputes and establish minimum conditions for gig work.</li> <li>10. Australian Government to empower the Fair Work Commission to provide pathways to permanent employment via a low-cost arbitration process.</li> <li>11. Australian Government to provide greater protections for sole trading independent contractors by establishing an accessible low-cost national tribunal relating to employment relationships.</li> </ol>

Jurisdiction and inquiry	Key recommendations
<p><b>NSW, Australia</b></p> <p><i>Impact of technological and other change on the future of work and workers in New South Wales. First report – The gig economy.</i></p> <p>(New South Wales Parliament, 2022, pp. xii–xiv)</p>	<ol style="list-style-type: none"> <li>1. NSW Government to commit to greater protections for gig workers, regardless of work status.</li> <li>2. NSW Government to establish a tribunal or extend the jurisdiction of the existing tribunal, with the power to set minimum pay and conditions for gig workers who provide labour to gig platforms regardless of work status.</li> <li>4. NSW Government to establish a portable entitlement scheme for gig and other precarious workers, in partnership with employers, unions and gig platforms.</li> <li>6. NSW Government to mandate improved transparency between platforms and workers concerning average earnings, most profitable times to work, real time use of the platform, data collection and utilisation, and performance management systems.</li> <li>7. NSW Government to require platform companies to publish regular data on their scope and operations, and the earnings of their workers in New South Wales.</li> <li>8. NSW Government to publicly affirm the right of gig workers to freely associate by joining (or not joining) a union.</li> <li>9. NSW Government to legislate to establish a system of collective bargaining for workers providing labour to gig platforms.</li> <li>14. NSW Government to legislate to establish a requirement for all on-demand platforms to register with SafeWork NSW before they begin trading.</li> <li>15. NSW Government to introduce discrete and enforceable codes of conduct for work performed by gig platforms in the rideshare, food delivery, parcel delivery, and disability care sectors of the gig economy.</li> <li>16. NSW Government to introduce a scheme that delivers standardised workplace health and safety training to workers providing labour to gig platforms in high-risk industries, which can be recognised by all platforms that a worker chooses to work for.</li> <li>17. NSW Government to partner with gig platforms, employers, and unions to develop an enforcement regime that provides for the inspection, auditing and reporting of a gig platform’s compliance with workplace health and safety laws by organisations independent of that platform.</li> <li>18. NSW Government to review health and safety legislation to ensure workers in the gig economy are protected by health and safety laws, including reviewing the definitions of ‘PCBU’ and ‘worker’ in the Work Health and Safety Act 2011.</li> <li>19. SafeWork NSW to urgently review the Work Health and Safety Act 2011’s provisions for health and safety representatives, to ensure that they are able to operate effectively for gig workers.</li> <li>20. NSW Government to provide full workers compensation benefits to on-demand platform workers that are equivalent to the level of benefits currently provided to employees injured in New South Wales workplaces.</li> </ol>

## 4 Findings

### 4.1 Key informant workshop

Refer to section 2.4 for methodological description.

#### Key findings:

- Regulators have limited influence on platforms in New Zealand currently. Reasons for this include:
  - most platform businesses are located offshore
  - there is a limited understanding of the implications of regulatory actions in international jurisdictions, noting the lobbying power displayed by platforms overseas
  - determining duty of care between platforms and drivers is complex, and largely related to gig drivers' employment status as independent contractors
  - there is a limited understanding of the nature of algorithmic work design.
- The relative invisibility of gig work in current data systems makes it difficult to define and respond to gig work related issues in New Zealand.
- Possible financial pressures faced by those engaging in gig work may have road safety implications (eg, increasing pressure to work longer hours).

A workshop was facilitated with six key informants from higher levels of the gig work socio-technical system to provide initial descriptions of system actors and system factors shaping road safety risk.

#### 4.1.1 System actors

System actors described by key informants included:

- courts and the legal system
- government and regulators/regulations
- unions and industry associations
- platforms
- passengers
- other road users
- workers and their whānau (see section 5.2 for the Actor Map).

It was noted that the gig work sector also includes those who drive to and from gigs (eg, residential support workers driving between clients' homes). These drivers make up part of New Zealand's 'grey fleet'.

#### 4.1.2 System factors

Key informants provided further observations about three of the six levels of the socio-technical system used in this research. The three levels were:

- Government regulations and policy
- Industry/platform/manager
- Worker.

#### 4.1.2.1 Factors at the government regulations and policy level

Key informants reported that regulators had limited influence on platforms currently, as platforms were primarily based offshore. It was felt that a new category of worker (distinct from employees and independent contractors) was not necessarily going to be a solution with regard to gig workers' employment status (for earlier discussion see section 3.6.1). Key informants noted that New Zealand regulators are watching international jurisdictions' actions, including employment court cases and associated legal precedence, but acknowledged New Zealand had some way to go before understanding appropriate regulatory controls locally.

#### 4.1.2.2 Factors at the industry/platform/manager level

Key informants noted the lobbying power of platforms and the general difficulty of regulating the sector. For example, Uber and Lyft spent \$200 million challenging the Prop 22 Bill in the US (see section 3.6.2.1). It was acknowledged that Uber was regarded as an industry leader, internationally and in New Zealand, in having established blueprints for standards and policies for newer and emerging platforms.

Key informants believed platforms had more influence over their workers than generally depicted through claims of simply being tech companies or 'software providers' providing workers with access to customers via apps. This characterisation made it difficult to determine the nature of the relationship between platforms and their drivers and has ramifications for determining liability and duty of care. The design of incentives mediated via apps was also noted as a factor reducing the actual level of flexibility afforded by gig work as well as road safety risk; for example, apps designed to encourage drivers to keep accepting trips and to drive for longer, with associated risk of driver fatigue. The design and operation of algorithms were far from transparent, and closely guarded by platforms due to their commercially sensitive nature.

#### 4.1.2.3 Factors at the worker level

Key informants recognised that the labelling of gig drivers as self-employed, independent contractors made it difficult for unions and regulators to understand the demographics, income, or even number of gig drivers in New Zealand. This classification also placed liability solely on gig drivers, with platforms not required to take responsibility for their drivers' income, job stability, well-being, or health and safety. Gig drivers were also largely invisible within existing data systems, making it further difficult to understand gig work in New Zealand.

It was recognised that gig drivers were required by gig platforms to meet many associated work costs (eg, fuel, vehicle maintenance, licences, mobile phone plan) and that wider economic factors (eg, cost of living, fuel costs) and market trends (eg, shift to electric vehicles) were adding further financial pressures. These factors could have implications for road safety; for example, by increasing pressure on drivers to work longer hours and to work during more lucrative, yet higher risk times, such as late at night.

## 4.2 Key informant system interviews

Refer to section 2.5 for methodological description.

### Key findings:

- Government agencies have relatively limited understanding of the gig economy currently. Reasons for this include a) difficulty keeping pace with sector innovations, b) inherent complexities related to algorithmic control of gig work, and c) limitations in current data systems.
- Higher-level key informants suspected the growth of gig work in New Zealand and unique pressures of gig driving (eg, the need to work long hours and at pace) were likely road safety risk factors.

- Gig drivers interviewed in this research often described working under stress and considerable mental load, although the extent of this appeared to differ among drivers.
- Many drivers acknowledged that pressures from the job caused them to drive less safely at times. These included management of platform apps, the need to make quick decisions under pressure, behaviours of other road users, and potentially challenging customers.
- Drivers described environmental and infrastructure factors that impacted their road safety. These included limited parking availability, road works, complex signage, and other network disruptions.
- Unsafe driving behaviours self-reported by drivers included erratic or risky driving, distraction, illegal parking, driving for long periods of time, and driving while tired.
- Drivers also described a relatively unsupportive workplace characterised by an individualist, competitive environment, limited access to platform support, and a concern that speaking out could lead to deactivation from platforms without opportunity to recourse.

In-depth interviews were undertaken with key informants from different levels of the gig work socio-technical system. The interviews provided further understanding of the system factors and interrelationships between them that connected to road safety risk. Key findings are presented in the following section.

#### 4.2.1 Legal and regulatory challenges associated with gig work

Key informants from higher levels of the system (Ministry of Transport, Waka Kotahi, MBIE) highlighted the difficulty of regulating the gig economy currently. Identified challenges included the current employment status of gig workers,<sup>14</sup> the difficulty of regulating a sector that was constantly innovating, and inherent complexities due to gig work being largely mediated via technology (eg, algorithmic management, use of artificial intelligence (AI) to assign work). Enforcement and accurately identifying responsibility were challenging because drivers are able to work for multiple platforms and because many platforms were based overseas.

*New Zealand's very good at ... writing and strategy and having it be world class and the regulation is really, really good. But it's the implementation where we fall down badly in a whole range of areas.* (MBIE representative)

Key informants from higher levels of the system acknowledged current difficulties in designing effective regulatory controls. The labelling of gig workers as self-employed, and the position of platforms that they simply facilitated the relationship between drivers and customers obscured the responsibilities of platforms with regard to worker rights and protections. There was uncertainty currently in the definition of the relationship between platforms, drivers, and users and resultant OHS responsibilities of platforms.

*We do have [the HSWA] that deliberately doesn't distinguish between employees and other types of workers, it doesn't matter if you are directly employed, there is always someone who is responsible for the work, and they should be making sure you're safe. In practice it is extremely difficult to hold entities to account because they are so adamant in maintaining their status that 'you're not our employee'.* (Union representative)

The current employment status of drivers made it difficult for drivers to communicate their issues and needs to regulators. Being labelled as self-employed, the process and cost of securing representation on employment-related matters was borne by workers. Unions were finding ways to support drivers where possible, although were limited in the extent they could support workers not in standard employment. It was also reported that drivers could be wary of unionising, believing it may jeopardise access to platforms.

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<sup>14</sup> Notwithstanding the 2022 Employment Court of New Zealand decision – see earlier discussion in section 3.3.1.3.



Leveraging traditional ways of addressing employment rights and protections was therefore difficult. Drivers were reportedly unaware of many of their rights, directly or indirectly disincentivised to join unions, or unaware that they could turn to unions for support.

*[Most drivers] don't even necessarily know that there is a distinction between employees and contractors.* (Union representative)

*... a lot of these workers aren't adequately prepared to run their own business and so they don't necessarily have the resources or ability to manage all [of their responsibilities].* (MBIE representative)

*[Platform] could do more [for its drivers] but in order to do that, you risk reclassifying everyone as employees ... which means you don't have the liquidity ... flexibility...* (Platform representative)

As evidenced in cases overseas, key informants recognised that regulatory interventions could have unintended consequences; for example, making access to the sector more difficult and reducing opportunities for workers who rely on gig work.

Key informants from higher levels of the system indicated relatively low understanding about gig work and gig drivers, let alone road safety issues. Understanding was often informed by anecdotes and assumptions, a situation perhaps not unsurprising given the emerging nature of gig work in New Zealand and barriers to understanding (eg, obscure and opaque algorithms, limitations in existing data systems).

*There were a lot of assumptions about [complaints] without really looking into the data.* (Waka Kotahi representative)

*[Regarding] defining the problem ... having a lack of data, it's hard to know what's happening, why it's happening.* (Ministry of Transport representative)

Data limitations made it difficult to build a business case for a greater focus on gig work. Currently there were limited requirements on platforms to report data to government; note, however, that drivers operating under their own TSL<sup>15</sup> are responsible for reporting serious incidents and complaints to Waka Kotahi. Key informants noted that without clear and significant evidence of DSI crashes involving gig drivers, it was unlikely that resources would be allocated to the issue.

*I could use my car and go pick people up ... who are [customers] complaining to, it is my own business ... are they going to complain to me? ... the responsibility is on me to notify Waka Kotahi of a complaint of a serious nature. I know in the data there are zero complaints, because why would they tell us?* (Waka Kotahi representative)

The current status of gig drivers as contractors presented barriers to drivers collectivising and drawing on wider supports. A union representative explained that even if a gig driver joined a union, unions may still not be able to collectively bargain on their behalf because platforms refuse to recognise them as employees. Drivers most often approached unions in relation to unfair dismissal from platforms, including when unsubstantiated customer complaints led to deactivation. Gig drivers who did engage with unions often had little understanding of their rights and employment status (eg, did not know difference between employee and contractor); those that did engage were likely to represent only the 'tip of the iceberg' in terms of need.

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<sup>15</sup> All small passenger service operators (eg, taxi drivers, rideshare gig drivers, small shuttle services) are required to have a specific TSL (a Small Passenger Service Licence). Rideshare gig drivers can either register this licence under their platform's TSL or apply for their own TSL as an individual operator of a small passenger service (see section 4.5.1).

## 4.2.2 The apps and the platforms

Ten interviews were carried out with gig drivers and one with a representative from a platform. As noted, it was difficult to engage platform companies in the research, and the findings below are predominantly derived from drivers.

Some drivers said they liked the platform apps and had gained experience on how to make the apps work for them. Others had a challenging or strained relationship with the apps, the algorithms, and as a result, the platforms.

*[We get drivers] to click through some ... advice about how to conduct yourself and some reminders about what ... gig companies always call 'community guidelines', because of course we can't require people to necessarily do anything or not do anything [because of] the nature of the contract relationships. (Platform representative)*

*[The platforms] pretend to [care] because they I think they send some ... safety question [through the app], but this is just for them to tick their boxes. (Gig driver)*

Drivers provided insight into how they worked with the design and operation of the platform apps. They explained how the apps influenced their patterns of work and at times influenced their ability to operate safely. For example, many commented on the distraction caused by the apps. New jobs appeared while they were driving and took their attention off the road to either accept or decline the job. Some app features meant new jobs overrode the existing screen displays, such as Global Positioning System (GPS) maps, with further interaction required to remove this. Drivers reported also being distracted by the use of multiple screens or phones, which they said enabled rapid switching between platforms and increased their availability for work.

Drivers reported having to make quick calculations to determine the value of the job. If a 'bad job' was accepted in haste, drivers were reluctant to cancel it out of fear that it would lower their rating score. A related concern was the limited information provided by the apps about each job. Drivers needed to accept the offer in order to receive more information. However, cancelling a job was difficult if it was subsequently deemed unsuitable or unprofitable. Drivers reportedly felt under pressure and mentally overloaded because of the constant need to make judgement calls on job offers and to accept or dismiss notifications.

The findings indicate that apps could incentivise certain work patterns for the drivers. Through incentives, drivers were directed towards working in specific locations, or incentivised to complete a certain number of trips within certain timeframes. Drivers were concerned about a lack of transparency in how incentives were structured, incentives being unachievable, and issues or delays receiving due compensation. These experiences could contribute to a lack of trust in platforms and mental overload.

*I can be right on the spot and [the app] will send me ten kilometres to pick someone up in an area there's no surge. It incenses me. (Gig driver)*

Drivers felt that incentives were structured to encourage them to work faster and more efficiently. To keep up, drivers often choose to work in busier CBD locations and park illegally; at times they were required to speed to minimise trip times and avoid delays. Some drivers described a pressure to work late, while tired, or while sick, to take advantage of high demand periods. Drivers feared inevitable quiet periods because they eroded overall earnings and reduced 'hourly' rates of pay. Variation between shifts meant drivers felt pressured to maximise the number of jobs in periods of high demand, or to work across multiple platforms.

*...you're driving around making sure that you reach the area faster, quicker, so that you've finished your delivery and then you're ready for the next pick up. (Gig driver)*

Drivers described a pressure to maintain customer service ratings to avoid deactivation from platform apps. Some believed that declining or cancelling jobs after accepting them could compromise future offerings. There was a general lack of transparency about how the apps determined such outcomes; nonetheless, drivers generally accepted the apps' mechanisms and attempted to act accordingly (eg, avoid negative customer ratings, minimise the number of jobs cancelled). Drivers had heard stories of others being deactivated from platform apps without explanation or the right to contest what happened.

*Uber doesn't substantiate that something has actually happened, they just deactivate the driver. That is the equivalent of an instant summary dismissal where you have no recourse to challenge it. (Union representative)*

### 4.2.3 Environment, infrastructure, and other road users

Interview participants from across the system identified factors in the environment that were linked to road safety risk. These factors mostly describe the driving or road environment and include other road users and the physical infrastructure.

Most often discussed, particularly by drivers but also by regulators, traffic enforcement, and some agencies, were the challenges with infrastructure and use of space. As new entertainment areas and food outlets appear, pressure was increasing on roads, traffic management, and parking availability. Rideshare and food delivery work were more available and profitable in these high-density locations, meaning gig drivers were frequently having to navigate these areas. Under time pressure, drivers parked wherever they could or used bus lanes, including for pick-ups/drop-offs. Tensions were evident between parking wardens, bus drivers, taxi drivers, and gig drivers. While some cities had provided 'small passenger service vehicle' parks, drivers reported these were limited in number, illegally used by the public, and generally unmonitored.

*... on a busy day, busy night, you could be ... sitting in traffic for over 15 minutes to get to the restaurant. Then, if you're willing to walk, there's no parking. So, what do you do? (Gig driver)*

Drivers described the mental load associated with navigating poor-quality roads, roadworks, unclear signage, and complex areas with unclear road use permissions. Considerable focus and concentration were required to avoid vehicle damage, plan routes, and minimise trip delays. Mitigations included rapid manoeuvres to avoid potholes and quick U-turns to avoid a road closure.

Given the amount of time spent on the roads, drivers experienced other road users as a key road safety risk factor. Risks included the unpredictable behaviour of pedestrians (particularly if drunk) and unsafe driving behaviours. Rideshare drivers recognised personal risk as well as for others; for example, from needing to brake suddenly. Drivers described the importance of constant attention as taking evasive action could lead to poor customer ratings.

*I'm always anticipating that other drivers can't see me ... or if there's a gap ... a car can fit through ... slowing down just in case ... That's saved me probably about two or three times. (Gig driver)*

### 4.2.4 Passengers and customers

Gig drivers and a key informant noted that passengers and customers had significant influence over how gig drivers operated. Rating systems led drivers to respond to the needs of customers even when this might be unsafe. For example, customers often requested pick-ups or drop-offs in unsafe places, turned up with too many passengers for one vehicle, or refused to wear masks when they were required to do so. Drivers were concerned that complaints from customers could potentially result in deactivation from the platform.

Drivers spoke of rude and abusive passengers and customers and of feeling unsafe at times. In such situations, drivers can provide feedback on the customer; however, they do not feel that a similar level of reporting or investigation is followed. This was frustrating for gig drivers and could be stressful.

*...they get the customers to rate you, which is a horrible ... thing. Because what happens is that that means there's pressure to do unsafe things. (Gig driver)*

Key informants from higher levels of the system reported that current apps can incentivise customers to make complaints because they may be refunded. Customers are afforded certain privileges such as being able to cancel orders without penalty, which can cause delays to drivers who have already begun the job. Drivers are reportedly not compensated in these circumstances.

The platform representative described the ability of customers to lodge complaints or issues with drivers as an important safety feature and key function of the platform apps. Most enforcement to date under the requirement that complaints of a certain severity be reported to regulators had focused on driver-related complaints.

#### **4.2.5 Income and financial pressure**

Gig drivers explained that with increasing living costs, longer hours and/or secondary jobs were increasingly needed. The pandemic had also impacted incomes and there was pressure to continue to work through lockdowns. Some lost jobs in other areas during the pandemic and took up gig work out of necessity; others saw an increase in their gig work during this time.

Gig drivers reported that on some shifts they could earn less than minimum wage. The long hours required to earn sufficient income caused pressure in other areas of their lives and could increase stress.

*You're working closely to 70 to 80 hours a week, that leaves you no time for family, no time for yourself, no socialisation. But the cost of living is so expensive these days that the first income just doesn't suffice as the amount that you need. (Gig driver)*

The interview data highlighted the uncertainty and variation of income between shifts. Drivers explained that time spent waiting or driving to and from a job was not paid, which meant there were financial incentives to work beyond time limits, accept more jobs, and at times remain in unsafe situations. One driver worked during the pandemic despite having asthma, which they felt was necessary but personally unsafe. Some expressed that they felt underpaid for the work they did and explained that the increasing number of drivers in the market meant they needed to spend more on the road to earn a sufficient amount.

Managing business expenses and doing administrative tasks required additional time from the gig drivers, further lowering their rate earned per hour. Associated costs with gig work included commercial insurance, registration, licensing, certificate of fitness, and vehicle wear and tear. Some felt unprepared and unsupported to manage their business such as doing taxes and checking they had been paid correctly.

#### **4.2.6 Implications for road safety risk**

The system interviews have provided insight into a range of contextual factors that have the potential to influence road safety risks from gig work. Interviews with drivers highlighted the pressure and stress they face while working. There is concern among drivers and those higher up in the system about fatigue and mental overload. Enforcement and management of these issues are challenging due to incomplete data on the scale of the problem and the relatively invisible nature of the workforce.

Gig drivers appear to be frequently stressed and experience mental overload; however, different drivers appeared to experience these stressors to varying degrees. Stressors included challenging driving

environments, other road users, customers, limited parking, and poor physical infrastructure. Drivers were often distracted by platform apps and had to make quick decisions under time pressure when accepting or declining jobs. Platforms reportedly offered little support, and drivers did not necessarily have access to channels of support from other drivers. Some drivers linked these factors to road safety risks such as distraction, illegal parking, the need to make sudden vehicle manoeuvres, and driving while tired.

*A significant burden is placed on the worker to be responsible for those things such as vehicle maintenance, but at the same time they're not being paid enough to actually take care of their responsibility ... we heard about Uber drivers not being able to afford to replace their tyres often enough, which creates a risk. (MBIE representative)*

Some drivers reported working multiple jobs and spending long hours doing gig work. This was coupled by mentally tiring tasks while driving and then extensive periods of waiting for work in the car.

*... it's just hectic. It makes you physically tired, to be honest ... mentally it does exhaust you. We have no choice, to be honest. We've got no choice ... I don't know how I'm managing it. I have no idea. (Gig driver)*

Participants from higher levels of the system indicated that fatigue and driving while tired were areas of concern but again relayed the challenges of data collection and regulation, particularly on worktime hours. Many drivers use multiple platforms and have secondary jobs where hours are not logged. Checking and enforcing logbooks for gig drivers is near impossible given the sheer number of workers. The platform key informant acknowledged the risk of driver fatigue and reported measures to restrict worktime hours. However, they also acknowledged limited power over drivers switching between platforms and undertaking secondary work.

Interestingly, gig work does not feature strongly in existing crash data (see section 4.4). The interviewees suggested that this may be because gig work is carried out in lower-speed, urban environments or because many drivers are not using more vulnerable modes of transport such as bikes, scooters, or mopeds. Various other reasons for this absence are discussed in section 3.5.2. However, reflecting the identified risk factors above, many drivers reported frequent near misses.

## 4.3 Ethnography

Refer to section 2.6 for methodological description.

### Key findings:

- Environmental factors such as lack of parking availability, poor road quality, complex road layout, and other road users often resulted in unsafe driving behaviour. This was more commonly experienced in central city areas, which were also identified as the most profitable areas to conduct gig work.
- Managing customer interactions and maintaining positive ratings was a stressor that could lead to drivers taking risks. Customers could pressure drivers to drive less safely; drivers described working faster to mitigate the risk of abuse and threatening behaviour.
- Mobile phone use was observed as a distraction (eg, accepting tasks, using map applications).
- Drivers reported limited training on how platform apps functioned, such as how algorithms assigned tasks and how incentives were structured. Lack of understanding about the apps could be a further stress.

- Road safety risk may be experienced differently by different types of gig drivers. Those motivated to maximise their income, who had high reliance on their gig income, and who worked in central city areas appeared more likely to undertake risky driving behaviours.

Findings from the three ethnographic data collection activities undertaken – in-situ observation, ride-along observations of food delivery drivers, and pre- and post-shift driver interviews – are presented in this section. Driver quotes and vignettes based on the researchers' experience are provided throughout. Many of the findings triangulate and validate earlier findings from the key informant interviews.

### **4.3.1 Environment – infrastructure and other road users**

The physical context within which gig work is conducted was reinforced as a critical factor shaping road safety risk. This context includes parking availability, the roading network, road condition including road works, and interactions with passengers and other road users.

Researchers witnessed and the participants explained that central city environments intensified their work for multiple reasons (eg, parking generally less available, high traffic density, roadworks, unclear signage, changes to the road layout). Parking unavailability in the central city meant one driver chose to only work in the suburbs despite it being less profitable. Environmental factors appeared less problematic in suburban areas where there was more parking availability and a more predictable driving environment.

#### **4.3.1.1 Parking**

The researchers observed a range of unsafe parking practices by food delivery and rideshare drivers. These included double parking when leaving their vehicle to collect food, temporarily parking across pedestrian crossings or footpaths, stopping in the middle of a busy road to pick up passengers, and parking in bus lanes. Other road users were often required to pre-emptively slow down or swerve around gig drivers (often travelling over the centreline).

Gig drivers undertook a range of behaviours in an attempt to avoid the consequences of illegal parking. Observed behaviours included leaving hazard lights on and keeping the car running while exiting the vehicle. One food delivery worker displayed a self-made sign on the dashboard explaining that the vehicle was being used for gig work (see Figure 4.1). Drivers made efforts to pick the least illegal parking space to minimise delay and ensure minimal disruption to other road users (eg, one driver chose to park in a loading zone rather than on broken yellow lines). Parking-related decisions often needed to be made in haste. Parking added further pressure on top of other stressors (eg, time pressure from the platform apps, customers, restaurants, passengers) and was a common source of frustration for drivers (eg, considered a factor that hindered their ability to meet the customers' needs and impacted their earning potential).

**Figure 4.1** Self-made sign displayed by an ethnography participant while working



Customer expectations regarding passenger and food delivery pick-up/drop-off locations influenced parking behaviour. We observed implicit understanding between drivers and customers that illegal parking would occur, requiring a quick entry or exit from the vehicle by the customer. Drivers reported making decisions to park illegally in order to reduce potential conflict with customers and to avoid negative ratings.

A link between parking and earnings was observed. Illegal parking was a calculated risk that could ‘pay off’ when time was saved and more jobs could be completed (see an example of such parking in Figure 4.2). Conversely, one parking fine could effectively mean the loss of a shift’s earnings. Risks were taken in the central city area, where parking is most difficult, as this was also the most profitable area to work.

Confusion or frustration about parking rules was another stressor; for example, some rideshare drivers were unclear whether they could use taxi stands. We observed unclear signage in certain zones, confusing information about times in use, and other road users illegally parked in small passenger service vehicle (SPSV) stands.<sup>16</sup> Drivers were frustrated at what they considered a lack of monitoring and enforcement of restricted parking areas. Food delivery drivers felt they should be able to use loading zones, given they were only parking temporarily and were performing a service. Current rules were thought to favour bus, taxi, and truck drivers. Drivers reported this created a sense of exclusion from these other drivers and added to feeling unsupported in their work.

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<sup>16</sup> Also called ‘Small PSV stands’, SPSV stands are designated parking spots for all SPSVs (eg, rideshare and taxi vehicles), akin to traditional taxi ranks and mobility parks (see Figure 4.3).

**Figure 4.2** Illegal parking photographed by an ethnography participant



**Figure 4.3** Small passenger service vehicle stand in Nelson (reprinted from Cropp, 2018)



#### 4.3.1.2 Road quality

Poor road quality and frequent roadworks within the central city<sup>17</sup> and surrounding areas were another source of frustration for drivers. We observed associated traffic delays in the evening, a time of peak demand for gig services. Drivers photographed and described how poor road conditions (eg, potholes) could necessitate avoidance manoeuvres and lead to vehicle damage, adding financial pressures. GPS map applications were often inadequate in keeping up with road closures and route changes. Navigating these in real time while responding to map feedback could be stressful and could result in erratic driving.

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<sup>17</sup> Particularly in the Auckland CBD.



#### 4.3.1.3 Other road users

Some drivers reported a high frequency of near misses with other road users.

*I came very close today to killing a cyclist ... and that's like something that happens every day [with] cyclists ... scooters. (Gig driver)*

The lucrative and therefore popular times for driving were nights, in high-density areas, and around places where people are likely to be drinking. However, these environments presented risks and added stress; for example, riders of electric scooters could perform quick and erratic manoeuvres, pedestrians could suddenly run in front of vehicles. Gig drivers were worried that necessary avoidance behaviours might reflect badly on their driving in front of passengers.

#### 4.3.2 Customer interaction

Ethnography participants noted that customer interaction was an important aspect of their job. Some enjoyed this aspect while others described it as a stressor and potential road safety risk factor. Some drivers had not fully appreciated the customer relations aspect of the work from the start but had come to more fully understand this through experience.

Several rideshare drivers reflected on the stress and potential road safety risks caused by drunk passengers, a particularly common experience during weekend night shifts. Reported experiences included passengers attempting to grab their steering wheel, getting in and out of the vehicle without checking for other road users, and being abusive. Food delivery customers could also be rude and offensive if deliveries were late or food was cold.

Gig drivers managed their interactions with customers carefully to maintain positive service ratings and avoid the risk of deactivation from the platform. Some were less consciously concerned about ratings, trusting that good ratings would follow as long as they did their job to the best of their ability. However, for others, managing customer ratings was considered a critical and central part of the job. Poor ratings for mistakes out of their control (eg, delays in food preparation) was a source of frustration; some drivers were visibly frustrated and anxious when arriving at a restaurant to discover the food wasn't yet ready. Drivers were frustrated at the number of occasions when the food package given to them by restaurants was in poor condition (eg, food stains on the bag, or ripped), fearing this would negatively impact customer ratings.

*... you don't take risks. Because [customers] have the opportunity with the rating system in [Platform]. If you're a bad driver, your rating's gonna reflect that ... the higher rated that you are, the more work you're going to get. (Gig driver)*

*... because of this rating system ... [other drivers will] try and keep their rating as high as possible. And they will break the law just to save themselves getting a low rating. (Gig driver)*

The importance placed on customer ratings, and whether this impacted driver behaviour, varied among the participating drivers. A key variable here appeared to be the extent to which drivers depended on gig work for their income. Those with greater dependency generally spoke more actively about the importance of ratings and displayed greater levels of frustration at delays or inconvenience while driving due to the potential impact on ratings. However, all participants explained that they sought to provide customers with a satisfactory level of service. We observed drivers constantly updating customers on any delays with their delivery and ensuring that messages were friendly in tone. However, this at times took their attention off the road.

Drivers reported being reluctant at times to make requests or demands of customers for fear of poor ratings (eg, requesting passengers to wear masks). Rideshare drivers reported that some customer requests made

them feel uncomfortable and could compromise safety (eg, asking the driver to travel further than the agreed route, perform dangerous driving manoeuvres, or drive to unsafe pick-up/drop-off locations).

Rideshare drivers reported that platform apps could direct them to pick up passengers in illegal places (eg, bus stops). Passengers could complain if drivers directed them to a different pick-up spot to that first identified. Despite reporting unsafe or illegal places back to the platform, it appeared little action was taken (eg, the app would continue to allocate these locations for picking up and dropping off passengers).

We observed that customer interactions could be emotionally draining for drivers. Managing drunk, abusive, and overly demanding customers was commonplace. Customer requests and behaviours compromise road safety. Drivers were frustrated that platforms were not doing more to support them in the customer interface and to mitigate customer-related risks.

### 4.3.3 Technology interface

Gig work is based on technology, and gig drivers are required to work according to app-mediated algorithms. Researchers' observations of this interaction provided important learnings and insight into the lived experiences of gig drivers. Drivers had different levels of understanding about how the algorithm worked (eg, how pricing and payments were determined and how incentives were reached). There appeared to be some confusion as to whether higher customer ratings would lead to more jobs and more profitable jobs being offered. There were also different views about potential consequences if jobs were declined; some drivers believed frequent declines reduced jobs offered while others were less concerned about this and declined frequently.

Some drivers appeared to have greater access to information from and about platform apps than others. This appeared to be dependent on the level of driver experience and time spent driving. The Blue, Gold, Platinum, and Diamond levels used by Uber to grade drivers appeared to be based on a driver's total number of points (accumulated through trips), cancellation rate, and average rating. Off-peak trips are worth 1 point and on-peak are worth 5. Drivers mentioned how progression up the levels unlocked access to various features/perks. Higher levels could result in drivers receiving fuel/auto shop/cell-phone plan discounts, being able to see a destination before accepting a trip, and being given ride priority at airports. Diamond-level drivers are also given access to a 24/7 support number, which is withheld from lower-tier drivers.

*We need drivers to have a contact number 24/7. A contact telephone 24/7 [answered] by New Zealand employees. (Gig driver)*

Participants described primarily learning on the job, with limited training or preparation by the platform. Those seeking to maximise their income from gig work described investing considerable time into learning about the platform's app and developing efficiencies that would make jobs easier and more profitable. While receiving some reward for this, this also seemed to foster a sense of resentment towards the platform and app.

*When you start Uber ... there's no training. You just hop in a car with a phone and you go straight on the platform. (Gig driver)*

Some incentive targets were reported by drivers to be unachievable. There was a belief that platforms stopped assigning jobs just as a driver approached the target, to avoid paying out incentives. Food delivery drivers reported that all jobs seemed less profitable now due to increasing fuel prices, the impact of the COVID-19 pandemic, and the obfuscated nature of the algorithm.

We observed that drivers were frequently required to interact with their mobile phones while driving. When asked about this, many felt the apps were generally unintrusive to their driving task (with phones typically

mounted on dashboards or windows). Some rideshare drivers had multiple phones, enabling rapid switching between different platforms and increased potential gig/job opportunities.

*I do have two phones. One is for DiDi and Ola and the other one is for Uber. But I can use them on one phone but it's just for ease so that I can navigate easily between the apps. So that's why I have two phones. (Gig driver)*

We observed typical app interactions during shifts and while driving. New tasks would appear on the app screen, displaying basic task information such as the general location for customer or food pick up, trip distance (kilometres), and the payment the driver would receive. While the notification itself was generally unintrusive in terms of sound and visual quality, drivers were required to read the notification, process the basic information, evaluate profitability, and eventually accept or decline the task. If accepted, more detailed task information followed, requiring further attention from the driver.

*[The Uber app is] so advanced, you know? When it started, it was very, very basic. And, you know, in the next six or eight months, there's going to be a hell of a lot more changes. (Gig driver)*

While driving, gig drivers would frequently refer to the map application, pinching and zooming around the map using one hand to understand the location and evaluate alternative routes. Some drivers also used multiple map applications, which required further interaction to swap between maps and evaluate the quickest route. While gig work in central city areas was generally observed as occurring in a relatively low-speed environment, some app interactions in the suburbs occurred within higher speed environments, including the motorway.

When food delivery drivers were close to completing a delivery (around 100 m away from the delivery location), the app would often offer another job. This would temporarily cover the on-screen delivery information for the current job, which seemed to interrupt drivers as they were reading specific information about where to complete the delivery. Drivers generally liked this system as it facilitated work continuity and could minimise delays between jobs. However, this also appeared to increase time pressure to complete the current task, and drivers seemed to work faster in this moment. Furthermore, drivers had to make decisions about accepting the next job while completing these tasks.

#### ***Ride-along: 5 pm on a Thursday evening***

As we were approaching the delivery location, the driver leaned forward and started scrolling through the app interface to read the delivery instructions – he would switch back and forth between reading the delivery instructions and scanning the road to find the correct street to turn down, determine parking availability, and find the address.

When we were around 100 m away from the destination a notification appeared on-screen indicating a new delivery task. This notification covered the screen, hiding the current delivery's instructions. The driver promptly accepted this new task without much scrutiny and went back to reading the original delivery instructions and messaging the customer that he was close. He began to drive faster – at a speed I felt to be too fast for the conditions; I assume because the new delivery task was now active. The rest of the delivery was conducted at high speed, with frequent map and app interaction in between scans of the road environment.

It felt to me that the timing of this new task notification added pressure and distraction in what was already a point of the delivery that most required the driver's concentration and interaction with the app.

#### 4.3.4 Mental load and distraction

Many of the factors mentioned in this section have illustrated the mental load experienced by gig drivers. Many indicated the job was significantly more complex than they had initially thought, and their work was not well understood by the public.

Near misses and the potential for road incidents required a high level of awareness from drivers. They spoke about holding onto the fear of near misses well after their shifts had ended, often reflecting on what could have been. Other road users were also a source of stress.

*That's my biggest fear ... cyclists or electric scooters ... I've probably had 20 or 30 near misses, like the one today, where you see them at the last second ... the after effect of that is that it's on your mind for a while ... half an hour later I'm thinking ... what if I'd hit him? (Gig driver)*

As discussed, the constant need to interact with apps added further to mental load. Tasks included reading maps, receiving new jobs, messaging customers, and calculating whether a job offered sufficient remuneration. During busy times drivers were under pressure to navigate the physical environment, customers, and the demands of the apps. During quiet times, they spent long periods of time waiting, cruising, and concerned about not making money. A commonly heard sentiment was that time not making money was time losing money.

Some drivers described feeling mentally overloaded and stressed at the end of a shift. However, some described reflecting after each shift on how they could have improved performance, efficiency, and customer satisfaction.

One feature of the platform apps is specifically worth noting. Food delivery drivers may be asked to deliver alcohol, which means the driver is required to verify the licence of the customer before hand-over. Issues with licence verification on the app would leave the driver with the responsibility of denying alcohol to customers, some of whom were already drunk, or large groups of people thought to be underage. One strategy reported for dealing with such a situation was to ask for additional identification and then to immediately leave when the customer left to retrieve it.

Drivers explained to the researchers that the stress and mental load experienced from gig work increased feelings of tiredness. Drivers indicated that the long shifts, stressful work, and mental overload was tiring. Rideshare drivers noted their attempts to self-manage their tiredness during a shift, such as napping at petrol stations or while their electric vehicle was charging, and one driver mentioned using energy drinks. Drivers also indicated it was difficult to plan adequate breaks given the unpredictable nature of when tasks would be offered. Some drivers noted they would often feel sleepy while waiting for rides.

### ***Ride-along: 7 pm on a Thursday evening***

While sitting in the car waiting for a task to appear, the gig driver began describing to me various aspects of gig work that he said people don't usually think about. He described how, when evaluating a task the app offered, you needed to know the specific restaurant and how quickly they prepared food to be ready, what parking availability was like at the pick-up and delivery addresses, and what routes to take to minimise delays. He mentioned always considering the possibility that the customer would be rude to him, and recounted experiences of racism. He noted the boredom and stress experienced on quiet nights, with long periods of sitting around waiting for tasks. He mentioned that when a task was eventually offered, he had to 'switch on' and work fast, and that's why he would feel agitation when waiting longer than anticipated at restaurants, or when other road users would slow him down. If he didn't complete enough deliveries in a shift, he would continue feeling frustrated at home afterwards.

After describing all of this to me, he said:

*It sounds very tiring, doesn't it? It is very tiring ... I guess I'm just used to it.*

### **4.3.5 Driving behaviours**

We observed gig drivers exhibiting a range of potentially risky driving behaviours. U-turns completed across busy roads were commonly observed. While drivers typically indicated before a U-turn, they often edged onto the road from a parked position to make their presence and urgency known to other road users. There were a number of situations where other road users appeared hesitant and unclear about the drivers' intentions, some choosing to speed up to pass the driver or to brake, to let the driver turn. Rideshare drivers were also observed pulling into parking spaces suddenly and without much warning and then interacting with their mobile phones while the car was still running. Gig drivers were observed using their hazard lights frequently, often when stopping in illegal places. Other risky driver behaviour observed included frequent edging towards other vehicles in traffic, quick lane changing without adequate warning, honking their horn at vehicles in front as soon as a traffic light turned green, and quick reversing. While these fast and opportunistic behaviours appeared calculated, there were instances when other road users had to react defensively. In one instance observed, a pedestrian was required to quickly move out of the way of the driver's vehicle.

*I've been doing rideshare for seven years now. I've had four accidents. (Gig driver)*

We observed various driving styles among the four food delivery participants we accompanied. While U-turns were common, some drivers displayed a generally calm and considerate driving style, while others appeared to drive fast, opportunistically, and with a belief that other road users should accommodate them. Different style appeared linked to a driver's motivation for doing gig work, the driving environment, and personal driving style. Drivers more dependent on gig work for income described the need to work quickly in order to make sufficient money, with the number of jobs completed per hour critical. These drivers admitted that it was difficult to drive safely and legally, while also seeking to maximise income. One stated that if he did not make illegal shortcuts and manoeuvres then his income per shift would not be worth the time spent working.

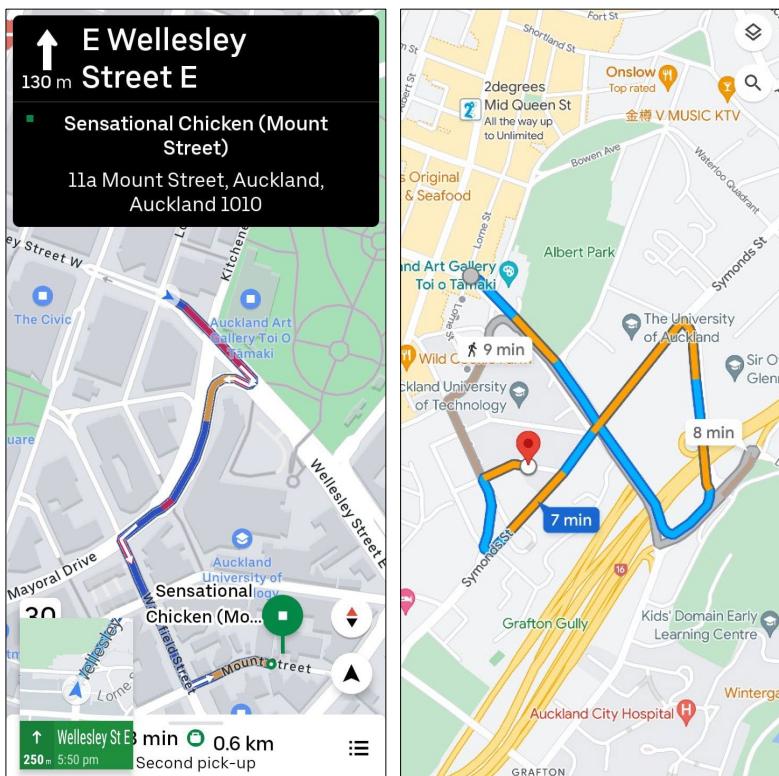
**Observation: 7:30 pm on a Thursday night**

We stood and watched as a gig driver pulled over and double-parked to let a passenger out of the vehicle. The gig driver quickly drove off and pulled up behind another vehicle stopped at a stop sign. The gig driver barely waited before becoming frustrated and holding down his horn. The driver in front pulled into the intersection and turned left. The gig driver proceeded to drive at high speed straight through the intersection without stopping and without seeming to check left or right. The gig driver then quickly made a turn at the next intersection. We were surprised to see such an obvious disregard for the road rules and other road users.

Food delivery drivers noted the pressure of customer expectations, such as delivering the food on time and making sure the food remained hot. As a result, safety-critical decisions were often made under pressure. Rideshare drivers also indicated that while food delivery drivers might generally have a sense of which restaurants and areas they should be working near, passenger pick-up locations were often random and required sudden changes in driving course when receiving a task. The complexity of the driving environment in the CBD, including narrower roads and higher congestion, appeared to cause more risk-taking behaviour and interaction with other road users, while suburban driving appeared to be more controlled and predictable.

Drivers noted that the platform apps often directed them to make unsafe U-turns rather than directing them to take a longer route not requiring such a manoeuvre. A screenshot of one such direction was provided by a ride-along participant and is shown in Figure 4.4. Directions for the same route from Google Maps are provided for comparison.

**Figure 4.4** Directions provided by platform app (left) vs Google Maps (right)



*Note.* There is no right turn from Wellesley St East into Mayoral Drive, and the U-turn shown on the map on the left violates the instruction of this signage.

Finally, it was observed that the pace of work varied from shift to shift. Some shifts were busy, with multiple tasks constantly appearing. These shifts require greater driver attention in route planning and the need to work quickly in order to take advantage of the high number of tasks on offer. Conversely, other shifts were slow, with more limited offerings. In these cases, drivers tended to cruise different areas or spend long periods of time waiting.

## 4.4 CAS review

Refer to section 2.7 for methodological description.

### Key findings:

- 203 crashes between 2019 and 2021 were identified to have involved a gig worker. Limitations in the CAS dataset mean this is likely to be an under-representation of all gig worker crashes in CAS within this time period.
- 67% of the gig worker crashes were non-injury crashes, 27% minor crashes, and 6% were deemed serious. The majority of crashes involved gig drivers being hit by another vehicle.
- Written crash descriptions showed some crashes were attributable to features of gig work, including U-turns and rapid changes of direction in response to a new job.
- A number of collisions involved pedestrians, with pedestrian intoxication a factor.

TCRs for 203 crashes between 2019 and 2021 were downloaded from CAS. The crashes were identified based on keyword searches including names of gig platforms that operate in New Zealand and filtered to ensure that a gig driver was involved. Quantitative and qualitative analyses of the TCRs are presented separately below.

### 4.4.1 Quantitative analysis of the CAS data

Of the 203 gig worker crashes identified, 136 were non-injury (67%), 54 were considered minor (27%), and 13 were deemed serious (6%). The analysis showed an increasing number of incidents mentioning gig platforms over the three years examined: 2019 ( $n = 62$ ), 2020 ( $n = 70$ ), and 2021 ( $n = 71$ ). This slight trend might be explained by an increase in the number of gig workers and growing awareness of gig work among those inputting the data.

The incidents were caused predominantly by rear-end/obstructions (49% of crashes). The other half involved crossing/turning (19%), overtaking (10%), straight-lost control/head on (8%), pedestrian versus vehicle (8%), bend-lost control/head on (5%), with the remainder coded as miscellaneous. The data indicated that gig drivers had primary contribution in 82 crashes (40%), partial contribution in 28 crashes (14%) and no contribution in 93 crashes (46%).

Analysing the crashes by type of gig work showed that 191 involved rideshare gig drivers (94%), 11 food delivery workers (5%), with the remainder 'Other'. Reflecting Uber's current market dominance (Uber, 2021b), 180 crashes involved Uber drivers (89%), 10 involved Uber Eats drivers (5%), 8 were Ola drivers (4%), and the remainder involved drivers using other platforms. Note that Uber is likely to be the most recognisable gig platform to other road users and police officers and Uber drivers may have been incorrectly noted in crash records on occasions.

The data also provides regional location information. Auckland (58%) and Wellington (26%) had the highest number of incidents, followed by Waikato (6%) and Canterbury (5%). This distribution reflects the greater concentration of gig drivers in the larger urban areas.

The crashes occurred most often in a 50 km zone, and only 16 were related to speeding. The low-speed environment likely explains why most crashes were minor. Where speed was a factor, drivers either accelerated by mistake, had sped up to overtake, or were driving too fast to stop in time. Vehicle factors were rarely identified as a contributory factor.

Environmental factors identified as potential contributors to crashes included rain, wet roads, high-distraction or high-density areas, traffic, pedestrian density, darkness, and sunstrike. Road or roadside contributors included high traffic, pedestrian numbers, tight roads, and blind spots due to parked cars and other factors. These factors are not surprising, as they are typical of inner-city location where gig driving commonly occurs.

Of the 203 crashes identified, 34% occurred between the hours of 10 pm and 5 am. The greatest number of crashes in an hour block occurred between midnight and 1 am (16 crashes). This finding clearly reflects that much gig driving occurs late at night and suggests that long hours and fatigue could be contributing factors. For some incidents, total driving hours had been recorded. The driver had been driving for 12 hours in four cases and for 10 hours in three cases; note, however, that crash severity did not appear to be linked to total hours driven in the data available. In all severe cases, the driver had been working between four and nine hours. There are known inconsistencies in the reporting of driving hours and sleep information, and these findings should be treated with some caution.

#### **4.4.2 Qualitative analysis of the CAS data**

A majority of crashes occurred because the gig driver was hit by another vehicle. Other vehicles were often travelling at speed and/or approaching from the opposite direction. Gig drivers were either unable to avoid the crash or were hit as the other vehicle ran a red light or went through an intersection without stopping. At times, the gig driver braked due to stopped traffic or an oncoming emergency vehicle and was hit from behind. These results illustrate the elevated exposure to risk experienced by gig drivers due to the frequency of their driving.

In a number of incidents, vulnerable road users (eg, pedestrians, those on scooters) were hit by gig drivers with the behaviour (including intoxication) of the vulnerable road user a contributing factor. These findings again reflect the high-risk environments that gig drivers often work within (eg, built up entertainment and hospitality precincts, late nights, weekends). In one incident, however, the gig driver had parked illegally in a motorcycle-only space and hit an approaching motorcycle rider while opening their car door.

Gig driver at-fault crashes commonly occurred because they pulled out or drove through an intersection not seeing another vehicle. Drivers reported distraction due to looking for a customer, addressing a notification on the platform app (eg, accepting a job), looking for a house number, or because of direct sun or another vehicle coming at speed. Some incidents occurred because the gig driver blacked out or fell asleep, indicating perhaps a medical event of some type. In the three cases where it was clear a driver had fallen asleep, one crashed at around 6 am after working from 10 pm the night before, another crashed at 3 am, and the third at 1 am. All three crashes occurred during the weekend.

The TCRs provided some information about the role of customers and platform apps in events. For example, gig drivers made U-turns either at the request of the GPS, the customer, or in order to take a job. In some cases, passengers had requested to be let out on the other side of the road requiring a change to the other side or were waiting across a road. In other examples, the driver was waiting for a customer pick-up and was hit by another vehicle. In one case a passenger began to vomit so the driver stopped and was hit from behind.



The TCRs also detailed incidents of gig drivers being abused by passengers and other road users. In one instance, a driver's vehicle was deliberately rammed by another vehicle after they reportedly partially blocked a lane. On another occasion, a bystander threw beer at a gig driver after they had got out of a vehicle to inspect a crash of no fault of the driver. Gig drivers also experienced road rage; in one case, a driver was chased out of a parking lot, and another was punched several times in the face by three passengers.

## 4.5 Review of other data sources

Refer to section 2.8 for methodological description.

### Key findings:

- Passenger (P) endorsements and small passenger service licences (SPSLs) may be useful in supporting estimates of the size of the rideshare sector of the gig economy. However, this dataset is limited in differentiating between gig drivers and other small passenger service drivers.
- Logmate collects driving hours for rideshare drivers driving under a platform's SPSL; there may be privacy requirements that limit regulators' access to Logmate's aggregated data. It may be important to first establish the number of rideshare drivers who are not driving under a platform's SPSL (ie, drivers who do not have systems in place for regular review of their logbooks).
- Platforms collect and store customer complaint data and must notify Waka Kotahi of any incidents deemed 'serious/notifiable'. This dataset largely comprises complaints about driver behaviour; the extent to which road safety related issues are notified through this channel is unclear.
- International studies have shown that electronic transaction data can be used to estimate the size and growth of the gig economy and to estimate worker demographics. In New Zealand, the use of electronic transaction data has been limited to platforms reporting their economic impact.

This section presents the findings from the review of data sources that could be used to better understand gig work in New Zealand and associated road safety risks. The review was limited to four data types (licensing, driver logbook, platform-collected data, electronic transactions) but also includes a brief discussion of parking/traffic infringement and insurance data. It was not within scope to access or analyse any data from any of the sources reviewed.

### 4.5.1 Passenger endorsements and small passenger service licences

#### 4.5.1.1 Data description

P endorsements and SPSLs are one of the few regulatory interfaces with the gig economy currently, and specifically rideshare services. The SPSL is a type of TSL, a licence required to conduct most transport-related operations in New Zealand. P endorsements indicate that the driver is certified to transport passengers; this certification is required by all drivers who transport passengers for work.

Since 2017, gig drivers providing rideshare services are required to register their vehicle as an SPSV and to provide proof of this to platforms before beginning to drive. Drivers apply for a P endorsement on their driver licence, either applying for their own SPSL or registering under their platform's SPSL. Drivers are required to display an SPSL label on their vehicle, which displays the TSL number and indicates the driver is specifically operating a small passenger transport service. These requirements apply to all providers of small passenger transport, such as taxis, private-hire vehicles, and shuttle services.

#### 4.5.1.2 Data collection

Interviews were conducted with two government employees with expert knowledge of the licensing system and its interface with gig work. Gig drivers apply for P endorsements and SPSLs from Waka Kotahi, and this information is stored within internal databases. As part of the P endorsement application, applicants provide personal contact and medical information, consent to a 'fit and proper person' check, and identify whether they will be operating a small or large passenger service. They must have also held a full New Zealand driver licence for at least two years. If applying for a personal SPSL, gig drivers would note in their TSL application that they would be providing a small passenger service and select 'Passenger services' from a list of industries as the nature of their proposed transport service. P endorsements need to be renewed every five years, whereas TSLs do not need to be renewed; the TSL database is therefore a register of all TSL numbers ever issued.

#### 4.5.1.3 Use, access, and availability

SPSL and P endorsement data has primarily been used when dealing with serious complaints about drivers. Platforms are required to inform the transport authority about complaints of a serious nature. When further investigation has been warranted, this data has been used to confirm if the driver was operating with the appropriate licensing.

The available data has not to date been aggregated to report the size of the rideshare sector of the gig economy or to examine potential road safety risks. As SPSLs do not need to be renewed, this database reportedly includes a large number of inactive SPSL numbers (ie, operators who are not currently undertaking any passenger service, alongside active SPSL numbers<sup>18</sup>). Due to both the size of the database and issues surrounding privacy, any review of SPSL numbers to remove inactive drivers would be a large and complex exercise. It is also difficult to discern who are the active drivers within the database at any given time as drivers would be obviously inactive only when they fail to renew their P endorsement after five years. This difficulty may be more common regarding gig drivers due to the transient nature of their work.

#### 4.5.1.4 Strengths and weaknesses

P endorsement and SPSL data have several strengths and could be used to better understand the gig economy. As a requirement for all rideshare drivers, there is some confidence that within the SPSL dataset there will be a register of all active gig economy drivers. The P endorsement data is also linked to driver licensing and vehicle registrations. The regulators interviewed recognised the data could be examined further to identify road safety risk factors (eg, by cross-referencing P endorsement holders' licence plates with traffic offences).

However, it is not currently possible from the data to determine if individual SPSL or P endorsement holders are conducting gig work or if they are undertaking other non-gig passenger service work (eg, taxi drivers, shuttle drivers). This is because 'small passenger service' is the most detailed description of their activity currently collected. Regulators also noted that passenger service operators can work across a range of passenger transport job types – for example, taxi or bus drivers can also work on gig platforms – and that the dataset is not currently granular enough to capture multiple driving jobs undertaken.

While the number of drivers registered under specific platforms' SPSLs can be identified, the proportion of gig drivers who are operating under their platform's SPSL or under their own is unclear. It is likely that the

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<sup>18</sup> Interviewees noted that the register contains around 200,000 TSL numbers, but they estimate around 40,000 active transport service operators (including organisations and individuals).

more engaged and active rideshare drivers in the gig economy have registered individually as this would give them the flexibility to work for multiple platforms without having to apply for multiple SPSLs.

Finally, it is important to note that the requirement to apply for an SPSL is only applicable to rideshare drivers and therefore that this data could not be used to estimate the number of other transport-related gig drivers (eg, food delivery, courier/package/parcel delivery).

#### **4.5.1.5 Future potential/recommendations**

The current SPSL and P endorsement dataset could be used to analyse increases in issuances of P endorsements and SPSLs since 2017 and compare these to pre-2017 trends. While this data would include non-gig work, if there have been significant yearly increases in issuances this could broadly describe growth trends.

SPSL and P endorsement data is also linked to vehicle registrations and driver licences. Analysis of data that is tied to this information (such as parking infringements or speeding offences) by vehicles that have SPSLs or P endorsements could reveal the common types of traffic offences by passenger service vehicles. These findings could be compared to a control group to examine any differences in offence trends. Note that the analysis of aggregated P endorsement and SPSL data would still not be able to identify drivers working in the gig economy. Vehicles that are registered under specific platforms' SPSLs could be a way of further narrowing this data for gig drivers specifically; however, this is unlikely to capture a significant proportion of rideshare drivers and may not capture the most engaged and active ones. The P endorsement and SPSL data will also contain a high proportion of inactive drivers, leading to an over-estimation of the size of the passenger service industry if using this data alone.

Considering that all rideshare drivers are P endorsement holders, key informants suggested surveying a sample of P endorsement holders to determine what proportion are working in the gig economy. However, further enquiry suggested that privacy requirements would limit the feasibility of such an approach.

The usability of SPSL data could be enhanced by requiring further information in the application process to determine if a driver is working for the gig economy – for example, through the addition of a 'platform-mediated/app-based work' category. This would allow for more detailed filtering of different passenger transport service types within the SPSL data. Consideration would be needed of how to update existing licences with this new information and how to update these licences if an SPSL/P endorsement holder primarily working in non-gig work began working for a gig platform. Key informants agreed there was need for a comprehensive review of the SPSL dataset to see if it was working as intended and to remove inactive drivers. The review could consider whether SPSLs should be required to be renewed and whether P endorsements should be renewed more frequently.

## **4.5.2 Logmate**

### **4.5.2.1 Data description**

Logmate is a Waka Kotahi-approved electronic driver logbook and has been identified as a pre-work requirement by platforms for gig drivers driving under a platform's SPSL (ie, if drivers hold their own SPSL they are able to use any Waka Kotahi-approved logbook method). These drivers are required to download the Logmate app on their phones and register on it their work vehicle with the TSL number of the platform they are working for. Logmate data contains information about start times, hours worked, and finish times.

Data is also collected about days off from driving, and there is provision within the app to record non-driving work hours<sup>19</sup> and log hours by platform if drivers work across multiple platforms.

#### **4.5.2.2 Data collection**

Drivers who drive under a platform's SPSL can complete their record of worktime on the Logmate app and Logmate will automatically send a record of logbooks within a specific time period to the platforms (within 14 days). Platforms are also able to manually view and export their drivers' logbook data via a Transport Operator portal within Logmate. Logmate has provision within the app for enforcement officers inspecting drivers' logbooks. Inspectors can ask the driver to log-in to the app, export a copy of all the shifts that need to be checked, and email themselves a PDF file of this data.

Logmate collects manual worktime entries, but also utilises location tracking with GPS data and date/time values provided by the mobile device to automate as much of the logbook entry process as possible (with input from drivers about start/end/break times etc). Drivers are able to edit their logbooks to fix any inaccuracies made by the automated system and are ultimately responsible for their logbooks.

#### **4.5.2.3 Use, access, and availability**

Regulators acknowledged there is limited data on fatigue within the rideshare sector generally. To date, Logmate data has only been used to investigate individual drivers' worktimes in specific cases. Logmate's privacy policy outlines that worktime records will only be released with the written consent of drivers unless the regulator has made an appropriate request.<sup>20</sup> There have been no known efforts by regulators to access aggregated worktime data from Logmate.

Logbook keeping is reportedly difficult to enforce. Challenges include the sheer number of gig drivers, difficulties enforcing worktime logging for drivers who also primarily work other jobs, and the complexities associated with workers driving for multiple platforms. A representative from the taxi industry interviewed also noted little monitoring of gig driver hours currently.

Platforms are sent reports of drivers specifically driving under the platform's SPSL by Logmate and are only able to see data for their specific platform (ie, have no oversight over Logmate data that is tied to an individual worker who is also working for another platform). By law,<sup>21</sup> platforms are required to: (a) manage the fatigue of passenger transport drivers who log their driving hours under the platform's own SPSL, and (b) keep a record of actions taken if problems have been identified. Platforms also have built-in fatigue management, such as blocking use of their app after the legal limit of continuous driving has been reached. It was beyond the scope of this research to examine how platforms are using and storing both the Logmate and self-collected fatigue data. However, it is understood that platforms are required to keep logbook records for 12 months and, if requested, these records must be available to an inspection officer.

#### **4.5.2.4 Strengths and weaknesses**

Logmate can be a useful tool for understanding the worktime patterns of rideshare drivers as it collects and stores information for a large number of drivers and can be linked to platforms. Provided there is availability and access to aggregated data for regulators, utilising digital Logmate data can alleviate the resourcing issues to manually inspect physical logbooks.

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<sup>19</sup> This is recorded on the app as 'Other duties' and only required to be recorded if you are undertaking *both* commercial driving and other work during a cumulative work period.

<sup>20</sup> Such as for the prevention and detection of crime, apprehension or prosecution of offenders, or if required by law.

<sup>21</sup> See the Land Transport Act 1998, Part 4B for further detail.

There are a number of limitations with Logmate, likely to also apply to other approved electronic logbook systems. While detailed reports can be prepared and sent to platforms, privacy requirements appear to limit the level of investigation regulators have undertaken to date. Individual driver data has been accessed, but this requires a specific request for the data.

While Logmate has measures in place to monitor driving times and keeps record of edits made to logbooks, regulators acknowledge that driver logbooks can be falsified. Drivers may not understand the requirements to record non-driving work or may intentionally withhold this information. Drivers may also hold SPSLs for multiple platforms (and/or a personal SPSL) and may falsely distribute their driving hours spent on one platform across multiple SPSLs. Drivers may also use multiple phones, with Logmate accounts linked to different SPSLs, potentially further obfuscating driving hours. While falsification of gig drivers' logbooks has not been formally investigated and confirmed, the potential for falsification is a clear limitation currently.

Only rideshare drivers registered under a platform's SPSL are required to use Logmate and to have their data sent to the platforms. If a gig driver has their own SPSL, they are required to self-manage their logbooks and may utilise any approved methodology, including physical logbooks. Logmate fatigue data collected from drivers logging driving hours under their own SPSL would not be sent to the platforms. Fatigue management for food delivery and courier/package/parcel delivery drivers is still unregulated.

#### **4.5.2.5 Future potential/recommendations**

Collecting and managing gig driver fatigue data is complex for both platforms and regulators. Because drivers are labelled as independent contractors and some use their own SPSL, platforms accept little responsibility for fatigue management. Platforms only have oversight of work under their platforms and have no visibility of non-gig work or other gig work undertaken by their drivers. A more centralised and complete picture of an individual gig driver's driving hours would require the sharing of fatigue data among platforms and other driving-for-work industries. A platform representative interviewed noted that platforms have the digital infrastructure to allow for this, such as mandatory Logmate use and in-app driving hours collection; however, driving industries (eg, taxis, buses, trucks) may require technological upgrades.

A review of the way SPSLs interface with fatigue management may be warranted. Gig drivers who drive under their own SPSL and conduct work for a platform do not have a review process for logbooks. This data gap directly links to current licensing systems. Further, licensing and fatigue management requirements are thus far only applicable to rideshare drivers. Apart from individual platforms' monitoring app-usage, no fatigue data is currently collected for food delivery drivers, who represent a large portion of the gig economy.

Gig work is often conducted in addition to other work as a source of secondary income, and a more complete view of fatigue may be required. Further attention may be required to ensure drivers are adequately educated about the requirements to log their time, including for multiple jobs and non-driving work.

### **4.5.3 Platform-collected app data**

#### **4.5.3.1 Data description**

Platforms collect a variety of data through their apps (eg, customer feedback and service ratings). Customers are able to lodge complaints on platforms regarding their experience, and platforms are required to keep a register of these complaints. Apps also utilise technology to detect driving patterns and indicators of a possible road safety related event (eg, sudden braking). Platforms utilise telematics and GPS to track driver movements, analyse driver behaviour (eg, rapid acceleration or sharp cornering), provide route advice based on what other gig drivers have typically done, and determine areas/zones of high activity for the task allocation algorithm.

#### 4.5.3.2 Data collection

Complaints data is recorded through customer feedback logged through the app reporting system, either during receipt of the service (eg, during an Uber trip) or after completion of the service. Platforms are required by law to keep a register of complaints<sup>22</sup> for two years and for this data to be available for inspection. If any of these complaints are deemed by platforms to relate to serious improper behaviour,<sup>23</sup> platforms are required to inform Waka Kotahi. The customer feedback system in one platform was found to provide extensive prompts related to reporting various safety issues, such as inappropriate or threatening behaviour, vehicle safety (eg, damaged vehicle), or unsafe driving behaviour.

Crash detection, telematics, and GPS information are collected in real time while drivers are using the app. With crash detection, any sudden stop detected provides an alert to drivers. If the vehicle stop is determined to be too sudden relative to driving speed, or if an unexpectedly long stop is detected during a trip, customers are prompted within the app to confirm their safety and to report any road safety event. Reportedly, responses to this data back to customers are mostly determined by AI; however, incidents are assigned to a human agent if the AI detects key words or phrases that indicate a serious incident.

#### 4.5.3.3 Use, access, and availability

Key informants acknowledged that complaints data receives the most attention from regulators currently. The serious/notifiable events data currently is primarily related to behavioural issues, such as accusations of inappropriate behaviour or sexual offences by gig drivers. To date, there do not appear to have been any road safety investigations based on the serious/notifiable event data.

Analysis of crash detection and telematics datasets have been used overseas to assist platforms to monitor driver behaviour and detect risky driving behaviours (Pai, 2017). GPS features also assist platforms to determine efficient routes for drivers through identifying common driving patterns, identify unsuitable pick-up/drop-off zones, and assist the task-provision algorithm to determine areas of high/low activity.

#### 4.5.3.4 Strengths and weaknesses

The complaints register and serious/notifiable events data has the potential to be further used to better understand gig work and road safety risks. The complaints register would contain a description of driver behaviour and vehicle conditions that have prompted concern from the customer. This data could be analysed and aggregated by gig work type (eg, rideshare or food delivery) to identify risk factors and incidents.

As noted, customer complaints processes appear to be currently largely used to report inappropriate driver behaviour. This reporting is vitally important and should continue. Customers may currently be less likely to report road safety related events through the available channels; for example, there may be reluctance to report what might be considered relatively minor incidents (eg, running low-risk red lights). The platform manager interviewed noted that platforms would only have oversight over the information customers reported. Current guidance from Waka Kotahi to platforms on types of notifiable incidents also appears to be particularly focused on inappropriate behaviour.

Crash detection and telematics data could be useful for identifying the frequency of abrupt stops, or to provide more detailed information about risky driving patterns. Current technologies will have limitations, and

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<sup>22</sup> This register should also include details about the driver, actions taken to resolve the complaint, and any communication with the complainant.

<sup>23</sup> Waka Kotahi guidance to platforms about 'serious complaints' include, but are not limited to, violence, assault, sexual offences, and driving while under the influence of alcohol or other drugs.

there may be risks interpreting the data in the absence of context. For example, through our ethnography, we saw that abrupt stopping prompts on apps often occurred under relatively safe and normal driving conditions. Appropriate severity thresholds, which trigger data recordings, may be required for this data to have value. It is also unclear at this stage as to what level the crash detection information is currently utilised, or if any record of these instances is kept.

#### **4.5.3.5 Future potential/recommendations**

A review of the current complaints register dataset may be warranted to understand the extent to which this channel is currently being used to report road safety related incidents. Interventions to increase customer awareness that incidents can be reported via these channels may be required. If not already defined, regulators may be required to define the severity threshold at which road safety incidents become notifiable.

Any action to increase customers' use of existing complaints channels should be cognisant of the level of scrutiny that gig drivers already feel their work is under from platforms and customers. The extent to which current driver behaviours result from higher-level system factors acting upon drivers must also be considered. Intuitively, the prospect of greater scrutiny of road safety by customers seems positive. However, the fairness of any interventions to enable this must be questioned as long as higher-level system factors exert considerable pressure on driver behaviour. The potential for unintended consequences must also be considered; for example, the risk of customers lodging bogus complaints, should this provide grounds for a refund of the service fee.

Access by government agencies to the GPS and driver-tracking data available to platforms may also help in better describing gig work and associated road safety risks (eg, by describing driving patterns, environments, vehicle movements, and so on). Whether this data could or would ever be available to government agencies was not examined.

Platform apps have the capacity to detect and respond to vehicle movements that might indicate unsafe or risky behaviours or incidents. Due to the limited participation of platform managers in this research, we have limited understanding of whether, how, and to what extent this capability is currently utilised.

### **4.5.4 Electronic transaction data**

#### **4.5.4.1 Data description**

Following limitations in traditional measures (see section 3.5), electronic transaction data has been identified as a data source to estimate the size, growth, and impact of the gig economy (Senate Select Committee on Job Security, 2021). Government organisations, researchers, and platforms have used this data to monitor increases in consumer spending for gig economy services and to understand the market impact of gig work (Actuaries Institute, 2020). Electronic transaction data tracking payments from platforms to individuals has also been used to identify profiles of gig workers and determine certain demographics and attributes of this population (Leung, 2020).

#### **4.5.4.2 Data collection**

Electronic transaction data is most commonly collected from a de-identified sample of electronic bank transactions (electronic funds transfer at point of sale (EFTPOS) or credit card transactions) within a sample of individuals and businesses. Samples of electronic transactions made between millions of people and businesses are routinely collected by banks and by consumer spending consultancies such as Quantum or MarketView.

Accessing electronic transaction data typically requires engagement with consumer spending consultancies or banks that will generate reports based on data specifications (eg, over a specified length of time, by

industries/groups of similar businesses, or by consumer segments). This allows analysis of consumer spending trends. Metrics relevant to the gig sector could be used, such as:

- profiles of consumers paying for gig services
- increases in consumer spend in the gig economy over time
- locations where there is higher demand for gig economy services
- the share of the market held by gig platforms compared to other providers (eg, net spending on rideshare platforms versus traditional private transport providers).

Electronic transactions can also be recorded between platforms and individuals, enabling identification of a likely 'gig worker' sample within the dataset. This would enable analysis of changes in the number of sampled individuals generating income via platforms and demographic categories. Platforms also record their own electronic transaction data, containing details such as pay-outs to drivers and merchants, tracking spend by time of day, and location of transactions. This 'private' transaction data is at the discretion of platforms and has been utilised in reports commissioned by platforms to assess their economic performance.

#### **4.5.4.3 Use, access, and availability**

In New Zealand, electronic transaction data has been utilised by platforms to examine their economic impact. These reports may use a combination of 'private' transaction data collected by the platforms themselves and 'public' transaction data available from consumer spending reports. For example, a report commissioned by Uber (New Zealand Institute of Economic Research, 2020) utilised both private Uber revenue data and MarketView electronic transaction data to report the economic impact of Uber Eats on restaurants and on the New Zealand economy. This report found that Uber Eats had contributed towards \$21.5 million more in revenue for the restaurant sector in 2018 and had increased the size of the New Zealand economy by \$162 million. This report has also used transaction data from 2018 to show areas in Auckland and times of day where Uber Eats is in high demand. A similar report in 2021 (Uber, 2021a) utilised platform transaction data to estimate the impact of Uber in New Zealand. The report found that in 2021, Uber Eats created \$88 million in additional value for restaurants – a significant increase from the 2018 figures.

Electronic transaction data available through reports from consumer spend consultancies or banks have been used overseas to examine aspects of the gig economy. Research in the United States (Farrell et al., 2018) tracked payments from online platforms to bank accounts of workers. This analysis found an increase both in families receiving income from platforms (from 2% to 4.5%) and total transaction volume between 2013 and 2018. It also found that by 2018, transport sector platform work was as large as 'non-transport work', 'selling', and 'leasing' platform work types combined.

In Australia, the Actuaries Institute (2020) used electronic transaction data provided by Quantum to analyse consumer spend in the gig economy and transactions made from platforms to individuals. This research found that in 2019, consumer spend in the gig economy had grown to \$6.3 billion, nine times higher than in 2015. By grouping similar gig work platforms together in data specifications, the researchers found that private transport and meal delivery had the largest proportion of gig drivers. They noted that traditional private transport industries such as taxi services had declined in consumer spend by 6% between 2015 and 2019. Demographic data from a gig worker sample based on transactions made from platforms to individuals described a gig workforce consisting of younger workers, students, and formerly unemployed workers. This found that engaging in gig work increased short-term levels of 'affluent expenditure';<sup>24</sup> however, long-term

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<sup>24</sup> In this study, affluence was determined by analysing the purchasing mix of 12 months of transactional behaviour of an individual and also analysing the price-point of the brands from which purchases were made.



risks to financial security remained (eg, participation in gig work appeared to have little impact on future expenditure on life and health insurance, or contributions to superannuation).

#### **4.5.4.4 Strengths and weaknesses**

New Zealand and overseas research shows that electronic transaction data can be used to help describe the size, growth, and impact of the gig economy, primarily by tracking consumer expenditure on gig services. Analyses can also provide information related to location of gig economy demand and the characteristics of consumers using gig services. Analysis of payments made to individuals by platforms can allow for the construction of a 'gig worker' sample within the electronic transaction dataset. Consumer segmentation information within electronic transaction datasets of this 'gig worker' sample can provide the key consumer segmentations that characterise workers in the gig economy. Analysis of spending patterns can also help to illustrate the economic conditions of gig workers.

Electronic transaction data has limitations (Actuaries Institute, 2020), including the amount of data provided. There is limited information available about worker demographics, with the analysis limited to broad segments. Electronic transaction data also provides limited description of the gig work context; for example, whether it constitutes primary or secondary income. The aggregated and anonymised nature of electronic transaction data means the data is reported at a gig work type level (eg, passenger transport, food delivery) rather than a platform-specific level.

#### **4.5.4.5 Future potential/recommendations**

While individual platforms have used electronic transactions and analysis of consumer spend to report their economic impact, there is an opportunity for a more comprehensive analysis of the whole gig economy in New Zealand. International research has shown that this analysis can identify trends at the level of specific gig work types, such as passenger transport or food delivery.

To understand the growth and impact of gig work industries, banks and consumer spending consultancies could provide electronic transaction data to show the consumer spend on platform-based industries (eg, comparison of spend on rideshare services and traditional passenger transport services). Aggregated reports tracking payments from gig platforms to a sample of individuals could be considered.

### **4.5.5 Other data sources**

Interviews with system actors (see section 4.2) and ethnographic data collection (see section 4.3) have highlighted other potential sources of data that can assist in understanding the gig economy.

#### **4.5.5.1 Parking/Traffic infringements**

Gig drivers highlighted frequent challenges with parking compliance during their work. SPSVs (which include the vehicles used for rideshare) have four work-related categories of traffic infringements:

1. causing obstruction for an SPSV available for hire
2. stopping on road for a longer than reasonable amount of time
3. driver not in immediate attendance while in an SPSV stand
4. leaving the vehicle unattended in a designated stopping area.<sup>25</sup>

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<sup>25</sup> These infringements are outlined across a variety of relevant legislation, such as the Land Transport Act 1998 or Land Transport Rule: Operator Licensing 2007. These can be found in more detail at <https://at.govt.nz/infringements-fines/vehicle-infringements/>.

Analysis of the issuances of these infringements by area could reveal locations that pose specific parking challenges for passenger transport drivers.

There would be challenges analysing these SPSV parking infringements, or any vehicle-related traffic offences (such as generic parking infringements or speeding fines), as these are not linked to the occupation of the driver. While it may be possible to cross-reference vehicle registration information recorded for parking/traffic offences with SPSL or P endorsement data, this will only confirm passenger transport vehicles, and may be limited in differentiating between rideshare gig work and other small passenger transport services. Further, parking/traffic infringements data will not be able to be used to determine other non-rideshare gig work. Key informants noted a current national review of parking compliance data. Such a review could examine the number of SPSV infringements issued or could provide a collated dataset of parking infringements from which SPSL and P endorsement data could be used to confirm gig drivers driving under a platform's TSL.

#### 4.5.5.2 Insurance

Review of gig platforms' pre-work requirements showed that drivers are required to provide proof of vehicle insurance and be listed as the primary insurance holder. Information provided on the required minimum insurance cover varied – for example, Uber and DiDi require a minimum of third-party insurance,<sup>26</sup> while the Ola website implies drivers need commercial insurance (and list 'rideshare' as the specific service). Commercial insurance data could be a source of information about rideshare drivers; however, further research would be needed to understand whether the data would be accessible.

A 2021 article from the Australian and New Zealand Institute of Insurance and Finance (Stuart, 2021) noted that traditional insurers were often reluctant to provide insurance to the gig economy, as risks were relatively unknown. Interviews with driving-for-work system actors in the UK (Ward et al., 2020) also highlighted a concern that gig drivers did not have correct vehicle insurance. To utilise insurance data as a source of information in the gig economy, further understanding of the types of insurance rideshare drivers have, or improving education about insurance requirements within the sector, may be warranted.

## 4.6 Online survey of gig drivers

Refer to section 2.9 for methodological description.

### Key findings:

- 197 gig drivers responded to the online survey. 53% reported rideshare as their primary type of gig driving, and 86% used cars most commonly.
- 71% of respondents reported work flexibility as a common motivation for undertaking gig work.
- While the majority of respondents self-reported a high degree of knowledge related to managing their fatigue, 57% reported frequently driving long hours to earn enough money, and 54% reported experiencing long periods of the same type of driving; both factors indicate the risk of experiencing tiredness during a shift.
- 64% reported frequently checking app notifications while driving, indicating the risk of distraction.

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<sup>26</sup> Uber recommends engagement with an insurance advisor to determine if commercial insurance is required.

- Other commonly identified road safety risk factors included exceeding the speed limit (33%), picking up and dropping off in unsafe or illegal positions (25%), and having a near miss (22%).
- 32 respondents reported a road accident in the last 12 months, with 8 reporting injury to themselves and 5 an injury to someone else.
- 38% reported experiencing physical pain or discomfort as a result of their driving, and 28% reported mental or physical fatigue. Only 20% reported a sense of community with other drivers.

This section presents the findings from the online survey of gig drivers. The base (denominator) is shown for each analysis as required. In cases, columns and rows may not total 100% due to rounding or because multiple responses were possible. Non-responses are excluded from some analyses.

## 4.6.1 Background

### 4.6.1.1 Demographics

Survey respondents were asked to provide demographic information related to gender, age, location, ethnic group, and education. The detailed results are found in Table 4.1 below. Between 12% and 19% of survey respondents did not provide a response for each demographic question.

**Table 4.1 Demographic characteristics of gig driver survey respondents**

Characteristic	Category	%
Gender	Male	63%
	Female	21%
	Other gender identity	1%
	Prefer not to say	16%
Age group	15–17	1%
	18–24	5%
	25–30	15%
	31–40	28%
	41–50	13%
	51–64	20%
	65+	7%
	Prefer not to say	12%
Ethnicity	Pākehā	36%
	Māori	9%
	Pasifika	5%
	Indian	17%
	Chinese	4%
	Other Asian	9%
	Other	9%
	Prefer not to say	18%

Characteristic	Category	%
Location of gig work	Auckland	50%
	Wellington	11%
	Canterbury	8%
	Waikato	7%
	Bay of Plenty	3%
	Otago	3%
	Other <sup>a</sup>	7%
	Prefer not to say	15%
Education	No qualification	3%
	Secondary school qualification	16%
	Postsecondary diploma/certificate	19%
	Bachelor's degree	29%
	Post-graduate degree	14%
	Doctorate degree	1%
	Other	0%
	Prefer not to say	19%

<sup>a</sup> Gisborne, Hawke's Bay, Marlborough, Northland, Taranaki, West Coast, Whanganui; 1% of respondents for each.

#### 4.6.1.2 Working context

Survey respondents were asked about the context of their gig work, including platforms worked for over the last 12 months, whether gig work constituted full- or part-time employment, hours worked per week, and length of time working in the gig economy. The detailed results are found in Appendix H (Figures H.1 to H.4).

Over half of survey respondents indicated having worked for Uber (54%) in the past 12 months. Close to one-third (29%) also indicated working for Ola and Uber Eats. Gig work was reported as either the main job (37%) or a form of secondary income (38%) by a similar number of respondents.<sup>27</sup> The number of gig work hours weekly varied with similar numbers reporting 0–15, 16–30, or 31–40+ hours per week. The length of time doing gig work in New Zealand also varied, with 1–2 years the most common (18%).

While Uber was the platform most commonly worked for, a range of platforms were identified. Similar numbers of respondents worked less than 15 hours per week for additional income as those who worked 30+ hours with gig work being their primary sources of income.

#### 4.6.1.3 Gig work types and vehicles

Respondents were asked to identify all types of gig work undertaken in the last 12 months as well as the type most frequently undertaken and which required use of a vehicle. The most common form of gig work was passenger transport/rideshare work (44%), with food delivery also common (41%) (Table 4.2).

<sup>27</sup> The remaining 25% of respondents either preferred not to say or skipped the question.

**Table 4.2** Types of gig work done over the last 12 months

Type of gig work	All types of gig work undertaken in the last 12 months (%)	Main type of gig work undertaken in the last 12 months (%)
Passenger transport/rideshare	44%	53%
Food delivery	41%	40%
Courier/package/parcel delivery	14%	7%
Healthcare	3%	0%
Other	3%	0%

Note. The base is the total number of respondents to the survey ( $n = 197$ ).

Table 4.3 shows that cars (86%) were the vehicle type most commonly used to conduct gig work, followed by van, ute, or a light truck (8%). Perhaps not surprisingly, few respondents reported the use of other vehicle types such as bikes. While this result might reflect our general difficulty recruiting gig workers to the survey, characteristics of the New Zealand context would suggest there is limited gig work conducted by bike currently. These include the limited density of urban areas (meaning it is less feasible to conduct gig work by bike) and that rideshare is the predominant gig driving service currently available.

**Table 4.3** Type of vehicle used for main gig work type over the last 12 months

Vehicle type	%
Car	86%
Van/ute/light truck	8%
Moped/scooter	2%
Motorbike	2%
E-scooter	1%
Non-electric pushbike	1%
E-bike	0%
Heavy vehicle	0%
Other	0%

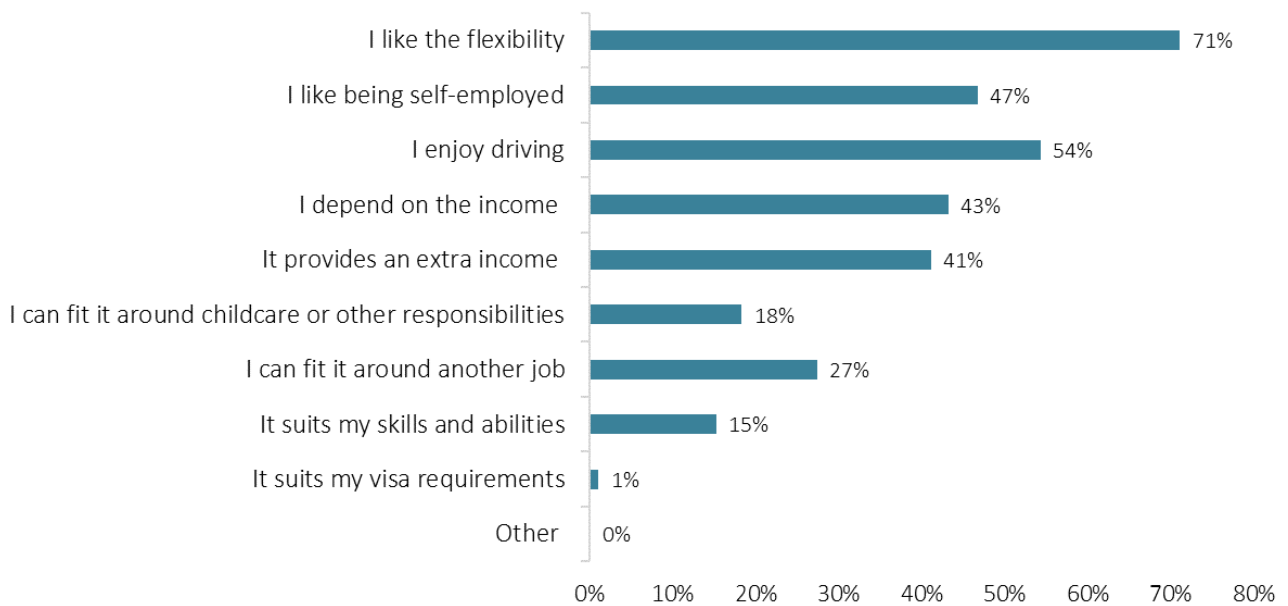
Note. The base is the total number of respondents to the survey ( $n = 197$ ).

## 4.6.2 Operating as a gig driver

### 4.6.2.1 Reasons for undertaking gig work

Prompted with a list, survey respondents were asked to identify the reasons they undertook gig work (Figure 4.5). The majority identified the flexibility of the work (71%), while close to half (47%) identified the opportunity to be self-employed. Over half reported they enjoyed driving (54%). Financial reasons were also reported, including being dependent on the income (43%) and that gig work provided additional income (41%). Only 15% of respondents reported that gig work suited their skills and abilities.

**Figure 4.5 Reasons for undertaking gig work**



Note. The base is the total number of respondents to the survey ( $n = 197$ ).

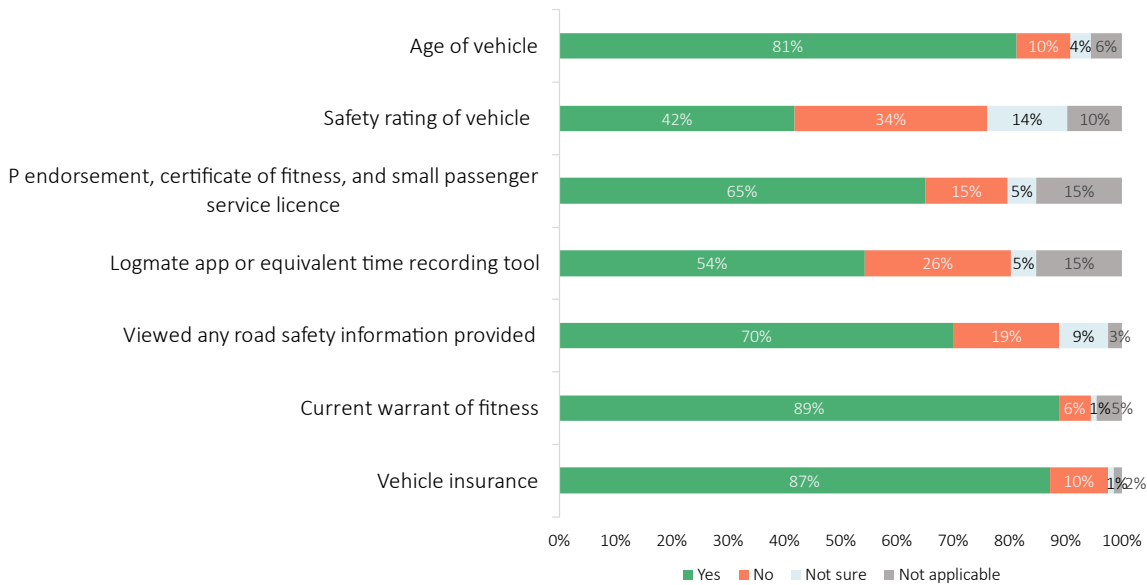
#### 4.6.2.2 Preparation

Respondents were asked if they had provided any evidence on the safety of their vehicles and had engaged in any other road safety checks prior to beginning gig work (Figure 4.6). Apart from the safety rating of their vehicle, the majority of respondents reported they had provided evidence or had experienced safety checks – ie, had provided evidence of a current warrant of fitness (89%), appropriate insurance (87%), and vehicle age (81%).

Certain checks were specific to passenger transport/rideshare; these included having a P endorsement, a certificate of fitness, an SPSL, and the requirement to download Logmate or other equivalent time recording tools. Similar proportions of respondents who had mostly undertaken passenger transport/rideshare reported they had provided proof of these requirements.

Almost one in five (19%) respondents reported they had not been required to provide proof of having viewed road safety information and 9% were not sure if they had. This suggests a possible gap and potential development opportunity that could be explored in the pre-work induction process.

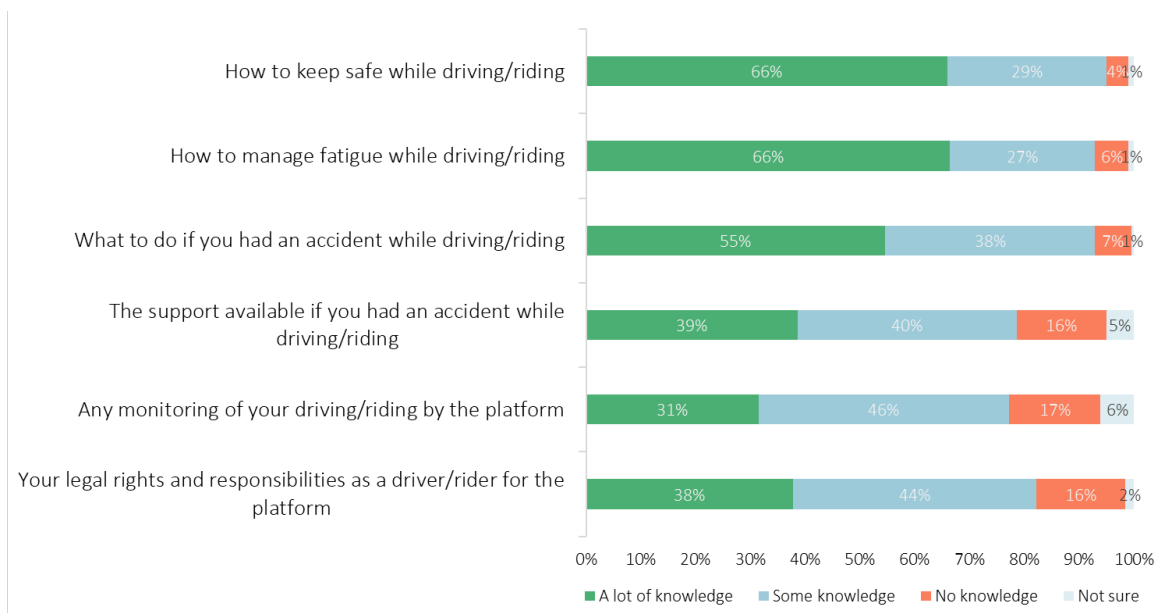
**Figure 4.6 Pre-gig work vehicle and road safety checks**



Note. The base is the total number of respondents to the survey (n = 197).

Respondents were asked about their knowledge of work-related road safety prior to starting their gig work and how much interaction with the platform they had regarding road safety (Figure 4.7). Two-thirds (66%) of respondents reported ‘a lot of knowledge’ about how to keep safe and how to manage fatigue while driving or riding. Respondents most commonly reported ‘some knowledge’ regarding aspects of road safety related to their platform, such as supports available should they have an accident (40%), any monitoring of their driving or riding (46%), and their legal rights and responsibilities as a driver or rider for their platform (44%). On all aspects of road safety knowledge examined, a proportion of respondents reported no knowledge, with this most notable in regard to the monitoring of their driving or riding (17%).

**Figure 4.7 Pre-gig work road safety knowledge**



Note. The base is the total number of respondents to the survey (n = 197).

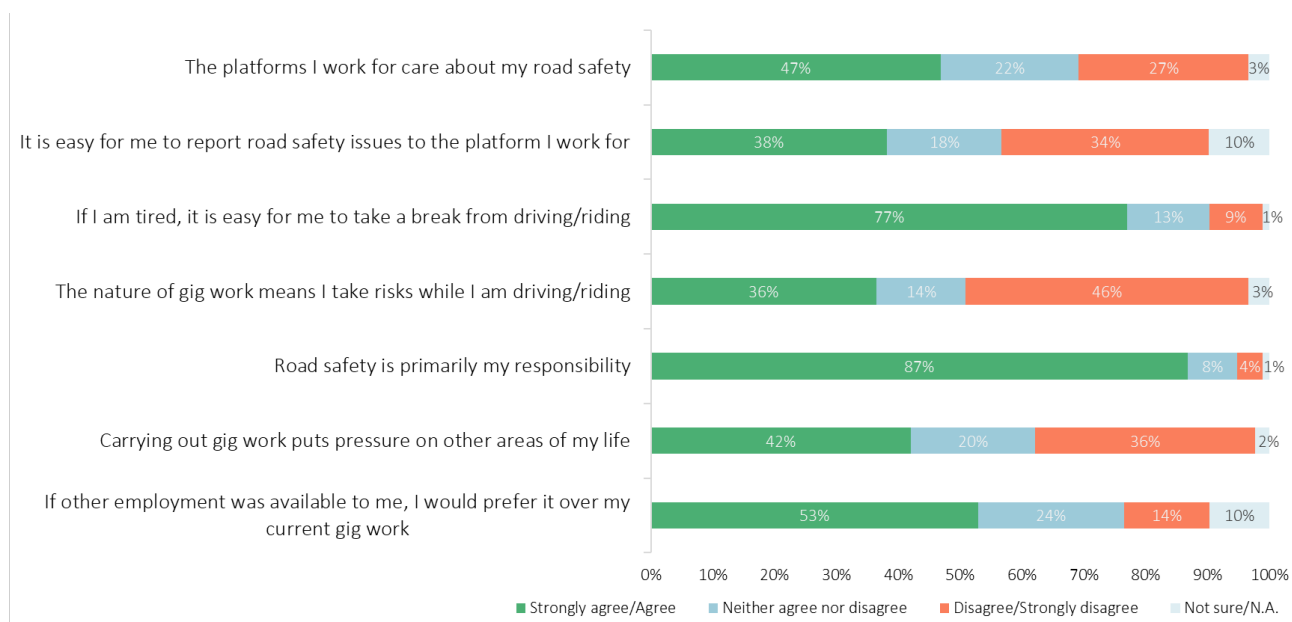
### 4.6.2.3 Being a gig driver

Respondents were asked about their level of agreement or disagreement with several statements about gig work and road safety (Figure 4.8). The majority (87%) agreed or strongly agreed that road safety was primarily their responsibility. Consistent with this finding, over a quarter (27%) disagreed or strongly disagreed their platforms cared about their road safety, and over a third (34%) disagreed or strongly disagreed it was easy for them to report road safety issues to their platform.

Over three-quarters (77%) of respondents agreed or strongly agreed it was easy to take breaks from driving if they were tired. Respondents were more divided on whether the nature of gig work led to risk taking while driving or riding (46% of respondents disagreed and 36% agreed). Consistent with the FIRST Union survey (Rosentreter & Miller, 2021), over half (53%) of respondents indicated they would prefer other employment over gig work if this was available to them.

Analysis by primary type of gig work showed that those in courier/package/parcel delivery work were more likely to feel that platforms cared about their road safety and that it was easier to report road safety issues to platforms (compared to passenger transport/rideshare and food delivery). As noted in the method (section 2.9), differences were not tested for statistical significance and should be considered indicative only. Note that few respondents to the driver survey reported courier/package/parcel delivery as their primary type of gig driving. Those mostly undertaking passenger transport/rideshare and food delivery were more likely to agree that gig work placed pressure on other areas of their life and that they would prefer alternative employment. These results are again indicative only; they provide some initial insight into how the work context and experience might differ by different types of gig work.

**Figure 4.8** Level of agreement regarding statements about gig work and road safety



*Note.* The base is the total number of respondents to the survey, with 'no responses' excluded from the analysis ( $n = 173-175$  depending on the statement).



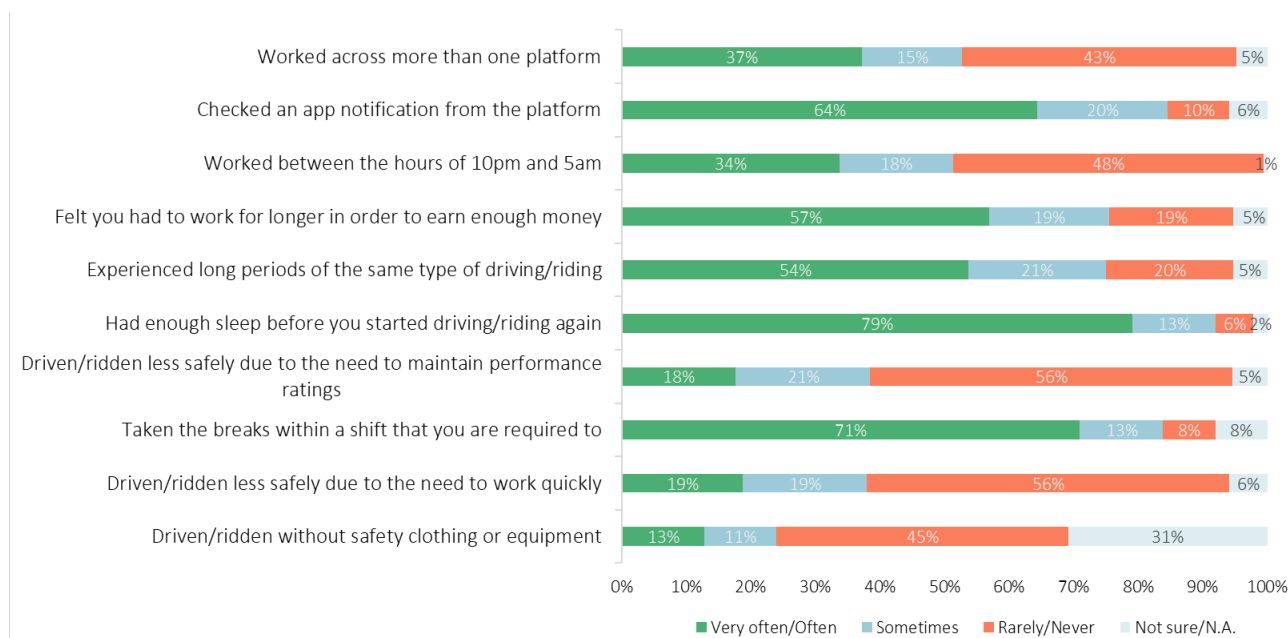
### 4.6.3 Gig work and road safety

#### 4.6.3.1 Driving or riding as a gig worker

Respondents were asked whether and how often they engaged in a range of behaviours or had specific experiences while driving or riding for their gig work (Figure 4.9). All the behaviours and experiences examined were known from the literature or hypothesised as potential road safety risk factors. The majority of respondents reported often or very often checking an app notification from the platform (64%), feeling like they had to work for longer to earn enough money (57%), and experiencing long periods of the same type of driving or riding (54%). The majority reported the same for having enough sleep before starting driving (79%) and taking required breaks during a shift (71%). These later findings relate to fatigue self-management and appear consistent with the finding that most gig drivers see road safety as a personal responsibility and take breaks when they feel they need to. However, the frequency at which drivers report driving longer hours to earn enough money and experiencing long periods of the same type of driving suggests that tiredness may accrue during a shift. With around two-thirds of respondents reporting frequently checking app notifications while driving/riding, this also indicates a source of distraction and further cognitive load during a shift.

About 40% of respondents reported they drove less safely either sometimes, often, or very often due to the need to maintain performance ratings or to work quickly. Analysis of these findings by primary type of gig work showed that passenger transport/rideshare workers more frequently reported almost all behaviours, notably working across multiple platforms and feeling they had to work longer to earn enough money. Food delivery drivers were slightly more likely to report that they often or very often drove less safely due to the need to work quickly, a finding which might suggest unique time pressures on food delivery drivers compared to passenger transport/rideshare drivers. Again, differences should be considered indicative only.

**Figure 4.9** Frequency of behaviours with road safety impacts



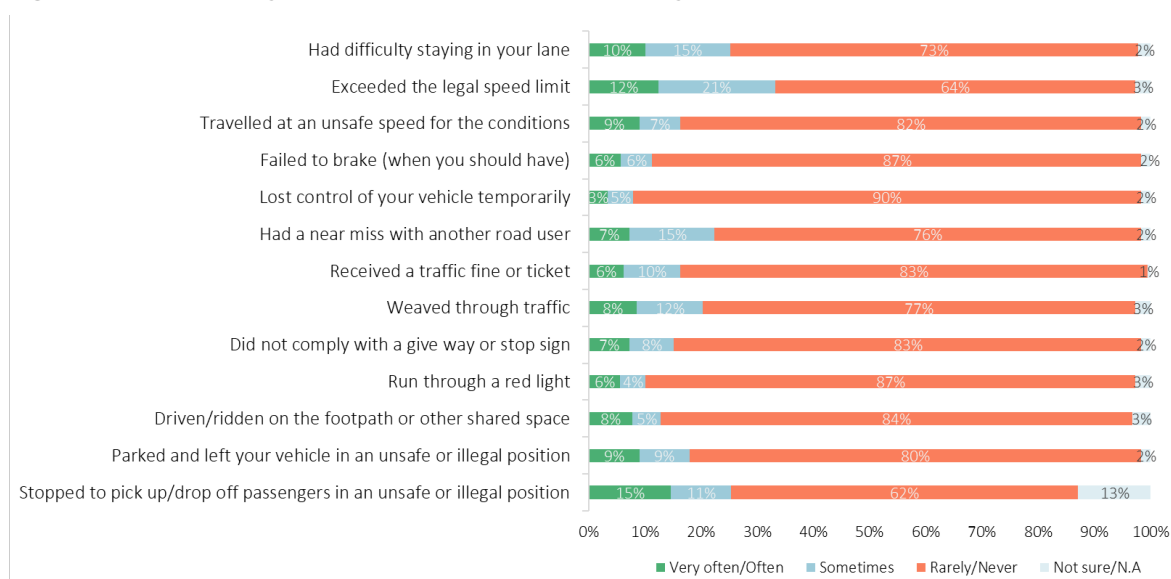
*Note.* The base is the total number of respondents to the survey, with 'no responses' excluded from the analysis ( $n = 186-188$  depending on the behaviour).

### 4.6.3.2 Road safety outcomes

Prompted by a list, respondents were asked whether they had experienced a range of adverse road safety events while driving or riding for their gig work (Figure 4.10). While most respondents reported either rarely or never experiencing most events examined, some experience was reported for each. Exceeding the legal speed limit was most commonly experienced (33% either sometimes, often, or very often) followed by stopping to pick-up or drop-off passengers in an unsafe or illegal position (25%), having difficulty staying in the lane (25%), or having a near miss with another road user (22%).

When these findings are broken down by the primary type of gig work, similar trends were found. However, food delivery drivers were slightly more likely to report they had experienced all the events either often or very often, particularly exceeding the legal speed limit. Again, these results are indicative only.

**Figure 4.10 Frequency of actions with adverse road safety outcomes**



*Note.* The base is the total number of respondents to the survey, with ‘no responses’ excluded from the analysis ( $n = 177-179$  depending on the action).

Respondents were asked if they had been involved in any road accidents, of any severity, over the last 12 months while driving or riding for gig work. Thirty-two respondents reported an accident of some type (Table 4.4) with over half (59%) of these reporting a single accident (see Figure H.5 in Appendix H). Similar proportions of food delivery drivers (15%) and passenger transport/rideshare drivers (18%) reported an accident, with only one courier/package/parcel delivery driver also doing so.

**Table 4.4 Involvement in road accidents while driving or riding for gig work in the last 12 months**

Response	%
Yes	16%
No	73%
Not sure	2%
Prefer not to say	1%
No response	9%

*Note.* The base is the total number of respondents to the survey ( $n = 197$ ).

Respondents who reported a road accident were asked if anyone had sustained injuries as a result (Table 4.5). Eight respondents reported being injured themselves, and five reported injuries to other people. Soft tissue injuries (eg, bruise or sprain) were the most common type of injury reported for both survey respondents (seven cases) and other people (four cases) (see Figure H.6 in Appendix H). Two respondents reported mental injuries or nervous shock as a result of the accident.

**Table 4.5 Road accident resulting in injury**

Response	Injury to self	Injury to other
Yes	8	5
No	21	24
No response	3	3

*Note.* The base is the total number of respondents to the survey who reported being in a road accident in the last 12 months ( $n = 32$ ).

Respondents reporting any road accident were asked if the accident had been reported to any organisations or agencies, including the platform (Figure H.7 in Appendix H). Of the 32 respondents who reported a road accident, 18 respondents noted that the accident had been reported to an insurance company, and 14 reported that the Police had been notified. Only seven respondents reported informing their platform about the accident, and six had not reported it to anyone.

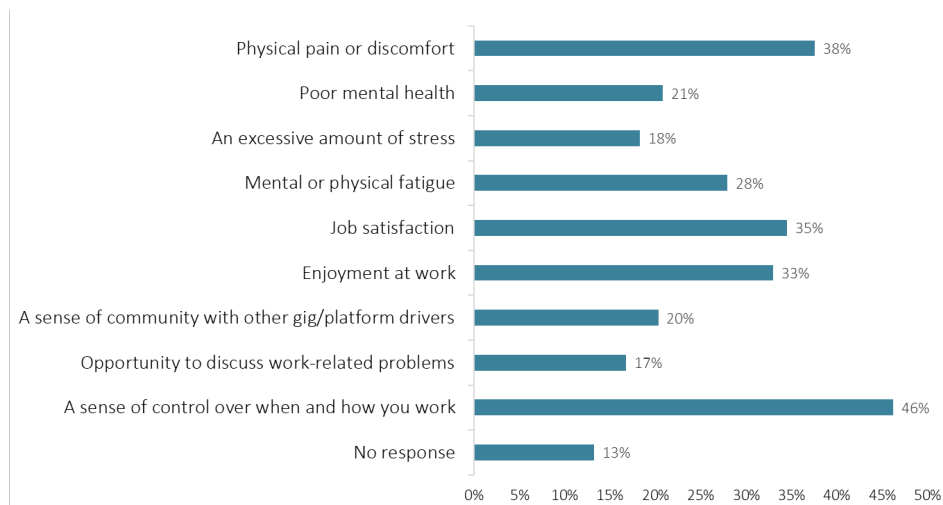
#### 4.6.3.3 Personal health and well-being outcomes

All survey respondents were asked whether they had experienced a range of health, social, and well-being outcomes as a result of their gig work (Figure 4.11). Consistent with earlier findings on the flexibility of gig work, almost half (46%) reported a sense of control over when and how they worked, and around one-third reported a sense of job satisfaction and enjoyment. However, over a third (38%) reported experiencing physical pain or discomfort, and over a quarter (28%) reported mental or physical fatigue. Only one in five reported feeling a sense of community with other gig drivers, and only 17% reported the opportunity to discuss work-related problems; both findings suggest limited access to any sense of workplace support.

Analysis of these findings by primary type of gig work found that passenger transport/rideshare drivers were more likely to report experiencing mental and physical fatigue compared to food delivery drivers, and less likely to report a sense of community with other gig/platform drivers. Courier/package/parcel delivery drivers reported all outcomes more frequently; however, the limited number of these workers in the sample should be noted.

These findings indicate that the mental and physical demands on gig work are commonly experienced and that these impacts may vary by type of gig work. The finding that few gig drivers feel connected to wider workplace culture and support is perhaps not surprising given that the context and structure of gig work is primarily mediated via app-based platforms and is characterised by working alone.

**Figure 4.11 Experience of health and well-being outcomes as a result of gig work**



*Note.* The base is the total number of respondents to the survey ( $n = 197$ ).

#### 4.6.3.4 Road safety risks

Survey respondents were finally invited to respond to two open-ended questions:

1. What is the greatest risk to your road safety as a gig worker?
2. What should be done to improve road safety for gig workers?

Examples of quotes in response to these questions are provided when appropriate.

Thematic analysis of the greatest risk question showed that a third of respondents considered the poor driving of other road users as their greatest risk (Table 4.6). Further, 14% of respondents noted that gig drivers had inherently greater exposure to risk, due to the frequency with which they drive, particularly in peak traffic conditions and other risk conditions (eg, late at night). The lack of safe parking options was also identified, as was fatigue and speeding. Some respondents identified low pay as a risk, requiring drivers to work long hours or work quickly to complete more jobs.

**Table 4.6 What is the greatest risk to your road safety as a gig worker?**

Response	%
Poor driving behaviour by other road users	33%
Unsafe parking options	14%
Generally increased exposure to risk due to frequency of driving, particularly in peak traffic times	14%
Passenger or delivery customer behaviour (eg, rude/threatening behaviour, or requiring unsafe pick-up/drop-off practices)	11%
Fatigue	9%
Speeding	7%
Low pay (eg, requiring longer work hours, or quicker deliveries)	6%
Driving environment (eg, road works, road closures, poor lane markings)	6%
Members of the public (eg, intoxicated pedestrians)	5%

*Note.* The question was asked to all respondents to the survey. The base is the total number of respondents who provided an answer to this question ( $n = 161$ ). Themes totalling below 5% of respondents and responses deemed ‘Not applicable’ (5%) are excluded from this table.

*The biggest risk in my opinion is the incentive to go fast to make more money from more deliveries. If we were paid more, we wouldn't have to work at pace just to earn minimum wage for our time. (Gig driver)*

Solutions offered by respondents to improve road safety for gig drivers are shown in Table 4.7. Strategies to improve road safety education (22%) and parking options (17%) were most commonly suggested. Note that suggestions for further education often lacked detail; for example, for whom. Suggestions related to improved parking included allowing the use of loading zones for deliveries and increasing the number of 'small passenger service' vehicle ranks.

A number of respondents (13%) felt that platforms should provide further support to drivers, including further education and improving employment conditions. Higher pay and benefits were identified (10%) as a response that could enhance road safety; for example, by reducing the need to work long hours and pressures to speed. Improvement to apps were also identified (9%), including updating the map/route with up-to-date road works information, limiting pick-up/drop-off behaviour in areas deemed problematic, or simply increasing the time expectations for completing deliveries. These responses were often related to reducing the pressure on drivers to manage customer expectations regarding pick-up and drop-off locations and expectations around delivery times.

**Table 4.7 What should be done to improve road safety for gig workers?**

Response	%
Road safety education*	22%
Improving parking options	17%
Increased support/governance from platforms (eg, driver training, employment status)	13%
Higher pay and benefits	10%
App changes to improve safety (eg, alternative route assistance, pick-up/drop-off limits, providing more time)	9%
Stricter enforcement (eg, policing, speed cameras)*	8%
Improving driving environment (eg, upgrading road condition, decreasing speed limits)*	8%
Increased regulation (eg, licensing, fatigue management)	6%
Allow use of other lanes (eg, use of bus lanes, special vehicle lanes)	6%

\* Applicable to all road users.

*Note.* The question was asked to all respondents to the survey. The base is the total number of respondents who provided an answer to this question ( $n = 160$ ). Themes totalling below 5% of respondents and responses deemed 'Not applicable' (13%) are excluded from this table.

*I think the company needs to have more of a relationship with the workers. There seems to be a disconnection between the company and the gig workers so increasing the connection would allow us to feel more cared and valued while working. (Gig driver)*

*NZTA and Auckland Transport should coordinate with Uber/Ola and inform them of safe pick-up points so when riders order a trip, they will be directed to the correct pick-up location. NZTA and Auckland Transport need to ensure space allocated for SPSV for pick up and drop off remains free at all times. (Gig driver)*

*We should all have to do a defensive driving course and also our work hours should be checked more. (Gig driver)*

## 5 Socio-technical maps

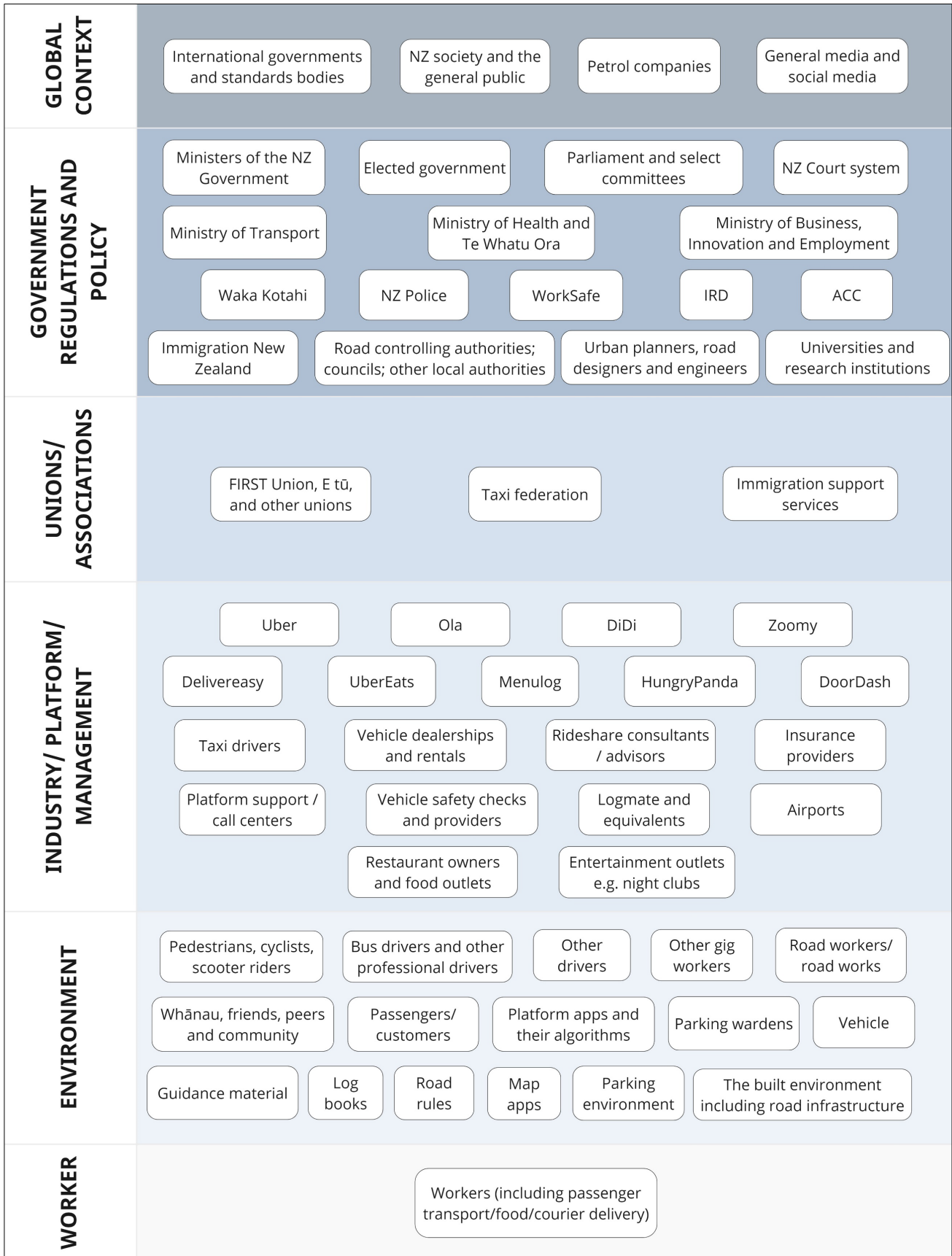
### 5.1 Introduction

The socio-technical system maps presented in this section are a synthesised visual display of all the findings from this research. The maps identify the socio-technical system factors that relate to the gig economy and road safety outcomes within the New Zealand context. Two maps are included in this section: an Actor Map (Figure 5.1) and an AcciMap (Figure 5.2). The latter is accompanied by narratives to highlight the major forces at work and the influences that result (Table 5.1). These maps provide a starting point for the following discussion section where the interaction between the socio-technical factors and the resulting road safety outcomes are discussed in chapter 6. The methods used to create both the Actor Map and the AcciMap are outlined in section 2.10.

### 5.2 Actor Map

The Actor Map (Figure 5.1) shows the person and non-person actors present in the New Zealand gig economy. The actors that sit higher up the map were identified as having influence, whereas those towards the bottom were identified as those that are influenced. The content of this map is the research team's summation of information drawn from the key informant workshop and system interviews.

Figure 5.1 Actor Map



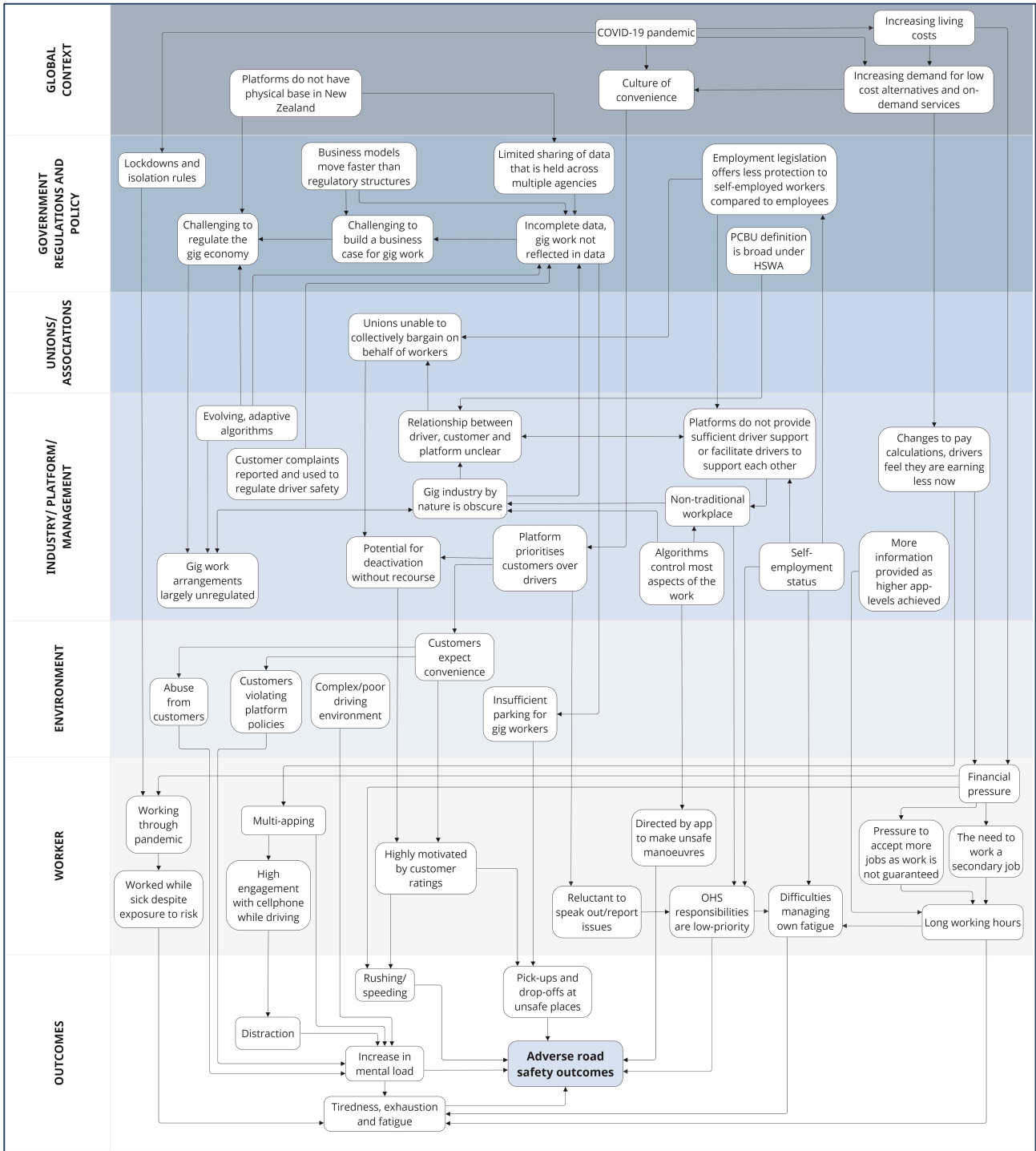
## 5.3 AcciMap

This AcciMap (Figure 5.2) identifies the decisions, actions, events, omissions and/or conditions that have contributed to adverse road safety outcomes in the New Zealand gig economy. While AcciMaps can be developed for a specific incident (outcome), for the purpose of this research the AcciMap below is populated with representative factors that emerged from a thematic coding of the research findings (for method detail see section 2.10.2). The AcciMap therefore concludes with a variety of outcomes that contribute to adverse road safety outcomes in general, rather than one specific outcome.

Please note, this AcciMap is not designed to cover every detail of the research findings. It highlights areas of the system that are not performing well, using generalised factors from the research data. Discussion of the research findings, including nuances in the data, can be found in chapter 6.



Figure 5.2 AcciMap



## 5.4 AcciMap narratives

Table 5.1 provides a narrative to explain how various factors influence each other and have downstream effects throughout the system. These narratives are written as subsections of the complete AcciMap; however, the sections are not mutually exclusive and thus some factors appear repeatedly.

The downstream trajectories illustrate how vertical integration exists within the system. Conversely, feedback (or lack thereof) flowing back up the system is not illustrated within the AcciMap. Instead, the system's failures to feed information up the system and inform appropriate responses by higher-level actors are highlighted throughout this report. For example, see section 4.3.2 regarding drivers highlighting issues that remain unaddressed by gig platforms.

Note: Bolded text indicates key factors that directly correspond to a factor (box) in the AcciMap.

**Table 5.1 AcciMap narratives**

	<b>The link to adverse road safety outcomes</b>
<b>A culture of convenience</b>	<ul style="list-style-type: none"> <li>• There is a growing <b>culture of convenience</b> among the general public for low-cost alternatives and on-demand services such as gig work.</li> <li>• <b>Demand for food delivery increased</b> during the <b>COVID-19 pandemic</b> due to lockdown and isolation rules set by the government. Gig work was a viable option for some during a time when other work was unavailable.</li> <li>• Gig drivers who responded to the increased demand <b>worked through the pandemic</b>, sometimes <b>while sick</b> and despite the exposure to risk, often for financial reasons such as pressures related to <b>increasing living costs</b>.</li> <li>• As pandemic restrictions eased, <b>customers did not always respect platform policies</b> requiring masks or passenger number limits. At times, <b>customers became angry or abusive</b>.</li> <li>• The mechanisms of the app <b>prioritise customers' needs</b>, reinforcing customers' expectations of convenience. Gig drivers are incentivised to meet customers' needs through a rating system, but also reprimanded when customers complain.</li> <li>• Gig drivers are <b>highly motivated by customer ratings</b>, which can sometimes lead to <b>rushing, speeding, and other unsafe actions</b> on the road. Gig drivers make pick-ups and drop-offs or U-turns in unsafe places.</li> <li>• Gig drivers are left feeling <b>tired, exhausted, and fatigued</b> due to <b>long working hours and mental overload</b>.</li> <li>• These risk factors and unsafe behaviours can heighten the risk of <b>adverse road safety outcomes</b>.</li> </ul>
<b>Regulating the gig economy</b>	<ul style="list-style-type: none"> <li>• Many <b>platforms do not have a physical base in New Zealand</b>.</li> <li>• Platform obscurity and the evolving, <b>adaptive algorithms</b> mean that platforms exist in a grey area of legislation. This makes it <b>hard to regulate the gig economy</b>.</li> <li>• It is difficult to regulate the gig economy without a full picture of the nature and scale of the problem. The data that is available is not in one place and is incomplete. This makes it <b>challenging to build a business case</b>.</li> <li>• Data is required to provide evidence justifying the multi-agency response that would be needed to address the complex and obscure arrangements in the gig economy.</li> <li>• <b>Gig work arrangements are largely unregulated</b>. Gig drivers operate in a <b>non-traditional work arrangement</b> and workplace where <b>algorithms control most aspects of the work</b>.</li> <li>• <b>Customer complaints</b> focusing mostly on inappropriate driver behaviour are reported to government agencies. Customers are not as encouraged to report unsafe driving. Customer complaints are also used by the platform to deactivate drivers. This places power with the customer, and potentially leads to <b>termination without opportunity for recourse</b>.</li> <li>• Legislation and <b>regulation do not adequately address gig work arrangements</b>, including the way that platforms design gig work arrangements. There is little regulatory oversight due to <b>limited access to and sharing of relevant data in this sector</b>.</li> <li>• The <b>limited understanding of gig work and gig platforms</b> by legislators/regulators has unknown implications for <b>road safety and risk of adverse outcomes</b>.</li> </ul>

The link to adverse road safety outcomes	
<b>Employment status</b>	<ul style="list-style-type: none"> <li>• <b>New Zealand employment legislation only applies to employees</b> and often relies on employers accepting that their workers are employees. Gig workers are labelled as independent contractors and are therefore considered PCBUs under the HSWA. The <b>definition of PCBU is broad</b>.</li> <li>• The <b>relationship between the platform, the driver, and the customer is unclear</b>. It is also unclear what responsibility platforms have as designers of the work and therefore also as PCBUs.</li> <li>• Drivers being contracted as self-employed workers <b>weakens the ability for unions and others to provide support and collectively bargain</b> on the driver's behalf. <b>Drivers can be deactivated without recourse</b>. There is <b>limited support and information available</b> to gig drivers.</li> <li>• <b>Support is not widely offered by the platforms</b>. Drivers become <b>eligible for more support as higher platform levels are reached</b>. However, reaching these levels requires dedication to the app's requirements, which at times places them under immense pressure to <b>work long and late hours</b>.</li> <li>• Because <b>platforms prioritise customers</b> over drivers, drivers are <b>unlikely to report concerns or ask for help</b> when needed. This adds to the <b>mental overload</b> experienced by drivers.</li> <li>• This mental overload can have implications for <b>road safety risk</b>. Additionally, gig drivers may not know where to receive support or advice when they encounter road safety risk or experience adverse events.</li> </ul>
<b>Increasing cost of living</b>	<ul style="list-style-type: none"> <li>• <b>Increasing living costs</b> are adding to the demand for low-cost alternatives and services, which may partly explain the <b>increased demand for gig work</b>.</li> <li>• <b>Pay calculations in the app algorithms have reportedly changed</b> and drivers feel they are earning less now and having to work for longer to earn enough.</li> <li>• <b>Financial pressures</b> and changes to the pay calculations led to drivers <b>working through the pandemic, working when they felt ill or unsafe, working long hours, and working across multiple platforms</b> to maximise earnings.</li> <li>• Working across multiple apps requires <b>high engagement with cell phones</b> (some using two phones) while driving. <b>App notifications are distracting</b> and require attention to dismiss or accept them. This causes distraction and contributes to a gig driver's <b>mental load</b>. Both factors can increase the potential for <b>adverse road safety outcomes</b>.</li> </ul>
<b>Road infrastructure</b>	<ul style="list-style-type: none"> <li>• <b>Incomplete data</b> on gig drivers means their work patterns and use of the road infrastructure may not yet be fully understood or reflected in city infrastructure.</li> <li>• Currently, drivers feel the infrastructure hinders rather than supports their work, particularly the insufficient parking. Without designated parking areas, drivers are forced to park illegally and risk fines.</li> <li>• <b>Customers expect convenience</b>; they put pressure on drivers to pick them up and drop them off at places most convenient for them. The apps enable this as they often direct drivers to <b>pick up passengers in illegal areas</b> (eg, bus lanes) and only regulate pick-up/drop-off positions at airports.</li> <li>• The <b>algorithms control most aspects of the work</b>. Drivers are, at times, directed to make sudden direction changes such as U-turns and other <b>unsafe manoeuvres</b>. This can heighten the risk of <b>adverse road safety outcomes</b>.</li> <li>• Poor road conditions, traffic, road works, road closures, and other road users also contributed to the <b>mental load</b> and increase the risk of <b>adverse road safety outcomes</b> for drivers.</li> </ul>
<b>Occupational health and safety (OHS)</b>	<ul style="list-style-type: none"> <li>• <b>OHS responsibilities are sometimes a low priority</b> for gig drivers.</li> <li>• Self-employment labels and the <b>broad definition of PCBUs</b> make it unclear who has OHS responsibilities when a driver is working (the platform, worker, or both). This can make it challenging to regulate and enforce OHS responsibilities.</li> </ul>

#### The link to adverse road safety outcomes

- Some workers may have insufficient access to information about OHS and may not be aware of their obligations as a PCBU.
- It is **challenging to build a business case** for OHS enforcement and show potential returns given the lack of data. Enforcement is also difficult because the platforms are not transparent and gig drivers often work across multiple platforms. There is **limited sharing of data** by platforms, so they have no knowledge of any work their drivers do outside of their own platform.
- **Algorithms have control** over most aspects of the work; the design of the work incentivises some gig drivers to maximise their efforts and therefore rewards workers for prioritising pace/intensity over health and safety.
- **Platforms offer minimal support for gig drivers.**
- Long hours are required for gig drivers to earn a sufficient income. This can make it difficult for workers to **manage their tiredness, exhaustion, and fatigue.**
- A largely unregulated system that places the onus on gig drivers to manage their own health and safety has the potential for **adverse road safety outcomes.**

## 6 Discussion

### 6.1 Introduction

This research sought to identify the socio-technical system factors contributing to road safety risk for gig drivers and other road users within New Zealand. Existing international and New Zealand research on gig work and road safety was reviewed, followed by primary data collection utilising mixed methods.

The research advances understanding of the size and nature of road safety risks associated with gig work in New Zealand and the socio-technical system factors involved, as mapped in chapter 5. Understanding has also been developed of the potential utility of existing data sources, not traditionally used in road safety, to further understand gig work and road safety risks.

This section synthesises and discusses the research findings, following the structure of the research objectives.

Section 6.2 addresses the first objective:

- 1. Provide a summary of international and New Zealand research on the subject of road safety outcomes and the gig economy.**
  - a. What are the road safety risks and outcomes for gig economy workers (internationally and locally)?
  - b. What is the potential size of the road safety problem involving gig economy workers in New Zealand?

Section 6.3 addresses the second objective:

- 2. Identify the socio-technical system factors that relate to the gig economy and road safety outcomes within the New Zealand context.**
  - a. What is the context (tasks, norms, management systems, policies, regulations etc) within which gig economy workers undertake driving-related work, and how is this context linked to road safety?

Section 6.4 addresses the third objective:

- 3. Highlight where additional types of data, other than those traditionally used in road safety, might be utilised to better understand the context.**
  - a. What are the opportunities, gaps, and limitations in current data sources?

### 6.2 Gig work and road safety risk

Our review of the international literature confirmed that the road safety of gig drivers is of increasing concern, with risk evidenced by crash and injury data from various countries (Convery et al., 2021). Behavioural risk factors identified in the literature included using mobile phones while riding or driving, working while fatigued, unsafe driving behaviours such as speeding, weaving through traffic and pedestrians, ignoring traffic signals, and impaired vision due to overloaded vehicles (Convery et al., 2021; Rawling & Munton, 2021).

Our review of the local literature showed there is less documented evidence currently of the size and nature of road safety risks for gig drivers and other road users in New Zealand. Our analysis of recent CAS data (2019–2021) identified a slight increase in the number of crashes involving gig drivers over time. Types of crashes most often involving gig drivers were rear-end/obstruction and crossing/turning incidents.

Analysis of CAS data illustrated the elevated exposure to risk that gig drivers experience, due to the frequency of their driving and the times and conditions within which they often work. While the CAS data was

not fully explored to thoroughly identify systemic contributory factors in crashes, increased exposure to system elements was a concern of many gig drivers taking part in this research; other road users and the physical driving environment, including road quality and available parking, were frequently cited as key risks.

While our survey of gig drivers cannot be considered representative of the wider population of gig drivers in New Zealand, the number and relatively low severity of crashes reported by our respondents triangulate with our CAS analysis. Taken together, these findings suggest that gig drivers in New Zealand are experiencing relatively minor crashes currently, and that generally these crashes are resulting in relatively minor injury.

Note, however, that CAS data is limited by significant under-reporting and does not necessarily describe the full range of factors determining risk. Similarly, other events that also describe risk, such as near misses, are not recorded. One in five gig drivers responding to our survey reported experiencing near misses either often or sometimes, a figure that indicates considerable potential for harm. Other findings from this research show that gig drivers are exposed to multiple road safety related risks; the CAS results should be regarded as only one source of evidence when assessing overall risk.

Another caveat to the road safety related findings is that we cannot verify the actual mode share of gig work in New Zealand. However, it is clear that gig drivers using vulnerable modes (eg, motorbike, cycles) are particularly vulnerable in the event of a crash. DSI crashes involving these workers have been the catalyst to significant road safety responses in Australia in particular (SafeWork NSW & Transport for NSW, 2021).

Vulnerable modes are used for gig work in New Zealand (eg, HungryPanda); however, car- and van-based delivery dominate current services. There are likely to be fewer urban environments in New Zealand that support delivery by bike (in particular) and to a lesser extent by motorbike and moped (eg, due to required travel distances). This situation and the fact that much gig driving occurs in low-speed environments likely help to explain the predominance of low-severity and non-injury crashes involving gig drivers currently.

However, this situation also indicates enhanced risk for other road users. The risk of incidents involving pedestrians was commonly reported by gig drivers, and the CAS analysis identified a number of such crashes. Gig drivers have greater exposure to the risks associated with driving late at night and within entertainment precincts; for example, unpredictable pedestrian behaviour due to intoxication.

As noted, gig work using vulnerable modes does occur in New Zealand and may indeed become more common in the future as our urban form intensifies or as urban gig work becomes more common. This research achieved limited reach to those using vulnerable modes, and given the potential for future growth, further targeted research with gig cyclists and motorcyclists may be warranted.

### **6.2.1 Non-standard work and road safety**

A key theme from this research is the link between the design and nature of gig work and road safety risks. The link between non-standard work and adverse health and safety outcomes for workers is well established (Barrett & Sargeant, 2011; Underhill & Quinlan, 2011). The emergence of gig work has added complexity to this relationship; for example, through the use of algorithms to organise work. International court cases have contested the employment status of gig workers with the goal of securing legal protection equal to those in standard forms of work (see Table 3.2 for discussion of rulings in Geneva, California, and the UK). However, the nature and organisation of gig work continues to evolve faster than regulators can keep pace with.

Consistent with previous studies (Christie & Ward, 2018; Senate Select Committee on Job Security, 2021) this research indicates that gig workers can lack access to traditional forms of support such as union membership; organisational support, training and supervision; and collegial support. Our survey of drivers showed that many had limited knowledge of their rights, where they could access support, and what actions they should take in the event of a road safety incident. Similarly, when a dispute arose such as a

deactivation from the platform due to a customer complaint, they reportedly had little support or ability to contest the charges. There could also be a lack of transparency regarding the deactivation decision. This lack of transparency in platform apps and how they operate has been observed in previous studies (Convery et al., 2021).

Understandably, gig drivers in our study described the importance of appeasing customers as far as possible. There was a belief that negative customer ratings or complaints could jeopardise future work opportunities. Drivers also sought to mitigate the risk of conflict with customers, as this could lead to abuse and threats. Our observations of gig drivers showed this could lead to unsafe or risky driving behaviours such as U-turns to pick up customers or to save time, the use of unsafe locations to pick up or drop off customers, and working at pace. These outcomes were highlighted in the CAS data analysis; for example, crashes that resulted from quick changes in direction.

Output-based or piecemeal pay is a feature of non-standard work that has been linked to adverse safety outcomes for workers (Quinlan & Wright, 2008). The literature suggests this type of pay structure encourages working at pace, work intensification, long hours and working while sick or impaired (LaMontagne et al., 2012; Quinlan, 2013; Quinlan & Wright, 2008; Reiman et al., 2015). These actions were evident among gig drivers in this research and were shown to be linked to pay and incentive systems. For example, drivers can feel compelled to take risks to maximise income and to meet performance expectations.

In addition to income pressures, the offer of driving-based gig work is mediated via algorithms designed to maximise labour efficiency. While difficult to fully understand given the scope of this research, drivers described app-based incentive systems that 'rewarded' driver performance with additional access to management support and fuller information about jobs, enabling more-informed decision-making when accepting or rejecting a job. Our results indicate that these systems provide incentives for some drivers to increase trip numbers, accept more jobs, and remain driving for longer.

The key informant workshop and system interviews revealed the challenges that regulators and enforcement agencies face in improving the safety of gig drivers due to their invisibility (on-road and in the data) and limited regulatory protections currently for those in non-standard work. This is why international and New Zealand entities have focused their efforts on employment legislation to regulate and improve gig work, with the expectation this will have positive downstream effects, including on road safety. The 2022 Employment Court decision in New Zealand is an important outcome for improving working conditions and potentially road safety. For example, minimum pay provisions may reduce the pressure on gig drivers to drive for long hours, thus reducing the likelihood of driver fatigue and associated risks.

## 6.3 The socio-technical system and road safety for gig work

This section discusses our findings on each level of the gig work socio-technical system examined in this research and relevant implications for road safety, as described by our findings and displayed using socio-technical mapping techniques in the previous section. The maps, and accompanying AcciMap narratives, have described a myriad of factors that have downstream impacts throughout the socio-technical system and that shape road safety risk for gig drivers and other road users. In addition, our analysis of current data systems has shown a relatively poorly performing system with regard to the generation and feedback of data that describes system performance and that is readily available to decision-makers to inform system improvement.

### 6.3.1 Global context

The COVID-19 pandemic impacted gig work and gig drivers in New Zealand in a number of ways. Some gig drivers described taking up gig work as a result of losing previous employment. Those undertaking gig work prior to the pandemic reported a decrease in the volume of work available, particularly rideshare, as a result of lockdowns. However, in order to maintain income, some drivers continued to work throughout lockdowns. As lockdowns eased but restrictions remained, rideshare workers were exposed to further risk; for example, through customers refusing to wear masks or abide by restrictions on passenger numbers.

An underlying driver to the growth of gig work globally is likely to be a culture of convenience – consumers increasingly expect more immediate satisfaction of their needs and desires, and workers increasingly seek more flexibility within their working arrangements. While this factor might boost supply and demand for gig services, this research shows that customer expectations can add to the work pressures on drivers; for example, expectations that hot food would be delivered quickly and that pick-up and drop-off locations would be of most convenience to the passenger. Expectations are further shaped by the app-mediated offer of service; clearly customer service is prioritised. Drivers described a pressure to work at pace and to take risks, to maintain customer ratings, and to meet app-mediated standards and incentives. Some drivers described this as adding to their mental load – a known road safety risk factor (Dorn & Matthews, 1995).

The research findings also suggest that the general public has limited understanding of gig work or indeed respect for the conditions and requirements under which services are delivered. As noted, drivers described various pressures from passengers and the possibility of conflict and abuse from customers. Our analysis of CAS data and interviews with drivers verified that drivers do experience abuse, including racism, from customers and other road users alike. Drivers explained that driving while frustrated and stressed, and under pressure to appease the customer or break the rules, made them tired and could impair their ability to drive safely. Our observations of gig work as well as our analysis of CAS data further showed how such pressures could lead to unsafe driving behaviours; for example, passenger drop-offs and pick-ups at red lights, and drivers making risky U-turns to collect passengers on the other side of the road.

### 6.3.2 Government regulations and policy

This research has confirmed that current regulatory frameworks are limited in covering gig work, due to the unique characteristics of how gig work is structured and delivered. To date, this has allowed platforms to avoid many of the regulatory requirements placed on other businesses operating in New Zealand. Designing effective regulatory and policy interventions will be difficult while there is uncertainty about the rights and responsibilities of both gig workers and platform actors. Clearly, interventions will need to be tailored to the unique gig work context, and sufficiently adaptive to the evolving nature of the gig sector.

From a socio-technical systems perspective, this research shows that the ‘upstream’ design of gig work and relatively limited regulatory controls currently have ‘downstream’ impacts on road safety risks. This analysis supports the conclusion that responses to mitigate risk are appropriate at a regulatory and policy level.

Key informants confirmed that current data limitations are a constraint to the design and delivery of appropriate interventions. The lack of a centralised data system makes it difficult for individual agencies to build a business case for action. Government representatives reinforced that regulatory and other responses need to be evidence based to meet accountability standards. Evidence is needed to show how investments would make a difference; for example, lower DSIs.

Mapping the socio-technical system of road safety risk for gig work has reinforced the need for collaborative, cross-agency responses, including an improved data system. Other jurisdictions have also recognised these needs (New South Wales Parliament, 2022; Senate Select Committee on Job Security, 2021). This research highlights the need for potential involvement from MBIE, Inland Revenue, WorkSafe, and Waka Kotahi, as



well as those in public health, insurance (including the Accident Compensation Corporation – ACC), and the Police, among others.

This research has highlighted the challenge of collecting data on a cohort of workers whose work is largely organised through non-standard means and which is difficult to identify within current data systems. For a variety of reasons, gig drivers can also be reluctant to draw attention to themselves (eg, due to their precarity), and this may add to their ‘invisibility’. Gig drivers also appear to operate largely as individuals and have limited access to support. Further, the organisation of gig work via apps is often not well understood by workers nor government bodies. This research shows that all these factors add to the vulnerabilities experienced by gig drivers and their invisibility within current data systems.

Gig workers who are self-employed are legally required under the HSWA to ensure, as far as is reasonably practicable, their own health and safety while at work. Many drivers in our survey understood they were responsible for their health and safety and largely considered road safety to be their responsibility. However, this research also shows there are pressures throughout the system that can make it difficult for drivers to maintain their health and safety. Drivers reported that it can be challenging meeting the demands and expectations of gig driving while also maintaining health and safety practices. These findings again point to the need for higher-level system responses to mitigate daily, on-the-job risks.

### **6.3.3 Unions and associations**

It appears that the self-employed label of gig workers reduces the ability for unions to offer support and for gig workers to utilise the leverage available to workers who do belong to unions. An inability to collectivise may also contribute to the relative isolation and limited access to support reported by drivers in our survey. Drivers may also be less likely to speak up without collective support. Regardless of current constraints on access and reach, New Zealand unions are active in seeking to achieve more equitable and supportive working conditions for gig workers.

### **6.3.4 Industry, platform, and management**

This research confirms that app algorithms determine most aspects of the job for gig drivers, including pick-up and drop-off points, time calculations, incentives awarded, and customer ratings. App functions could lead drivers to feel they were being ‘punished’ by platforms; for example, by being offered clearly unprofitable jobs. The threat of low customer ratings could lead gig drivers to drive unsafely and take risks.

Drivers reported that changes in pay calculations meant gig work was less profitable. Drivers relying mostly or solely on gig work for income felt particular performance pressure. Increasing numbers of drivers meant drivers had to work harder to earn sufficient income. Some drivers recognised that if they were paid more, they might not need to work so quickly and for so long, to earn sufficient income.

Drivers often worked across multiple apps to increase job opportunities and minimise downtime. Over half of our survey respondents reported often or sometimes working for more than one platform. Switching between phones and evaluating jobs on different platforms could add mental load and the potential for distraction.

This research has also identified limitations in current systems to monitor the numbers of hours being driven and whether drivers are meeting mandated break requirements. Fatigue management requirements are only applicable to rideshare drivers, and platforms only have monitoring jurisdiction over the drivers actively using their app or driving under their TSL. Further, TSL licensing may also mean that for a large number of drivers, their driving hours are not linked to platforms. Current systems are also limited in accounting for additional non-gig work hours completed.

Drivers responding to our survey reported that it was difficult to report safety issues, and many felt that platforms did not care about their safety. Interviews with drivers revealed a narrative or belief that 'speaking out' could result in deactivation from platforms.

Gig work is promoted to workers on the basis of its flexibility; however, our findings suggest that platform apps have deep, yet subtle influence over gig drivers and that drivers have less flexibility in their work than claimed by platforms. A platform representative interviewed suggested that it was the platform's job to figure out the product features and incentives to encourage people to be safe. However, the platform also limited their involvement to avoid any suggestion that drivers were employees and so that the flexibility of the platform was not compromised.

### 6.3.5 Environment

Various factors make up the immediate work environment in which gig drivers operate, including the vehicle used, road network and infrastructure, and urban form. The driving patterns and behaviours of gig drivers impact other road users, both professional and non-professional. Gig drivers interact with a range of other people in the course of their work, including passengers, customers, restaurant staff, parking officers, and the general public.

Results from our driver survey indicated relatively high vehicle safety standards, certificate of fitness compliance, and compliance with licensing requirements. Some key informants expressed concern about the use of vehicles for gig work that had low safety star ratings. Uber does require rideshare vehicles to be less than 10 years old, an important vehicle safety standard. Some platforms email drivers with reminders; for example, when their certificate of fitness is due.

Gig drivers in high-density central city areas generally drive at low speeds, a likely protective factor in the event of a crash. However, driver reports and our analysis of CAS data showed that pedestrians and other vulnerable road users can be a particular risk in these environments. While our findings indicated that drivers in the suburbs experience a less complex and more stable driving environment, operating in these environments can involve driving in higher-speed environments, including motorways.

Navigating the road environment – including roadworks and closures, in addition to other demands – reportedly adds to the physical and cognitive load experienced by drivers and can lead to erratic and unsafe driving. Road quality and roadworks can result in delays, exacerbating time pressures and adding to frustration, stress, and tiredness. Gig drivers described an accumulation of stress over time due to their repeated exposure to road disruptions and road quality issues. Other road users may be more likely to have 'one-off' encounters with such stressors and may therefore be less likely to experience negative cumulative impacts.

Drivers in this research clearly described stress and risks related to other road users. Road rage, abuse, and racism were reported. Drivers could be blamed for and bear the brunt of actions or outcomes beyond their control. Our analysis of CAS data showed that around half of the incidents identified involved gig drivers being hit by another vehicle.

Other dimensions of the work environment can add further risk. Service demand can be highest and the work most lucrative during poor weather, late at night, and during lunch and dinner time peaks – all factors that may contribute to the risk of fatigue. The pace and intensity of work can also vary considerably. We observed food delivery workers entering an autopilot-like state of rapid behaviours once on a gig – in the vehicle, phone mounted, seatbelt on, and off. Periods of down time, waiting for work, could also be stressful as this was non-paid, and could add further pressure to work quickly once back on a job.

### 6.3.6 Workers

This research reinforced that workers can be attracted to benefits of gig work such as self-employment and flexibility in when and for how long they work. However, we also found that factors throughout the socio-technical system exert considerable pressures and demands on drivers, which in some circumstances can lead to road safety risk. Food delivery and rideshare gig work appears to present unique stressors, yet commonly there is a need to work at pace and under pressure from platforms, customers, and the driving environment. Reported impacts included the need to park in illegal or unsafe positions and needing to drive less safely. About a third of drivers in our survey reported exceeding the speed limit often or sometimes. A quarter reported experiencing difficulty staying in their lane. One in five reported near misses with other road users often or sometimes. Our observations of drivers and interviews with them provided further evidence of such risks.

A picture emerges of a socio-technical gig work system that leads drivers to being exposed to multiple and potentially cumulating (eg, over a shift) road safety risk factors, commonly experienced or expressed through frustration, stress, physical and cognitive load, and potentially unsafe or risky driving. However, this research also suggests that worker characteristics, the driving environment, and gig work type are mediating factors that determine risk exposure, impacts on other road users, and whether road safety harm results. For example, we found that normative behaviour may differ by gig driver type. Our ethnography showed that drivers highly invested in maximising the work opportunities and income offered via the app could behave differently to those driving part time for supplementary income or social contact. Invested drivers tended to accept more and decline fewer jobs and were particularly deliberate in appeasing passengers and customers. They tended to drive more quickly and at times more erratically to complete as many jobs as possible and to satisfy passenger demands. They were more likely to report feeling pressured to break the law or take risks to get the work done and to achieve their desired level of income. In contrast, drivers less reliant on gig driving for income tended to exhibit a more relaxed driving style. They appeared more likely to decline unsuitable jobs, take breaks when needed, and say no to customers. Some drivers said they loved the app because they could work flexible hours and they enjoyed meeting people.

Workers taking part in this study also described gig driving as more complex than initially thought. The work requires high mental activity and alertness – it involves numerous micro-calculations and quick decisions under pressure, often with incomplete information and while navigating challenging driving environments. Gig drivers are also required to interact with their phones while working, sometimes using multiple devices and apps. Passenger and customer management adds to mental and physical load and tiredness.

Our survey of gig drivers indicated some level of fatigue management by drivers; over three-quarters of our respondents agreed or strongly agreed it was easy for them to take breaks within a shift when tired. However, over a quarter also reported mental or physical fatigue as a result of their gig work; over a third reported physical pain or discomfort. Over half reported they worked between the hours of 10 pm and 5 am. About three-quarters reported working long hours to earn enough money and about the same proportion reported that they undertook similar types of driving for long periods of time. These are all risk factors for fatigue (Christie & Ward, 2018); however, it would appear that drivers are currently largely required to self-regulate their fatigue over a shift. Less is known about how drivers monitor their cumulative fatigue over consecutive days and its implications for chronic fatigue and associated increases in road safety risk.

Potential differences between what drivers say and what they do and experience are evident when comparing our survey findings on fatigue management with what we experienced through ethnography. We observed the unwavering pressure that gig drivers can be under, over long shifts, particularly those seeking to maximise their earning potential.

A majority of gig drivers responding to our survey considered road safety to be their responsibility. Two-thirds of our respondents self-reported having a lot of knowledge about how to keep safe and manage fatigue. While the individual responsibility position is understandable, it reinforces why responses across the socio-technical system are required. Systemic pressures may lead to adverse road safety outcomes, despite the efforts of individual drivers to stay safe. There are likely to be other gig drivers who cannot or do not take such precautions; these types of gig drivers were also perhaps less likely to take part in this research.

## 6.4 Use of non-traditional data sources

While available resources limited the scope of our review, this research has advanced understanding of a range of data sources that could be better used to describe the gig economy and associated road safety risk. For all data sources reviewed, we identified both strengths and weakness in what data is collected, how it is managed, and the extent to which it is currently used to describe gig work and road safety. We also identified potential for enhancing the value and utility of each data source for descriptive purposes. Overall, this research reinforces that a more coordinated data system will be essential in guiding effective responses to road safety risks and for ongoing monitoring. The data system must feed data on system performance back up through the system in a timely way, enabling ongoing monitoring and evaluation and continuous performance improvement.

This study was unique in that it applied a socio-technical approach to understand road safety risks related to gig work. This approach has shown how various societal, regulatory, and operational factors influence gig driver behaviour and potential road safety risk. In order to develop further confidence in the various influences that have been proposed through this research, appropriate data from across the socio-technical system should be developed in addition to the more tradition forms of road safety data. For example, in addition to making CAS more effective in identifying gig driver crashes, a system that asks questions about high-level contributing factors to gig driver crashes would also be helpful. In Australia, in the outdoor education, transport, and healthcare sectors, socio-technical data collection and reporting systems are being developed and used (McLean et al., 2022; Newnam et al., 2020, 2021).

Our recommendations for next steps, for each data source, are summarised in the following recommendations in chapter 7 of this report.

## 7 Cross-sector recommendations

### 7.1 Introduction

While this study finds limited evidence to date of serious harm related to gig work, there is a tangible prevalence of reported harm. Triangulation of our findings provides consistent evidence that the work system comprises multiple risk factors. Gig work is increasingly becoming the primary type of employment for many, and the proportion of all work that is 'gig work' is likely to continue to increase. Assuming the gig economy continues to grow, resultant pressures on the Safe System will likely increase; it would be proactive to better understand and manage road safety risks related to gig work before they grow larger.

As discussed throughout this report, gig work can offer benefits and advantages to workers. It can be a reasonably accessible form of employment that provides important income. Any responses to mitigate road safety risk must be cognisant of this context; for example, not imposing unnecessary barriers to gig work. Further, actions should be informed by learning from road safety related actions undertaken by other countries. A brief review of these, within the scope of this research, has provided initial direction here.

This chapter provides recommendations for action based on the research findings. The recommendations are grouped by distinct areas of action; however, they are not listed in any order of priority or importance.

Sections 7.2 to 7.10 address the fourth objective:

#### **4. Provide cross-sector recommendations of actions that could be taken to mitigate any negative impacts of the gig economy.**

- a. How are other jurisdictions internationally responding to identified gig economy road safety risks and outcomes?
- b. What are the cross-sector recommendations for actions to be taken based on the research findings?

### 7.2 Coordinated action

This research finds that current silos within government are a factor constraining the identification and delivery of effective regulatory and other supports to the gig economy. Other countries have recognised the need for cross-sectoral responses to address gig work and road safety – evidenced, for example, through the recommendation from Transport for NSW to establish an Industry Action Plan.

1. Appropriate government agencies should:
  - a. further investigate how other countries have established coordinated responses across government, with a view to establishing a similar response in New Zealand
  - b. ensure that a coordinated approach clearly establishes the roles, responsibilities, and mandate of central and local government agencies in enhancing road safety for gig drivers and other road users.

### 7.3 Data systems

This research reinforces the need for a coordinated data enhancement strategy and more collaborative/shared data system. The data system must feed data on system performance back up through the system in a timely way, enabling ongoing monitoring and evaluation and continuous performance improvements. Uncoordinated and decentralised data systems are a constraint to better understanding gig work and to continuous enhancements of road safety supports. Quality data is needed to inform and justify regulatory

interventions. Waka Kotahi has recognised this principle through its current work on strengthening the Safe System regulatory system. More specific recommendations around data are provided below.

### 7.3.1 Passenger endorsements and small passenger service licences

Driver licensing is one of the few interfaces that passenger gig work has with the regulatory system; however, existing data systems currently offer limited value and utility for describing and monitoring the gig economy.

2. Appropriate government agencies should consider:
  - a. analysing pre- and post-2017 SPSL and P endorsement datasets to support estimates of growth in the gig economy
  - b. analysing SPSL and P endorsement data, linked to vehicle registrations and driver licences and motor vehicle infringement data, to support further understanding of the driving behaviour of gig drivers, noting likely limitations in the data with respect to definitively identifying gig drivers
  - c. surveying a sample of P endorsement holders to support estimates of the proportion actively working in the gig economy, noting likely privacy challenges
  - d. adding a gig work driver category within the SPSL application process to support estimates of the proportion of licence holders who are gig drivers
  - e. whether and how existing licence holders and non-gig driver licence holders (who subsequently undertake gig work) should be required to update their information
  - f. requiring more frequent renewal of licences, to enhance the accuracy of the data (eg, using the process to remove drivers from the database no longer engaged in gig work)
  - g. a comprehensive review of the licensing system and dataset, to enhance descriptive utility.

### 7.3.2 Driving hours

3. Appropriate government agencies should:
  - a. further examine the feasibility and value of requiring driving hours data to be shared across platforms and other driving-for-work industries
  - b. review the way that SPSLs interface with fatigue management for the gig economy
  - c. recognise that there is currently no data collected about driving hours for non-rideshare gig drivers (eg, food delivery drivers)
  - d. consider whether it would be possible for current systems for monitoring gig work driving hours to also capture the number of hours undertaken in other types of work, within a cumulative work period
  - e. ensure drivers are fully educated about the requirements to log their time, including for multiple jobs and non-driving work.

### 7.3.3 CAS data

Our analysis of recent CAS data showed that crashes involving gig drivers are increasingly being recorded and are detectable through this data.

4. Appropriate government agencies should consider:
  - a. the regular monitoring of CAS to identify DSI incidents and to initiate appropriate responses; for example, notification of significant road safety incidents to WorkSafe for investigation as workplace incidents (the Senate Select Committee on Job Security (2021) recommended similar actions with respect to the monitoring and investigation responsibilities of SafeWork Australia)

- b. ensuring appropriate data is accurately recorded in TCRs to ensure crash causal factors (eg, fatigue) can be identified.

### 7.3.4 Platforms/Apps

There were limits in the extent to which this research could provide in-depth understanding of how the apps used by platforms operate. To what extent government agencies could influence how apps operate, in order to enhance road safety, is unclear. Nonetheless, we make the following recommendation.

- 5. Appropriate government agencies should consider:
  - a. an initial review of the current complaints register dataset to better understand the extent to which this channel is currently being used to report road safety related incidents
  - b. the value of interventions to increase customers' awareness that road safety related incidents can be reported via customer complaint channels
  - c. (if not already defined) the value of defining the severity threshold at which road safety incidents become notifiable events within the current customer complaint channel
  - d. distributing an analysis of notable road safety related incidents to key stakeholders on a quarterly basis (as also recommended by SafeWork NSW & Transport for NSW, 2021)
  - e. the feasibility and value of enhancing government access to GPS, driver tracking, and vehicle incident data available to platforms to support descriptions of gig work and road safety risks (eg, by describing driving patterns, environments, vehicle movements)
  - f. whether platforms can be encouraged to develop further safety features within existing apps (eg, removal of known unsafe passenger pick-up points from the information displayed to both drivers and passengers, and real-time information on disruptions to the road network, including road works and road closures)
  - g. whether apps/platforms or other channels can be developed to give greater voice to drivers with respect to reporting road safety related incidents.

## 7.4 Employment and health and safety

This research has illustrated how employment and health and safety regulatory reform applied to gig work is likely to have a generalised positive impact on road safety. However, this research showed that the application of current employment and health and safety regulation to gig work is complex and is not necessarily well understood by actors throughout the gig work socio-technical system. The 2022 Employment Court decision in New Zealand may add further complexity. This research also showed that while many gig drivers would prefer alternative employment to gig work, they can find it difficult to secure this.

- 6. Relevant government agencies should:
  - a. support regulatory reforms that increase employment rights and health and safety provisions for all gig workers
  - b. consider the development of guidelines that clearly establish the application of current regulations to gig work and to gig driving specifically (see, for example, Senate Select Committee on Job Security, 2021)
  - c. consider whether existing training and employment support programmes could be strengthened or further targeted to better support gig workers who are seeking other employment.

## 7.5 The design of gig work

The research revealed that workers use multiple apps but that platforms only have discretion over their own app. This is a further constraint to a collaborative/shared data system and better understanding of critical dimensions of gig driving; for example, driving patterns and hours.

7. Appropriate government agencies should further examine:
  - a. the requirements and feasibility of developing a more collaborative/shared data system that more accurately captures the working patterns and hours of gig drivers across platforms.

This research highlights how the design of app algorithms can influence driver behaviour and safety. Design is largely unregulated, and it is difficult for regulators to keep pace with industry innovation.

8. Relevant government agencies should further examine:
  - a. the responsibilities of platforms under the HSWA and subsequent responsibilities for ensuring that app design is protective of driver health and safety
  - b. whether design elements of the work can be regulated, independent of a worker's employment status.

## 7.6 The physical driving environment

The road network and associated infrastructure are core dimensions of the workplace for gig drivers. Not surprisingly, drivers in this study identified the physical driving environment as a major risk factor. In this respect, the continued roll out of the Safe System under Road to Zero will afford general road safety enhancements for gig drivers, as for all other road users in New Zealand.

Driving gig work requires patterns of urban mobility not well catered for by current infrastructure; most obviously parking. The driving environment adds mental load to drivers and influences driver behaviour and attitudes, including the extent they feel their work is supported or not by the urban environment.

Changes to the city layout may result in higher numbers of bikes and motorbikes used for gig work as city plans prioritise spaces free of cars and other large vehicles. City plans need to account for a potential rise in more vulnerable modes of transport used by gig drivers.

9. Relevant government agencies should:
  - a. further consider the likely future role, importance, value, and predominance of gig drivers and the extent to which planning systems should respond to specific needs of gig drivers
  - b. (if agreed above) examine city master and other planning systems that will need to accommodate gig drivers and what accommodations are required (eg, infrastructure that supports unique mobility patterns such as designated pick-up and drop-off locations)
  - c. clearly communicate to gig drivers current parking allowances and rules
  - d. ensure other road users are deterred from using existing parking allocated to gig drivers (eg, through enhanced enforcement).

## 7.7 Passengers, customers, and the general public

Passengers and customers play a significant role in the health and safety of gig drivers. Platform apps lead passengers and customers to expect a high level of service; feedback on the service received is encouraged. This can generate pressure to work at pace, take risks (to maintain customer ratings) and to comply with app-mediated incentives. Passengers, customers, and the general public do not necessarily



understand or respect rules governing gig work. Drivers are vulnerable to abuse, threats, and other anti-social behaviour.

10. Relevant government agencies should consider:
  - a. education initiatives to enhance general public understanding of gig work and respect for gig drivers
  - b. options for ensuring apps are designed and operate to be protective of driver health and safety, in alignment with the HSWA
  - c. as noted earlier, the feasibility of expanding channels that enable passengers, customers, and the general public to report road safety concerns related to gig work and gig drivers.

## 7.8 Education and training

This research showed that gig drivers may not fully understand the unique requirements and pressures associated with gig work prior to becoming gig drivers. Many reported that the demands of the work have a negative impact on their physical and mental health.

11. Relevant government agencies should consider:
  - a. opportunities for enhancing driver access to road safety and health and well-being information and guidance at the point of entry to gig work
  - b. making a defensive driving qualification a requirement for undertaking gig driving
  - c. whether opportunities exist for using platform apps as a mechanism for delivering road safety and health and well-being advice and support
  - d. the introduction of standardised workplace health and safety training for gig drivers (such as those recommended to the NSW Government by the New South Wales Parliament, 2022).

## 7.9 Development of safety culture

This research finds that gig drivers experience low workplace support, limited access to management support, and a business model that encourages individualism and competition. Actions to develop and promote a safety culture in the gig economy, particularly within the platforms themselves, seem warranted. System-wide involvement is required to facilitate collective support, information sharing, and the continued development of safe infrastructure. The role of the unions is likely to be important. Deterrents or potential consequences for gig drivers seeking union support should be examined.

12. Relevant government agencies and other system actors should:
  - a. explore opportunities to offer collective support to gig drivers, and identify and address current barriers to gig drivers seeking information and support
  - b. ensure that city master planning accounts for likely growth in gig work undertaken using vulnerable modes and the vulnerable nature of this work (eg, at pace, at night, high-density traffic areas)
  - c. recognise that robust workplace safety cultures are effective when they are led by companies, and thus understand that stand-alone safety regulation with little engagement/buy-in of gig platforms may create a culture of non-compliance.

## 7.10 Driver segmentation

This research indicates that exposure and responses to road safety risk and the likelihood of harm may differ by gig driver segments. However, it was not in scope to conduct a systemic segmentation. It also seems

likely that more 'extreme' gig drivers were unlikely to take part in this research. Gaps remain in our understanding of different segments and how their characteristics interact with factors throughout the socio-technical system to either increase or mitigate risk and the potential for harm.

13. Appropriate agencies should consider:

- a. a comprehensive gig driver segmentation study and further examination of how driver characteristics interact with the socio-technical system
- b. ways to enhance their engagement with the gig driving workforce, given that research has found them to be a hard-to-reach population and the importance of better understanding the context of gig driving.

## 8 Research limitations

### 8.1 Introduction

Previous research has identified challenges undertaking gig work related research. These include difficulties accessing the workforce (International Labour Office, 2021), limited existing data (Riggs et al., 2019), and that the gig economy and gig work is constantly evolving (International Labour Office, 2021). This section summarises the limitations and challenges experienced by this research project.

### 8.2 Key informant knowledge

Some key informants interviewed, particularly from higher levels of the socio-technical system, acknowledged limited understanding of the gig economy in New Zealand and the day-to-day nature of gig work. This was not surprising, with this research commissioned to address knowledge gaps. A key factor contributing to current gaps was the limited level of data on platforms, accessible to regulators, given that many are based overseas. Other factors were that many drivers operate as part of the 'grey fleet',<sup>28</sup> and limitations in the extent that income, tax, and other data can be derived for gig workers operating as independent contractors.

### 8.3 Participation by platform managers

While considerable effort was made to engage and recruit platform managers to this research, only one manager eventually participated. This means there are gaps in the level of understanding derived at the 'industry/platform/management' level of the socio-technical system.

The following factors may have contributed to this recruitment challenge.

- Many international gig platforms operating in New Zealand have a limited physical presence. For example, in 2019 Uber closed its Auckland office and moved 20 marketing and operations jobs to Sydney (Nadkarni, 2019).
- Platforms may have perceived the research to have a negative focus (eg, road safety problems) and therefore may have been unwilling to engage in the research.
- Current legal proceedings against platforms in New Zealand and globally may have generated further reluctance to take part.

### 8.4 New Zealand legal action

Further to the above, a high-profile class-action lawsuit against Uber was in the Employment Court of New Zealand throughout 2022. This lawsuit, taken by a group of Uber drivers and supported by FIRST Union and E tū, asserted that the drivers were employees of Uber and therefore should be entitled to the protections and benefits afforded to all employees in New Zealand (eg, minimum wage, sick leave). Some gig drivers and platform managers may have been reluctant to participate in this research due to these proceedings (eg, increased scrutiny of the sector, enhanced concern about anonymity). A potential indicator of this observed

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<sup>28</sup> 'Grey fleet' refers to private vehicles used for work purposes. This limits the generation and availability of relevant data.

during the research was the number of respondents to the gig driver survey who declined the invitation to provide demographic information at the end of the survey.

## 8.5 Recruitment of gig driver respondents

The online survey of gig drivers was 'live' for over six months, with only 197 completed surveys achieved. As noted, many people first entering the survey were ineligible to complete the survey and many completed surveys did not meet quality standards. However, the overall result and recruitment challenges experienced were unexpected, as we initially identified multiple New Zealand-based gig driver Facebook groups with a combined membership of over 20,000 people.

Comments posted in response to our recruitment via Facebook groups indicated some reluctance to take part without guaranteed remuneration.<sup>29</sup> Note also that given the resources available for the survey, recruitment channels were limited to online channels, research panels, and industry contacts. Physical canvassing of areas known to be occupied by gig drivers may have been a useful recruitment strategy; however, this was not within scope.

Given the lack of national data on the number and demographics of gig drivers in New Zealand currently, we cannot estimate the extent to which our final survey sample is representative of the gig driver population. The lack of population data also prevented the establishment of any demographic quotas in the sample; doing so would have also added to recruitment difficulties. Finally, a survey response rate also cannot be calculated as the number of gig drivers receiving the invitation to complete the survey is unknown.

Note that some respondents may not have provided authentic responses; however, as noted, extensive quality and logic checks were used. A bot initially infiltrated one of the panel survey links; measures were quickly taken to block access and all resultant completed surveys were discarded.

## 8.6 Level of system understanding

The system interviews conducted presented unique challenges, not least the requirement to conduct them online as a result of COVID-19. This impacted the extent to which rapport could be developed with participants, potentially impacting the depth of information generated. As discussed, some higher-level key informants also lacked detailed knowledge and insights.

Participants in socio-technical research are generally recruited on the basis of their knowledge and experience of a particular level or levels within the system. This can limit the extent to which participants are able to comment about the wider system, such as identifying key factors in other levels and interactions between factors across the levels. Validating causal links can therefore be challenging, and the triangulation of data from multiple sources is critical to the process. However, it should be noted that the 'system' is unlikely to ever be fully described in any socio-technical system research, given the complexities and dynamism of most systems.

Note also that it was beyond the scope of the resources available for this research to include gig driver passengers and customers as participants in the research. Inputs from these stakeholders would have provided useful additional understanding of gig work and road safety issues in New Zealand currently.

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<sup>29</sup> Invitation to be included in a prize draw was the only incentive offered.

## 8.7 Limited ethnography

The research resources only permitted limited ethnography, with observations and interviews only conducted in Auckland, predominantly in the CBD and surrounding suburbs, and during peak times for passenger and food delivery gig work.

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## Appendix A: Information sheet and consent form

### System interview information sheet

#### What is the purpose of this research?

This research project was commissioned by Waka Kotahi, the NZ Transport Agency and is being carried out by Mackie Research. The aim is to identify how the New Zealand (NZ) gig economy intersects with road safety and what might be done to improve road safety for gig workers and other road users.

*Gig work* is work gained through a digital platform. Individuals are hired via the platform to perform short assignments as contractors on a “as and when needed” basis. The *NZ gig economy* refers to all work undertaken in NZ that is gig work.

#### How was I identified and why am I being invited to participate in this research?

You have been invited to take part in this research because you are involved in or have some knowledge of the NZ gig economy. For example, you may be a government official, a manager for a gig company, a gig worker, or some other stakeholder.

#### What does my participation require?

You are invited to take part in a telephone or video conference interview with a member of the research team. The interview will take approximately 45 minutes and will be undertaken on a day and at a time that suits you.

Your participation in an interview is:

- a. voluntary; you may withdraw at any time.
- b. anonymous; we will not use or report your name or report any other information that could identify you, any company, or else.

You will receive a summary of key points from your interview for review and to identify any changes or additions you would like to make.

#### What will happen to the information I provide?

The information you share will be combined with all other interviews conducted and all the other information that is collected as part of the research. The research findings will be reported to Waka Kotahi in a written report that will be published and publicly available on the Waka Kotahi website.

All information from the research will be securely stored on the Mackie Research computer network. The information will only be available to the members of the research team.

#### Recorded information

Interviews will only be recorded with the permission of participants. Recordings may be paused or stopped completely at any time. You may retract any recorded interview information within 10 working days of the interview. Recordings may be transcribed to assist data analysis. Recordings and transcripts will only be used by the research team to assist data analysis and will not be shared with any external party. The recordings will be securely stored in digital format for 10 years and then destroyed.

**What are the benefits of this research?**

This research will contribute to a better understanding of the NZ gig economy and of the road safety of gig workers. It will help to identify actions that could be taken to improve road safety for gig workers and for all other road users in NZ.

**Further questions**

If you have any questions, please contact either of the following members of the research team:

Michael Blewden, michael@mackieresearch.co.nz

Clare Tedestedt George, clare@mackieresearch.co.nz

## System interview consent form

I have read the Information Sheet and understand the nature of the research on **gig workers and road safety in NZ**. I have had the opportunity to ask questions and have had them answered to my satisfaction.

I agree to take part in the research interview.

I understand my participation is voluntary and I can withdraw at any stage.

I agree/do not agree for the interview to be voice-recorded.

I understand my participation is anonymous and no identifying information will be reported.

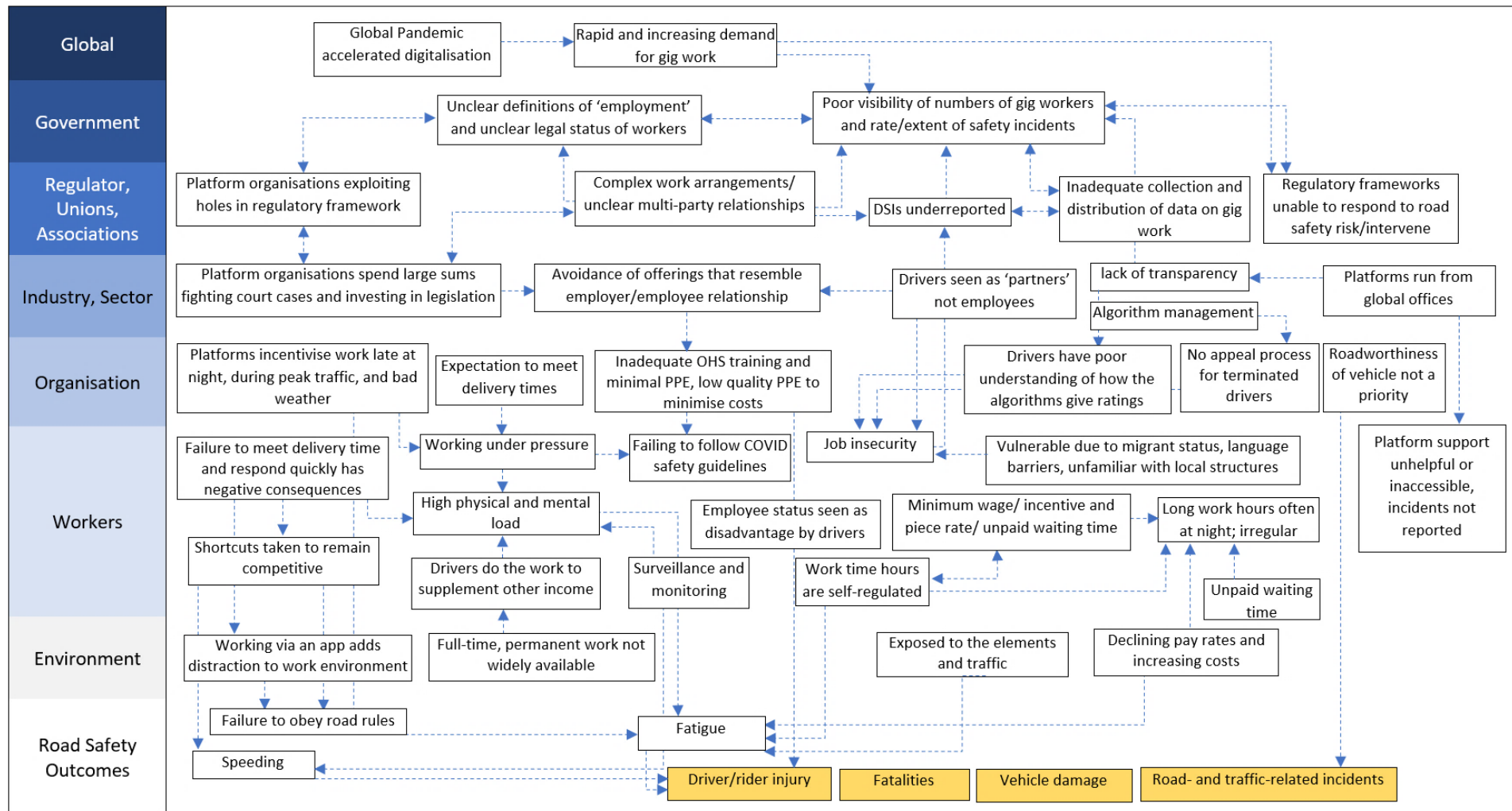
Participant name: \_\_\_\_\_

Signature: \_\_\_\_\_

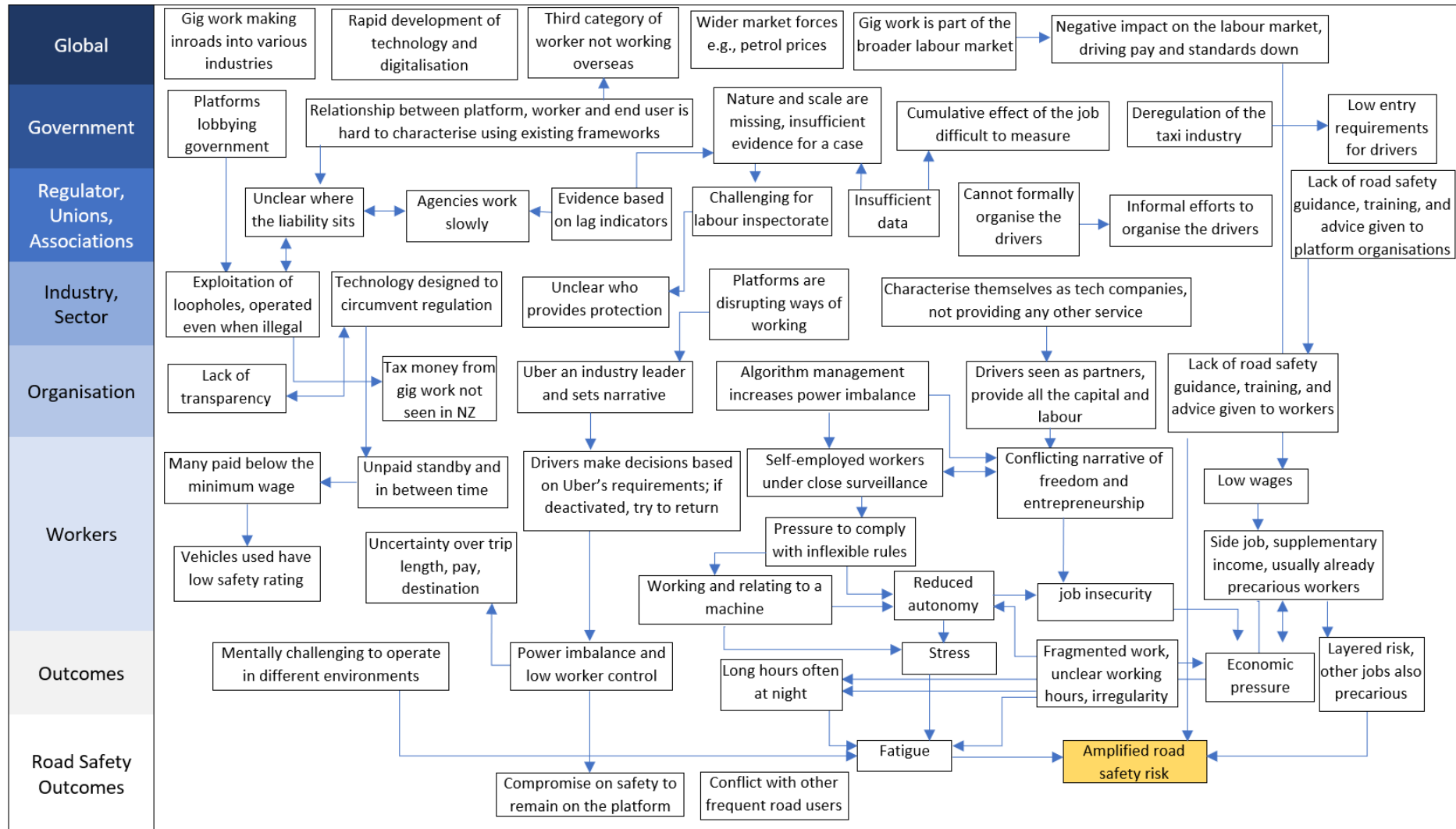
Date: \_\_\_\_\_

## Appendix B: Preliminary socio-technical maps

Socio-technical map developed following the literature review (first iteration)

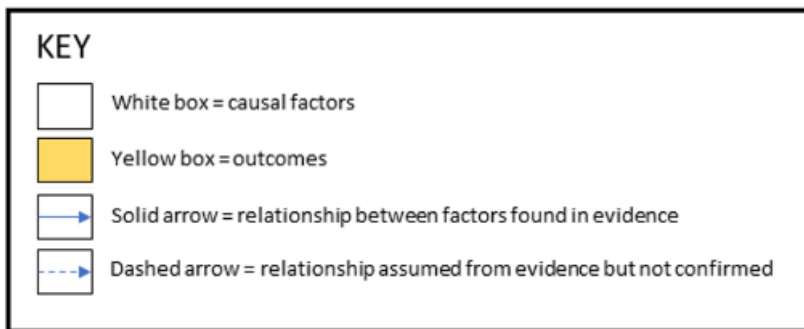


## Socio-technical map developed following key informant consultation (second iteration)



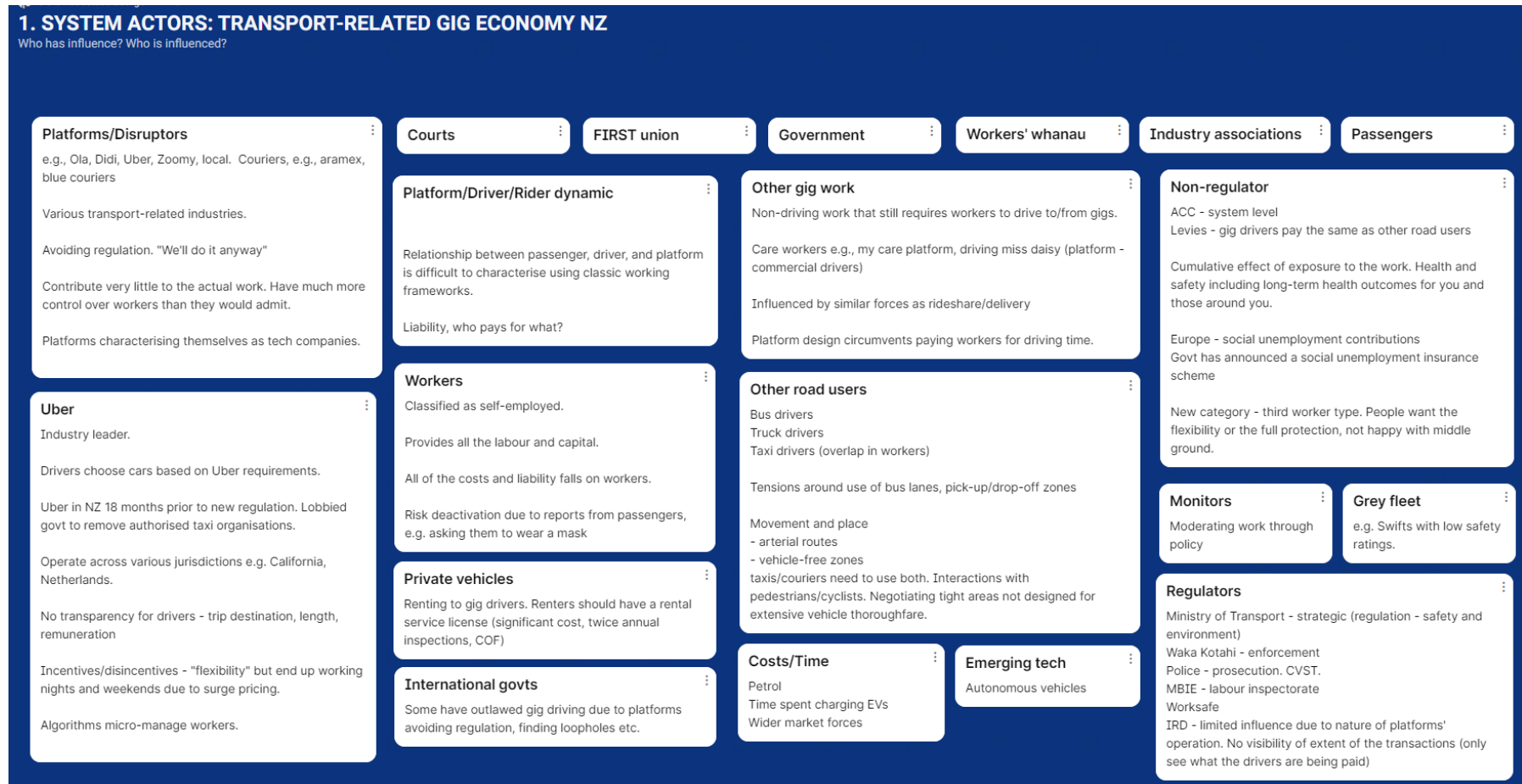


## Key for socio-technical maps



*Note.* The second map was created based on the data collected during the key informant workshop. The arrows are solid because the participants offered the connections. However, subsequent methods (system interviews, gig worker survey, ethnography) were used to confirm any causal relationships that were incorporated into the final AcciMaps.

## Appendix C: Key informant group output



## Appendix D: Recruitment survey example

### System interview recruitment survey

Thank you for expressing your interest and for completing this questionnaire.

None of the information you provide in this survey will be shared with other organisations.

**Your answers will only be used by the Mackie Research team to select people for interviews.**

If you are selected, we will contact you to arrange an interview at a time that is convenient for you. All interviewees will receive a **\$100 petrol voucher**.

If you are not selected, we will permanently delete all of the information you provide.

*Please note: The term 'gig work' is used here to mean work organised through a digital platform (e.g., Uber, Ola etc.). 'Gig workers' are individuals who are hired via a platform to perform short assignments ('gigs') as contractors.*

What type of gig work do you do? (Tick all that apply)

- Food delivery
- Passenger transport/rideshare
- Courier/package/parcel delivery
- Healthcare
- Other (specify)

What type of vehicle do you use for your gig work? (Tick all that apply)

- Car
- Van/ute/light truck
- Heavy truck
- Motorbike
- Moped/scooter
- E-scooter
- Non-electric push bike
- E-bike
- Other (specify)
- None

In which area do you undertake most of your gig work? (Tick one)

- Northland
- Auckland
- Waikato
- Bay of Plenty
- Gisborne
- Hawke's Bay
- Taranaki
- Whanganui
- Wellington
- Tasman
- Nelson
- Marlborough
- West Coast
- Canterbury
- Otago
- Southland

In the last 12 months, has gig work been your: (Tick one)

- Main job
- Secondary job (i.e., in addition to other non-gig work)

How long have you been doing gig work in New Zealand?

- Less than 12 months
- More than 12 months

What is your gender?

- Female
- Male
- Non-binary
- Other

Which ethnic group/s do you identify with? (Tick all that apply)

- Pākehā
- Māori
- Pasifika
- Indian
- Chinese
- Other Asian
- Other (Specify)
- Prefer not to say

Which, if any, of the following road safety issues have you experienced while doing gig work?

- Did not follow any road sign, signal, or rule (e.g., speed limit, give way rules)
- Potentially risky event (e.g., drifted from lane, travelled too fast for the conditions, temporarily lost control)
- Had to brake suddenly/take urgent action (e.g., to avoid a crash)
- Had a near miss
- Felt like you might fall asleep while driving/riding
- Felt distracted or stressed while driving/riding
- Minor collision (e.g., with a kerb, sign, vehicle)
- More serious collision
- None of the above
- Other (please specify)

Have you ever suffered a road safety-related injury (minor or serious) while doing gig work?

- Yes (please specify)
- No

Which of the following describes you? (please tick one)

- New Zealand Citizen
- New Zealand Permanent Resident
- New Zealand Work Visa Holder
- New Zealand Student Visa Holder
- Australian Citizen
- Australian Permanent Resident
- Other (please specify)

Thank you for completing this survey.

Please provide your contact details below. These will only be used to contact you if you are selected for an interview. If you are not selected the information you have provided, including your contact details, will be permanently deleted.

Name: \_\_\_\_\_

Phone number: \_\_\_\_\_

Email: \_\_\_\_\_

## Appendix E: System interview guide example

### Interview guide for regulators

Questions	Follow-up questions/probes
<b>Understanding/experience of gig economy</b>	
Can you tell me about your role and the work you do? How does your work intersect with the gig economy?	Probe specific intersections e.g., type of gig work, specific platforms.
Through your work, what understanding of the gig economy do you have currently?	Probe understanding of: Nature of work Size Worker type/context e.g., students, multiple gig roles
<b>Gig economy impacts</b>	
Is the gig economy impacting your work in <u>any</u> way? e.g., issues, needs, gaps, challenges arising. What other impacts are you observing, directly or indirectly, from the gig economy? Anything else?	For each impact identified, probe: When did [x] become apparent? What are the implications (if any) of [x] for your work? Have there been any responses to [x] so far? What needs to happen? Gaps/limitations – e.g., current roles, scope, jurisdiction, regulation, coordination
Are there any other new or emerging aspects of the gig economy you are aware of that we haven't discussed, but which might have relevance for this research?	Probe: Why/how relevant?
<b>Gig economy and road safety</b>	
As you know, much of the current gig work in New Zealand involves transport; this research is focused on gig work and road safety specifically. <i>[If not already identified]</i> : Does your work intersect with any transport dimensions of gig work? What impact is this having? e.g., issues, needs, gaps, challenges arising.	For any impact not previously identified, probe: When did [x] become apparent? What are the implications of [x] for your work? Has there been any response to [x] so far?
Are you aware of any specific road safety issues directly or indirectly related to gig work? Anything else?	Probe for specific risks: Sub-groups – e.g., youth, migrants Vehicle related – e.g., moped Context – e.g., night-time For each risk identified, probe: Why is [x] happening? What are causal factors? What evidence are you seeing of [x]? What impacts/outcomes are you seeing from [x]?
Are you aware of any current or emerging responses to any of the road safety issues we have discussed?	Probe: By whom Stage/extent of response- strengths/weaknesses Gaps/limitations – e.g., current roles, scope, jurisdiction, regulation, coordination

Questions	Follow-up questions/probes
<b>Actions/recommendations</b>	
<p>[For each road safety issue identified]</p> <p>What actions are needed to address/mitigate [x]? e.g., processes, guidance, support, training. What else is needed?</p>	<p>Probe:</p> <p>Who should undertake [x]</p> <p>Roles/responsibilities of platforms</p> <p>Challenges/barriers to [x]</p>
<p>Are you aware of any regulatory developments or potential at the overall gig economy system level that could have relevance for gig workers and road safety?</p>	<p>Probe:</p> <p>Focus/nature of development</p> <p>Challenges/barriers/mitigation</p>
<p>As you know, the gig economy in New Zealand is part of a global system with New Zealand comprising a relatively small market. Are you aware of any characteristics of this global context that might impact any of the road safety issues or responses we have discussed; for example, present potential opportunities, barriers, or risks.</p>	<p>Probe:</p> <p>What might need to happen to leverage?</p> <p>What might need to happen to mitigate?</p>

## Appendix F: Gig worker survey

Thank you for completing this survey about gig work and road safety. 'Gig work' is work gained through a digital platform, via apps like Uber, Ola, Didi, Menulog, and Delivereasy etc.

The survey is being conducted by Mackie Research (Auckland) for Waka Kotahi, the New Zealand Transport Agency. **To be eligible to complete this survey, you need to have undertaken any type of gig work in the last 12 months that has required the use of a vehicle.**

Completing this survey is voluntary and anonymous. **You are not required to provide your name. No information will be reported that could identify you or anyone else.** The findings will be published in a report available on the Waka Kotahi website.

In recognition of your time, you are invited at the end of the survey to enter a draw to receive one of ten MTA vouchers valued at \$75. The contact details you provide will not be linked to your survey answers.

**Please share this survey link with other gig workers you may know.**

What type of gig work (that requires the use of a vehicle) have you mostly done in the last 12 months? (Tick one)

- Passenger transport/rideshare
- Food delivery
- Courier/package/parcel delivery
- Healthcare
- I have not done any gig work in the last 12 months that has required the use of a vehicle
- Other (please specify)

What type of vehicle have you used for the gig work that you have mostly done in the last 12 months? (Tick one)

- Car
- Van/ute/light truck
- Heavy truck
- Motorbike
- Moped/scooter
- E-scooter
- Non-electric push bike
- E-bike
- I have not used a vehicle to carry out gig work in the last 12 months
- Other (please specify)

What other types of gig work, if any, have you done in the last 12 months? (Tick all that apply)

- Passenger transport/rideshare
- Food delivery
- Courier/package/parcel delivery
- Healthcare
- No other
- Other (please specify)

Why do you do gig work? (Tick all that apply)

- I like the flexibility
- I like being self-employed
- I enjoy driving
- I depend on the income (e.g. to pay my bills)
- It provides a extra income (e.g. spending money, more money for savings)
- I can fit it around childcare or other responsibilities



- I can fit it around another job
- It suits my skills and abilities
- It suits my visa requirements
- Other (please specify)

Please answer the following questions based on the gig work (requiring the use of a vehicle) that you have mostly done in the last 12 months. Tick 'Not applicable' to any question not relevant to your vehicle.

Before you were able to start driving or riding for your gig work, did you prove:

	Yes	No	Not sure	Not applicable
The age of your vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The safety rating of your vehicle e.g., safety star rating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your P-endorsement, Certificate of Fitness, and Small Passenger Service license	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
That you had downloaded the Logmate app or equivalent time recording tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
That you had viewed any road safety information provided	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
That your vehicle had a current Warrant of Fitness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
That your vehicle was insured appropriately	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Before you started to drive or ride for your gig work, what was your knowledge of:

	No knowledge	Some knowledge	A lot of knowledge	Not sure
How to keep safe while driving or riding e.g., identifying hazards, maintaining your vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to manage fatigue while driving or riding e.g., getting enough sleep, hours of work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What to do if you had an accident while driving/riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The support available if you had an accident while driving/riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any monitoring of your driving or riding by the platform you would be working for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your legal rights and responsibilities as a driver or rider for the platform you would be working for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please answer the following questions based on the gig work (requiring the use of a vehicle) that you have mostly done in the last 12 months.

While driving or riding for your gig work in the last 12 months, how often have you:

	Very often	Often	Sometimes	Rarely	Never	Not sure	Not applicable
Worked across more than one platform e.g., Ola and Uber	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checked an app notification from the platform you were working for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked between the hours of 10pm and 5am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very often	Often	Sometimes	Rarely	Never	Not sure	Not applicable
Felt you had to work for longer in order to earn enough money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Experienced long periods of the same type of driving or riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had enough sleep before you started driving or riding again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Driven or ridden less safely due to the need to maintain performance ratings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taken the breaks within a shift that you are required to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Driven or ridden less safely due to the need to work quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Driven or ridden without safety clothing or equipment e.g., reflective clothing, lights, helmet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please answer the following questions based on the gig work (requiring the use of a vehicle) that you have done most of in the last 12 months. Please remember your responses are anonymous.

While driving or riding for your gig work in the last 12 months, how often have you...

	Very often	Often	Sometimes	Rarely	Never	Not sure	Not applicable
Had difficulty staying in your lane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exceeded the legal speed limit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travelled at an unsafe speed for the conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Failed to brake (when you should have)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lost control of your vehicle temporarily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Had a near miss with another road user e.g., vehicle, pedestrian, cyclist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Received a traffic fine or ticket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weaved through traffic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did not comply with a give way or stop sign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Run through a red light	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Driven or ridden on the footpath or other shared space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parked and left your vehicle in an unsafe or illegal position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stopped to pick up or drop off passengers in an unsafe or illegal position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

While driving or riding for your gig work in the last 12 months, have you been involved in any road accident?  
(No matter how minor)

- Yes
- No
- Not sure
- Prefer not to say

How many road accidents have you been involved in?

- 1
- 2
- 3
- 4
- 5+
- Prefer not to say

Did the accident(s) result in any vehicle damage? Please consider all damage no matter how minor.

- Yes
- No
- Prefer not to say

Please describe the vehicle damage

Did you receive any injury from this accident? (No matter how minor)

- Yes
- No
- Prefer not to say

What injury or injuries did you receive? (Tick all that apply)

- Soft tissue injury (e.g., bruise, sprain)
- Laceration (e.g., cut, puncture wound)
- Fracture/dislocation (e.g., broken bone)
- Burns (e.g., corrosive injury, scald)
- Dental injury
- Head injury (e.g., concussion, brain injury)
- Mental injury/nervous shock
- Injury type unknown
- Other (please specify)

Did anyone else receive any injury from this accident? (No matter how minor)

- Yes
- No
- Not sure
- Prefer not to say

What injury or injuries did they receive? (Tick all that apply)

- Soft tissue injury (e.g., bruise, sprain)
- Laceration (e.g., cut, puncture wound)
- Fracture/dislocation (e.g., broken bone)
- Burns (e.g., corrosive injury, scald)
- Dental injury
- Head injury (e.g., concussion, brain injury)
- Mental injury/nervous shock

- Injury type unknown
- Other (please specify)

Was this accident reported to... (Tick all that apply)

- The Police
- The platform you were driving or riding for
- An insurance company
- WorkSafe
- To ACC – i.e., for an ACC claim
- None of the above
- Other (please specify)

In the last 12 months, have you experienced any of the following as a result of your gig work? (Tick all that apply)

- Physical pain or discomfort e.g., muscle or joint pain
- Job satisfaction
- Poor mental health e.g. anxiety, panic, hopelessness
- A sense of community with other gig/platform drivers
- Opportunity to discuss work-related problems
- An excessive amount of stress
- Enjoyment at work
- Mental or physical fatigue
- A sense of control over when and how you work

As a gig worker, to what extent do you agree or disagree with the following statements?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Not sure	Not applicable
The platforms I work for care about my road safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to report road safety issues to the platform I work for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I am tired, it is easy for me to take a break from driving or riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The nature of gig work means I take risks while I am driving or riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Road safety is primarily my responsibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carrying out gig work puts pressure on other areas of my life e.g., family life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If other employment was available to me, I would prefer it over my current gig work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In your experience, what is the greatest risk to your road safety as a gig worker?

In your opinion, what should be done to improve road safety for gig workers?

*These final questions will help us to understand the types of gig workers that have completed this survey.*

Which of the following gig work platforms have you worked for in the last 12 months? (Tick all that apply)

- Uber
- Ola
- DiDi
- Zoomy
- UberEATS
- Delivereasy
- Menulog
- DoorDash
- HungryPanda
- Aramex
- Prefer not to say
- Other (please specify)

In the last 12 months, has gig work been your:

- Main job
- Secondary job i.e., additional to other non-gig work
- Prefer not to say

In the last 12 months, how many hours of gig work have you done each week on average?

- 0–5
- 6–10
- 11–15
- 16–20
- 21–25
- 26–30
- 31–35
- 36–40
- 40+ please specify
- Prefer not to say

How long have you been doing gig work in New Zealand?

- Less than three months
- Three to six months
- Six to 12 months
- 1–2 years
- 2–3 years
- 3–5 years
- 5+ years
- Prefer not to say

What is your gender?

- Male
- Female
- Another gender
- Prefer not to say

What is your age?

- 15–17 years

- 18–24 years
- 25–30 years
- 31–40 years
- 41–50 years
- 51–64 years
- 65+ years
- Prefer not to say

Which ethnic group or groups do you identify with? (Tick all that apply)

- Pākehā
- Māori
- Pasifika
- Indian
- Chinese
- Other Asian
- Prefer not to say
- Other (please specify)

In which area do you undertake most of your gig work?

- Northland
- Auckland
- Waikato
- Bay of Plenty
- Gisborne
- Hawke's Bay
- Taranaki
- Whanganui
- Wellington
- Tasman
- Nelson
- Marlborough
- West Coast
- Canterbury
- Otago
- Southland
- Prefer not to say

What is your highest level of education?

- No qualification
- Secondary school qualification
- Postsecondary diploma/certificate
- Bachelor degree
- Post-graduate degree (Honors or Masters)
- Doctorate degree
- Prefer not to say
- Other (please specify)

**Thank you for completing this survey.**

**Please share this survey link with any other gig workers you may know.**

If you would like to go into a draw to receive one of ten \$75 MTA vouchers, please click the following link below to provide your name and contact details below.

**Your details will only be used to conduct the draw and will not be connected to your answers to this survey. Your details will not be able to be connected to your answers in this survey.**

## Appendix G: Ethnography tools

### Observation prompts for researchers

**People's behaviour:** Describe patterns of behaviour such as:

- Interactions between gig workers and other vehicles
- Gig workers and other road users (e.g., pedestrians, bikers, scooter riders etc.)
- Gig workers and the use of their own vehicles (e.g., would you describe it as careful, careless etc.)
- Gig workers and their customers (e.g., Notice any interactions between the gig worker and customer)
- The nature of their driving
- Are there any potential near miss situations? Failure in judgement from any of the road users that you think might lead to an incident?
- Are there any safety protective situations? i.e., actions that, despite the environment, have kept someone safe?
- Do the gig workers appear rushed? Stressed? Calm? Waiting a lot?

**The physical environment:** Describe patterns such as:

- Are the gig workers following road rules?
- Observe/question the circumstances under which the activity occurs
- Gig workers' interaction with the infrastructure (e.g., driving up on the footpath, where are they stopping?)
- What does the road look like? Describe the amount of space, lighting, other traffic around, bike paths, pedestrian crossings, space for U-turns, buses, scooters (parked or moving), parking meters, traffic lights, intersections, quality of the road surfaces, on-coming traffic, shared spaces, footpaths, signage etc.

**Other road users:** Who else is around?

- Age, ability, gender, ethnicity
- Describe the types of people using ride-share, the gig workers, others interacting with the gig workers, those on the street etc.

**Environment:** Identification of environmental factors

- Weather conditions, e.g., how light is it? Cold? Rain?

**Vehicles:**

- Types, make, age, condition etc. You might focus your efforts here on the gig workers' vehicles.

## Ride-along prompts for researcher

### The work:

- How many jobs are coming through and at what rate?
- What does the driver do when a job comes through?
- What does the alert sound like? How distracting is it?
- Do you see any jobs being cancelled? (You could ask why when possible)
- Possible to know how much they make from each job?
- How often are you stopping?

### Behaviour:

- How does the driver appear? (e.g., calm, stressed, distracted, irritated, bored?)
- How are they interacting with others, the road?
- Do they slam the door when getting in and out?
- Are they running to pick up the food?
- Nature of their driving

### Road safety:

- Do you notice any unsafe behaviours?
- Are there attempts to consider safety?
- Defensive driving i.e., driving to the conditions, accommodating other's behaviour?
- Do you feel safe?
- Would you have done something differently?
- What's causing any unsafe behaviour, do you think?
- Where are you stopping? Safe to stop there?

### Personal questions: (where appropriate).

- Do they enjoy/dislike the job? Why?
- What impact is it having on their personal/family/social lives?
- What do they worry about?
- How do they feel while doing the work?
- What are they wearing, does it provide protection from any elements e.g., the weather?
- Has this work had any impact on your physical or mental health?
- Have you ever had an incident while doing this gig work?

### Break time:

- Are they getting any down time?
- Where are they stopping?
- Why are they stopping i.e., is it by choice/scheduled or are they waiting for work?

### Environment:

- What is the state of their car – inside and outside?
- What's the weather doing?



## Reflective interview prompts for researcher

### Pre-shift interview

*Tell me a little bit about your gig work:*

- Platforms used?
- When you started gig work and why?
- Full-time or part-time? Hours per week?
- Your primary job? Other jobs?
- Your experience of working with an app. How do you use the app during the day? How do you log/monitor your hours? What happens when an issue arises?

*Tell me about your plan for today's shift:*

- What does a good day/shift ahead look like? (e.g., longer trips, good/nice customers, what they believe to be a fair income, no negative safety events, limited waiting time, no cancellations etc.)
- How much are you expecting to earn? How long are you expecting to work?
- How are you feeling today prior to starting? (e.g., tired, fresh, uninterested, great). Do you have any concerns?

### Post-shift interview

- Can you talk me through the notes you took and why you felt they were important to note them down? Describe the photos, what thoughts did you have at this moment?
- Try the Five Whys exercise – why did you make that decision? Why did you do take that route, decline that job, stop at that time? Talk about road safety experiences and their use of the app.

*Further prompts:*

- We talked previously about what a good shift looks like – was this a good shift, if so why or why not?
- Road safety issues/encounters? Did anything happen to compromise your safety? Did you make any decisions that you think kept you safe today?
- How did you interact with the platform app today? How did you log your hours? Logmate?
- How are you feeling after the shift? (e.g., tired, stressed etc.)
- How were your interactions with the customers? Other road users?
- What was the most challenging part of the shift? Did you enjoy a particular part?
- Any further thoughts?

## Reflective interview prompts for participant

Participants were provided with a clipboard, pen, and sheet of paper with the instructions.

The following can be used to prompt your notes:

Take photos, videos, voice recordings, and/or written notes when safe to do so

Think about: your driving, other road users, parking and pick-ups/drop-offs, your use of your phone and the app, logging your driving time etc.

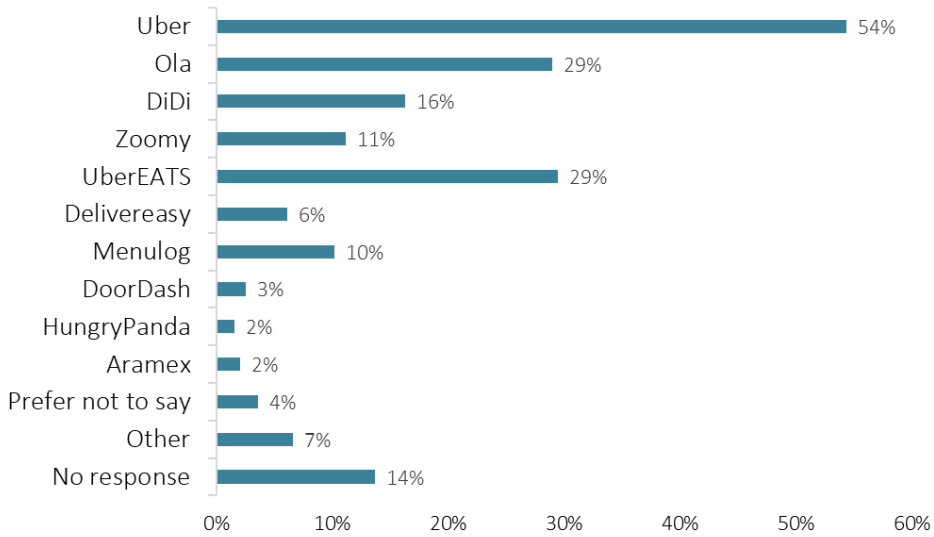
We want to understand all your experiences during your driving shift; **your thoughts, decisions, challenges, and the driving environment**. Note down anything you think is interesting or relevant.

*Feel free to write any thoughts, reflections, or notes below:*

## Appendix H: Additional gig worker survey results

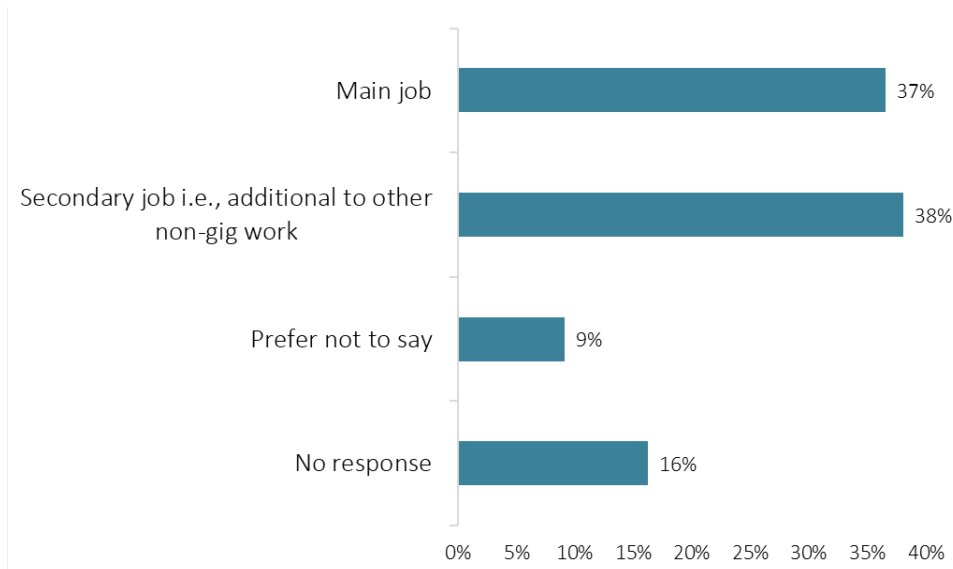
### Working context

Figure H.1 Gig platforms worked for in the last 12 months



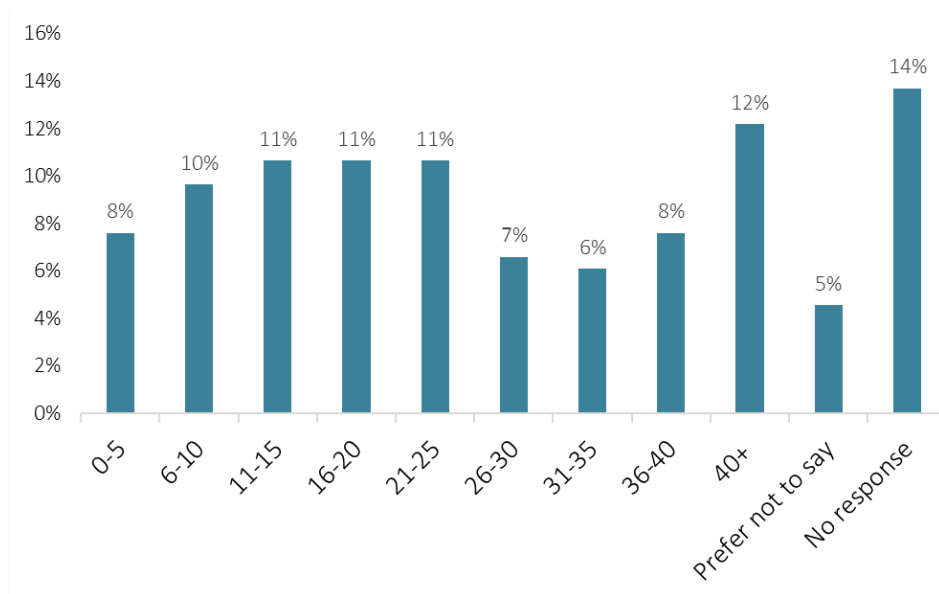
Note. The base is the total number of respondents to the survey ( $n = 197$ ). Multiple selections were permitted.

Figure H.2 Gig work as income source over the last 12 months



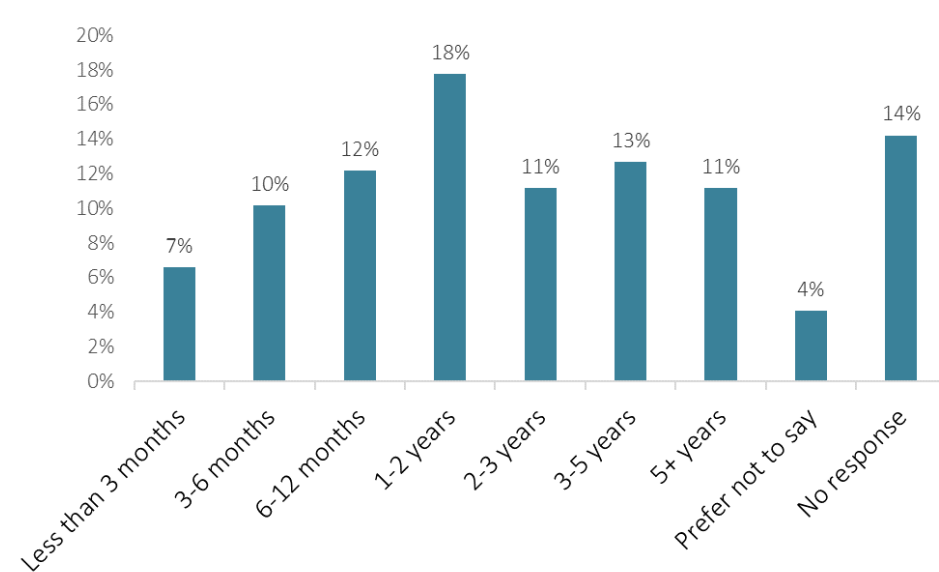
Note. The base is the total number of respondents to the survey ( $n = 197$ ).

**Figure H.3 Hours of gig work done per week in the last 12 months**



Note. The base is the total number of respondents to the survey (n = 197).

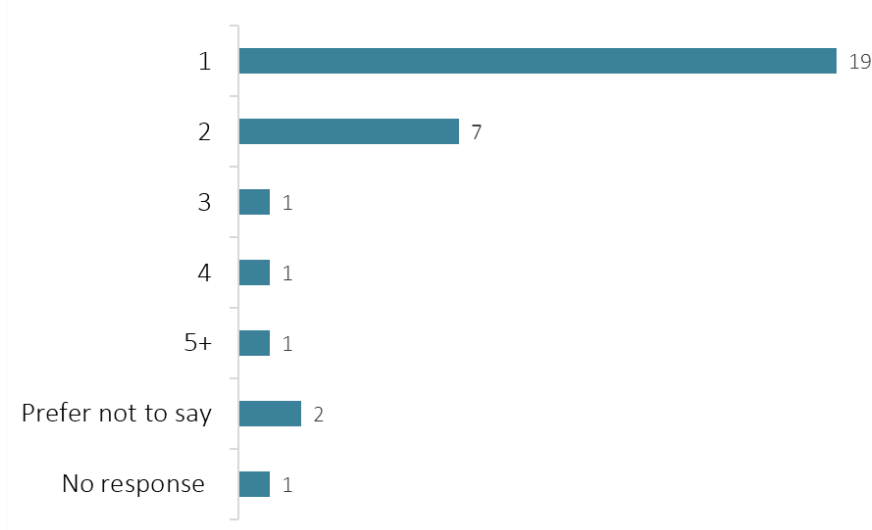
**Figure H.4 Length of time doing gig work in New Zealand**



Note. The base is the total number of respondents to the survey (n = 197).

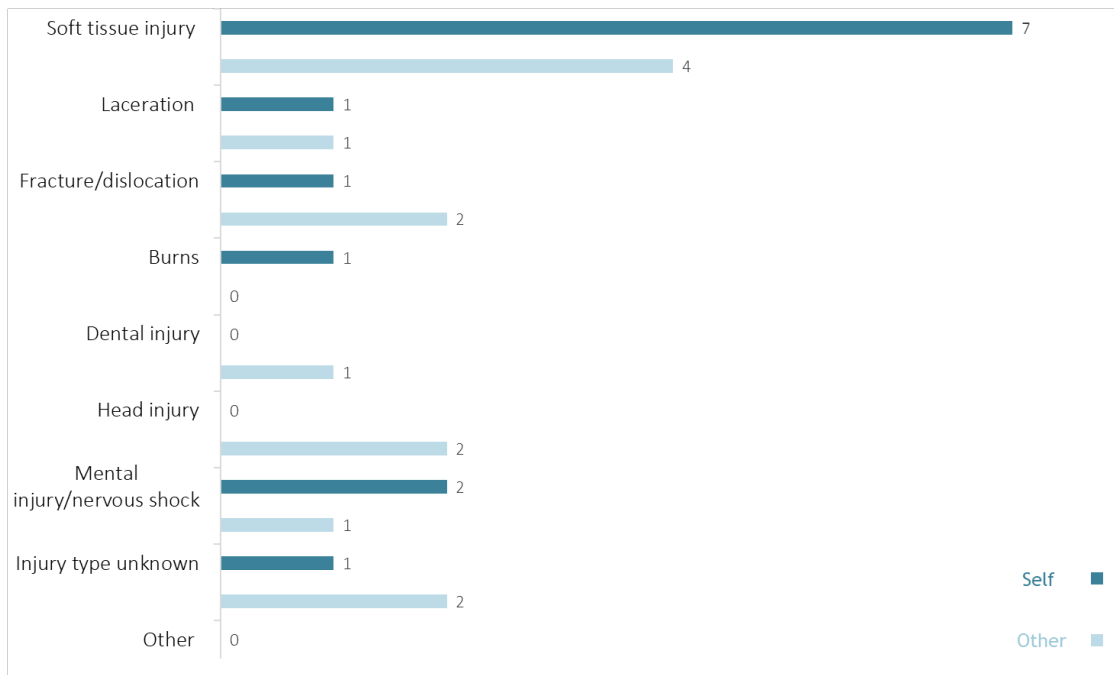
## Road safety outcomes

**Figure H.5** Number of road accidents involved in during the last 12 months



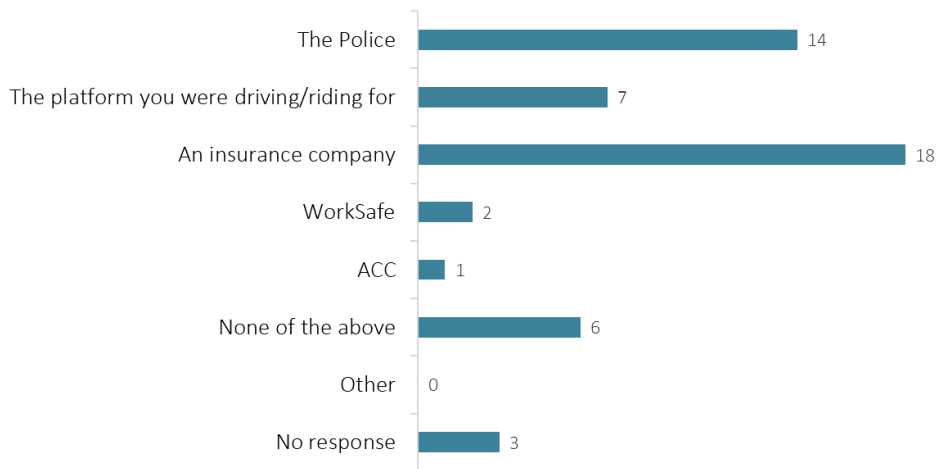
*Note.* The base is the total number of respondents to the survey who had been involved in a road accident in the last 12 months ( $n = 32$ ).

**Figure H.6** Injuries received by self or anyone else resulting from a road accident



*Note.* The base is the total number of respondents to the survey who had been involved in a road accident in the last 12 months and indicated an injury to themselves ( $n = 8$ ) or another person ( $n = 5$ ). Multiple selections were permitted.

**Figure H.7 Organisation the road accident was reported to**



*Note.* The base is the total number of respondents to the survey who had been involved in a road accident in the last 12 months ( $n = 32$ ). Multiple selections were permitted.