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“COFFINS ON WHEELS”:
A BIOETHICAL STUDY OF WORK CONDITIONS, DRIVER BEHAVIOUR AND ROAD SAFETY IN THE JOHANNESBURG MINIBUS TAXI INDUSTRY

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A thesis submitted to the Faculty of Health Sciences, University of the Witwatersrand, in fulfilment of the requirements for the degree of Doctor of Philosophy (PhD) in Bioethics and Health Law

Johannesburg, 2019

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DECLARATION

I, Lee Randall, declare that this thesis is my own, unaided work. It is being submitted for the Degree of Doctor of Philosophy in Bioethics and Health Law at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

_____
(Signature of candidate)

_____ day of _____ 20_____ in _____

Dedication

to Pip,
Lindiwe and Mbali –
my key circle of support

and to the drivers who gave
their time in the interests
of reducing crashes

Presentations and publications arising from the research project

Presentations:

Coffins on Wheels: When an occupational choice turns deadly
Oral presentation at the Congress of the Occupational Therapy Association of South Africa (OTASA), Kempton Park, July 2016

Coffins on Wheels: Drivers' work conditions in the Johannesburg minibus taxi industry
Poster presentation at the 4th Work Disability Prevention and Integration (WDPI) conference, Amsterdam, Holland, September 2016

***"Mageza Empompini"*: Mental health challenges and psychiatric risks faced by Johannesburg minibus taxi drivers**
Oral presentation at the Symposium of the Psychiatric Occupational Therapy Interest Group, Johannesburg, October 2017

Johannesburg minibus taxi drivers – occupational realities and road safety concerns
Poster presented at the 17th Congress of the World Federation of Occupational Therapy (WFOT), Cape Town, May 2018

Magazine article arising out of the study (written by William George after he interviewed me about my study):

Is profit taking precedence over passengers' safety?
Focus on Transport and Logistics, Issue 4 (2018, April)
Available: http://www.focusontransport.co.za/is-profit-taking-precedence-over-passengers-safety/

Abstract

Road traffic injuries and deaths (RTID) are a global public health crisis affecting the ethically charged road traffic system, and disproportionately affect the poor. By world standards South Africa has extremely high crash rates and in many respects is failing to apply road safety best practice, despite being a signatory to the UN Decade of Action for Road Safety 2011-2020. In the economic hub of Johannesburg the minibus taxi industry (MTI) is a dominant mode of paratransit (informal public transport) which offers flexible and affordable services and helps reduce the social divide caused by the lingering spatial realities of apartheid. It is also a source of economic empowerment and much-needed jobs – however, as with paratransit systems elsewhere, unsafe driving is common and many of the taxis are elderly or defective. Frequent MTI crashes contribute to Johannesburg's road deaths being more than triple the international city average. Members of the public tend to vilify MTI drivers and ascribe a high degree of moral responsibility to them, but this intuitive reasoning seems to disregard their work conditions and how these affect their driving behavior. It also fails to take into account the South African road safety status quo and the possibility that MTI drivers are akin to an indicator species in relation to the ills of our road traffic system.

Prevailing views of road safety are shaped by the Vision Zero philosophy and the Safe System approach, which assign responsibilities both to road users and to system designers. In line with this, my study addresses the question of what moral responsibilities should be ascribed, and to whom, in relation to reducing RTID in the Johannesburg MTI. I answer this bioethical question by means of a dual descriptive-normative inquiry. My descriptive inquiry is based on my mixed-methods empirical research with drivers, aimed at addressing the dearth of knowledge of their work conditions and tapping their views on crash causation and road safety responsibilities. My results, viewed against the backdrop of road safety best practice, lead me to label the operating principles of the Johannesburg MTI 'contra-constitutional' due to their violating the drivers' labour rights as well as the human rights of drivers, passengers and other road users alike. I also analyse the South African road safety

situation with regards to road safety best practice and comparative information from three groups of reference countries: the BRICS, our African neighbours (and two other African countries with similar paratransit), and several aspirational countries with very low RTID. This analysis leads me to develop the term ‘crashogenic’ to describe our road traffic system.

My normative inquiry draws on arguments which have been made by other authors focusing on moral considerations in relation to road safety. It applies Nihlen Falquist’s moral responsibility ascription framework – developed with regards to Sweden’s Vision Zero policy – in a novel fashion, employing graphical representation in addition to narrative reasoning. Thus, I use her three categories of *blame responsibility*, *causal responsibility* and *forward-looking responsibility* and ascribe specific moral responsibilities to identified rolepayers, with a view to reducing RTID in the Johannesburg MTI.

My study makes an original contribution to the bioethical debate on road safety, with a unique South African perspective. It also extends the existing knowledge base regarding drivers’ work conditions in paratransit systems.

Acknowledgements

My supervisors, Associate Professor Kevin Behrens and Professor Ames Dhai, who respected my passion for my topic, nudged me as the need arose and deepened my understanding of moral philosophy and bioethics. Much gratitude to you both.

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The many people who gave of their time, insights, expertise and willingness to think aloud – including playing devil's advocate at times.

My fieldworker/interpreter and administrative helpers, who threw themselves into assisting with particular tasks, as well as the two colleagues who helped with validating my thematic content analysis of the interview data.

My sister Sue for her wisdom with regards to editing, word processing and statistics, as well as data librarian Nina Lewin for her perspectives on the mysteries of postgraduate research and writing. Also my parents, Peter and Isobel Randall, who are born teachers and fostered my academic curiosity from a young age.

Last but not least, my family and friends for their patience and support during the stressful, financially lean years required to complete this study.

A note on terminology

"Crashes" versus "accidents"

There is a body of thought which discerns between the above terms and favours the use of "crashes" rather than "accidents" – see for instance Kayani (2011, p28-29). As the term "accident" has connotations of an event which is unanticipated, unavoidable and unintentional, it is banned outright by some road safety organizations.

My stance is that road incidents resulting in injury or death are seldom completely unforeseeable – instead, most are highly predictable if causative factors are properly analysed. This leads to my personal preference for the term "crash". However, the term "taxi accidents" rolls easily off the tongues of many South Africans (including taxi drivers themselves) and I thus used interchangeably with "taxi crashes" during this study. I refer to both "road accidents" and "road crashes" in the thesis, with awareness that the former term may in other contexts convey an unintended message.

Terms I have coined and explain in the thesis

crashogenic	likely to cause crashes
crashogenic environment	a road traffic context or system in which physical, legal, sociocultural and political factors together create a high likelihood of road crashes, with resulting deaths and injuries

List of acronyms and terms

AV	autonomous vehicle
BRICS	Brazil, China, India, Russia, South Africa
DOT	Department of Transport
GDRT	Gauteng Department of Roads and Transport
HICs	high income countries
ITMP25	25-year Integrated Transport Management Plan
LMICs	low- and middle-income countries
MDGs	Millenium Development Goals
MTDQ	Minibus Taxi Driver Questionnaire
MTI	minibus taxi industry
NRSS	National Road Safety Strategy 2016-2030
OHS	occupational health and safety
paratransit	flexible, non-scheduled/informal passenger transport
PSV	public service vehicle
RTIA	Road Traffic Infringement Agency
RTID	road traffic injuries and deaths
RTMC	Road Traffic Management Corporation
SANS	South African National Standards
SDGs	Sustainable Development Goals
TRP	Taxi Recapitalisation Programme
UNDA	United Nations Decade of Action 2011-2020
VRU	vulnerable road user
WHO	World Health Organisation
WRRS	work-related road safety

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CHAPTER 1: INTRODUCTION

> *Road traffic collisions have enormous health consequences all around the world and the public health burden attributable to these collisions is increasing. Furthermore, in most developing countries in the world where the burden is the greatest, there is little or no public health leadership for the prevention and control of the consequences of such collisions.*
>
> World Health Organization (WHO), 2001, p1

1.1 Preamble

In this chapter I outline the road safety problem my study seeks to address and introduce my thesis as a whole. I start by providing background information, summarizing the key issues underpinning my research and making reference to the literature from a diverse range of disciplines concerned with road safety. A more thorough elaboration of the key issues and of the literature will be provided later in the thesis, so for ease of reading I employ minimal referencing in this chapter. Having provided some background information I explain the rationale for the study, set out the central research question, describe the study's aim and objectives and situate it within the discipline of bioethics and the critical realism research tradition. I also comment on the three types of philosophical inquiries and note that my study is both a descriptive inquiry and a normative inquiry.

I then introduce two novel terms, *crashogenic* and *crashogenic environment,* which I have developed during the course of the study, and note that I will be using the term *contra-constitutional* (borrowed from the legal sector) in a novel manner.

Finally, I explain the structure of the rest of the thesis to help the reader understand the logical flow of its chapters and the connections between its different elements.

1.2 Background

1.2.1 Road traffic injuries and deaths (RTID) as a major global problem

In recent decades road traffic injuries and deaths (RTID) have become an increasingly significant and costly global problem, both in high-income countries (HICs) and low- and middle-income countries (LMICs) like South Africa (WHO, 2015, OECD/ITF2016). Steady increases in RTID in the 1990s and early 2000s led to the declaration of the United Nations Decade of Action for Road Safety 2011-2020 (henceforth referred to as the UNDA), with the aim of saving 5 million lives on the world's roads (WHO, 2009). Over the course of the Decade so far there has been a proliferation of road safety research and the development of new road safety strategies around the world, but the results in terms of reducing RTID have been mixed. One useful result of the UNDA has been the development of road safety best practice on an international level, and the global status quo is now much clearer than it was previously.

RTID – like many other public health problems – fall along a social gradient, with a disproportionate burden experienced by more disadvantaged sectors of society. For this reason, I will position them as not only a public health issue but also as a public health *ethics* issue. RTID are of particular concern in South Africa, which has one of the highest road death rates in the world, at 25-26 people per 100 000 compared with the world average of 17.4 per 100 000 (WHO, 2015; OECD/ITF 2016; DOT, 2017c). The most recent annual figures from the World Heath Organisation reflect that 13,273 people died in South Africa in one year – equating to 36 people per day, or 3 people every 2 hours[1] - and this count omits those who survived with serious injuries.

I will argue that South Africa compares poorly with many other countries in its application of road safety best practices and that our government is failing to

[1] See WHO's interactive "Death on the Roads" global map at http://www.who.int/violence_injury_prevention/road_traffic/death-on-the-roads/en/#country_or_area/ZAF.

provide leadership in this area, with fatal or disabling consequences for an unacceptable number of people. Around the world, vulnerable road users (VRUs) are at heightened risk of RTID, with crashes disproportionately affecting poor people, children and youth, pedestrians and public transport passengers. In South Africa's poor communities, although walking remains the most dominant mode of mobility numerous people rely on the unregulated, unsafe paratransit system known as the minibus taxi industry (MTI). The MTI commands a particularly high mode share in the economic hub of Johannesburg, due to inadequate provision of other modes such as buses and trains.

More than two thirds of South African road crashes are preceded by traffic law offences and could be avoided and prevented through improved driver behavior (DoT, 2017c). Traditional road safety programmes focusing on individual drivers have not yielded good results, but in recent years the Department of Transport (DOT) – like its counterparts in many other countries – has adopted a Safe System approach which looks beyond individual behavior to focus on the responsibilities of the designers of the road traffic system. I will argue that DOT is not living up to the promise contained in the current National Road Safety Strategy 2016-2030 (NRSS), in that it is neither effectively dealing with individual drivers *nor* properly addressing the road traffic system as a whole. Kimber (2003, p.17) notes that the argument regarding road safety "turns on where the responsibilities are placed" and confusion regarding how to balance drivers' freedom to control their vehicles' movements and the need to reduce the risks associated with those movements.

The growing field of work-related road safety (WRRS) has placed under scrutiny the work conditions of those who drive for a living and the United Nations General Assembly has urged member states to address work-related road crashes and give particular attention to the work conditions of professional drivers (UNGA, 2016). A great deal of research has been conducted with formally employed drivers, particularly bus and truck drivers, but relatively little attention has been paid to drivers who work in the

paratransit systems which are a key mode of transport in many LMICs. Formal sector research reveals a strong connection between work conditions and driver behavior – and thus crash rates and RTID – and this has resulted in stricter regulation of professional drivers' work conditions, especially in HICs. A similar connection almost certainly exists between work conditions, driver behavior and road safety in the less regulated paratransit sphere, in which unsafe driving has been identified as a significant problem. However, there is a dearth of research in this regard.

1.2.2 The South African minibus taxi industry (MTI)

As in many other African countries, minibuses[2] dominate the paratransit space in South Africa. The MTI emerged as a pirate industry in the 1970s and 1980s, the height of the apartheid era. The policy of racial segregation forced black South Africans to live in dormitory townships and outlying areas far from centres of commerce and industry, which were reserved for white people. The areas where black people lived were inadequately supplied with public transport like buses and trains and those modes tended to be expensive and inconvenient in relation to commuters' needs. These realities – coupled with protests against government-supplied transport services – led to private sedan vehicles being used as shared taxis, which fostered a demand for such services and caused some taxi operators to switch to minibuses. Initially deemed illegal by the authorities and later legalized under strict conditions, the MTI rapidly grew to become the dominant transport mode for poor black South Africans in most parts of the country. This gave rise to powerful social organisations, led by so-called "strongmen", which became interconnected with groups involved in the struggle for liberation as well as to some criminal formations and activities. When government abandoned its attempts to

[2] The National Land Transport Act (Act 5 of 2009) defines a minibus as "a motor vehicle designed or modified solely or principally for conveying more than nine but not more than 16 seated persons, including the driver" (Definitions, s1.1, lines 18-20 (p.12), Government Gazette No. 32110; 2009, April 8). By contrast, a midibus conveys more than 16 but not more than 35 people, including the driver.

control or eradicate the industry it proliferated, becoming a key source of black economic empowerment and a major supplier of jobs.
Since the demise of *apartheid* and advent of democracy in 1994, the new government has made various attempts at re-regulating, formalizing and upgrading the MTI. These have included the setting up of a National Taxi Task Team (NTTT) in the late 1990s, followed by the Taxi Recapitalisation Programme (TRP) which was launched in the 2000s with a primary aim of replacing the ageing taxi fleet with new safer and larger vehicles. These interventions have had limited success and to date the MTI remains largely informal and self-regulated, characterized by endemic violence (related to internal power struggles and conflicts over routes and ranks) together with high numbers of elderly vehicles. With the advent of Integrated Public Transport Networks (IPTNs) centred on Bus Rapid Transit (BRT) services in major South African cities (such as the Rea Vaya BRT service in Johannesburg), the future role of the MTI appeared to be limited to that of a feeder service. However, marked resistance to BRT services on grounds that these will displace minibuses and result in job losses has led to the MTI being included in IPTNs on an operational and ownership level. Government has committed to providing capital for the setting up of new business structures to replace the existing taxi associations and motherbodies[3] and is paying compensation to displaced MTI operators who choose not to be part of the IPTNs. Conflict has escalated in recent years, possibly fueled by the lucrative opportunities offered by government, and has manifested in murders of taxi drivers, operators and association officials as well as deaths and injuries amongst passengers and other members of the road-using public.

Colloquially referred to as Coffins on Wheels, the minibuses themselves are not always roadworthy and the manner in which they are driven frequently elicits moral outrage from members of the public. There is some appreciation of the fact that MTI drivers' work conditions are poor – for instance, their nickname *mageza empompini* (Zulu for "they who wash at the tap") not only

[3] Motherbodies are amalgamations of taxi associations – for instance, the South African National Taxi Council or SANTACO.

implies that they are unwashed or uncivilized, but also acknowledges that their long work hours scarcely leave time for a proper bath. Government statistics point to minibuses having disproportionately high (and rising) traffic offence rates in Gauteng, the economic heartland of South Africa, at a time when traffic offences are declining in relation to other vehicle classes and across the country as a whole. This suggests that the public's negative stereotyping of MTI drivers in Johannesburg is at least partially justified. In this economic hub, the MTI carries over 70% of commuters and crashes have a significant multiplier effect, due to many of those who are killed or injured being breadwinners. MTI crashes also affect the road-using public at large, causing RTID amongst pedestrians and other motorists and resulting in traffic blockages and damage to public and private infrastructure. Thus, while the MTI plays a valuable social role (being described by Fobosi (2013) as "the servant of the urban poor"), it is associated with a significant and ethically unacceptable externality in the form of RTID.

Human factors play a significant role in most crashes and the Road Traffic Management Corporation (RTMC), South Africa's lead agency for road safety, notes that more than two thirds of road crashes across all vehicle classes are preceded by at least one traffic offence (RTMC, 2015). This highlights the importance of addressing driver behavior in road safety policies and programmes. Despite this, and despite the dominance of the MTI as a transport mode, little or no research has been conducted in relation to MTI drivers' work conditions, how these affect their driving behaviour and the impact this has on road safety. The existing knowledge base consists of outdated empirical data like that obtained during an International Labor Organisation study which was conducted 15 years ago (ILO, 2003), statements issued by the industry itself, anecdotal data and incidental findings from other studies. Without up-to-date empirical data it is not possible to design effective strategies for optimizing MTI drivers' work conditions in a way which improves driver behavior and thus has a positive effect on road safety.

1.2.3 Moral considerations in relation to road safety

The road traffic system is ethically charged, being characterized by daily life-and-death situations. In addition, RTID display a social gradient – more disadvantaged sectors of society are disproportionately affected by road crashes, and LMICs are worse affected than HICs. Vulnerable road users (VRUs) like pedestrians, children and users of poor quality public transport face particular risks, and also have limited access to transport services in relation to obtaining post-crash care. These realities raise issues of social justice, transport equity and health equity and make road safety deserving of scrutiny from a bioethical perspective. Congruently, the philosophical literature reflects a number of key moral considerations in relation to road safety, although there is a surprising paucity of this literature. Lin (2016) likens failing to take ethics into account in relation to new systems of mobility (eg: autonomous vehicles) to "driving with one eye closed" (p.82). This statement could arguably be made in relation to the whole road traffic system.

Proponents of the emerging moral road safety movement view roads and transport as public goods and safe mobility as an enabler in relation to other public goods like access to education, recreation, the labour market, health care and social and religious participation. An argument can be made that for most people – certainly for those living in urban settings – there is no way to avoid using the road traffic system and still participate in the full range of life activities. Yet this system is associated with harmful externalities including not only RTID but also noise, congestion, air pollution and environmental degradation. Despite this, as noted by Elvebakk (2005) the *ethical* aspects of road safety policies tend to be "ignored or undercommunicated" (p.1).

The moral road safety movement, broadly, is compatible with several dominant moral theories. It is beyond the scope of this thesis to explore these in depth but I provide a brief working definition of each theoretical standpoint here and in the footnotes below. Thus, taking a moral view of road safety

suggests (in a consequentialist way[4]) that society has a moral obligation to reduce road crashes for the greater good, supports the development of sound road-related legislation and adherence to and enforcement of this (a deontological view[5]), focuses on RTID as undesirable due to their high human costs (an ethics-of-care approach[6]), propounds that morality or good character is as important as a driver's licence and driving safely is "the right thing to do" (a virtue ethics perspective[7]) and points out the relatedness and interdependencies between users of the road traffic system (echoing the philosophy of Ubuntu[8]).

I contend that moral theories are highly applicable to road safety in general and the road safety situation in the Johannesburg MTI in particular. My work is original in that no previous researcher has examined the issue of MTI crashes and RTID from a moral standpoint. It is also in line with the changes which are occurring in road safety paradigms on an international level and within South Africa.

With increasing awareness of morality and road use, changes have occurred in relation to road safety policy and practice around the world. Up until the late 1990s/early 2000s, governments tended to focus almost exclusively on individual driver behavior, due to the high contribution of human factors to road crashes (WHO, 2015; OECD/ITF, 2016; DOT, 2017c). Strategies put in place to mitigate this included vehicle technologies aimed at reducing human

[4] Consequentialism, broadly speaking, sees the most ethical option as that which generates the best possible outcome – the greatest utility – for the largest number of people.
[5] Deontologists focus strongly on the ethical duty to obey moral laws and prescripts, with a lesser focus on the outcome of one's actions. They are concerned with moral duties and laws, not necessarily those enacted by the State, except where they specifically regard obedience to the law as a moral duty.
[6] Ethics-of-care proponents focus on the importance of benevolence and caring interpersonal relationships as the basis of ethical action.
[7] Virtue ethics concerns the moral character of people, and their virtuous acts, as the foundation for a good life.
[8] Ubuntu ethics rests on an African communitarian worldview which treats people as having intrinsic dignity (humanity) while also belonging to a broader interconnected community. This is encapsulated in the saying "a person is a person because of other people", translated from the Zulu "umuntu ngumuntu ngabantu".

error, as well as a range of measures designed to offset human frailty (eg: seat-belts, airbags, motorcycle helmets, child restraints and more pedestrian-friendly car designs). Despite these, RTID persisted as an increasingly critical global problem and a seemingly unmodifiable feature of the road traffic system. In Sweden in the late 1990s a discussion in parliament led to the adoption of an alternative road safety paradigm, Vision Zero, on grounds that the only morally acceptable road safety goal is zero road fatalities. This represented a marked departure from what had become the prevailing ethos – namely, that RTID were a trade-off against factors like convenience, efficiency and quality of life. In placing greater emphasis on the role of the system designers Vision Zero aimed to transform the system as a whole and in this way address RTID more effectively. While some countries have critiqued Vision Zero in its pure form as utopian and unachievable, many have emulated aspects of it by adopting a Towards Zero approach to road safety – these include, for instance, Australia and the United States. Over the past two decades the Safe System approach to road safety has become accepted as best practice, with numerous countries adopting it to a greater or lesser degree. This approach acknowledges that *all* roleplayers in the road traffic system have responsibilities for road safety – individual wrong-doing drivers are not absolved of blame – but it places the greatest emphasis on the responsibilities of the system designers.

1.3 Rationale for the study

South Africa has officially adopted a Safe System approach in its current National Road Safety Strategy 2016-2030 (NRSS) (DOT, 2017c). With this, government has acknowledged the importance of addressing the road traffic system as a whole and has taken a stand that high levels of RTID should not be viewed as inevitable or morally acceptable. Given our extremely high road fatalities (by world standards), as well as our signatory status in relation to the UNDA, as a country we thus have an urgent duty to reduce RTID. In the case of the MTI, the tendency of members of the public (and traffic authorities) to blame crashes almost entirely on driver behavior, in terms of the Safe System paradigm this is inappropriate and overly simplistic. Due to the high number

of roleplayers in the industry, the multiplicity and complexity of crash causation factors and the sheer volume of passengers who rely on the MTI for their daily travel, emotive finger-pointing must give way to a carefully reasoned approach to moral responsibility ascription. There is also a better need to understand the antecedents or underlying conditions which shape MTI driver behavior, so as to address the human factors components of MTI crashes.

The NRSS focuses on achieving big quick wins, categorizing road safety interventions in relation to their ease of implementation (ranging from hard to easy) and their potential impact (ranging from low to high) (DoT, 2017c). "Star interventions" are those which are both easy to implement and have high impact, making it appropriate for them to receive immediate focus. They include interventions aimed at improving road user behavior as well as interventions which increase protection for VRUs (DoT, 2017c, p.75). Due to the severe impact of MTI crashes and RTID on vulnerable sub-sections of South Africa's population, particularly in an economic hub like Johannesburg, research into road safety within the MTI could help with designing of "star interventions". What is required is a deep understanding of the present "lay of the land" (Kon, 2009), along with robust data which can assist with making difficult decisions in relation to funding of road safety programmes (Partheeban, Arunbabu & Hemamalini, 2008). An inquiry into the moral responsibilities in the situation will help determine who should act, and in what ways, to improve the situation.

I must explain my choice of a driver-centric focus, amongst the multiple possible foci presented by the MTI. The sheer size and complexity of the industry made it appropriate to dive deeply into a particular perspective rather than simply skim its surface, and I have opted to use a driver-centric perspective for the following reasons:

- There is a clear "felt need" on the part of the public, evident in the print and social media.

- A focus on public transport drivers was encouraged in South Africa's road safety strategy for 2011-2020 (since replaced with NRSS) (Arrive Alive, 2011).
- As human factors are a key component of crashes, and human-centred strategies are required to reduce those crashes (Green, 2006), exploration of driver behavior is appropriate. In the case of those who drive for a living, their driving behavior is shaped by their work conditions and previous research has revealed poor work conditions in the MTI.
- Although drivers are a source of rich insights for designing effective road safety strategies, the perspectives and experiences of MTI drivers have not previously been tapped for this purpose. Indeed, their voices have largely been silent in previous research – as noted by Sauti (2006, p.xviii), in most MTI studies "the driver of the minibus taxi is hardly referred to directly".[9]
- To be effective, crash reduction strategies need to be tailored to specific contexts within the broader road system (Dixey, 1999). Due to the repetitive nature of their job MTI drivers are highly familiar with the ranks, roads and routes they utilize and they frequently come into contact with other MTI roleplayers – taxi owners, association officials, traffic authorities, rank and queue marshals, touts, vehicle washers, other service providers like mechanics and petrol attendants, and of course their passengers. Furthermore, they have daily on-road encounters with other users of the road traffic system, including fellow MTI drivers, other motorists and pedestrians. They can offer rich contextual insights and valuable suggestions in relation to ascribing road safety responsibilities.
- I also suspected that MTI drivers may be in a sense an indicator species[10], able to explain some of the broader realities in the South African road traffic system.

[9] Sauti's own ethnographic study focuses on "the man behind the wheel" and addresses social stereotyping of MTI drivers on the Randfontein-Johannesburg route, but does not touch on road safety.

[10] An indicator species is a thing that indicates the state or level of something – for example, car ownership may be seen as an indicator of affluence.

In summary, I opted to use a driver-centric perspective to fill a knowledge gap relating to MTI drivers' work conditions and driving behavior, explore the high-priority road safety problem of RTID as it relates specifically to the MTI, consider the broader road traffic system in South Africa and develop a reasoned argument regarding the ascription of moral responsibilities for improving the situation. This is a response to Arrive Alive's observation that "we can no longer afford to fail to identify the responsibilities assigned to government and its agencies for implementation of road safety strategies" (Arrive Alive, 2011, p.67).

For reasons of affordability and practicality, and also because Johannesburg is the economic hub of South Africa, my study was bounded geographically by the borders of greater Johannesburg. Effectively, it provides a case study of the Johannesburg MTI.

1.4 Central research question

The central research question I sought to answer was:

What moral obligations and responsibilities can be ascribed (and to whom) in relation to improving Johannesburg MTI drivers' work conditions and promoting road safety?

1.5 Study aim and objectives

The overarching aim of the study was to answer the research question on the basis of information obtained through empirical research and the literature, combining this with a moral reasoning process. In summary, I aimed to put forward a well-developed argument, ascribing clear moral obligations and responsibilities to identified roleplayers in relation to improving the work conditions of Johannesburg MTI drivers in a way which would improve their driving behaviour and thus road safety in the industry. I also aimed to make

concrete recommendations with regards to road safety programmes targeting MTI drivers.

To achieve this aim, I set the following objectives:

i. To contextualise the Johannesburg MTI by examining the South African and international literature regarding paratransit, public health ethics, road safety and moral road use.

ii. To establish key features of Johannesburg MTI drivers' work conditions (including their occupational health and safety (OHS) concerns) and better understand how these influence their driving behaviour.

iii. To elucidate the drivers' views in relation to crash causation factors as well as their views regarding moral responsibility for road safety in the Johannesburg MTI.

iv. To use all the available information (empirically derived and drawn from the literature and other sources) to develop a reasoned argument, ascribing moral responsibilities to identified roleplayers in relation to improving drivers' work conditions and behaviour and thereby reducing crashes and RTID in the Johannesburg MTI.

I must note at the outset that the study does not deal with MTI externalities *other* than RTID, such as congestion, noise or air pollution. I do however acknowledge these and note that some have been addressed either directly or indirectly by other researchers.

With regards to the actual processes employed during the study, I commenced with contextual research which continued throughout the study's lifespan. I needed to carry out substantial contextual research in the form of a preliminary literature review and exploratory meetings with subject experts even before I could design the study and develop the research instruments. My other contextual research has consisted of a range of activities aimed at a

deepening my understanding of the Johannesburg MTI, including further discussions with subject matter experts, communications with road safety NGOs and NPOs and a review of documents which fall outside of the scientific literature. The latter include "grey literature" from the mainstream media, niche media and social media (eg: blogs and Facebook pages) as well as fact sheets, flyers and brochures (eg: from vehicle manufacturers, MTI financing organisations and road safety NGOs). I held both scheduled and ad hoc meetings and discussions with a variety of people with useful perspectives on the MTI – these included a representative from a private sector organisation which provides taxi financing and insurance services, a consultant with experience in facilitating conflict resolution in the Pretoria MTI, the chairperson of a Johannesburg-based taxi association, a taxi chamber organiser from SATAWU, a high-ranking SANTACO official, an official within the Department of Transport, entrepreneurs focused on value-added services like on-board wifi and vehicle branding, two foreign researchers into the MTI, a *tuk-tuk* driver who was previously an MTI driver, an Uber driver, a user of Cape Town's MyCiti bus service (which incorporated some former MTI drivers), academics and researchers with expertise in public transport design and the paratransit sector, a driving instructor involved in training MTI drivers, a human factors expert researching rail crash investigations and a number of MTI commuters (some of whom had been injured in MTI crashes). Further insights were derived from my professional work as an occupational therapist, which includes assessing Road Accident Fund claimants and testifying as an expert witness. Many people in social and professional settings, upon hearing about my research, proffered spontaneous opinions (variously intellectual and emotional) relating to road safety and MTI drivers. Finally, I made many field observations – some purposeful and others *ad hoc* – at taxi ranks and confluence points both in the CBD and on the roads of greater Johannesburg; after new, suprising, perplexing or disturbing observations I jotted down what I termed "vignettes from the field" as a form of reflective journalling. I also took a number of photographs to illustrate different aspects of the Johannesburg MTI and driving behaviour – these can be found in an appendix to this thesis.

Throughout the study I have taken note of international, national, provincial and local transport-related developments and newsworthy events, including in particular the release of Gauteng's 25-year Integrated Transport Management Plan (ITMP25) in 2013, public statements and press releases relating to road safety initiatives and road death statistics in South Africa (particularly the so-called "festive season" and "Easter weekend" media reports) and the overdue release of South Africa's National Road Safety Strategy (NRSS 2016-2030) in 2017. I monitored online and print media for information about MTI-related events, which included taxi strikes against e-tolling in November 2014, the "taxi wars" which ensued after the Mall of Africa opened in Midrand in April 2016, rolling protest action against Toyota (a key minibus taxi manufacturer) in KwaZulu Natal in May 2017, an MTI blockade of Gauteng highways in June 2017 to protest high interest charged by taxi financiers, the suspension of contested Soweto taxi routes by MEC for Transport Ismail Vadi in July/August 2017 (with defiant drivers being arrested and having their vehicles impounded), a march by Tshwane taxi drivers in August 2017 to demand the scrapping of their traffic fines, Operation Buyo Mthetho ("bring back the law") which was launched by the City of Johannesburg in early 2018 and resulted in the impounding of numerous unroadworthy or illegal minibus taxis, and most recently the killing of 12 taximen from the Ivory Park Taxi Association while they were travelling back from a colleague's funeral in KwaZulu Natal. Some of the events reported on in the press brought parts of Gauteng to a standstill, elicited vociferous public reactions and were reminders of the sheer size of the MTI and its potential to boost or impede the South African economy. Finally, I gained valuable additional perspectives through attending professional gatherings and events related to road safety, within the limits of what was practical and affordable. These included several Transport Forum meetings of the Transport Special Interest Group (a loose national consortium of transport-related organisations and interested individuals), a conference of the Global Road Safety Partnership (GRSP) for Africa in Durban in late 2016 and road safety related sessions at various other conferences. On three occasions I was able to present my work-in-progress – at the July 2016 congress of the Occupational Therapy Association of South Africa (OTASA) in Johannesburg, the September 2016 international Work Disability Prevention

and Integration (WDPI) conference in Amsterdam and the May 2018 international conference of the World Federation of Occupational Therapy (WFOT) in Cape Town. I was also able to read through two free online courses offered by WHO and Johns Hopkins University, dealing with road safety legislation and international road safety best practice (see Murphy, 2017a; Murphy, 2017b; and Murphy, 2017c). These were invaluable in providing up-to-date multidisciplinary and international perspectives.
My contextual research both provided a foundation for my empirical research and helped me make sense of the empirical results. The fit between the contextual, empirical and normative aspects of the study is illustrated in the diagram below.

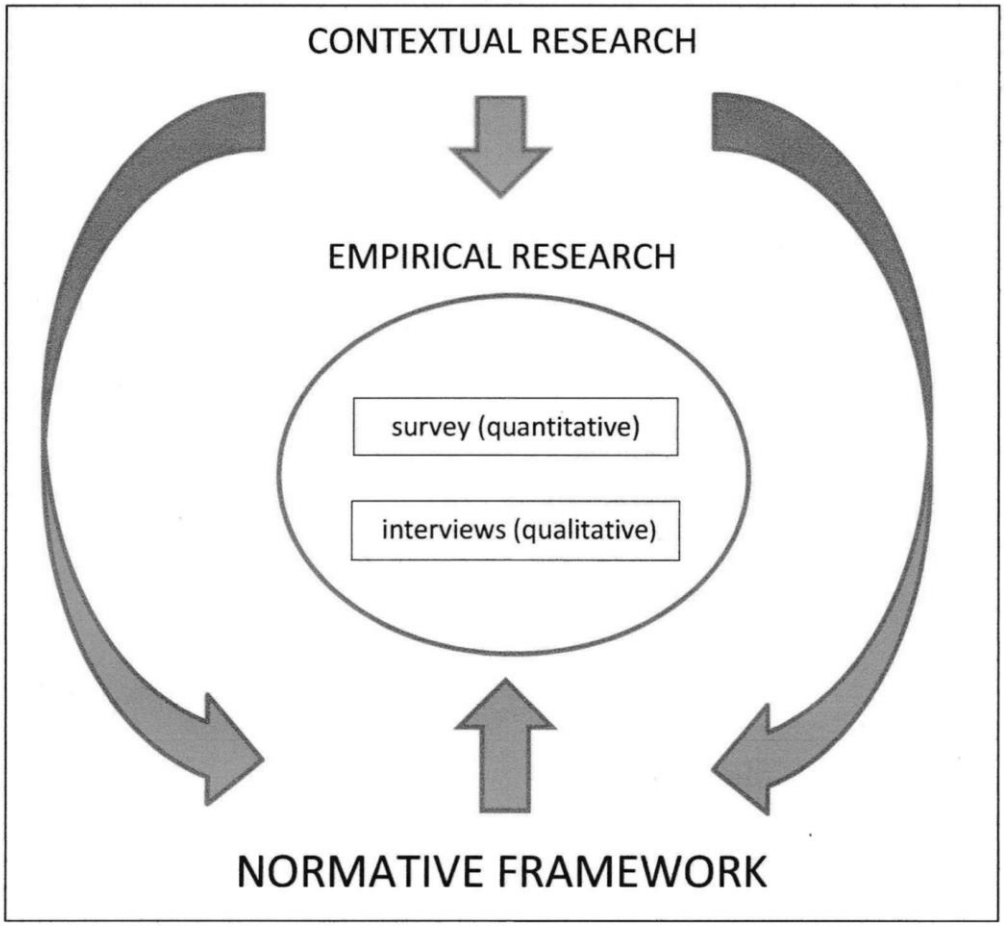


Figure 1.1: Diagrammatic representation of the research process

The particular methods and tools I used during my empirical research are described in depth in the next chapter. The relationship between the study objectives, methods and tools is depicted in the table below.

Table 1.1: Relationship between study objectives, methods and tools

Objectives		Methods	Tools
i.	To contextualise the Johannesburg MTI by examining South African and international literature regarding paratransit, public health ethics, road safety and moral road use	Literature and materials review supplemented by contextual research including field observations	Library and online searches, media scans, discussions with experts, field observations, attendance at transport-related events and forums
ii.	To establish key features of Johannesburg MTI drivers' work conditions (including OHS concerns) and how these influence their driving behaviour	Quantitative research Qualitative research	Taxi driver survey at ranks Taxi driver interviews
iii.	To elucidate the drivers' views in relation to crash causation factors and their perceptions of duty bearers and moral responsibilities in relation to reducing crashes.	Quantitative research Qualitative research	Taxi driver survey at ranks Taxi driver interviews
iv.	To develop a reasoned argument for ascribing moral responsibilities to identified roleplayers in relation to reducing crashes and RTID in the Johannesburg MTI.	Comparison of empirical findings with international road safety best practice; application of moral theories and tools.	WHO and WRRS benchmarks Nihlen Falquist's MRAF

1.6 Situating the study in relation to academic disciplines

The study falls within the field of bioethics, an interdisciplinary field which itself forms part of the philosophical branch of applied ethics. Bioethics focuses on issues of life, death and health of human and other beings and, as noted by Gordon (undated) in the Internet Encyclopedia of Philosophy, offers ethical guidance in a particular field of human conduct. Thus, bioethical studies explore the question, "what could or should be done about x?", where "x" represents a particular problem or phenomenon. Childress et al (2002) note that bioethicists address social conditions associated with widespread morbidity and mortality, while Benatar, Daar and Singer (in Benatar & Brock, 2011) assert that they help identify duty bearers in relation to public health problems.

There are three dominant research traditions in the health and social sciences, namely positivism, interpretivism and critical realism; this study fits best within the last of these. Positivists focus on natural phenomena through scientific processes, based on an assumption that objective reality exists and can be measured; they tend to favour quantitative research methods. By contrast, interpretivists aim to elucidate the meaning of things and events and acknowledge the subjective and socially constructed nature of reality; they tend to favour more qualitative methods. Critical realists seek to generate critical theory as a resource which will help people "understand, question and *change* their world" (writer's emphasis) (du Plooy-Cilliers et al, 2014, p.33); they see reality as multi-faceted and thus view multiple data-collection methods as necessary for validity and reliability. In line with this, my study employed mixed-methods empirical research containing both quantitative and qualitative elements. My inclusion of empirical work is congruent with Kon's assertion that empirical research into road safety is needed "to move forward in a well-reasoned and well-informed direction" (Kon, 2009, p.63).

From a philosophical perspective, my study is an ethical inquiry into road safety issues in the Johannesburg MTI. Sulmasy and Sugarman (2010) differentiate between three types of such inquiries, namely those dealing with

metaethics, those dealing with descriptive ethics and those dealing with normative ethics. The first investigate such issues as the "meaning of moral terms" and the "logic and linguistics of moral reasoning". The second investigate people's perceptions of what should be done as well as what is *actually* done in "particular circumstances of ethical concern". The third investigate what ought or ought not to be done, and what type of people we ought to strive to become. This study is not metaethical in nature, in that it accepts the meanings given to terms like "moral responsibility" by other authors. It also does not grapple with the meaning of "right" or "good" in the road safety sphere – it takes as a given that what is "right" is that which reduces the public health problem of RTID. The study *is* descriptive in nature, seeking through empirical work to elucidate MTI drivers' work conditions and gain a sense of how these affect their driving behaviour, while also tapping their perceptions of who the duty bearers are – and what should be done – in relation to reducing crashes and RTID. However, the study goes beyond the descriptive and also takes the form of a normative inquiry. Thus, I will use the descriptive data and the yardstick of road safety best practice – coupled with the moral responsibility ascriptions suggested by the drivers and my own reasoning process assisted by the literature – to put forward an argument about what should be done about the ethically unacceptable situation of RTID in the Johannesburg MTI.

In the course of this inquiry I draw on relevant arguments made by moral theorists in relation to public health issues in general and road safety in particular. Thus, I make reference to the Vatican's pastoral code for moral road use, Hans Jonas's writings on the imperative of responsibility and ethics of technology and other researchers' explorations of moral issues relating to vehicle use, road crashes and RTID. I also use tools and frameworks offered by other authors to assist me to develop a clear argument in response to my central research question. Chief amongst these is the moral responsibility ascription framework (which I will refer to as the MRAF) which was developed by the Swedish philosopher Nihlen Falquist in 2009, with particular reference to Vision Zero. The MRAF divides road safety moral responsibilities into *causal responsibility*, *blame responsibility* and *forward-looking responsibility*

and I use these same categories in my closing argument about road safety in the Johannesburg MTI.

1.7 Use of novel and applied terms

Although this was not an overt aim at the outset, during the course of the study I have generated two new descriptive terms which help capture the essence of the issues at hand. These are "**crashogenic**" and "**crashogenic environment**", terms I have coined to describe the broader South African road traffic system within which the Johannesburg MTI operates. They are reminiscent of the term "obesogenic", which has been used in discussions of the public health problem of obesity[11]. I also apply a known term in a novel way, borrowing the term "**contra-constitutional**" from the legal field as a way of capturing key moral-legal concerns with how the Johannesburg MTI currently operates – ie. the manner in which its operating principles lead to violations of Bill of Rights contained in the South African Constitution.

1.8 Outline of the rest of the thesis

The rest of this thesis is divided into a number of chapters in which I explain the methods used during the study, acquaint the reader in greater depth with the relevant issues (as reflected in the scientific and philosophical literature and a variety of other documents), set out my empirical results, interpret and discuss those results in relation to the literature and develop and defend my closing argument. I finish up by offering a set of practical recommendations, acknowledging the study's limitations and suggesting directions for future research.

As is not uncommon in the bioethical field, the thesis does not contain a specific section labelled Literature Review. Instead, I use the literature throughout the thesis, as and when this is relevant. It features prominently in

[11] An obesogenic environment consists of "the sum of influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals or populations" (DOH, 2015, p.15).

chapters 3, 4 and 5 in which I provide an overview of RTID, paratransit (with specific reference to the Johannesburg MTI) and moral considerations in relation to road safety. It makes a strong re-appearance in chapter 8, in which I offer an integrated discussion of my empirical results, making reference to the literature, and in which I develop and defend my argument in response to the research question.

In summary, the rest of the thesis is organized as follows:

- **In chapter 2** I explain the methods employed during my empirical research, which took a mixed-methods (quantitative-qualitative) form and consisted of a driver survey followed by in-depth driver interviews. I mention the considerations which were involved in obtaining Human Research Ethics Committee (HREC) clearance and describe some cross-cutting issues related to language diversity, development of my research instruments, my use of a fieldworker/interpreter and how I set the geographical bounds of the study. I also outline the measures I employed to ensure reliability and trustworthiness of the data.

- **In chapter 3** I elaborate on RTID as a global public health ethics problem, review global road safety initiatives (including the UNDA for Road Safety, Vision Zero-type policies and the Safe System approach), describe the current body of knowledge regarding road safety best practice in key areas relevant to the MTI, and introduce the more particular issue of work-related road safety (WRRS). I then offer a synopsis of the road safety situation in South Africa, making reference to our current National Road Safety Strategy (NRSS) 2016-2030. I also provide comparative information from three sets of reference countries – the BRICS, selected African countries including our abutting neighbours, and a group of aspirational or best practice countries – to illustrate South Africa's road safety strengths and weaknesses. Finally, I argue that South Africa's road traffic system is "crashogenic" and as a result the MTI operates in a "crashogenic environment", offering definitions of both of these terms.

- **In chapter 4** I turn my attention to paratransit (informal transport systems), of which the South African MTI is one. I describe their characteristics in a general sense, including the need for and difficulties associated with reform. I then hone in on the South African MTI, offering a very condensed history to illustrate its origins and operating principles. Next, I describe Johannesburg as a world city before setting out what is known – and not known – about the Johannesburg MTI. In this way I provide the reader with a contextual foundation for the empirical data which follows later in the thesis.

- **In chapter 5** I explore the moral considerations related to road safety, as reflected in a wide range of philosophical writings as well as the Vatican's guidelines for pastoral care of the road. In this chapter I also introduce Nihlen Falquist's MRAF, in preparation for applying this as a reasoning tool later in the thesis.

- **In chapter 6** I set out the results of my survey of 50 drivers at 20 ranks in greater Johannesburg, using descriptive statistics and some correlational analyses.

- **In chapter 7** I present the results of my in-depth one-to-one interviews with 12 drivers, which I subjected to thematic content analysis.

- **In chapter 8** I offer an integrated discussion of my results from the survey and interviews, with reference to the literature, and develop and defend my argument regarding what should be done – and by whom – in relation to reducing crashes and RTID in the Johannesburg MTI. I then use Nihlen Falquist's MRAF as a tool to ascribe blame responsibility, causal responsibility and forward-looking responsibility to different roleplayers related to the industry.

- Finally, **in chapter 9** I summarise the main points of my argument and put forward a set of practical recommendations for driver-centric road safety interventions in the Johannesburg MTI. I also acknowledge the study's

limitations, comment on the degree to which my results can be generalized and suggest directions for future research.

1.9 Closing remarks

In this chapter I have set the scene for the chapters to follow, providing brief background information relating to the research topic and offering an overview of my study. I have also provided a set of signposts for the benefit of the reader, explaining the logical flow of the forthcoming chapters which make up the body of the thesis.

CHAPTER 2: METHODS

2.1 Preamble

Kon (2009) has stressed the importance of empirical work as part of bioethical research. This includes exploring the "lay of the land", commenting on the "ideal versus reality" and suggesting possibilities for "improving care" – all of which can, in turn, support "changing ethical norms".

At the outset of my study the "lay of the land" was far from clear in relation to MTI drivers' work conditions, behaviours and perceptions of who is responsible for road safety, due to a dearth of past research. My empirical work (which constitutes a descriptive inquiry, in philosophical terms) aimed to collect data which could be contrasted with "the ideal" in the form of road safety best practice and WRRS principles. My ultimate aim was to use this comparison (a process of normative inquiry) to generate possibilities for "improving care". I hoped that this in turn would allow me to make a contribution to "changing ethical norms" within the industry.

In this chapter I explain the methods used during my empirical research, after acknowledging that I approached this with an outsider perspective.

2.2 Acknowledging my outsider perspective

As an outsider and non-user of the Johannesburg MTI, I was awake to the need to offset potential bias and correct for blind spots through acquiring of deep insights. Having lived and worked in Johannesburg for some decades, I had been thoroughly exposed to assumptions and generalisations made about MTI drivers via letters to the press, social media, radio and television talk shows, and interactions with friends, family and colleagues. It seemed to me that many Johannesburg residents held stereotypical views of MTI drivers, perceiving them as almost universally reckless and lawless and thus responsible for many road crashes. As a daily road user I had second-hand experience of the MTI, at least in those parts of Johannesburg which I

frequented, and I had certainly seen numerous instances of dangerous driving. Rigorous empirical work was necessary to assist me to develop my understanding of those aspects of the industry which do not readily meet the eye and to offset the potential for unconscious bias on my part.

2.3 Cross-cutting issues affecting the empirical research

My empirical research involved two phases, namely a survey phase and an interview phase. These were separated temporally but were intrinsically related from a content point of view. The two-step approach to data collection allowed for a rapid scan of the realities in the field (via the survey), followed up by in-depth interviews during which I could probe critical aspects in greater depth.

Before describing the specific methods associated with each phase of empirical work (divided under the sub-headings Sample, Instruments, Procedure and Data Analysis in each instance) I deal here with several cross-cutting issues. These include the geographical bounds of the study, the use of a fieldworker and interpreter, ethical considerations and the obtaining of Human Research Ethics Committee (HREC) clearances, as well as measures used to ensure reliability and trustworthiness.

2.3.1 Geographical bounds of the study

From a geographical perspective, my study was confined to the greater Johannesburg area for reasons of manageability and affordability and also because this area is the economic hub of South Africa. Centred on the historical Johannesburg CBD, it is bounded by the outlying townships, informal settlements and new formal settlements which developed at its edges during the *apartheid* era and more recently. Thus, my study used similar demarcations to those used by the Gauteng Department of Roads and Transport (GDRT, 2012, p.40), focusing most strongly on the area within and between the low-income communities of Zandspruit and Diepsloot to the north-west; Midrand, Ivory Park, Tembisa and Alexandra to the north-east;

Ekurhuleni to the east; Soweto and Lenasia to the south-west; and Roodepoort to the West. The map below gives a sense of the area of interest.

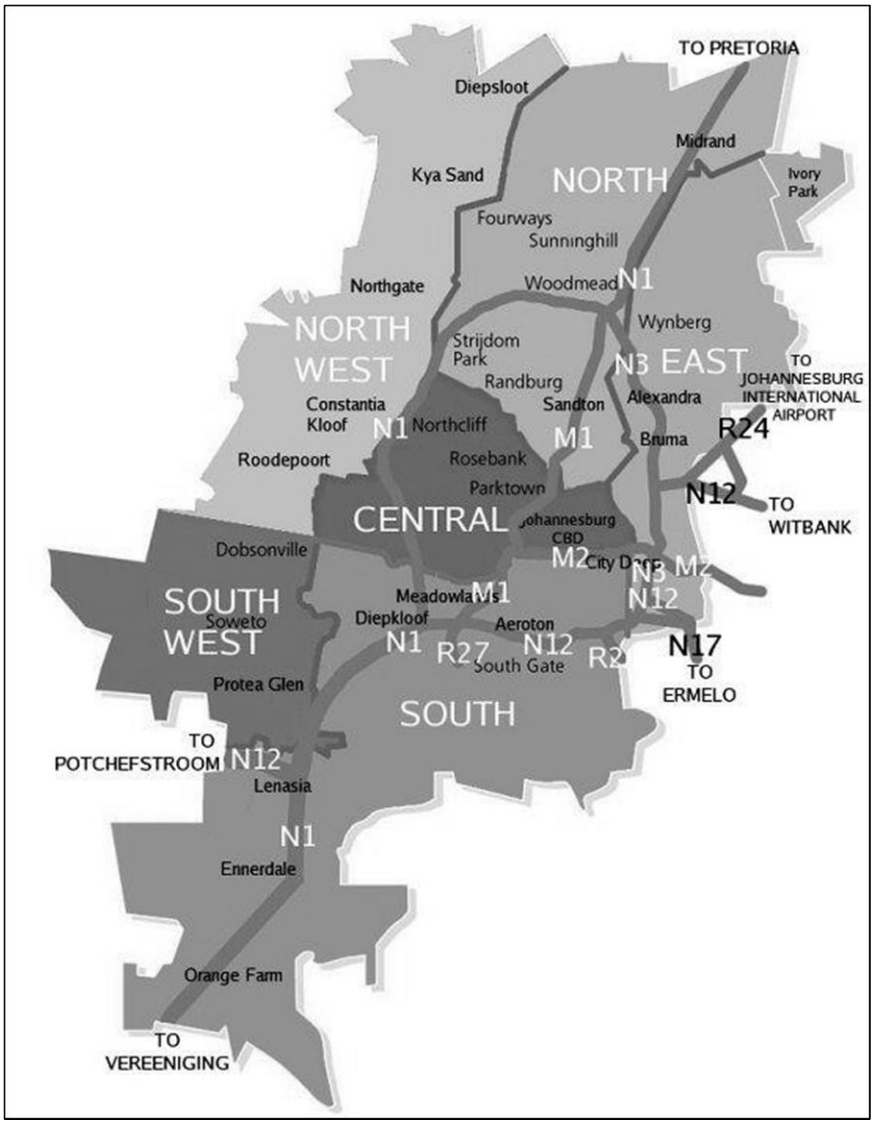


Figure 2.1: Map of greater Johannesburg and its arterial highways (from www.south-africa-tours-and-travel.com/map-of-johannesburg-south-africa.html)

I planned to administer the survey at major taxi ranks in the Johannesburg inner city/central business district (CBD), which acts as a hub or convergence

point for numerous MTI routes. The City of Johannesburg (COJ, undated-c) lists 8 formal ranks within the CBD which together serve both short- and long-distance taxis. The ranks of greatest interest were those major ones which serve short-distance taxis, as long-distance taxis were excluded from the study due to introducing too many additional geographical variables. The two most promising ranks were Noord Street (also known as Jack Mincer), a confluence point for taxis from 15 routes, and Metro Mall, a confluence point for taxis from 34 routes; other ranks, by contrast, serve only 3-6 routes. I hoped that targeting Noord Street and Metro Mall would make it quick and easy to gather sufficient surveys and tap data from multiple routes and associations. However, I planned to extend the survey to other ranks if the need arose – for instance, I noted that the Carlton Centre mini-rank lay roughly midway between the previously mentioned ones and accommodated taxis from 6 routes.

Prior to the survey's launch in mid-2015 there was an upswing in violence and volatility in the Johannesburg MTI, partly related to new routes serving the recently opened Mall of Africa in Midrand. Safety concerns were raised by press coverage of murders and conflicts affecting both drivers and taxi owners, particularly in the Johannesburg CBD – indeed, Noord Street was dubbed "Moord Street" ("*moord*" being the Afrikaans word for "murder") after several shootings took place there. For safety reasons, Noord Street and Metro Mall were omitted from the survey and it instead took place at other inner-city ranks as well as at confluence points throughout greater Johannesburg. This diluted the "visibility" of the survey, for the safety of participants as well as of the fieldworker who administered it. Ultimately, 20 venues were visited, being loosely named (for the purposes of the study) as Nancefield, No. 1 Office Park, Jabulani Mall, Park Station, Bree Street, von Brandis, Carlton Centre, Morafe, Dube West, Baragwanath, Kempton Park, Wanderers, Hancock, MTN, Faraday, Westgate, Sandton, Eastgate, Rosebank and Corlett Drive. The response rates achieved at each venue are discussed in chapter 6.

2.3.2 Use of a fieldworker and interpreter

I used a research assistant in the form of a fieldworker (survey phase) and interpreter (interview phase) for the following reasons:

- Language diversity

  South Africa has 11 official languages, with isiZulu being most dominant (spoken at home by 24% of the population and other significant languages being isiXhosa (18%), Afrikaans (13%), Sepedi (9%), English and Setswana (8% each), and Xitsonga (4%) population)[12]. Sauti (2006) notes that during her study of the Johannesburg-Randfontein MTI route she interviewed the drivers in English, but they reported a variety of home languages. I felt that it would be inadequate to use English as the sole medium for my study and I thus approached two professional translation services for advice on which languages (besides English) are most commonly used in Gauteng. Both stipulated isiZulu and Sesotho, which would cater for the Nguni language group and Ndebele language group[13]. Accordingly, I had my research instruments professionally translated from English into these two languages. As I lack fluency in any language except English, this resulted in a need for a multilingual fieldworker during the survey phase and a multilingual interpreter during the interview phase.

- Confidentiality and anonymity considerations

  Based on general knowledge of the MTI as well as information from informed advisors I knew that my presence at taxi ranks as an older, white female, would be anomalous and could draw undue attention to the study participants. This could in turn affect their anonymity and ability to give information confidentially. I also noted that as a historical non-user of the MTI I would have difficulty quickly orienting myself at taxi ranks and judging the dynamics at play – as a "clumsy" interloper I could inadvertently create undue visibility for prospective study participants. It

[12] As indicated on https://www.internetworldstats.com/languages3.htm.
[13] According to Census 2016 (StatsSA, 2018b), the most common languages in Gauteng are isiZulu (23%) and Sesotho and English (each 13%).

was preferable to use the services of a fieldworker with prior knowledge of the industry.

- Response rates and trust in the research

  Previous researchers have noted that MTI workers are predominantly black males (Barrett, 2003; Magubane, 2003; Peltzer & Renner, 2003; Sauti, 2006; Mashishi, 2011). Some report encountering hostility, suspicion and a reluctance to provide information, at times bordering on paranoia – for instance, Mchunu et al (2012) note the difficulties they encountered when entering into and gaining trust within the community of KwaZulu Natal MTI drivers. These phenomena can make the industry unsafe to outsiders, although Sauti (2006) (a black female who utilized the MTI herself) notes that most drivers she approached on the Johannesburg-Randfontein route were "calm and cooperative" and only a few were "resistant and less friendly" (p.2).

  As an obvious outsider to the MTI, I felt that I would have difficulty gaining the participants' trust, putting them at ease and achieving optimal response rates. The mix of language, gender and race issues, as well as the need for prior familiarity with the industry, resulted in the most trustworthy "face" of the research being offered by a multilingual, black male fieldworker with a personal history of using the MTI. I felt that his immediately apparent comfort and familiarity with the settings in which the industry operates would help maximise response rates and trust.

- Safety

  Safety was a key consideration due to documented conflict (Sekonyane & Dugard, 2004; Fobosi, 2013) and gender-based violence (Khoza, 1997 (cited by Sauti, 2006)) within the MTI. Thus, I utilized the services of a male fieldworker with prior knowledge of the industry, who was "street smart" and able to appraise the risks in settings like taxi ranks and modify

his approach accordingly[14]. Other safety considerations related strongly to the MTI drivers themselves – as noted by du Plooy-Cilliers et al (2014, p.16), researchers are responsible for ensuring that their studies do not "cause anybody emotional stress, physical discomfort, humiliation or even embarrassment". I maximized participants' comfort and safety by using a fieldworker who could "blend in" and thus not draw undue attention to their involvement in the survey. In relation to the fieldworker's safety, I designed the study in such a way that he did not have to travel in the taxis to conduct the research – instead, he approached drivers while they were stationary at ranks and confluence points.

Peltzer and Renner (2003) note in relation to their survey of MTI drivers in Pietersburg that university students with interviewing skills and an appreciation for research processes and ethics make effective fieldworkers. In keeping with this, I appointed a multilingual black male, historically an MTI user, who was a senior student in a university communications degree course. I provided him with training so that he had a thorough overview of the nature and purpose of the study, with a detailed orientation to the participant information sheet, consent forms and Minibus Taxi Driver Questionnaire (MTDQ), all of which are described a little later in this chapter. We agreed that he would use a systematic approach, to the degree that this was practical, when recruiting survey participants. For instance, on arrival at a particular rank or confluence point he may work from north to south or east to west, or target a different taxi queue each day, or identify which associations were most active at the rank and then attempt to recruit drivers from different associations. We agreed that he would scan and email me completed consent forms and questionnaires at regular intervals, handing over the hard copies at the earliest opportunity. I provided him with time sheets as well as

[14] Peltzer & Renner (2003) reported using a black *female* fieldworker during their study in Pietersburg in 2000 and Sauti (2006), a black *female,* conducted her own research on the Johannesburg-Randfontein taxi route despite others telling her that this would be "dangerous and challenging as a female". It is possible that the settings of their studies – or the period in which they were undertaken – were less volatile than appeared to be the case in Johannesburg in 2013/2014, when this study was planned and ethical clearance sought for it.

disbursement claim forms, on which he recorded his fieldwork time, travel costs and incidental costs like airtime and photocopying.

Whilst busy with the survey (which took place from July to October 2015) the fieldworker gave me regular feedback as to his experiences and the drivers' responses, which allowed us to refine the survey procedures as needed. For example, at the request of some drivers, he administered the survey not only during the midday lull period but also at other times – for instance, in the evening after the afternoon peak was over.

I offered the fieldworker a further role as an interpreter during the interview phase, providing him with additional training for this. Using the same person for both the survey and interview phase had positive ramifications, as his insights into the findings of the survey helped him make sense of some of the interviewees' responses and translate them from isiZulu or Sesotho into English. Furthermore, many of the interviewees recalled him from the survey phase and this helped to "break the ice" at the start of the interviews.

2.3.3 Ethical considerations and HREC clearance

Prior to commencing any empirical research I obtained ethical clearance from the Human Research Ethics Committee (HREC) of the Faculty of Health Sciences, University of the Witwatersrand (see certificate in appendices). This clearance rested on the study being designed according to principles outlined in documents like the latest amendment of the Declaration of Helsinki (WMA, 2013), the research ethics guidelines provided by the National Department of Health (NDOH, 2012) and the Health Professions Council of South Africa's "Code of Ethical Practice for Medical Biotechnology Research in South Africa" (HPCSA, Booklet 7, 2008). These bound me to act with integrity, show respect for persons, adhere to principles of beneficence, non-maleficence, justice and fairness, respect the law and system of government, exercise competence and recruit only adult participants with legal and factual capability of consenting.

I viewed MTI drivers as a vulnerable population in relation to the definition of vulnerability offered by Dhai (2015)[15]. This was due to the historical violence and divisions within the industry and because previous researchers had suggested they may be in exploitative labour relationships (see for instance ILO, 2003; Barrett, 2003). It was thus critically important to approach them in a discreet fashion, to advise them that they may at any time decline to continue and remove themselves from the study with no adverse consequences, and to de-identify and anonymise all data to protect their identities.

I designed four consent forms, one for participating in the survey, one giving consent to be contacted telephonically and invited for an interview, one for participating in an interview and the one giving permission for the interview to be audiotaped. In this, my study differed from that of Peltzer & Renner (2003), who obtained only "informal consent" from the MTI drivers they interviewed/surveyed in Pietersburg in 2000. It also differed from the study of Sauti (2006), in which she interviewed MTI drivers on the Johannesburg-Randfontein route and audiotaped the interviews because they "had much to say" (p.15) – there are no indications in her dissertation that formal consent was obtained for this. For reasons which will be detailed later, not all of the consent forms were used as face-to-face audiotaped interviews had to be abandoned in favour of telephonic interviews. Telephonic interviews offered no opportunity to obtain written consent and instead the participants were asked to give their consent verbally. Due to the high identifiability of voice recordings and the inability to obtain written consent for these, no audiotaping took place and instead I captured the drivers' responses by making rapid handwritten notes as the interviews progressed.

[15] Dhai (2015) defines vulnerability as follows: "Vulnerability is an inability or decreased ability of a research participant to sufficiently safeguard her/his own needs and interests resulting in her/him being at an increased likelihood of being identifiably wronged in varying degrees if special safeguards to protect her/him are not invoked by the Research Ethics Committee".

The data from the survey phase and interview phase were de-identified and anonymized as follows:

- Completed survey questionnaires were labelled not with participants' names but with codes, and the applicable consent forms (also labelled with codes) were stored separately from the questionnaires.
- At the end of the survey the participants were asked whether they would like to be contacted at a later stage about being interviewed, and those who indicated interest in this were asked to sign a further consent form, confirming that they could be contacted telephonically and providing a cellphone number for this purpose. The full list of survey participants and the sub-list of potential interviewees were kept under lock and key in my office at all times during the study. Electronic versions of these lists (and all other raw data relating to the study) were stored on my password-protected desktop computer, to which no-one else had access.
- My rough interview notes were labelled with the participant's first name as well as the date of the interview but when they were typed up into transcripts they were de-identified, being labelled simply according to the order of the interviews (ie. Participant 1, Participant 2, Participant 3, and so on). In the case of one interviewee, the interview was split across two sessions on different dates and this resulted in two separate transcripts – these were labelled Participant 8(a) and Participant 8(b). The raw notes and typed transcripts were stored under lock and key in my office at all times.

I note that some other researchers in the road safety field have been less rigorous in de-identifying or anonymizing their participants, but the volatility of the MTI and fact that many drivers have been injured or killed during internal conflicts resulted in my opting for maximal anonymity in my study. Kayani (2011), for instance, labelled the interviewees who participated in his study into fatalism and road safety in Pakistan in a way which could have made them identifiable to others. Thus, he labelled a 36-year-old female police official with a master's degree (the *only* female police official he interviewed)

as PolMas36F and a 40-year-old male truck driver with middle-level schooling (one of 6 male truck drivers he interviewed) as TrkMidSch40M. I viewed the strategy of naming interviewees purely according to the order in which they were interviewed (with no information available to outsiders as to what this order was) as the safest and most ethical option for my study. In addition, although I already knew some demographic information about most of the interviewees, by virtue of their having already taken part in the survey phase of the research, I did not specifically attach this information to their interview notes or transcripts. Going forward, all participant information, the original survey questionnaires and the handwritten and typed interview transcripts will be held under lock and key (and in a password-protected computer) at my office for the next 6 years in the event that no publications result from this study, or alternatively for 2 years after the date of publication.

A further ethical consideration was whether the study could cause harm to the participants. I did not anticipate that they would experience any direct physical or psychological harm, but I thought that drivers with experience of road crashes could potentially experience emotional distress while being interviewed about their views on road safety. As a qualified occupational therapist who has worked with road accident survivors for over 2 decades I am professionally capable of recognizing signs of emotional distress but I knew that offering any type of intervention would change the nature of the research process. I thus made arrangements to allow me to refer any drivers who showed distress for free psychotherapy services at the university's Emthonjeni Community Psychology Clinic (see confirmatory letter in appendices).

2.3.4 Reliability and trustworthiness

Throughout the empirical phases of my study the reliability of the data was maximized by the use of recognized, systematic and logical ways of processing it. My supervisors played an oversight role, ensuring academic rigour and adherence to accepted research principles, and I also obtained input from statisticians and experienced researchers while designing the study

and as needed while processing the data. During the qualitative phase I subjected my own thematic content analysis to external scrutiny and validation on two occasions, while it was underway and before I finalized the themes drawn from the data. This validation process involved two independent reviewers in the form of colleagues who have expertise in qualitative research and were not involved in my study in any other way. The first colleague assisted at the point of code generation by reviewing the tentative codes and sub-codes I had generated, looking for missed patterns as well as instances where I seemed to be perceiving patterns which were not actually present. The second colleague assisted at the point of preliminary theme generation, reading all the interview transcripts and critiquing the tentative themes I had developed. The feedback received from these reviewers largely confirmed my coding and theme generation process but led me to make certain refinements in both instances.

In my study I did not face the reliability challenges experienced by some other road safety researchers, in that I was not attempting to gather factual data about specific road crashes or events and was instead tapping the drivers' overarching views on road safety in the MTI. Kayani (2011) notes that the reliance on self-reported information was a methodological weakness in his qualitative research into fatalism and road safety in Pakistan. In-depth interviews were conducted with a range of participants to obtain detailed data about specific road crashes, but a disconnect was found between off-the-record information and what was revealed during the interviews – to the extent that some participants actively denied or contradicted information they had previously given to the researcher. This phenomenon was most marked with professional drivers (being less apparent with other categories of interviewees like general car drivers, police officers, policymakers and religious orators) and was particularly apparent when the interviews were tape-recorded. Kayani attributed the problem to some participants misunderstanding his role and fearing legal or reputational consequences if they revealed the facts about crashes during the interviews. My study design took into account that questioning MTI drivers about road crashes in which they had been involved could be overly threatening and could raise significant

concerns about the motives of the research and about consequences like losing their jobs.

My study does have some similar reliability problems to that of Kayani in that I tapped self-reported information on the drivers' work hours, wages and target amounts paid over to the owners during my survey and interviews but was not able to cross-check this information for factual accuracy. Due to the informal nature of the MTI there is a general lack of documentary evidence like driver time-logs, employment contracts and payslips, wages tend to be paid in cash and the industry does not make use of electronic monitoring devices like the tachometers which are used in the formal transport sector to track driving time. Nevertheless, my data appear at least somewhat reliable in that other researchers report congruent findings (ILO, 2003; Barrett, 2003; Behrens, McCormick & Mfinanga, 2016; Plano, Behrens & Zuidgeest, 2018).

With regards to trustworthiness, this rests on the involvement of my research supervisors and the two independent reviewers mentioned previously. They cast their eyes on the data, assisted with the preliminary processing of the qualitative information and critiqued my thinking process in relation to interpreting the data. Furthermore, I used triangulation of data sources – namely, the survey, the interviews and contextual data including grey literature (newspaper articles, letters to the editor) and radio, television and social media. The contextual data helped ensure that I interpreted the survey and interview data in a way which was sensitive to the historical and geographic context in which they were collected.

2.4 Empirical research methods

2.4.1 Taxi driver survey

(a) Sample

Through the fieldworker, I recruited a purposive non-parametric sample of 59 MTI drivers at Johannesburg taxi ranks and this yielded 50 fully usable

surveys (the reasons for 9 surveys being discarded is discussed in chapter 6). I used a similar strategy to Peltzer & Renner (2003), whose fieldworker approached 130 MTI drivers at ranks in what was then Pietersburg, during their work hours, assuring them of complete anonymity and confidentiality and requesting their participation in an interview with a structured questionnaire. Sauti (2006) took a different approach in her ethnographic study of MTI drivers on the Johannesburg-Randfontein route, using "chance encounter" interviews as well as purposive interviews with drivers and other role players (queue marshalls, rank-based hawkers, car washers, taxi association officials and traffic cops). Sauti also used a novel approach to tap the opinions of ordinary motorists, drawing up a very short written survey which was handed to about 100 motorists at traffic lights and stop streets; she was surprised that as many as 70% of the motorists completed the survey and handed it back at the same sites within the next week.

For the purposes of this study, I initially hoped that a large enough sample would be obtained for the results to be generalizable to the population of all Johannesburg MTI drivers. This intention was thwarted by a combination of scientific, practical and financial factors. In the first place, the dearth of information about the population of interest made it difficult to determine scientifically what sample size would have been needed for representivity. There is no register of MTI drivers and the best available information suggested that there may be as many as 11,000 operating in Johannesburg (CoJ, undated-b)[16]. A population of that size would generally require 95+ participants to obtain survey data which can be analysed with a confidence level of 95% and no more than a 10% margin of error[17]. However, this would in itself depend on what variables were under consideration – for instance, previous researchers have noted that 98-99% of MTI drivers are male (see for instance ILO, 2003) and this implies that a much larger sample size may be

[16] Croucamp (2003) notes the difficulties of estimating the true size of the taxi fleet – for instance, in 2000/2001 the DOT estimated that there were 126,000 legal taxis and *an even greater* (but unknown) number of unregistered taxis, countrywide.

[17] This is based on using Epi-Info sample size calculators, plus discussions with experienced quantitative researchers and biostatisticians in the Faculty of Health Sciences.

needed to “capture” the perspective of even *one* female MTI driver, if gender was a variable of interest. The variables in which I was most interested were the drivers’ employment status (eg: salaried drivers versus owner-drivers versus drivers who simply receive a share of the day’s takings); employment terms (eg: having or lacking employment contracts, payslips, paid leave and benefits like medical aid or funeral cover); work conditions (eg: duration of a typical work week, length and frequency of breaks, and the age and quality of the vehicles they drive); their ages and length of driving experience; their levels of personal experience of road crashes; and their levels of concern about road safety.

Information obtained from experienced South African researchers and through postgraduate student workshops suggested that face-to-face survey interviews can achieve high response rates of 60-70%. On this basis, I calculated that at least 150-175 drivers would need to be approached to achieve a sample of 95; however, I did also note the findings of Sauti (2006), namely, that taxi ranks are overcrowded and difficult spaces in which to interact with drivers and other MTI role players. Ultimately, I only achieved a response rate of 33.8% given the practical and financial constraints of the study – the reasons for this are outlined in depth in chapter 6. My sample is thus non-parametric in nature and the data are descriptive and not generalizable to the broader population. The purposive sampling techniques I used did, however, ensure that the drivers surveyed were from a range of different routes, operators and associations.

Inclusion and exclusion criteria were needed to ensure that the survey was completed only by experienced short-distance MTI drivers who were familiar with greater Johannesburg, rather than those who simply pass through the city as long-distance drivers. I presumed that the latter, especially those who drive between Johannesburg and neighbouring countries, may well face different issues and have substantially different work conditions and behaviour when compared with Johannesburg MTI drivers, which would blur the focus of the study and the trustworthiness of the data. The inclusion criteria thus included significant involvement (12+ months within the past 3 years) in short-

distance MTI driving, as well as plying of routes which fall within greater Johannesburg. Language-related inclusion criteria ensured that the study could proceed with a minimum of language complexity while at the same time allowing for some language diversity.

My exclusion criteria included an age-related inclusion – thus, no driver under 18 (ie. beneath the legal driving age) was allowed to participate in the study, as this would have involved colluding with lawless behaviour. The other exclusion criteria ensured that drivers participated voluntarily in the survey and gave their written consent to do so. In summary, the inclusion and exclusion criteria were as shown below.

Table 2.1: Inclusion and exclusion criteria

INCLUSION CRITERIA	EXCLUSION CRITERIA
• **Significant involvement (12+ months within the past 3 years) in short-distance MTI driving**	• **Under 18 years**
• **Plying of routes which fall within greater Johannesburg**	• **Unwillingness to participate**
• **Familiarity with English, IsiZulu or Sesotho as a medium of communication**	• **Declining to sign consent form (for survey phase)**

(b) Research instruments

A questionnaire survey presented the most feasible option for gathering data from Johannesburg MTI drivers with regard to their experiences, work conditions and perceptions of road safety issues. Surveys tend to be relatively cost-effective, being less time-consuming than other data-gathering approaches, and can elicit large amounts of data in a standardized way. They also lend themselves to being completed anonymously, with the information obtained kept confidential and not exposed to people outside of the research

process. Their downside is that they can be superficial unless open-ended questions are included, and the latter significantly increase the time required for analysing the data set without necessarily adding a great deal of extra value. These pro's and con's of surveys have been commented on by many authors – see for instance Bless et al (2013) and du Plooy-Cilliers et al (2014). Kouabanen (1998) and Peltzer & Renner (2003) used survey methods incorporating a fatalism scale and a questionnaire listing 30 possible causes of road traffic accidents to explore drivers' perceptions of crash causation factors and how these related to fatalistic beliefs. Surveys have also been used in previous MTI research in South Africa – for instance, Mashisi (2011) used a structured 47-item survey (containing both qualitative and quantitative questions) when canvassing the opinions of taxi owners and operators regarding the Taxi Recapitalisation Programme (TRP), while Sauti (2006) used a simple written questionnaire to tap motorists' views of MTI drivers.

As an occupational therapist I frequently use questionnaires to explore job demands and work conditions – for instance, the Job Description Questionnaire[18] focuses on job purpose, responsibilities, essential job functions and prerequisites while the Job Demands Questionnaire[19] explores operational aspects of the job, such as its physical demands and the presence of hazardous or challenging work conditions. There are also questionnaires specific to the field of driving, such as the well-known Manchester Driver Behaviour Questionnaire (Reading et al, 1990) which measures aberrant driving behavior in the form of errors and violations. This has been used to identify at-risk drivers in many settings around the world but has been critiqued as too heavily reliant on the driver's honest self-reporting – see for instance af Wåhlberg, Dorn and Kline (2011).

Since no existing questionnaire covered all the areas of interest for this study or properly accommodated the informality of the Johannesburg MTI, I

[18] See Rochester Institute of Technology, https://www.rit.edu/fa/humanresources/forms/jdqinstructions

[19] See http://www.doctorpetruska.com/Forms/Job/Job%20Demands.pdf

developed a customized research instrument which I called the Minibus Taxi Driver Questionnaire (MTDQ). This was modelled partly on existing questionnaires and job analysis tools and was informed by the literature pertaining to professional driving, drivers' occupational health and safety, road safety and the South African MTI. The survey was designed to elicit information not only about the drivers' work conditions but also about their stressors, health and safety concerns, level of past experience of MTI crashes and their perceptions of the most common crash causation factors. Furthermore, it tapped information about the vehicles they drive, including their makes, ages and safety features – these questions were included because of the relationship of vehicle type and age to safety. Magubane (2003) found that 82% of Pietermaritzburg taxi drivers he surveyed viewed the main purpose of the government's recapitalization programme as being to scrap older vehicles in favour of safer, newer vehicles. Mashishi (undated) found that taxi owners in Hammanskraal favoured particular vehicle makes due to sentimental value, with a high proportion of the taxis being more than 10 years old and owners showing a reluctance to change to newer vehicle makes and models.

The first draft MTDQ contained 20 closed-ended questions, some having sub-questions. The last three items focused on driver demographics (gender, age, level of education) – I deliberately placed these at the end of the questionnaire, as asking them upfront may have caused concerns regarding anonymity and made the drivers resistant to proceeding with the survey. They were also the most expendable items – thus, if a driver tired or ran out of time before those particular items were completed this would not detract from the usability of that questionnaire. The questions and sub-questions included multiple-choice or closed-ended items (in which only one of several possible responses could be selected), inventory-style items (in which any number of several possible responses could be selected) and matrix items (in which the selected response is that which best reflects one's view on particular issue). Some ordinal and interval scales were included – for example, the drivers were asked to indicate their age groups using the numerically scaled options 18-24, 25-34, 35-44, 45-54, 55-64 and 65 or older. Other scaled items related

to their years of driving experience, starting and ending times for their work days, and ages of the vehicles they drove. I tried to use terms familiar to MTI drivers – for instance, in a question dealing with their income I used the term "checkings" (which appeared in other studies such as ILO, 2003) to describe the fares received for the day. Other than this, I avoided jargon and I did not use any acronyms. Most items were short, for ease of administration.

The draft questionnaire was piloted with two taxi commuters and one person with prior experience of mediating in the taxi sector, as I could not access any MTI drivers for this purpose and my attempts to obtain input from a taxi chamber organizer at the South African Transport and Allied Workers Union (SATAWU) proved fruitless. I tried to run the questionnaire past the chairperson of a Johannesburg taxi association, but he effectively rejected it, indicating that his association would not support research amongst drivers and instead suggesting that I survey taxi owners.

The pilot group indicated that they felt that all the questions and answer options on the survey would be clear and understandable to MTI drivers. They did not suggest that any items be omitted, or that any further items or sub-items be added. I thus finalized the MTDQ as is, after checking it for errors, and drew up consent forms and participant information sheets. As noted previously all the research instruments were professionally translated from English into isiZulu and Sesotho. The participant information sheet made it clear that participants could choose which language to use for the survey.

The English versions of the research instruments are provided in the appendices at the end of the thesis and the isiZulu and Sesotho versions can be made available on request. Due to language intricacies, the English questionnaire is 6 pages long while the IsiZulu and Sesotho versions are somewhat longer.

(c) Procedure

I designed the MTDQ to be administered as a cross-sectional survey, thus obtaining a snapshot of drivers' reported realities at that point in time[20]. I considered a number of possible administration procedures, including mailing or emailing the survey, administering it telephonically and administering it face-to-face. The lack of any available database of MTI drivers' names and contact details dispelled the first three options. My discussions with the SATAWU organizer suggested that relatively few MTI drivers are unionized and based on my approach to an association chairperson it seemed unlikely that taxi associations would provide me with drivers' names and contact details[21]. Accessing drivers via associations or taxi owners could also have affected their ability to participate in an anonymous and confidential way, created suspicion about the underlying motives for the study and elicited fear that responding (or *not* responding) could jeopardize their jobs. Even if a database of addresses and telephone numbers had been available, a postal survey would have been hampered by the inefficiencies of South Africa's postal services (including slow and unreliable deliveries and high numbers of people with no postal addresses), an emailed survey would have been inappropriate given the very limited access to email amongst informal sector workers, and a telephonic survey would have been highly costly due to the likelihood that calls would have to be made to cellphones rather than landlines. Language and literacy issues also played a role – Bless et al (2013) note that in developing countries mailed questionnaires are hampered not only by logistical challenges but by their requirement for language and literacy abilities which some respondents may not have, especially in a multilingual society. The same authors note that mailed questionnaires may be completed – without the researcher's knowledge – by someone other than the intended respondent, the response rate is often as low as 20-40% and the

[20] The MTDQ could also lend itself to longitudinal use – for instance, to monitor changes in the MTI over time, conduct cohort studies or obtain before-and-after (pre-test/post-test) information in relation to particular innovations or industry events.

[21] Personal communication with a consultant previously involved in MTI mediation suggested that in many instances the taxi owners themselves lack proper records of the drivers who work for them.

proportion of incomplete or unusable questionnaires is frequently high. These realities can bias the results.

Given the factors outlined above, I settled on face-to-face surveying as the only viable option. Hoping to achieve time efficiencies and economies of scale I explored the possibility of group administration with the previously mentioned SATAWU organizer and taxi association chairperson, but it was clear that it would be unrealistic and possibly unethical to “recruit” drivers in groups and administer the survey to them simultaneously. In the case of SATAWU, as noted previously I was informed that few MTI drivers belong to it; the taxi chamber was neither active nor well-organised and did not convene any regular meetings of the drivers (and even if it had done so, this may have represented a highly skewed sample). With regards to working through taxi associations, as mentioned previously the chairperson I approached declined to facilitate research with drivers and suggested instead that I conduct a survey amongst the taxi owners. I also had a brief meeting with an executive member of the South African National Taxi Council (SANTACO), but despite an invitation for me to present a proposal to its executive committee I was not offered a time or date for this even when I followed up on this – supporting my immediate impression that SANTACO viewed driver-centric research as either threatening or unimportant. Finally, I met with a representative of SA Taxi, a private sector financier of the MTI, who also made it clear that he had no direct relationships with drivers and would not be able to convene a group for the purposes of my study.

There are benefits to face-to-face surveys – for instance, Du Plooy-Cilliers et al (2014) note that they have “the major advantages that questions can be clarified, response rates are high, and respondents do not have to be literate”; furthermore, the researcher “has an opportunity to build rapport with the respondents and thereby ensure their cooperation” (p.151). Similarly, Bless et al (2013) note the benefit of having an interviewer record responses, clarify questions and answers and facilitate the completion of all questions without omission of difficult ones. The latter authors acknowledge that the interviewer’s personal characteristic (eg: age, gender, social status) may

affect participants' responses but this can be offset by a well-structured questionnaire. On the downside, all the aforementioned authors note that one-to-one questionnaire interviews are costly and time-intensive, typically involving travel time for the interviewer in addition to the actual time taken to administer the survey – as a result they are most feasible with smaller sample sizes. Another negative factor associated with face-to-face surveys is that they offer lower anonymity than, for instance, mailed surveys – this can lead to potential dishonesty in relation to sensitive or embarrassing information.

Having settled on face-to-face administration, I considered the use of a pen-and-paper measure versus a technology-driven option like loading the survey onto a laptop or tablet. The former option was chosen for reasons of cost, practicality and safety. Apart from necessitating a higher research budget, the need to carry a valuable electronic device in public spaces like taxi ranks seemed likely to compromise the fieldworker's safety by attracting attention from opportunistic criminals.

Insofar as the timing of the survey was concerned, although MTI drivers are out on the roads for much of their time many have a well-documented lull in the middle of the day, typically spent at a taxi rank or confluence point (see for instance Mashishi, 2011; Sauti, 2006). This lull offered a chance for a fieldworker to access drivers on a face-to-face basis at a time which would not inconvenience them, interfere with their earning ability or require them to leave their naturalistic environment. Thus, I planned that the survey would be administered between the 3-hour morning peak traffic period and 3-hour afternoon peak traffic period referred to by the Gauteng Department of Roads and Transport (GDRT, 2012, p.78) – ie. between 10h00 and 14h00 on weekdays. A similar strategy was employed by Sauti (2006) when she interviewed MTI drivers on the Johannesburg-Randfontein route. In reality, my survey was at times administered outside of the lull due to some drivers not having a lull and others preferring to participate at other times (eg: at 08h00, once the morning peak died down, or in the evening after they finished work).

I intended that the survey would take place in September/October/ November 2014 but a delay in securing funding resulted in the study running more than 1 year late. Ultimately, I recruited and trained a fieldworker in July 2015 and the survey was administered during July, August, September and October that year.

(d) Data analysis methods

Once the survey was underway I set up a shadow questionnaire on SurveyMonkey so that I could enter responses questionnaire-by-questionnaire to see the picture emerging from the data. Once all questionnaires had been obtained I cleaned and checked the data with the help of an experienced statistician and drew up a data directory which assigned numerical values to each possible response – this can be made available on request. The responses were then captured one questionnaire at a time by my administrative assistant onto an Excel spreadsheet which I set up for this purpose. I checked that all her entries were correct and then utilized graphical methods (eg: pie charts, bar charts and frequency tabulations) to explore and visually represent the findings. In order to carry out some correlational research I obtained the assistance of an experienced statistician, which allowed me to explore relationships between variables measured by the survey. The most suitable tool for this was the Spearman-Rho (ρ) test, a non-parametric test suitable for ranked data and moderate sample sizes.

2.4.2 Taxi driver interviews

At an early stage of planning my study I considered the options of focus groups versus individual interviews, in order to obtain deeper and more specific information than that which was likely to be elicited by the survey. Other researchers in the MTI have utilized both options. For instance, Croucamp (2003) used a combination of focus groups and individual interviews mainly with taxi drivers but also with taxi association members, state officials, South African Police Service members and ex-members, consultants who worked with the industry and civilian victims of taxi violence. In all, he completed 189 interviews, including 56 with MTI drivers or former

drivers in 5 different provinces. Dimitrov (2012) conducted focus groups with public transport users in Tshwane, recruiting participants from the street and local centres using a sampling framework and holding the sessions in private homes and community centres.

I had to select an appropriate method for the resources (time and funds) I had available. Dimitrov's study was commissioned and funded by the Department of Transport and she was assisted by an NGO, which made the costs of her multiple focus groups affordable. Croucamp took 4 years to carry out the focus groups and interviews involved in his study. I had limited funding, no assistance from any external organization and a time limited period in which to complete my study, making focus groups a dubious option and confining the period I could spend on either interviews or focus groups. I rejected focus groups primarily, however, because the nature of the MTI suggested that trying to bring together drivers from different taxi associations into one room would be fraught with complexity and risk and would compromise anonymity and confidentiality. It also seemed unlikely that I would easily manage to gather focus groups from within particular associations, given that taxi owners would probably resist my taking multiple drivers off the roads at any given time.

Thus, for practical, financial and ethical reasons the method I selected was individual interviews.

(a) Sample

As noted previously, drivers who participated in the survey were asked whether they would like to be contacted at a later stage for an interview – those who expressed interest signed consent forms providing a cellphone number for this purpose. I was aware that the time lag between the survey phase and interview phase (mainly related to the time needed to analyse the survey results) may cause attrition – for instance, due to drivers moving to other geographical areas, leaving the MTI, changing their contact details or dying. I thus planned to broaden my recruitment strategies as needed, using convenience sampling and/or a snowball technique. My recruitment of

participants was purposive in nature, aiming to attract information-rich participants who were interested in expressing their views and had (hopefully) given the topic some prior thought – for instance, due to taking part in the survey. Criterion sampling was utilized in that the survey participants had already been screened in relation to the study's inclusion and exclusion criteria; the same criteria would be applied to any interviewees recruited from outside of the survey group. Similarities are present in my study and that of Croucamp (2003), who used a non-probability purposive sampling method and snowball-type selection procedure to recruit his participants (who included not only MTI drivers but also a range of other roleplayers related to the MTI).

A high percentage of the drivers who completed the survey expressed an interest in being interviewed, namely 45 (90%) of the 50 survey participants. One of these, however, omitted his contact number on his consent form and another wrote a contact number which contained 14 instead of 13 digits (not picked up at the time by the fieldworker). Thus, at the end of the survey phase I was in possession of a list of 43 potentially contactable interviewees, representing 86% of the survey sample. The steps I followed to actually make contact with prospective interviewees are described a little later under the heading "Procedure". I anticipated that a non-probability sample of 15-20 MTI drivers would allow for sufficient interview transcripts to achieve data saturation, while at the same time being affordable and manageable. I also planned to discontinue the interviews at below 15, if data saturation had been reached by then, or to continue up to a maximum of 25 if data saturation was not achieved by the 20th interview. The cap of 25 had to be imposed for financial reasons.

Ultimately, 11 of the sample of 12 interviewees were drawn from the survey phase and the 12th was recruited via convenience sampling at a taxi rank.

(b) Research instruments

My survey provided broad brush-stroke insights into MTI drivers' work conditions, including giving an overall sense of the degree to which they had experienced injurious crashes; it also touched on their views regarding crash causation factors. My interview schedule was designed to complement and cross-check the relatively superficial quantitative data from the survey. Initially I planned to use a semi-structured interview schedule containing 10 open-ended questions. However, a lack of success in recruiting drivers for face-to-face interviews (discussed a little later under the heading "Procedure") brought about a need to switch to telephonic interviews, with further HREC clearance being sought and obtained for this. To allow for the telephonic format I significantly reduced and simplified the interview schedule, after some discussion with my fieldworker and interpreter-to-be regarding the language level and terminology which would be most appropriate for the drivers. Thus, the eventual schedule consisted of the three open-ended questions shown below, with follow-on questions and probes being added as needed:

- Please tell us what you think causes taxi accidents?
- What do you think about people saying that taxi drivers break the law?
- What do you think different people or groups should do, to try and bring down the number of taxi accidents in Jo'burg?

Croucamp (2003) notes that he used an unstructured and open-ended questionnaire focused on interviewees' life stories and personal experiences, trying to avoid a sense of a formal investigation which may make respondents uncomfortable "due to the sensitive and often dangerous conditions that prevail in the industry" (p.42). My questions also aimed to avoid being overly formal and focused on the drivers' suggestions and perceptions rather than on anecdotes or experiences – however, they allowed room for the drivers to provide the latter kind of information should they wish to do so.

For face-to-face interviews I created a participant information sheet and consent form, with an additional consent form for tape-recording – the latter

was optional and made it clear that interviewees could decline to be recorded, in which case their responses would be captured in handwriting by myself. The participant information sheet explained the interview purpose and process, assured the drivers that all responses would be kept confidential and noted that they could withdraw from the study at any time with no negative consequences. It also indicated that participants who would like to see the results of the study could ask for this and a summary would be provided to them. With the switch to telephonic interviews it was no longer possible to obtain written consent, resulting in the need for a revised and shortened participant information sheet which could be presented verbally. This ended with the query "May we ask you some questions?", and an affirmative answer was taken as denoting verbal consent. As the interviews all included an interpreter the participant information sheet and interview schedule were not translated from English into isiZulu or Sesotho. Instead, all three language options were offered at the outset of the telephone call and the participant was asked to select one. In cases when isiZulu or Sesotho was chosen, the interpreter then provided two-way translation – ie. translating the English participant information sheet and the researcher's questions into the selected language, and translating the interviewee's responses into English. The revised participant information sheet is provided in an appendix at the end of the thesis.

(c) Procedure

I initially planned to carry out face-to-face interviews in a private room at the Steve Biko Centre for Bioethics, at my offices or at a venue of the driver's choice. As with the survey, the timing of the interviews was expected to coincide for the most part with the drivers' "lull" period in the middle of the day. I anticipated that they would last around 1 to 1 ½ hours each. I planned to set up the appointments telephonically, offering all participants the option of interpretation in either isiZulu or SeSotho. Where a driver specified in advance that English would suffice, I would then not book an interpreter for that interview. I planned to provide the participants with simple refreshments (tea,

coffee, water, biscuits) and reimburse them R50 towards their transport costs to and from the venue.

Prior to the interview phase commencing the Steve Biko Centre relocated to a new and well-secured building adjacent to Wits Medical School and it became clear that it would not offer a suitable option for interviewing the drivers. This was due to the fact that they would have had to sign a security log on entering the building, which would be likely to cause concerns around confidentiality and anonymity. Furthermore, given the limited parking available at the building they would either need to leave their taxis on the street outside (which could have made their presence unduly "visible" – for instance, to other taxi drivers, taxi owners or taxi association officials who happened to drive past and recognize their vehicle) – or provide their vehicle details so that parking could be pre-booked for them (again, potentially causing concerns about anonymity). The new building was also difficult to move around without a student card or staff card, having turnstiles and doors which were linked to those cards. All in all, the Centre thus presented too many challenges to be a viable option for my interviews.

I thus settled on interviewing drivers at my offices on Louis Botha Avenue in the north east of Johannesburg. This is a major arterial road leading from the Hillbrow/inner city area northwards towards the townships of Alexandra and Tembisa, and carries heavy MTI traffic. I felt that it thus may be sufficiently familiar to many MTI drivers to be non-threatening; furthermore, the offices are easy to locate. Additional benefits were that I was in control of the space and could better guarantee the drivers' anonymity, with there being no need for them to sign a register to access the premises and with plentiful off-street parking available in which their taxis would not be visible to passers-by.

Working from the list of 43 drivers who consented during the survey phase to being contacted about an interview, starting in March 2016 I thus began calling drivers to recruit interviewees. Unfortunately, many calls were met with "subscriber unavailable" or "this number does not exist" messages, or messages indicating that an SMS would be sent to the subscriber notifying

him of the call. Others simply rang unanswered with no option to leave a voicemail, or did not ring at all. With persistent efforts, however, I eventually reached 5 drivers who consented to being interviewed, and set up appointments with the first 3 for the period 31 May to 9 June 2016; the other 2 advised that they would contact me to set up appointments when they were ready. The three booked appointments fell on weekdays during the aforementioned lull period, ie. between 10h00 and 14h00. Once I had set up an appointment I sent the details (time, date and address) to the drivers' cellphones via SMS. For each appointment that I set up, I simultaneously booked the interpreter.

Unfortunately, none of the booked appointments was kept by the drivers, even with follow-up calls to enquire as to their whereabouts. One repeatedly indicated that he was on his way (but never actually arrived), another asked to reschedule the appointment (then did not arrive at the rescheduled time) and the third indicated that his taxi was unexpectedly out of service and he thus could not attend. This situation resulted in a significant wastage of time and financial resources, due to the need for the interpreter to be paid for his time and expenses on each occasion. The remaining two drivers who had indicated that they would be available for an interview could not be reached again and did not respond to my missed calls on their cellphones. Thus, after three weeks with no successful interviews having taking place I pursued an alternative recruitment strategy, namely convenience sampling. This involved the fieldworker/interpreter approaching drivers in person at Balfour Park taxi rank (close to my offices), explaining the focus and purpose of the research and inviting them to participate in an interview either at my offices or at the rank. Despite initial expressions of interest by three drivers all of them then changed their minds and declined to be interviewed, leaving the fieldworker/ interpreter with a sense that they had spoken amongst themselves and became suspicious about the research process. Fortunately, another driver at the same rank indicated that he *would* like to be interviewed as long as this took place immediately and at the rank rather than at my offices; he stated that the taxi owner would not allow him to leave the rank with the vehicle. On being telephoned by the fieldworker/interpreter I immediately drove to the rank

and introduced myself to the driver, who verbally consented to being interviewed (declining to sign a consent form on grounds that he was non-literate). At the driver's suggestion we all sat in his taxi and commenced with the interview but an interruption occurred after 10 minutes when another driver (reportedly working for the same taxi operator) arrived and indicated that he needed the vehicle. The interviewee did not seem concerned at this interruption and simply suggested that we continue inside the adjacent taxi, which belonged to the same operator. We thus continued the interview in that vehicle but a similar interruption happened after another 10-15 minutes when that vehicle too was "claimed" by another driver. At the interviewee's suggestion, we completed the interview in my own vehicle, which he had noticed me parking at the edge of the rank. I did not manage to follow the interview schedule to the letter due to the frequent interruptions, the driver having difficulty with understanding some of the questions and him indicating that he had limited time available. Instead, I used a modified and abbreviated set of questions.

After this face-to-face interview I weighed up whether rank-based interviews would be more viable than office-based interviews. Due to concerns about ensuring privacy and confidentiality, coupled with safety concerns for the drivers, the fieldworker/interpreter and myself, after a discussion with my research supervisors I concluded that they were *not* an appropriate option. Thus, I sought clearance from the HREC with regards to switching to telephonic interviews, which seemed the most realistic alternative. The aforementioned shortened interview schedule was based on practical considerations – in particular, that the drivers' cellphones may run out of battery power and/or airtime and that they may have limited time during which they could speak out of earshot of others. I modified the participant information sheet for verbal administration and obtaining of verbal consent and abandoned any thought of audio-recording of the interviews.

This modified approach proved successful, with the fieldworker/interpreter coming to my office during the middle-of-the-day lull and us working our way down the list of prospective interviewees from the survey phase. Thus, using

a speakerphone we called drivers on the list and invited them to participate in an interview. Those who had already been offered face-to-face interviews and then not arrived were *not* re-contacted, in case they felt hounded and because their non-arrival suggested that they may have changed their minds about participating. Many of the calls placed were unsuccessful, eliciting "subscriber unavailable" and "number does not exist" messages. Of those drivers who were reached, 3 declined to participate in an interview and several others expressed interest in being interviewed but asked to be called back at another time, and then could not be reached again. Eventually, 11 drivers were successfully recruited and participated in telephonic interviews, either during the initial phonecall or during a subsequent call. In some cases the interviews were split over more than one phonecall due to call-dropping – in two cases, the drivers called back immediately to request that the interview continue and I then called them a second time so that the costs of the calls were for my account rather than a drain on their own airtime. One interview ended up being split between two lengthy calls many weeks apart – the driver concerned had limited time available and expressly indicated that he would like to ponder the questions properly and have an opportunity to expand on his answers. I was due to go on leave and thus arranged to call him again on my return, at which point (with his agreement) the same three questions were put to him a second time. This resulted in a two-part transcript.

After I had completed 11 interviews (the one rank-based interview and 10 telephonic interviews) I judged data saturation to be close. To ensure that this point was reached I conducted a 12th interview and then brought the interviewing phase to a close.

(d) Data analysis methods

During all the interviews I made handwritten notes of the drivers' responses, at times using abbreviations or symbols (particularly when they spoke rapidly and when they spoke in English so that there were no lulls for interpretation) and at other times recording phrases or sentences verbatim. At the end of each interview the interpreter gave any additional input he felt was relevant – for instance, he clarified the use of particular words or phrases by him or the

interviewee and helped complete or correct verbatim quotes which I had partially captured in haste. It was not possible to capture every nuance of the information provided by the drivers, a downside of non-audiotaped interviews. To do so would have required overly lengthy and pedantic interviews which would have lacked spontaneity and could have caused the drivers to terminate the interviews early due to the frustration of having to wait for each response to be captured in full. On a practical level, very long interviews would also have been a drain on the drivers' cellphone batteries and the chances of interruptions would probably have risen. My focus was thus on capturing key points (particularly those which they emphasized as important or repeated more than once) and some of the more nuanced information. The latter was more feasible in the interviews involving higher levels of interpretation, as while the interpreter was putting the next question to the driver in isiZulu or SeSotho I could quickly write additional or "catch-up" notes relating to his previous response.

While the interviews were still in progress my administrative assistant typed up a transcript of the English thread of each interview, ie. the questions posed in English by me, plus the driver's responses either directly in English or as translated into English by the interpreter. Working purely from the English version of the interview data ensured that the transcripts were fully understandable to both me and my supervisors, given that none of us is fluent in either isiZulu or Sesotho. I checked all the typed-up transcripts against my original handwritten notes (some including supplementary comments from the interpreter) and corrected errors and added anything which had been left out. As noted previously, the typed transcripts were then assigned names according to the order in which the interviews occurred (Participant 1, Participant 2, and so on).

Next, I subjected the transcripts to thematic content analysis, a recursive process which involved an initial rapid scan of the whole *data corpus* (body of data), followed by reducing the data into component parts and then visiting, re-visiting and increasingly ordering it. This allowed me to distil out a set of key themes to reflect the topics which received the greatest "airtime" across

the interviews, while at the same time not disregarding lesser themes which were only mentioned by a few drivers. The steps followed were as shown below, and my supervisors provided oversight along the way to ensure a trustworthy and unbiased process.

Step 1

I read rapidly through all the transcripts to get a sense of their areas of overlap and areas of uniqueness – this allowed for an initial familiarization with the data – and noted key words which appeared frequently within and across the transcripts. These were "pressure", "stress", "rush", "money", "target" and "private", and I used the word search function in MS Word to obtain a frequency count for each, as a preliminary way of organizing the data. I then re-read the transcripts line by line to gain a sense of the context in which those key words were used[22], which suggested that the words "pressure", "stress" and "rush" were used in similar ways by the drivers, as were the words "money" and "target". Those sets or pairs of key words were thus combined into clusters. On my closer reading of the transcripts an additional two clusters became evident, comprising several key words which conveyed essentially the same meaning. These were "fix"/"defect"/"problem"/ "scrap"/"*skorokoro*"[23] (all terms referring to mechanically defective taxis) and "hours"/"tired"/"exhausted" (all references to the drivers' long work hours and resultant fatigue). I carried out further frequency counts using all the key words/key word clusters, as shown in the table below, and I also noted the percentage of interviews in which each key word/key word cluster appeared was also noted. This small amount of "quantitative" processing of the qualitative data was helpful in relation to identifying key themes at a later stage.

[22] More experienced qualitative researchers informed me that this process is sometimes termed Key-Words-in-Context, or KWIC.

[23] "*Skorokoro*" is South African slang for a worn-out, defective vehicle

Table 2.2: Frequency counts and prevalence of key words appearing in interviews

Key words/ key word clusters	Number of appearances in total	% of interviews in which they appeared
“money”/“target”	50	92%
“pressure”/“stress”/“rush”	35	83%
“private”	19	67%
“fix”/“defect”/“problem”/“scrap”/“*skorokoro*”	13	58%
“hours”/“tired”/“exhausted”	13	50%

Step 2

I then deconstructed the transcripts into segments (individual phrases, sentences or very short paragraphs which each conveyed a discrete concept) and assigned each of these a reference number. For instance, the first deconstructed segment from Participant 1’s transcript was labelled 1.1, the second segment was labelled 1.2, the third segment was labelled 1.3, and so on.

Step 3

My next step involved immersing myself fully in the data by re-scrutinizing the transcripts line by line. From this scrutiny I developed a set of codes and sub-codes, loosely based around the key words already identified but also going beyond them to incorporate less frequently appearing words and concepts. Thus, the codes and sub-codes were of an emergent rather than pre-set (*a priori*) nature – that is, I did not start with any preconceived idea of what the data set “should” contain, and instead observed what it *did* contain. The initial codes and sub-codes are provided in an appendix to the thesis. I used these codes and sub-codes to set up a spreadsheet on Excel, with each cell representing a particular sub-code.

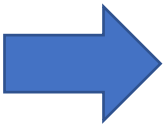
Step 4

I then individually considered the deconstructed segments from each transcript and systematically assigned them to the relevant cells of the spreadsheet by entering their reference numbers. Where a particular segment seemed to belong equally under more than one sub-code, I entered it into both or all the cells concerned. This created a clear visual representation of the entire *data corpus* on a single page and gave me a sense of where the data were more concentrated and less concentrated (see appendices).

Step 5

Next, I re-examined the spreadsheet to identify very "empty" cells (ie. sub-codes with few entries) as well as cells which contained very similar content (ie. where the same segments appeared repeatedly under different sub-codes). This led me to collapse certain cells/sub-codes into each other, with a new or expanded sub-code name being selected. Other sub-codes fell away altogether as the entries in them could easily and logically be re-assigned elsewhere – in this manner, I removed superfluous sub-codes without losing any data. I also sought vertical linkages between codes to see whether any of the codes could be collapsed together. Through this process of horizontal and vertical consolidation I progressively reduced the overall number of codes and sub-codes, while still allowing each data segment to find a clear "home" somewhere in the emerging framework.

For example, the sub-codes falling under the code "Social vilification" were reduced as follows:

Initial sub-codes		Eventual sub-codes
1. Negative perceptions 2. Discrimination (eg: taxi drivers vs bus drivers) 3. Not a proper/normal driving job 4. Self-fulfilling prophecy 5. Lack of respect from other road users 6. Generalization/stereotyping 7. Piece-job mentality 8. Lack of consideration for drivers 9. Transport not seen as valuable		1. Negative perceptions, generalization and stereotyping 2. Not a proper/normal driving job 3. Lack of consideration for drivers; not seeing them as rendering value

Step 6

Using the revised spreadsheet as a guide, I then copied all the deconstructed segments from the transcripts and pasted them into a Word document under the relevant code and sub-code headings. At this point, I called on the first of the two independent reviewers who have been previously mentioned, asking her to read through all the segments, codes and sub-codes and comment on whether she agreed with the codes and sub-codes as well as the assignment of the data segments – in other words, whether the "patterns" which I was beginning to see in the data were also visible to her or whether my placement of any of the data seemed illogical or anomalous. She confirmed that my codes and sub-codes made sense and that all the deconstructed data segments seemed to have been appropriately assigned.

Step 7

I thereafter revisited each code/sub-code set individually and re-read all the segments it contained, making notes about themes which seemed to be emerging (some of which were themes which are also evident in the literature and some of which were novel). In this way I developed 17 possible themes with names such as:

Possible theme 1:	Target-based payment systems/"competition on the roads"
Possible theme 2:	Taxi bosses and associations are money-focused
Possible theme 3:	Drivers are expendable and not protected by unions or the government.

Step 8

To maximize reliability and trustworthiness I then involved the second independent reviewer, asking her to read through all 12 transcripts and critique my list of possible themes, commenting on whether they appeared to match the data. I also asked her to indicate whether she perceived any other strong themes emerging from the transcripts which I had *not* perceived, and to highlight interview segments which seemed particularly meaningful or contained language which could help label a theme. She identified one issue (relating to the drivers feeling disempowered and not perceiving themselves as responsible parties) which she felt I could have been picked up on more strongly. Other than this, she was satisfied that my preliminary themes accurately captured the essence of the data contained in the transcripts.

Step 9

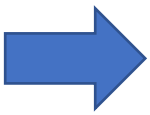
Based on the feedback from the second independent reviewer and a final re-reading of the transcripts, I then identified areas of overlap amongst the preliminary themes and refined them down to a set of 7

final themes. I gave each of these a short and “punchy” name, with some names being drawn from verbatim quotes which seemed to “jump out” from the transcripts due to their ability to convey the essence of the theme. Other names were made up of a combination of words or phrases used by different interviewees.

The process by which the final themes emerged is illustrated overleaf.

Possible themes

1. Target-based payment systems/ "competition on the roads"
2. Taxi bosses/associations are money-focused
3. Drivers are expendable and not protected by unions or government
4. Drivers lack advanced driving skills, proper qualifications and customer service training
5. Vehicle defects are disregarded by taxi owners and corrupt traffic officials
6. There are tensions between minibus taxis and "the privates"
7. Taxi drivers are vilified and stereotyped by authorities and the road-using public
8. Drivers are stressed and may abuse substances to try and cope
9. Drivers lack alternative occupational choices
10. Drivers' work hours are excessively long and cause fatigue
11. Drivers lack employment rights/benefits
12. Violent means are used to address conflicts in the industry
13. Passengers have an impact on drivers' emotions and behavior
14. Drivers are distracted by multi-tasking
15. Multiplier effects result from the numbers of passengers carried
16. Unsubsidized minibuses compete with subsidized transport systems
17. The lives and rights of passengers and drivers are undervalued



Final themes

1. **It's all about the money**
(from themes 1 and 2)

2. **It's not a proper driving job**
(from themes 3, 4, 8, 9, 10, 11, 12, 13 and 14)

3. **Taxi drivers drive like delinquents**
(from themes 7 and 8)

4. **The taxi is scrap, a *skorokoro***
(from theme 5)

5. **We are not transporting Coca Colas**
(from themes 4, 15 and 17)

6. **We push the economy – we should own the road**
(from themes 6, 15 and 16)

7. **Government needs to put its eyes on the industry**
(from themes 5, 6, 7, 10, 11, 12, 16 and 17)

2.5 Closing remarks

In this chapter I have highlighted the cross-cutting issues which I had to address during my two-phase empirical research process. I have explained how I obtained ethical clearance and described the procedures I used on a practical level in relation to each phase of the research.

Thus, I have equipped the reader with an understanding of the methods used in the study, which will be useful later when I set out the results of the survey (in chapter 6) and the results of the interviews (in chapter 7).

CHAPTER 3: RTID AS A GLOBAL PUBLIC HEALTH ETHICS PROBLEM

3.1 Preamble

In this chapter I set the scene for the rest of the thesis by describing the worldwide epidemic of road crashes and RTID in greater detail and explaining the main aims of the United Nations Decade of Action for Road Safety 2011-2020 (UNDA). I then position RTID as not only a public health problem but also a public health *ethics* problem, and one which is of particular concern in LMICs like South Africa. Next, I offer a whistle-stop tour of road safety on a global level, describing the paradigm shift which has moved government policies from an emphasis on the responsibilities of individual drivers to an emphasis on the responsibilities of the designers of the road traffic system. Thus, I describe the Vision Zero policy which was first adopted by Sweden in the late 1990s on grounds that the only ethically acceptable goal is zero road deaths; this has spawned related policies like Towards Zero and Sustainable Safety. I also explain the components of the Safe System approach which has been adopted by numerous countries, including South Africa. I wrap up this section by providing a synopsis of road safety best practice in key areas relevant to the MTI and making mention of the field of Work-related Road Safety (WRRS).

The next section of the chapter contains an overview of South Africa's road safety "lay of the land", beginning with the burden and costs of RTID in this country and moving on to a brief review of our current road safety policy and some of the inconsistencies this reflects. Based on South Africa's non-compliance with several aspects of road safety best practice, plus this policy uncertaintly, I argue that our road traffic system represents a crashogenic environment (my own term, which I define). Finally, I compare South Africa to three sets of reference countries – the BRICS, selected African countries (including our abutting neighbours) and a group of aspirational countries with very low RTID. These comparisons highlight the strengths and weaknesses of our road traffic system.

3.2 The worldwide epidemic of road crashes and RTID

Road crashes causing RTID are a key problem in modern society, related to the "spectacular growth in road transportation" which has taken place in many countries (Partheeban, Arunbabu and Hemamalini, 2008, p.59). The first road death due to a motor vehicle happened in London in 1896 and was perceived as a highly abnormal and unfortunate event[24]. As automobility became entrenched and motor vehicles became ubiquitous in HICs, however, road crashes became increasingly commonplace and by the end of the 20th century RTID were viewed by many as an unavoidable, almost natural, aspect of the road traffic system (Nihlen Falquist, 2009). In the 21st century road deaths ("the silent killer") have outstripped mortality due to malaria, TB and HIV/AIDS (WHO, 2009), with road crashes now being the 10th leading cause of death globally (WHO, 2017). More than 1.3 million people die on the world's roads every year (WHO, 2017) – the equivalent of the entire population of a small country like Estonia, exceeding the populations of Mauritius and Swaziland and approaching the population of Bangladesh[25]. Another 50 million people or more sustain injuries each year (WHO, 2015) – a figure equivalent to 89% of South Africa's 2016 population[2]. For people aged 15-29, road deaths exceed all other causes of death (UNGA, 2016). This is not just a public health problem, but a public health crisis.

The current situation is also extremely costly. The United Nations General Assembly notes that road crashes typically consume 3%-5% of a country's GDP (UNGA, 2016), and in many LMICs the cost of crashes exceeds the value of incoming development assistance (Nihlen Falquist, 2009).

[24] https://www.theguardian.com/world/2014/aug/26/uk-first-fatal-car-accident-archive-1896

[25] Population figures from the United Nations Demographic Yearbook for 2016: Estonia 1,316 million, Mauritius 1,263 million, Swaziland 1,133 million, Bangladesh 1,424 million, South Africa 55,909 million (accessed at https://unstats.un.org/unsd/demographic-social/products/dyb/dybsets/2016.pdf).

With regards to future levels of crashes and RTID, these are difficult to predict given that the road traffic system around the world is experiencing the effects of disruptive technologies which together constitute what Milam and Riggs (2018b) call "new mobility" and Maurer, Gerdes, Lenz and Winner (2016) call "the next mobile revolution". These include new motorized transport modes like Transportation Network Companies or TNCs (eg: Uber, Lyft and Taxify), Mobility as a Service (MAAS), Autonomous Vehicles (AVs) and Connected Vehicles (CVs)[26]. Milam and Riggs note that modelling suggests that even though some of these technologies – in particular AVs – have the potential to improve road safety, together they may have the effect of increasing motorized traffic, which could in turn *increase* crashes and RTID. Increased traffic would also fly in the face of what many governments are trying to achieve, namely to increase public transit ridership so as to improve efficiencies and lessen environmental damage. Milam and Riggs argue that governments will need to balance the interests of private companies with the public good by putting in place new regulations – for instance, to foster vehicle-sharing and encourage people to use electric vehicles. However, it is difficult to guard against unintended consequences, given that "new mobility" is currently associated with more unknowns than knowns. Maurer et al (2016) note that AVs, specifically, will have "a direct impact on our society that today we can barely imagine" (p.v) and "ethical questions will override all others" – only when "autonomously acting vehicles have successfully been provided with a kind of ethics in decision making will driving robotics be able to assert itself in practice" (p.vi). As noted by Lin (2016), a sense of ethics is a "notoriously difficult capability to reduce into algorithms for a computer to follow" (p.69) but crash-avoidance is not always an option – even for a very sophisticated AV – and crash-optimisation (lessening the overall degree of damage) requires ethical reasoning about what this would mean.

[26] I have an intuition that highly connected vehicles equipped with extensive infotainment systems (such as have become available over the past decade) could be contributing to the documented increase in distracted driving and related crashes around the world. That, however, is beyond the scope of this study. Certainly, infotainment features are not generally found in South African minibus taxis!

3.3 United Nations Global Decade of Action for Road Safety, 2011-2020

The extent of the growing global road safety problem was highlighted at a 2009 gathering of ministers of transport in Moscow and led to the United Nations General Assembly (UNGA) unanimously adopting a call for a Decade of Action (UNDA) for Road Safety 2011-2020. The UNDA was launched in May 2011 and endorsed by over 100 countries including South Africa (WHO, 2009). Its goals were to stabilize and then reduce global road traffic fatalities by 2020, with UN resolution 64/255 of 2010 recognizing RTID as a public health challenge which was jeopardizing the achievement of the Millennium Development Goals (MDGs) (DOT, 2015).

Through the UN Road Safety Collaboration, the World Health Organization (WHO) drew up a Global Plan to guide governments, civil society organisations, international agencies and the private sector during the UNDA. This plan divides road safety activities into the 5 “pillars” shown below (WHO, 2011):

I. Road safety management
II. Safer roads
III. Safer vehicles
IV. Safer road users
V. Improved post-crash care

Since the advent of the UNDA, understanding of what constitutes road safety best practice has increased exponentially and signatory countries have developed new road safety resources and action plans. The WHO’s Global Status Reports on Road Safety in 2013 and 2015 have helped map countries’ progress towards the UNDA target (WHO, 2013; WHO, 2015). As an additional resource, the WHO developed an interactive online map called Death on the Roads[27] which provides a rapid overview of road safety best

[27] http://www.who.int/violence_injury_prevention/road_traffic/death-on-the-roads/en/

practice and the prevailing situation in different countries. I have drawn on this for comparative country information, as I will discuss later in this chapter.

IRTAD, the International Traffic Safety Data and Analysis Group, was set up as a joint venture of the OECD and the International Transport Federation (ITF) to monitor the progress its member and observer countries are making towards achieving the UNDA goals. In its 2016 annual report IRTAD notes that during the first half of the UNDA (2010 to 2014) road fatalities globally fell by 8.8% despite an increase in vehicle kilometers travelled – however, up to two thirds of this reduction was believed to be related to the global recession rather than to road safety measures (OECD/ITF, 2016). There were also worrying signs that the downwards trend may be reversing as many countries experienced economic recovery – see figure below. It is postulated that the rise in distracted driving due to mobile devices is one contributing factor in relation to this reversal (see, for instance, OECD/ITF, 2018)[28].

Although five IRTAD countries (Iceland, Sweden, the United Kingdom, Norway and Switzerland) had achieved fatality rates of under 3 per 100 000 by 2015, the worst performing member country had a much higher rate of about 12 per 100 000 and South Africa (as an *observer* country) stood out for our markedly high rate of 26 per 100 000. Based on an overview of member countries IRTAD concluded that road safety policy should focus particularly on VRUs, drink driving, speeding and wearing of seat-belts and motorcycle helmets. It also advised member countries that it is necessary to measure serious injuries as well as fatalities, to obtain a clearer picture of the overall burden of RTID.

IRTAD's latest report provides an overview of the change in road deaths in 32 countries during the period 2010 to 2016 (see figure below) (OECD/ITF,

[28] Also see my previous comment regarding automotive infotainment, which I suspect may be as distracting as mobile devices (if not more so). It strikes me that this technology has become more widespread in the past 5 years or so, which would coincide with the abrupt reversal of the downward trends in road deaths.

2018). Most countries have experienced a decline and this suggests that UNDA activities may be paying off.

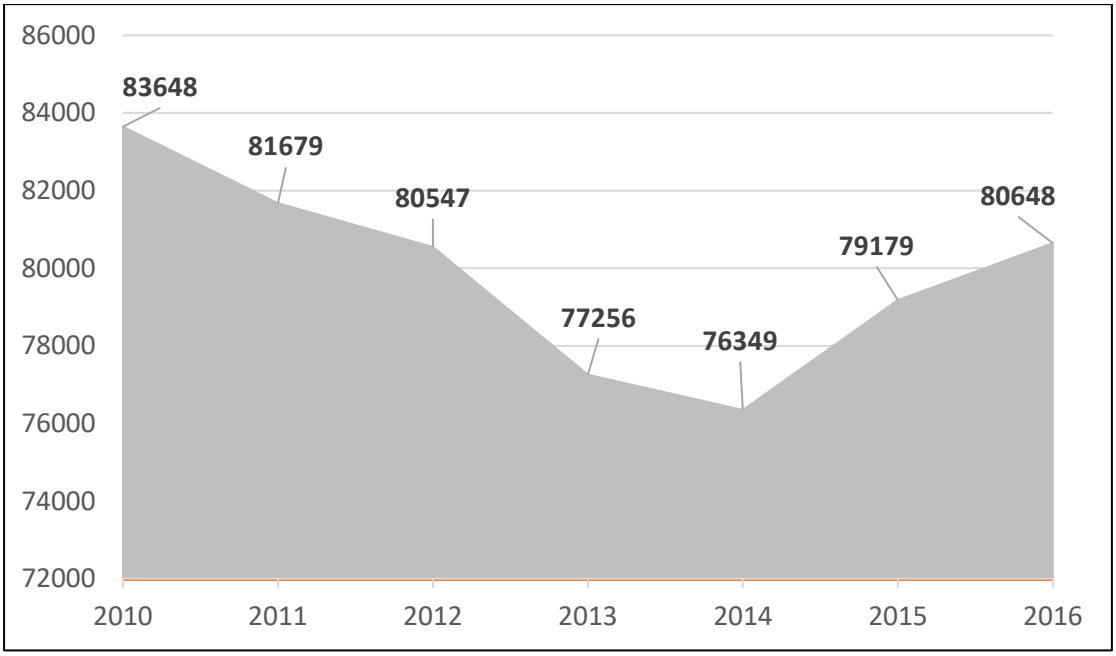


Figure 3.1: Aggregate evolution in the number of road deaths, 2010-2016 (data derived from 32 countries, with estimates only from Argentina) (reproduced with permission from ITF, from OECD/ITF, 2018, p.9).

Unfortunately, South Africa is one of several countries which have experienced an *increase* in road deaths, albeit small – this is illustrated overleaf.

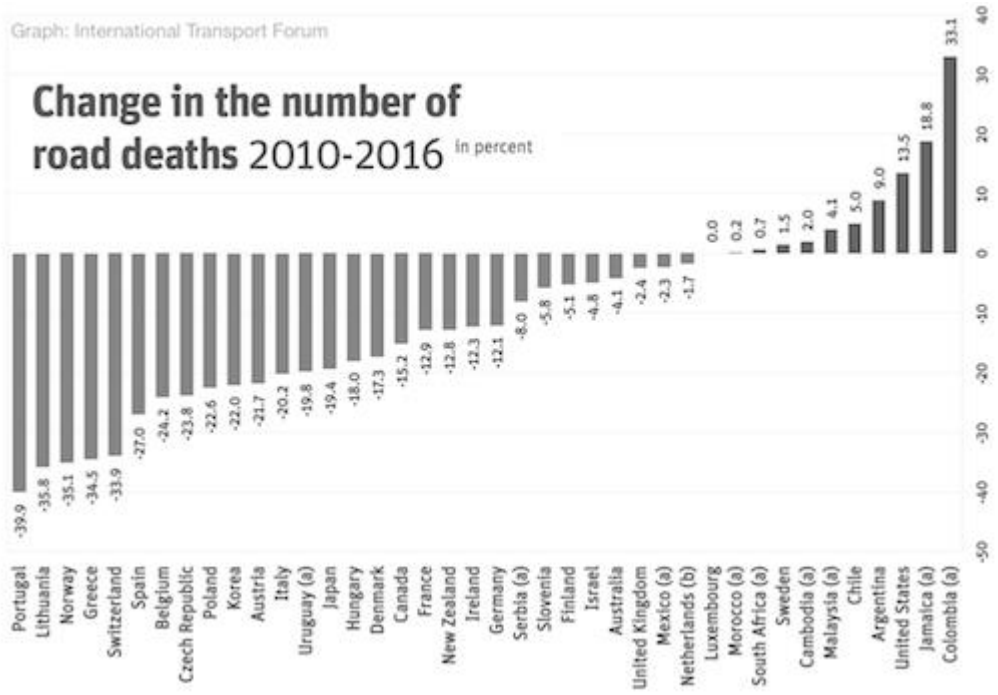


Figure 3.2: Percentage change in the number of road deaths, 2010-2016 (in 32 countries featured in IRTAD's 2018 report) (reproduced with permission of ITF from OECD/ITF, 2018, p.11).

Voluntary global road safety performance targets have been developed by WHO member states for the post-UNDA period, 2020 to 2030 (WHO, 2017b). These include establishing national road safety action plans with time-bound targets, acceding to road safety related UN legal instruments, meeting certain technical standards for new and existing roads, implementing vehicle safety standards, reducing speeding and related RTID, increasing the use of motorcycle helmets and seat-belts/child restraint systems, reducing RTID due to use of alcohol and other psychoactive substances, restricting or prohibiting mobile phone use while driving, and setting national targets to minimize the time interval between road traffic crashes and provision of professional emergency care. There is also a target relating to professional drivers which is of particular relevance to my study – this reads as follows:

Target 11: By 2030, all countries enact regulation for driving time and rest periods for professional drivers, and/or accede to international/ regional regulation in this area.

3.4 Why RTID are a public health *ethics* problem

Clearly, road crashes and RTID have achieved global recognition as a public health problem – indeed, a crisis. I argue that they are also a public health *ethics* problem.

The online Stanford Encyclopedia of Philosophy (SEP) defines public health ethics as the discipline concerned with the moral or ethical issues associated with public health – ie. with the "balancing of individual liberties with the advancing of good health outcomes". Thus, the field of public health ethics has "deep moral connections to broader questions of social justice, poverty, and systematic disadvantage" (SEP, 2015, unpaginated). As I noted in chapter 1, the road traffic system is ethically charged rather than ethically neutral. It is deeply influenced by broader political and economic factors as well as by power relations and the unequal distribution of resources and opportunities within society. Likewise, road crashes and RTID are influenced by these factors and their levels rise and fall in accordance with the political economy of a country. Horn (2015) argues that public health ("a public enterprise undertaken by organisations and governments") must address ill health related to patterns of systematic advantage – however, unless consensus is reached regarding "whose moral responsibility it is to deliver on the promises articulated by such a theory" (p.28), public health efforts tend to falter.

Like many public health issues, road crashes and RTID have differing impacts on different countries as well as on different social groups within individual countries, highlighting the need for careful ethical reasoning when it comes to tackling them. I will now examine the uneven distribution of RTID under several sub-headings.

3.4.1 Disproportionate impact of RTID on LMICs

A marked variation in fatality rates is evident across countries (Krug, 2012; Naci, Chisholm & Baker, 2009), with over 90% of road crash deaths occurring in LMICs (Road Safety Fund, undated; Ki-Moon, undated). Africa's death rate is almost 2.5 times that of Europe (WHO, 2013) – indeed, in 2007 when Africa possessed only 2% of the world's vehicles it accounted for 22% of the world's road deaths (Krug, 2012). As developing countries have become increasingly motorized they have shown a significant rise in road deaths – thus, from 1980 to 2000 there was a 300% increase in road deaths in Africa – while at the same time death rates have declined in developed countries (UN-Habitat, 2013, p.11). Crashes in LMICs have also tended to be more serious than those in HICs – for instance, in 1983 the fatality-per-crash rate in developing countries was reported to be 20 times that in developed countries (Jacobs & Sayer, cited in Dixey, 1999). Overall, a marked gap has developed between HICs and LMICs when it comes to road safety.

RTID present a major challenge to development in LMICs (Naci, Chisholm & Baker, 2009; Lopez et al, 2006). Costing millions of Disability Adjusted Life Years (DALYs) annually, they drive many families into poverty due to predominantly affecting economically active people (WHO, 2009; Azetsop, 2010). Hazen and Ehiri (2006) and Watkins and Sridhar (2009) refer to this situation as a *hidden* development crisis, which is congruent with Khayesi (2005) noting that the World Summit on Sustainable Development which took place in Johannesburg in September 2002 "did not include a single item on road safety…on its agenda, declaration, or plan of action" (p.710). In recent years, however, the depth of the crisis has become more obvious and the UN General Assembly now notes that reducing RTID is an "urgent development priority" (UNGA, 2016, p.2). Partheeban, Arunbabu and Hemamalini (2008) point out that road crashes "consume massive financial resources that [developing] countries can ill afford to lose" (p.59), with the costs including emergency transport, medical and hospital costs, rehabilitation and mental health costs, pharmaceutical costs, ancillary treatment, funeral and coroner costs, administrative costs, police/fire service costs, legal and court costs,

victim services like child protection and foster care, property damage, loss of productivity (work and household), public welfare expenditure, burden of care on relatives and friends, travel delays and traffic blockages. This excludes the social and emotional costs of pain, suffering and loss of quality of life. The resource constraints of LMICs compound the problem, creating difficulties with allocating adequate funds to road safety – as Khayesi (2005) notes, "funding for road safety activities in Africa is very limited, a mere drop in the ocean" (p.710).

3.4.2 RTID could jeopardize the realization of the SDGs

A lack of attention to road safety compromises the ability of LMICs like South Africa to achieve the meaningful and lasting development envisaged by the United Nations' 2030 Agenda for Sustainable Development. This agenda overtly recognizes road safety as a priority, reflecting this in two of its Sustainable Development Goals (SDGs)[29]:

Goal 3 **(Ensure healthy lives and promote well-being for all at all ages):** "By 2020, halve the number of global deaths and injuries from road traffic accidents".

Goal 11 **(Make cities and human settlements inclusive, safe, resilient, and sustainable):** "By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons."

The ambitious nature of Goal 3 has been noted by the United Nations, given that the world's vehicle population almost doubled between 2000 and 2013 and global road deaths increased by 13% over the same period.[30] With

[29] http://www.undp.org/content/undp/en/home/sustainable-development-goals.html
[30] https://sustainabledevelopment.un.org/sdg3

regards to Goal 11, a key challenge is the rapid rate of urbanization worldwide. By 2015 54% of the world's population lived in cities, resulting in urban sprawl and lower densities which create difficulties in the provision of transport and other services.[31]

IRTAD has noted that including road safety targets in the SDGs has enhanced the "visibility, urgency and ambition of global road safety policy", requiring countries to "intensify their efforts in co-ordinated road safety actions" (OECD/ITF, 2016, p.13). However, global progress has been poor in relation to the goals of the UNDA. In April 2016 the United Nations General Assembly noted that although "the overwhelming majority of road traffic deaths and injuries are predictable and preventable", road crashes remain "a major public health and development problem that has broad social and economic consequences" (UNGA, 2016, p.2). This burden impacts most heavily on resource-constrained LMICs.

3.4.3 Social gradient of RTID within countries

Levels of road crashes and RTID do not differ only from one country to another. Instead, *within* countries there is a distinct social gradient and the poorest people are the most affected, with a well documented link between social class and RTID (Azetsop, 2010; Christie, 2018). Almost half of road deaths involve VRUs like pedestrians, cyclists, motorcyclists and passengers using unsafe public transport (Krug, 2012), making RTID a social equity issue (UNGA, 2016). Former archbishop Desmond Tutu highlights the social gradient of RTID in relation to South African schoolchildren, noting in his endorsement of the Zenani Campaign[32] that "It is the poorest children who have to negotiate the most dangerous routes to school" (Tutu, undated, unpaginated). In Africa and Asia, in particular, RTID are high due to roads

[31] https://sustainabledevelopment.un.org/sdg11

[32] The Zenani Campaign is a road safety campaign set up in South Africa in memory of Nelson Mandela's 13-year-old granddaughter, who was killed in a car crash in Johannesburg en route home from the opening ceremony of the 2010 Soccer World Cup.

carrying both motorized vehicles and non-motorized transport and the presence of many VRUs, with little segregation of the traffic; the situation is compounded by poor law enforcement due to resource constraints, inefficiency and corruption (UN-Habitat, 2013).

Dimitrov (2012) notes that 'transport disadvantage' or 'travel poverty' (inadequate access to safe and reliable transport) leads to social exclusion and barriers to accessing key life opportunities. In South Africa, due to the way that public transport was previously used to maintain social segregation and due to the lingering spatial legacy of apartheid, most people still experience transport disadvantage and a paradigm shift will be needed before transport can be used to meet social goals. Dimitrov's focus groups with public transport users in Tshwane suggested that seamless public transport services, coupled with appropriate land use planning, can foster social cohesion. However, in post-democracy South Africa transport planning has often been carried out by politically appointed individuals, "far removed from the transport needs and aspirations of the community or society concerned" (p.6). Thus, despite the high prevalence of zero-car households in South Africa, car-oriented infrastructure design and car-dependent mobility systems remain dominant. Similarly, Hoffman (2012) notes that although "the right to freedom of movement is enshrined in the South African constitution", three quarters of South African households do not own a vehicle and, "like many fellow Africans, more than two thirds of people rely on minibus taxis to get around" (unpaginated).

Because of transport disadvantage, the higher rate of RTID amongst poor people is compounded by difficulties accessing post-crash services like health care and rehabilitation – thus, transport inequality goes hand-in-hand with health inequality. Even in HICs like the UK, particularly deprived areas need extra funding to allow for "a mix of engineering, education, enforcement and health promotion activities" to address the road accident causal chain (Christie, 2018, p.140). Higher levels of road safety funding are required in LMICs due to deprivation being more widespread, but there are seldom sufficient funds available to address the high levels of RTID.

Several authors note the need for a justice-based human rights-centred approach to RTID. Azetsop (2010) relates the "disproportionate distribution of RTID" in Kenya to "a problem of justice in relationships between social institutions and individuals as well as among population groups" and argues that "[t]he existence of a socioeconomic gradient situates [road] safety policy in the realm of social justice and public policy" (p.119). Thus, there is a need for "careful ethical discernment" in relation to public policy dealing with social goods like transport (p.125), in order to achieve distributive justice. Azetsop also points out that road crashes arise not only from individual behaviour but also from inequalities in vehicles and environments – thus, "social forces set the stage for risk for injury and vulnerability to crashes" (p.117). Amongst other factors perpetuating high levels of RTID, he points to poor law enforcement and surveillance as well as civil disobedience and unregulated transport systems. Horn (2015), too, argues that a theory of justice is an appropriate underpinning for public health programmes, noting that a strong link should be made between social justice and public health in "low-income contexts where social injustice and poverty often impact significantly on the overall health of the population" (p.26). UN-Habitat (2013) notes the "critical importance of mobility and accessibility in fully enjoying human rights" and the resultant need for "mobility benefits" to be fairly and equally distributed across different groups (p.10). Due to their ubiquitous nature, improving of minibus-based transport systems is highlighted by UN-Habitat as one of the most significant ways of reducing RTID in LMICs.

Khayesi (2005) notes that the road traffic system makes an important contribution to Africa's socioeconomic development, creating trading opportunities, connecting areas which would otherwise be isolated and promoting movement of people and goods. However, development aid focused on road building – without also properly considering road *safety* – disregards the reality that "thousands will die and many more thousands will be injured while using roads in Africa and other parts of the world" (p.711). Khayesi thus argues that road *safety* is in itself "an important and valuable public good" (p.711), connected to human rights; this should be reflected in governmental and non-governmental policies and programmes.

Wrapping up, it is clear that RTID are a serious public health problem and their disproportionate distribution in society makes them, in addition, a public health *ethics* problem. I will now move on to a brief discussion of the field of road safety, which has as its overt aim the reduction of road crashes and RTID.

3.5 A whistle-stop tour of the road safety field

The road safety field is vast and encompasses numerous different disciplines, from the social sciences to technical sciences like engineering. In this section I will set out a number of key road safety issues, to act as a foundation for both my descriptive inquiry and my normative inquiry. I will also explain the paradigm shift which is taking place in government policies and road safety programmes around the world, with the embracing of a more ethics-based stance and development of the Safe System approach.

3.5.1 Road safety metrics

As a starting point, we need to understand more clearly what we mean by RTID so that we can think and talk about them with greater ease and understanding. Definitions of a road fatality have varied from one country to another, with some only counting deaths at the scene of the accident or within the next 24 hours, others counting deaths within 7 days of an accident and yet others counting deaths within 30 days of an accident. To harmonize the global approach and ensure more valid comparisons between countries the Glossary for Transport Statistics (Eurostat/ITF/UNECE, 2009) provides a general definition, namely “death within 30 days of a road crash”. This is being used increasingly around the world in road safety programmes and policies (OECD/ITF, 2016, p.458).

The South African terms related to RTID are as follows:

- **road fatality**: Any person killed during or immediately after a crash, or death directly attributable to a crash within 30 days of such a crash.

- **seriously injured**: Any person sustaining injuries to such an extent that hospitalisation is required. Serious injuries include fractures, concussion, internal injuries, severe cuts and lacerations, severe shock, etc. which require medical treatment, hospitalisation and/ or confinement to a bed.

- **slightly injured**: Any person sustaining minor cuts and bruises, sprains and light shock which may be treated at the scene of the crash or at home.

Data collection in relation to fatal injuries is generally better than that related to serious but non-fatal injuries, making road deaths easier to count than injuries. However, even deaths can be under- or over-counted, depending on factors like whether crashes are reported to the police, whether databases are updated when patients die in hospital after crashes, and whether the cause of death is correctly coded. Cross-checking is required between police data and health services data but even in a country like the Netherlands (well known for its high road safety standards) there is a 15% discrepancy between police records and health service records (OECD/ITF, 2016). In Sweden, data is further refined in that suicides on the roads (thought to constitute 10% of all road deaths) are treated as a separate category (OECD/ITF, 2016). WHO uses algorithm-derived calculations and regression models to correct for under- and over-counting of road deaths in a particular country.

Absolute numbers of road deaths alone are not very helpful, so instead we convert them to metrics we can understand and work with and which allow us to compare one country with another. Thus, IRTAD uses three indicators to measure road safety performance across its member and observer countries IRTAD[33] (OECD/ITF, 2016). These are:

- road deaths per 100 000 people (mortality rate)
- road deaths per 100 000 vehicle-kilometres travelled (fatality risk)
- road deaths per 10 000 motor vehicles

[33] South Africa became an observer member of IRTAD in 2015/2016, joining 70+ member and observer organisations (private and public) from more than 40 countries.

Of these, the first metric is most often used as figures are readily available in most countries and it also allows us to compare road deaths with deaths from other causes like HIV/AIDs, heart disease or murder. However, this metric is less helpful when we try to compare countries with widely different levels of motorization. This is where the second metric comes in, relating deaths to actual exposure – this gives a sense of the traffic safety in a country. However, most countries do not collect data on distance travelled, and some countries have high levels of non-motorized transport (NMT) like cycling or walking, which makes this indicator unsuitable. It also tells us nothing about the proportions of different vehicle classes in a country, and some vehicle classes (for instance, motorcycles) have much higher fatality risks than others. The third metric, usually expressed as road fatalities per 10 000 vehicles, can help compare safety performance in countries with similar vehicle classes, but again it does not help us much in relation to countries with high levels of NMT. It also depends on reliable vehicle statistics so it cannot be reliably used in countries which do not deregister “scrapped” vehicles, or have high levels of vehicles (eg: bicycles and mopeds) which are not registered. What this metric has helped us understand is that as countries become increasingly motorized there is an initial increase in road deaths but this trend settles down over time.

Having explained ways of measuring and comparing road safety in different countries, I now move to a brief discussion of the significant contribution of human factors to road crashes.

3.5.2 Contribution of human factors to road crashes

Three groups of factors are implicated in crashes – human factors, vehicle-related factors and road-related factors; historically, around two thirds of crashes have been related to human factors (Bogdevicius et al, 2004). This picture has changed in HICs, as vehicle standards and road infrastructure have improved – thus, an estimated 87% of fatal road crashes in the UK and 94% in the USA are now attributed to human factors (DOT, 2017c). In South Africa, an LMIC with variable road condition and vehicle quality, Arrive Alive

estimated in 2011 that at least 90% of crashes were due to human factors in the form of traffic violations (Arrive Alive, 2011). More recently, the RTMC has estimated that 74% of crashes in South Africa are related to human factors (RTMC, 2014). Crashes are often multifactorial, and the three types of factors can be inter-related. This is typically represented in the type of diagram shown below, in which I have used the percentages suggested by Arrive Alive (2011) for the relative contribution of each category of factors.

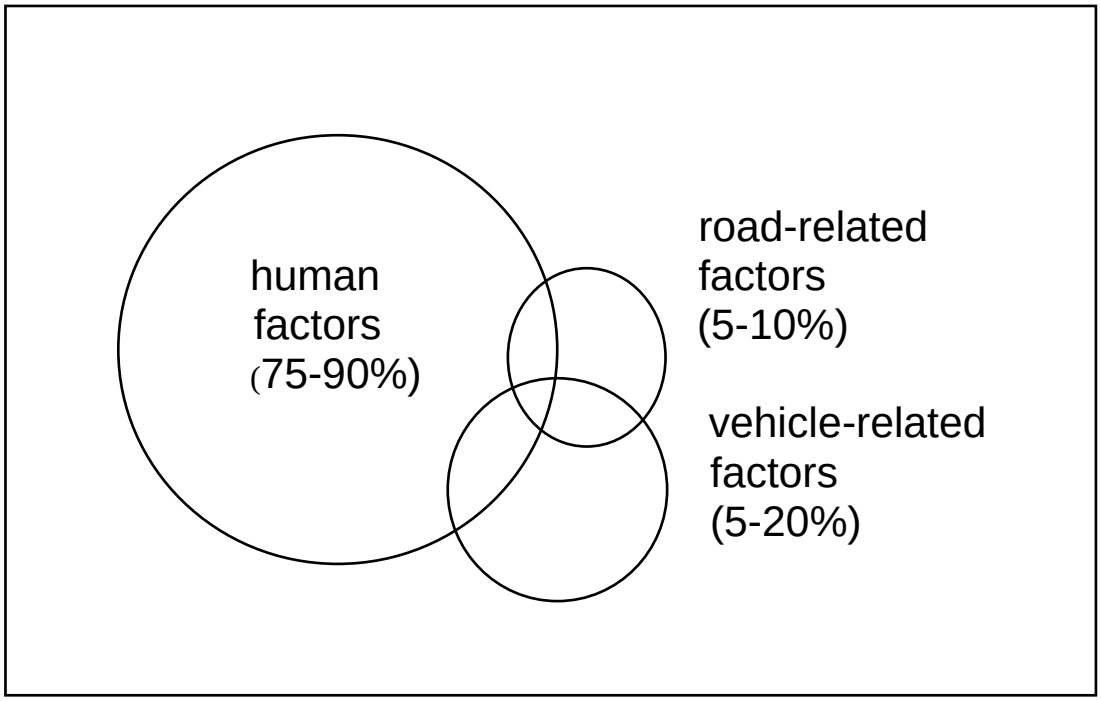


Figure 3.3: Typical representation of the relative contribution of human factors, road-related factors and vehicle-related factors to road crashes.

In terms of human factors, the foremost risk is speeding, with other risky behaviours being overtaking into incoming traffic or across a barrier line, driving while intoxicated, fatigue, turning in front of oncoming traffic, following vehicles too closely, making U-turns and disregarding stop signs, red traffic lights and yield signs. Distracted driving is playing an increasingly important role, with common distractions being mobile devices, eating, smoking,

grooming, passenger activity and sounds from radios and navigation aids (RTMC February 2016 data, cited by DoT, 2017c). The DOT notes that since human error is the most significant cause of road crashes, “most of the efforts in reducing crashes must be geared toward firstly understanding the reasons” for this and secondly to “decreasing the opportunities” for error (DoT, 2017c, p.28). Chandler (2018) points out that technology already exists which has the potential to virtually eliminate road crashes, in the form of ignition interlocks for alcohol and seat-belt use, speed governors and connected and automated vehicles – however, even these cannot work without effecting culture change and “recalibrating” human behavior.

3.5.3 The paradigm shift in road safety policy

In the late 1990s Sweden’s government debated the ethical issues related to the road traffic system and reached consensus that the only ethical road safety target was one focused on *zero* road deaths or serious injuries. This gave rise to the Vision Zero policy, which was voted into law by a large majority in 1997. Murphy (2017a a, slide 10) notes that this policy is based on “a refusal to accept human deaths or lifelong suffering as a result of road traffic” and a view that the “responsibility for fatalities in the road system is assigned to the failure of the road system rather than the road user”.

The fundamental premise of Vision Zero is that life and safety override other social benefits such as cost savings, convenience and speed of travel and that the road traffic system should reflect this philosophy in its design and operations. Murphy (2017a, slide 11) notes that this implies a need for a transport system which will

- Forgive human error
- Minimize risk when road users make mistakes
- Protect people from death and serious injury

This represents a paradigm shift from previous approaches to road safety and ways of viewing the road traffic system, which Elvebakk (2005) has described as "mitigated liberalism" (p.ii). She notes that the previous paradigm involved people being given a great deal of freedom, but at the same time being "highly constructed" (through "training, technology and culture") and subjected to specific restrictions (eg: speed limits) and deontological requirements (eg: to adhere to such speed limits or face negative consequences). Road safety efforts were thus focused mainly on individual drivers and attempted to change their behavior behind the wheel. Arrive Alive (2011) notes that the challenges associated with such efforts relate to people's lack of knowledge of the road rules and lack of willingness to comply with them, as well as poor enforcement (for instance, a lack of following up of fines) and the resultant "culture of impunity" on the roads.

The Vision Zero paradigm places the ultimate responsibility for road safety with the system designers, even though individuals still have moral duties to comply with the limitations codified in the law. It involves a much greater recognition of the fact that people form part of a greater road-using community, with duties which they must enact to towards each other[34] if the ideal of safe mobility is to be achieved (Nihlen Falquist, 2005). This new view of road safety is summed up as follows:

> *…although individuals must abide by the law and behave responsibly, the system designers (primarily road maintainers and vehicle-producing companies) are ultimately responsible, which means that* ***they*** *have to take measures if individuals fail to take responsibility.*
> (Nihlen Falquist, 2005, p.2; original emphasis)

[34] I note that this is rather reminiscent of ubuntu ethics (which I touched on in chapter 1) and is echoed by the Kenyan National Transport & Safety Authority, which holds that "Driving is in many ways a social skill, in the sense that co-operation between road users is important for the benefit of traffic safety" (NTSA, undated, p.v).

Elvebakk (2005, p.ii) points out that the Vision Zero paradigm, focusing on end-states, is a “consequentialist moral standpoint” with a “no trade-off view” of human life. Further, she notes that it has “introduced a new class of deontological actors”, with authorities as the system designers becoming seen as “morally responsible for road accidents” (p.ii) rather than responsibility resting entirely with road users themselves.

In 2000 the Norwegian parliament too adopted the Vision Zero policy, accepting that “the traffic system should be so safe that its workings should not normally lead to loss of lives or to permanent injury” (Elvebakk, 2005, p. 1). Since then, the Vision Zero paradigm has infiltrated an increasing number of countries and organisations around the world, and it is clearly visible within the goals and practices associated with the UNDA and its 5 pillars for road safety action. It has, however, been critiqued as overly ambitious (utopian) and politically unrealistic (Perkins 2010), and concerns have been raised about the level of expenditure required to achieve this goal, particularly as the returns on investment diminish over time. Some cities, states and countries have thus adopted modified versions, as illustrated by the Towards Zero policies of the USA and Australia, the Safer Journeys policy of New Zealand and the Sustainable Safety policy of the Netherlands. Perkins describes the latter as involving an intersectoral approach which inculcates a road safety culture both vertically and horizontally within government. It focuses on improving road infrastructure and vehicle technology in a way that promotes safer behaviour on the part of road users, based on an understanding that humans are fallible and make errors which will result in at least some crashes. The government of the Netherlands views system designers as responsible for making the road transport system as safe as possible so that the consequences of crashes can be minimized, while individual road users remain responsible for adhering to laws and respecting the limitations of the system (Perkins, 2010). In Western Australia, concerns were raised that the radical goals set by many European governments, such as a 50% reduction in fatalities within a short timeframe, were not realistic and were “merely inspirational rhetoric” (Perkins, 2010, p.2) – thus, the Western Australian government has instead deliberately focused on a step-wise process of

lowering road fatalities, within available budgets and bearing in mind political realities.

Broadly, whether the term used is Vision Zero or Towards Zero, this is shorthand for a goal that eventually no-one will die or be seriously injured within the road transport system. This emulates concepts already applied within the aviation sector, where each fatal accident has been viewed as an avoidable event and thus subjected to intense scrutiny to determine how to prevent similar events in future. Indeed, in the aviation sector non-fatal incidents which result in injuries, as well as *near-accidents* which cause neither fatalities or injuries, are also subjected to investigation. Nihlen Falquist (2009) has noted that in this sector, the fact that pilots are employees and passengers are customers creates a contractual situation which affects the distribution of responsibility – in particular, the pilot is contractually responsible for the safety of everyone on board. In the rail sector, major incidents (and sometimes minor incidents and near-misses) are (at least in theory) also investigated with a view to preventing similar incidents occurring in future (Hutchings, 2017). By contrast with the aviation and rail sectors, road crashes are investigated to a much lesser extent – for instance, in South Africa investigations are only carried out in relation to major fatal crashes (defined by the RTMC as crashes in which 5 or more are killed, crashes in which 4 or more vehicles are involved, or fatal crashes involving vehicles carrying hazardous substances)[35] (RTMC, 2012, p.3). Nihlen Falquist (2009) notes "A question that may be asked is why the explicit pilot-in-command's responsibility which makes the pilot responsible for everyone's safety on board the aeroplane, does not apply to the car driver" (p.392).

Although on the surface a Vision Zero policy seems to be "an ethically sounder approach to road safety policy", a useful critique is provided by Elvebakk (2005). She notes that whether or not it is the *right* policy – ie.

[35] There is also provision for the RTMC to investigate "any high profile crash" for which it deems this necessary. However, Caro Smit of the road safety NGO South Africans against Drunk Driving (SADD) advised me telephonically in February 2016 that very few crashes with under 5 fatalities are investigated at all.

whether it is the best choice of all possible options – is not without controversy. In keeping with my own argument that the moral road safety movement is capable of encompassing more than one moral standpoint, Elvebakk argues that if the authorities are now to be seen as responsible for acting on the road system through its physical structure, there "seems to be a good case for trying to evaluate the road system in terms of a pluralist moral framework" given that "the existing approaches all seem to exclude some of the relevant ethical considerations" (p.ii).

Elvebakk likens the Scandinavian countries' longstanding "mitigated liberalism" also to a "contractualist liberalism" and notes that, based on this, road safety campaigns there previously focused on individuals' consciences and sense of obligation to others. She suggests that this extended to the state's obligation to keep the road system in a fair state of maintenance, to provide a reasonably safe environment for users – thus, the "classical paradigm" of road safety in Norway was one of "mitigated (or contractualist) liberalism, where the individuals are subject to deontological requirements, and the authorities shape the system (partly) on the basis of utilitarian considerations" (Elvebakk, 2005, p.20)[36]. By contrast, she notes that Vision Zero is based on two innovative principles, the first being that road crashes will take place but their impacts can be reduced to the extent that deaths do not occur, and the second being that fatal crashes are not related to shortcomings in an individual but are rather related to the whole road traffic system. Citing Tingvall and Haworth (1999), Elvebakk notes that this "gives the authorities a pronounced and overarching responsibility for how the road

[36] Kimber (2003) fleshes out these "utilitarian considerations" by commenting that road safety was traditionally a case of balancing out investments against lives saved. At the time of his writing, in the UK the official stance was that it was worth spending £1.2m to save one life on the roads, and £3.5m to save one life in the train system – in effect (given the allowances built in to the calculations) it was seen as worthwhile to allow 100 people to die on the roads to save one life on the railways. He attributes this striking imbalance to rail being a 'closed' system where the operator takes responsibility on behalf of passengers, making even rare crashes unacceptable. By contrast, the roads represent an 'open' engineering system in which users carry their own risks, resulting in "an extraordinary penalty on traffic" (p.5). Kimber notes that this highlights the impossibility of reaching rational conclusions about how many road deaths are economically acceptable.

users fare in the system" – due to this change in focus, the "accident-causing failure" is no longer considered "the end point for "the authorities' preventive strategies" (p.21). While literally achieving zero road deaths may not be possible, the system no longer treats loss of life as "normal", it recognizes that there is seldom just one explanation for a crash and it even tries to prevent crashes caused by individuals' own behavior. Thus, Elvebakk notes that Vision Zero firmly positions ***one*** good – "life and health" – above all other goods; however, by allowing for some crashes to occur (not seeking to eradicate them altogether) and instead focusing on reducing RTID, the policy is not as expensive as it may otherwise be. Very costly road safety policies and programmes could inadvertently shift harm to other areas – for instance, by eating into the share of GDP going to health services.

Elvebakk discusses a number of problematic aspects of Vision Zero policies and I will set out her main arguments here. In her view, the biggest drawback is that the end is seen to justify the means; on the other hand, she does note that if workplace deaths or air or rail fatalities equaled road deaths, this would have elicited a public outcry. She also makes the point that deaths themselves are not the problem, given that death is a natural part of life and numerous non-natural deaths occur for reasons other than road crashes (including, for instance, suicide). Furthermore, Norwegians see risk as acceptable, given their love of adventure sports and outdoors activities. However, deaths which happen in private spaces seem somehow different from deaths in the public space and there are also low barriers to entry into the road traffic system (compared, for instance, to the aviation sector). Elvebakk argues that Vision Zero is thus "a choice to move the road system, and its users, into a more thoroughly public, professionalized, and regulated sphere" (p.26); this is strongly supported by society, with many people seeing this move as relevant to themselves. Elvebakk does note the problem of differential risks and self-chosen risks which could also put others at risk – using in this the examples of people choosing to ride motorbikes or drive old vehicles – but she notes that it is human nature to overlook possibilities and only deal with certainties. Thus, she comments that people respond very differently to the possibility of someone dying on the roads, compared to

someone trapped in a mine. In addition, she comments that factors like equity, whether risks are chosen or imposed and whether there are any reciprocal benefits also affect people's responses to risk. She notes that there is an asymmetrical constraint in the idea that letting hundreds of people die on the roads is morally equivalent to killing hundreds of people –however, there will also be asymmetry in a situation where the system designer takes on so much responsibility that individuals' sense of responsibility declines. In that case, if the responsible behavior of road users continues to be necessary, Elvebakk argues that the safety of the system will actually *worsen* over time. She sums up her analysis of ethical issues related to Vision Zero as follows:

> *It is probably quite uncontroversial to claim that there is an ethical aspect to transport safety in general. Given that behavior in traffic has the potential to cause death or serious injury, there are clearly moral considerations that apply, and moral judgements could rightly be passed upon people who behaved recklessly or even aggressively, and thus endangered others in traffic.*
>
> *The harder question is whether the fact that individual road users are subject to moral judgement also implies that ethical considerations apply at a policy level, and if so, how. We may find that morality is a personal responsibility, and that the state should not interfere in this area, beyond punishing those that have harmed others.* (Elvebakk, 2005, p.17)

Vision Zero as a paradigm has given rise to the Safe System approach to responsibility, as a way of operationalizing it. I will thus turn my attention to describing, firstly, the thinking behind this approach, and secondly, its components.

3.5.4 The Safe System approach to road safety

Kimber (2003) was amongst the early authors who noted that dealing with human error in isolation makes less sense than dealing with the *human-*

vehicle-road system as an entity. Thus, he takes the traditional human/ vehicle/road crash causation complex (illustrated earlier in this chapter) and expands it as shown in the figure below. Kimber also suggests that human errors be split into 'routine' driver errors which will always be an integral part of the system, and errors or 'failures' which are non-routine. The latter can be further divided into errors of excess (aberrant behaviours like speeding or drunk-driving) and errors of inexperience. He then argues that traditional road safety approaches focused on behavioural change as "the primary remedy for road accidents" should give way to rectification of the system more broadly, as "big reductions can come from engineering the vehicle or the environment so as to remove the consequences of human error" (p.3).

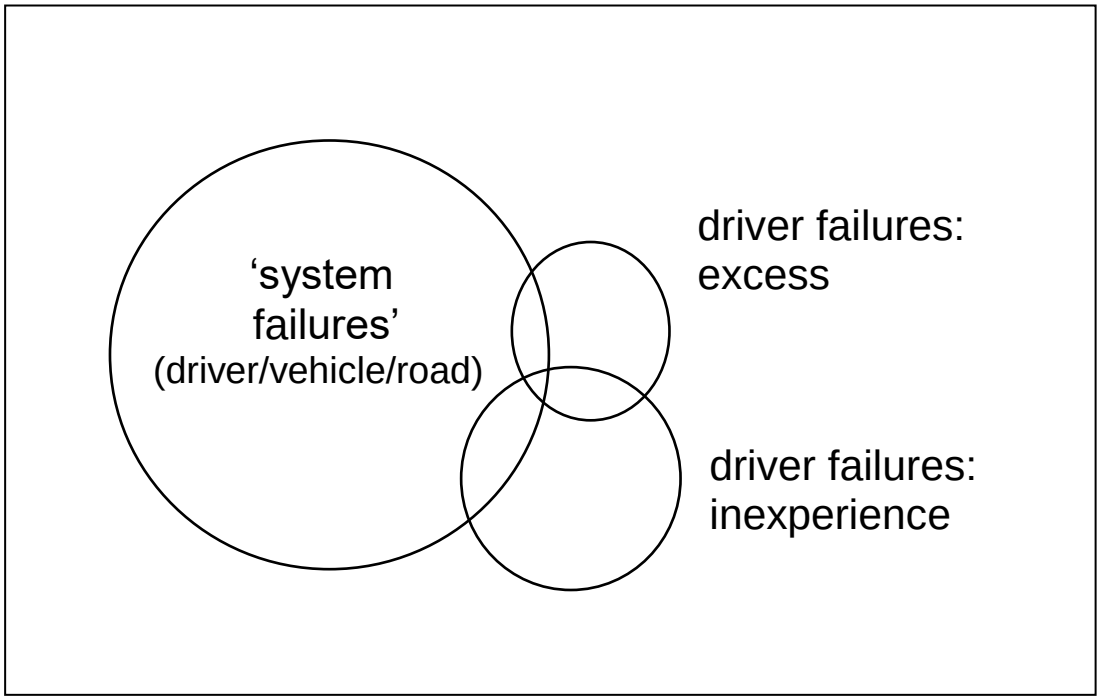


Figure 3.4: Alternative representation of factors contributing to road crashes (adapted from Kimber, 2003, p.6)

(a) The limits of human error reduction and human frailty mitigation

The Safe System approach is a quantum leap from previous road safety approaches which primarily focused on limiting human error and compensating for or mitigating (at the point of impact) human frailty. Before detailing what goes into a Safe System policy I will briefly comment on what previous road safety strategies typically hoped to achieve. Thus, they accepted that crashes would occur but aimed to lower RTID through limiting human error on the one hand and mitigating human frailty on the other; in both cases, the focus was primarily on the immediate, "in-vehicle" or "here-and-now" situation. I will give some examples of what I mean.

- **Limiting human error** (reducing crash frequency and severity) was achieved through:
    - teaching road users not to make errors (through road safety training programmes and driver licensing requirements)
    - using the law to enforce this teaching (for instance, by spelling out exactly which driving behaviours were viewed as unacceptable and what punishments would be meted out should these occur)
    - installing vehicle technologies to alert drivers of potential errors and reduce the consequences of such errors (eg: ESC, automated braking systems, alcohol interlocks, fatigue warning devices)
    - encouraging VRUs like pedestrians and cyclists to wear reflective clothing and stick to particular lanes or areas to make themselves more visible to drivers

- **Mitigating human frailty** (reducing injury frequency and severity/fatality) was achieved through:
    - installing vehicle technologies to decrease the speed and impact forces involved in a crash (for instance, Electronic Stability Control (ESC) and Frontal Impact (FI) measures)

- installing vehicle technologies to reduce the occupants' vulnerability to serious injury in the event of a crash – these include seat-belts, child restraints, airbags, shatter-proof windscreens and so on
- using vehicle technologies to decrease the damage done by vehicles to VRUs – for instance, by enforcing Pedestrian Protection (PP) standards
- developing other protective measures like helmets and protective clothing for VRUs like cyclists and motorcyclists
- using the law to enforce the use of the above, with transgressions being punishable both preventively and post-crash

The "science of human vulnerability" from a road safety perspective was captured in the form of a sculpture by Melbourne artist Patricia Piccinini in 2016, with input from a trauma surgeon and crash investigator[37]. Known as Graham, "the only person designed to survive on our roads", the sculpture reveals how the human body would have to evolve to withstand the forces experienced during road crashes (see figure below). It is used in the "Towards Zero" road safety programmes of the Transport Accident Commission of Victoria and its image has become familiar to road safety practitioners worldwide. The sculpture is accompanied by extensive educational material including a 360° online visual tour; this notes that human beings can survive running at full speed into a wall, but transport accidents happen at much greater speeds and involve much higher forces. Thus, amongst other features, the sculpture has no neck (with the ribs extending up to the skull to protect the vulnerable spinal cord), a "flat, fatty face to protect the nose and ears", "airbags in between each rib", "thicker and tougher skin" and knees which "bend in all directions".

[37] See, for instance, https://www.theguardian.com/world/2016/jul/21/road-safety-confronting-sculpture-shows-human-vulnerability-to-crashes. A 360° view of Graham can be seen at www.meetgraham.co.au/.



Figure 3.5: Partial view of sculpture made for Project Graham, “The only human designed to survive a car crash”
(image available in the public domain, at www.meetgraham.au.com/)

As I noted in chapter 1, Kimber (2003) points out that the road safety argument “turns on where the responsibilities are placed”; he notes that insofar as rail and air travel are concerned “we take it as given that the pilot or train driver is fully part of the whole engineering system….We would not, for example, be happy for an airline pilot to do aerobatics on a passenger-carrying aircraft” (p.17). However, in relation to road travel “there is still a popular belief that the driver should be more of a free agent”, due to confusing “the driver’s freedom to determine the detailed vehicle movement with the necessity of following procedures that limit the risk generated by that movement” (p.17). Kimber asserts that limiting the risk is “beyond reasonable dispute” and that “[t]he only question is to what level the risk needs to be limited, and in what terms this should be stated” (p.17).

On a practical level, Kimber notes that “it is certainly true to say that, more-or-less always, the accident could have been prevented by the driver doing something differently, at some stage” and the “causal chains leading to an accident might in principle be interrupted at a number of points” (p.6) – however, a focus on the driver-vehicle-road system has far greater potential to

reduce RTID. Kimber equates this to preventing industrial injuries by fitting safety guards to machines, given that workers may make errors and place their hands too close to the moving parts. He argues that when *routine* human error is allowed to manifest in crashes, this means that the system (vehicles and roads) have not been properly designed. In relation to *excess* type (extreme behaviours) system changes could perhaps also prevent these causing crashes but the more reasonable approach is to treat them as violations and deal with them through training and law enforcement. With regards *inexperience* errors, Kimber notes that it is unreasonable to rely solely on vehicles and roads to correct for these – making it more appropriate to subject younger, less experienced drivers to "more exacting requirements" (p.12). Kimber recommends three actions to improve the driver-vehicle-road system, namely improving roads and vehicles across the board[38], reducing risks associated with inexperience and controlling "outright excessive behavior" like speeding and drink-driving – for instance, through speed governors and alcohol interlocks (p.13).

The arguments made by Kimber and others in relation to the driver-vehicle-road system led to the development of the current Safe System approach.

(b) Components of the Safe System approach

Perkins (2010) and Murphy (2017a) have noted that the Safe System approach can be implemented regardless of a country's stage of road safety development and within the parameters of existing systems and policies. Safe System models have been fruitfully implemented in numerous countries around the world, including in Scandinavia, Australasia and Malaysia, sometimes with World Bank assistance, and have yielded significant improvements in a short space of time (Perkins, 2010). Murphy (2017a) notes that "High performing" countries in relation to road safety all have Safe System models in place. In the Safe System approach, embodying Vision

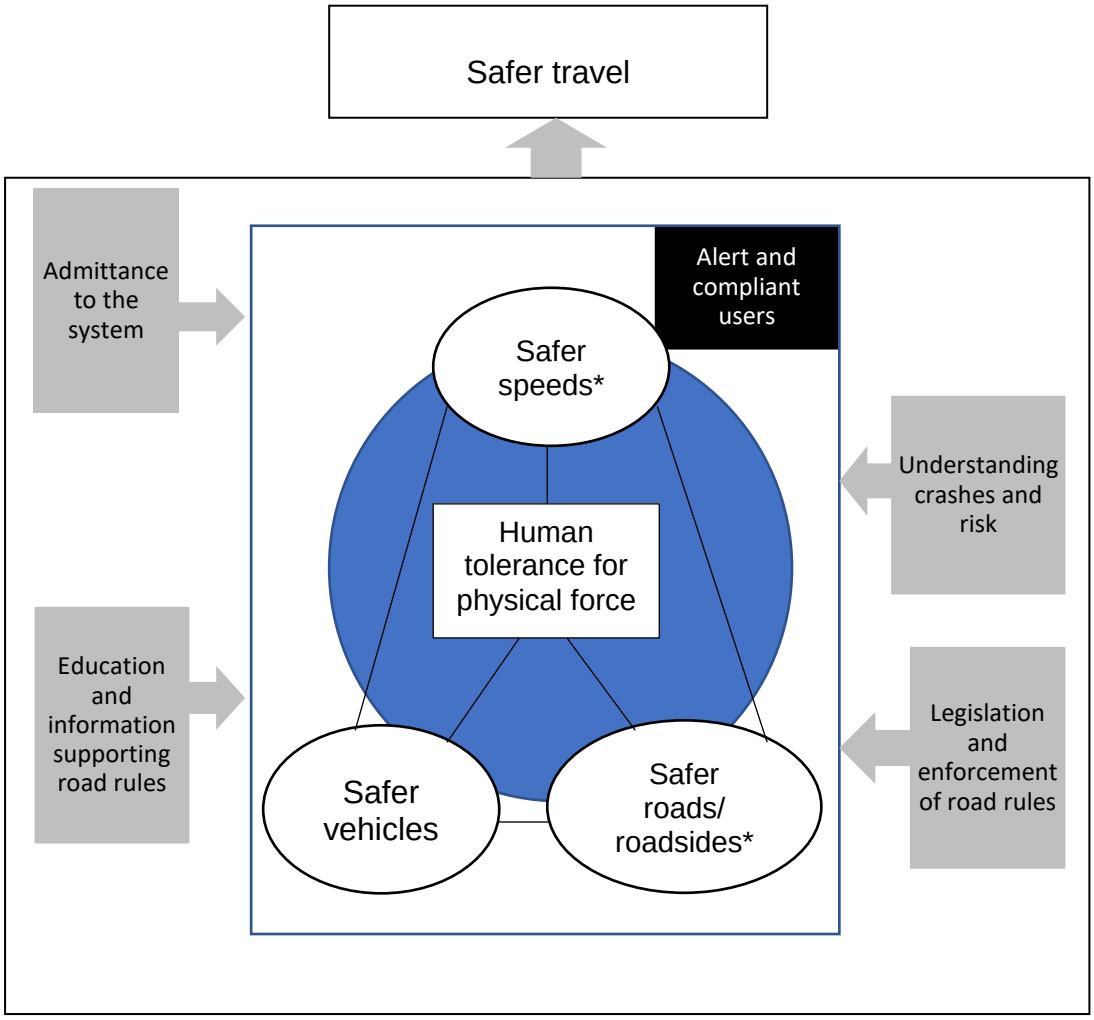
[38] In relation to this, Kimber mentions the European Roads Assessment Programme (EuroRAP) and New Car Assessment Programme (NCAP).

Zero philosophies, “human life and health are paramount” and “cannot be traded off against the benefits of the road transport system, such as mobility” (Peden et al, in WHO, 2004, p.19). Human fallibility and error are factored in, with an acknowledgement that responsible road users “will make mistakes on the road, but the price they pay should not be death or serious injury (Murphy, 2017a, slide 5). Responsibility for road safety is perceived as shared by road users and the *providers of the road system*, (my emphasis), with the underlying imperative being “the demand from the citizen for survival and health” (WHO, 2004, p.20). Safe System approaches are multisectoral and suitable for countries at all stages of road safety development (Murphy, 2017a). They contain the following key components:

1. Alert and compliant road users
2. Safer speeds
3. Safer vehicles
4. Safer roads and roadsides

The arrangement of these components is illustrated below. The basic parameter is the human body’s vulnerability to trauma, with speed control being a major focus due to higher speeds causing greater impact energies and thus a higher chance of RTID (Perkins, 2010; Murphy, 2017a).[39]

[39] The speed threshold which promotes maximum safety differs from context to context – for instance, pedestrian survival becomes less likely with speeds above 30km/h, and survival of properly restrained vehicle occupants is optimised by speeds below 50km/h (side-on collisions) or 70km/h (head-on collisions) (Perkins, 2010).



* more forgiving of human errors

Figure 3.6: Components of the Safe System approach to road safety (adapted slightly and reproduced with permission from Murphy (2017a, p.8, citing Howard (2004)).

3.5.5 Work-related road safety (WRRS)

Work-related road safety (WRRS), also known as occupational road safety, is a niche within the broader road safety field. It tends to be driven both by governments and by the private sector and is particularly prominent in HICs. While numerous studies and programmes around the world fall under the ambit of WRRS, two particular initiatives are noteworthy in relation to their

breadth of scope (having a multi-country, multi-company focus) as well as their ambitious goals to decrease road crashes and RTID. These are the Road Safety Task Force (RSTF) set up in 2010 as an international private sector initiative to support the UNDA (RSTF, 2010) and the PRAISE Project (Preventing Road Accidents and Injuries for the Safety of Employees), a 3-year initiative of the European Agency for Safety and Health at Work (ETSC, undated). Both entities note that many road deaths are related either to commuting or to driving in the course of a job.

The RSTF included representatives from major corporations like Shell, Michelin and Renault and non-governmental organisations (NGOs) focused on road safety, together with experts from WHO, the UN, the World Bank and the ILO. After a round-table meeting in Rio de Janeiro it released a White Paper for Safe Roads in 2050: Achieving Zero Work-related Deaths (RSTF, 2010). This rests on the premise that work-related or occupational road safety need to be addressed as a specific issue, due to work-related traffic making up a sizeable part of all vehicle traffic, a third of all road deaths occurring "on the job" and 30-50% of all workplace fatalities happening on the roads. The RSTF defines "work-required driving" broadly, including in it the professional driving of trucks, buses and vans, on-the-job driving by sales people, driving to road-based tasks (for instance, by road maintenance crews) and employees' commutes to and from work[40]. It notes as follows:

> *Transport sector workers are highly exposed to road safety risks. The adoption of best standards and practices in road development, maintenance and traffic management can afford greater protection. Transport regulations must be adapted to insure that transport companies operate with safe drivers on safe roads. Safety must prevail over and above any other concerns, including economic or commercial ones. For it to do so, integrating road safety provisions for employees within existing rules is a key lever.* (RSTF, 2010, pp.59-60)

[40] If the deaths of passengers commuting to and from work via the South African MTI were to be counted as "work-related deaths", in addition to the deaths of drivers, the total figure would presumably be extremely significant.

Both the RSTF and the PRAISE Project are premised on a view that work-related RTID are unacceptable and require vigorous intervention by governments and employers. Key crash causation factors noted by both entities are fatigue, distracted driving, driving under the influence, speeding, inadequate driving skills and vehicle-related factors like unroadworthiness. The RSTF sets out the following ambitious goals to address occupational road deaths:

- Freeze the number of work-related road deaths by 2020
- Reduce the number of deaths by 50% by 2030
- Reduce it by more than 50% by 2040
- Achieve zero work-related road deaths by 2050

The last of these is described as "not a utopian vision, but a realistic attempt to find practical solutions to an unacceptable situation" (RSTF, 2010, p.40). Recognizing the resource-constrained situations in LMICs, the Task Force proposes that HICs lead the way, providing assistance and information to LMICs. It identifies the following Levers to improve occupational road safety:

- investing funds (with 10%-15% of countries' infrastructure budget being devoted to improving road safety)
- advocacy and awareness-raising in relation to road safety (for instance, through Road Safety Weeks and educating of employees and the public as to the major risk factors)
- fostering research into the causes of work-related crashes and creating good quality data collection systems resting on standardized crash analysis systems, incorporating 'purpose-of-trip' measures to identify work-related deaths and interlinking with occupational health and safety data systems
- setting up multisectorial partnerships including win-win public-private partnerships and cross-border partnerships, under the auspices of lead agencies which would ensure continuity in times of political change

- using benchmark metrics and setting aggressive targets, including making road safety quality management levels “comparable with aircraft or industrial premises levels” (p.98)

The practical recommendations emanating from both the RSTF and the PRAISE Project include legislative measures (eg: regulations regarding work hours, driving time and rest periods as well as driver health standards), road design measures (eg: improvement of parking and rest areas), vehicle design measures (eg: provision of airbags and crumple zones), technological measures (eg. speed-limiting devices, capnograph equipment which monitors driver sleepiness and intelligent seat-belt reminders), driver licensing and training programmes (including raising the job prerequisites, certifying drivers as medically fit and training and re-training them at appropriate intervals), and improved emergency handling and post-crash care. Additional suggestions include zero tolerance policies, driving-related codes of conduct, merit-rating systems[41], compulsory road safety training for employees, road insurance, and healthcare provision. Driver demographics may need to be taken into account – for instance, in HICs work-force aging is a significant concern, while in LMICs risks often relate to drivers being younger and less experienced.

The RSTF makes a business case for road safety, given the human and material costs of crashes together with lost sales revenues, brand image impact, insurance costs, lost work days and do on. It notes the need for “quick winner” projects (ie. road safety interventions which rapidly pay dividends). The PRAISE Project makes a legal case, premised on employers in all EU Member States having a legal duty of care which extends to occupational health and safety and road safety compliance. It includes in this the employers’ choice of vehicles and whether they consider how well these would protect their occupants in a crash, and how compatible they are with other vehicles. The need for employers to tap employees’ perspectives to

[41] The Task Force referred to these as “bonus-malus” systems, involving rewarding of employees who adopt safer driving habits.

properly identify and deal with risks and find workable solutions is highlighted.[42]

While WRRS has a lower profile in LMICs than in HICs, there have been some road safety initiatives which are of particular relevance to the paratransit sector. For instance, in late 2014 Kenya launched a training curriculum for the training, testing and licensing of drivers and this contains a specific chapter for drivers of Public Service Vehicles (PSVs) like *matatus* (NTSA, 2014; Kajilwa, 2018).

3.5.6 International best practice in road safety

As the UNDA has progressed and Safe System approaches to road safety have been implemented, a great deal of data-gathering and analysis has taken place and a number of key road safety insights have emerged apart from recognition of the need for a Safe System approach (DOT, 2017c). It is clear that successful and sustainable programmes are those which focus on local action priorities and bear in mind existing capacity to reduce RTID. It is also apparent that governance and accountability should rest with governments, but that it is effective for them to draw in other roleplayers like corporates, insurance companies and non-governmental organisations (NGOs). Accurate data is important, so that people perceive road safety measures as evidence-based and thus relevant and legitimate, and adequate funds and human resources must be made available so that programmes can actually be implemented. Furthermore, specific deadlines should be set and monitoring and evaluation should be undertaken using outcomes-based measures. Road safety education and training should be offered frequently and involve all stakeholders, with graduated driver training and licensing systems being preferable to simplistic systems. Enforcement of road traffic rules should focus on the most hazardous locations and road infrastructure should be designed on the basis of safety audits, so as to reduce conflict

[42] Interestingly, the PRAISE Project compiled a manual specifically aimed at improving safety in relation to taxi services, but this is focused on metered sedan taxi services in HICs and thus not of much relevance to the South African MTI.

points and vehicle crossing speeds (eg: replacing of junctions with traffic circles). Modern technology such as intelligent traffic management systems, automated data collection and alcohol interlocks should be utilized. Perhaps most critical, each country needs a lead agency for road safety management, empowered with the necessary funds and underpinning legislation.

Using data drawn from WHO's interactive online map, "Death on the Roads"[43], I will now review a number of best practice guidelines in relation to key human factors and vehicle factors, commenting in respect of each whether South Africa is considered by WHO to be compliant (and placing this in context by noting how many countries around the world ARE considered to be compliant).

(a) Human factors

WHO offers guidelines in relation to 5 key human factors: drink-driving, speeding, use of seat-belts, use of child restraints and use of motorcycle helmets. Of these, the first three are relevant to my study[44]. In each case, I will first provide brief background information together with WHO's recommendation, then indicate South Africa's compliance status.

Drink-driving

Drinking is linked to high-risk road behaviours like speeding and not wearing a seat-belt. Even low levels of alcohol can impair driving behavior and the risks rise exponentially with higher Blood Alcohol Content (BAC). Younger, less experienced drivers are most susceptible to the influence of alcohol. WHO recommends that drink-driving laws use two criteria:

[43] See http://www.who.int/violence_injury_prevention/road_traffic/death-on-the-roads/en/.

[44] The topic of child restraints in public transport vehicles merits urgent bioethical attention in its own right but is beyond the scope of my study. Newer minibus taxis do tend to be equipped with seat-belts for adults, but very few (if any) offer child restraints. Older minibuses frequently have no seat-belts at all.

- BAC ≤0.05g/dl for the general population.
- BAC ≤0.02g/dl for young or novice drivers

34 countries are compliant

South Africa is NON-COMPLIANT due to having a single BAC limit of 0.05g/dl – there is no lower limit of ≤0.02g/dl for young or novice drivers.

- **Speeding**

  Speeding increases crash likelihood, and higher speeds increase RTID. Speed is involved in 30% of HIC road deaths and 50% of LMIC road deaths. An adult hit by a car travelling at 80 km/h has a 60% chance of death, compared to a 20% chance if the car is travelling at 60 km/h[45]. Speed limits should be adjustable for local circumstances – for instance, residential areas and school locations may need limits set at 30 km/h, accompanied by speed bumps and other calming measures. WHO recommends that urban speed laws are based on these two criteria:

  - The speed limit is ≤ 50 km/h
  - Local authorities are empowered to adjust national speed limits in specific areas

  47 countries are compliant

  South Africa is NON-COMPLIANT due the urban speed limit being too high, at 60km/h. However, it does allow for adjusted speed limits in specific areas.

- **Seat-belts**

  Wearing a seat-belt can reduce front-seat fatalities by up to 50% and back-seat fatalities by up to 75%. Compulsory seat-belt laws (accompanied by good enforcement and public awareness campaigns) are

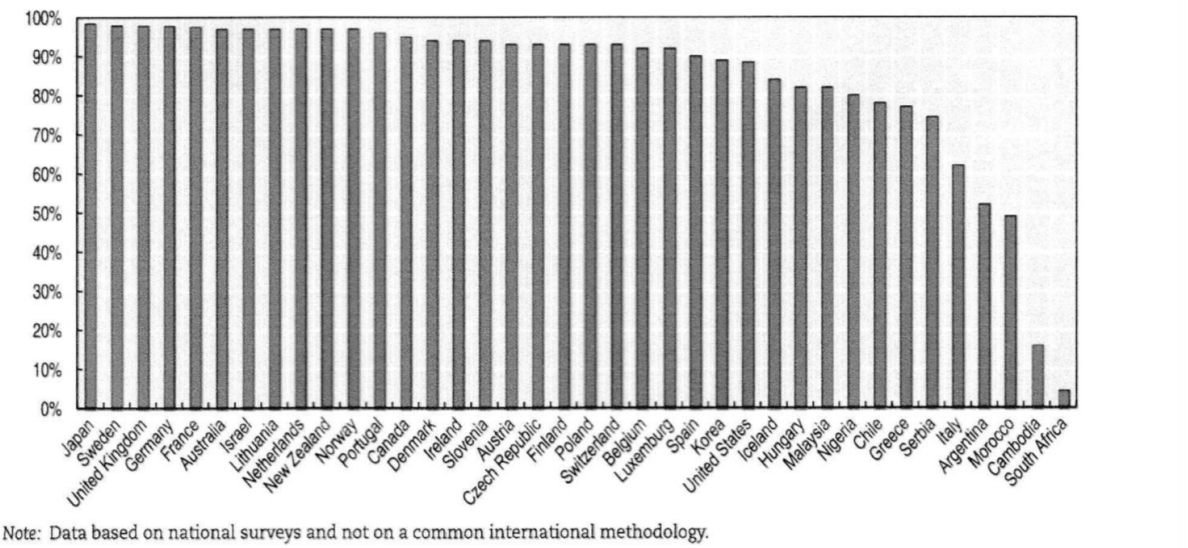
[45] A recent report (ITF, 2018) adds that most unprotected road survivors survive impacts at up to 30km/h, a modern car protects occupants up to 50km/h in a side collision and a safe car protects occupants up to 70km/h in a head-on collision.

very effective at improving use rates. WHO recommends that seat-belt laws are based on these two criteria:

- The law applies to drivers and front-seat passengers
- The law applies to back-seat passengers

105 countries are compliant

South Africa is COMPLIANT but has been noted by IRTAD to have very poor actual rates of seat-belt use, way beneath the rates in most countries (see figure below).



Note: Data based on national surveys and not on a common international methodology.

Figure 3.7: Seat-belt use by drivers or front seat passengers, 2015 or later (reproduced with permission from ITF, from OECD/ITF, 2016, p.34).

(b) Vehicle-related factors

Safer vehicles help prevent crashes and they also reduce RTID when crashes occur. HICs are characterized by improved vehicle safety standards, both because of regulations and because of customer expectations – what were previously safety “add-ons” in upmarket vehicles are increasingly required for

all new vehicles and thus more affordable. As LMICs motorize rapidly, and as some venture into vehicle manufacturing, there is a pressing need for vehicle standards to be introduced in all countries to reduce road crashes. I provide information below about three key standards which are featured on the "Death on the Roads" interactive map. Countries are scored on a 7-point scale, on which South Africa scores 4/7.

- **Electronic stability control (ESC):**
  This is effective at preventing under-steering or over-steering causing skidding and loss of control, thus helping to reduce crashes and RTID.

  46 countries make ESC mandatory
  South Africa is COMPLIANT.

- **Standards on impact:**
  Vehicles should withstand the impacts of frontal crashes and side crashes when tested at specified speeds.

  49 countries apply frontal impact testing, 47 apply side impact testing.
  South Africa is NON-COMPLIANT. Most compliant countries are HICs.

- **Pedestrian protection standard:**
  This is achieved through softer bumpers as well as modification of the front part of vehicles, to reduce the severity of impact. As 22% of fatalities involve pedestrians, vehicles need to be more "forgiving".

  44 countries (mainly European HICs) apply these standards
  South Africa is COMPLIANT.

Despite our vehicle standards being compliant in two of the three key areas, these standards relate only to new vehicles. South Africa's vehicle fleet was noted to be more than 10 years old, on average, in 2011 (Arrive Alive, 2011). Thus, a great many vehicles on our roads are unlikely to be covered by these standards.

3.6 South Africa's road safety "lay of the land"

As I noted in chapter 1, bioethical research should begin by seeking to understand the status quo (Kon, 2009). Under several sub-headings, I will thus describe the prevailing road safety situation in South Africa, as I see it.

3.6.1 Overview of the burden and costs of RTID in South Africa

In 2011 the NGO Arrive Alive noted that there were about 1 million road crashes per year in this country, commenting that "[e]very single South African should know and understand that our country has one of the worst road safety records in the world, losing over 40 people a day to traffic crashes, with a further 20 being left permanently disabled and several hundred suffering serious injuries" (Arrive Alive, 2011, p.19). The goal of Arrive Alive's road safety strategy for 2011-2020 was to reduce fatalities on the country's roads by 50% by 2015, which would have saved 27 000 lives over 5 years and decreased the deaths to no more than 20 per day (Arrive Alive, 2011). This goal was not met and, as I noted in chapter 1, 36 lives continue to be lost on South Africa's roads daily[46].

Counting of road deaths is a challenge and Khayesi (2005) notes that under-reporting of RTID is "a major problem in Africa" and elsewhere (p.711) – in 2002, for instance, it was reported that about 200 000 people died on African roads (including numerous pedestrians and public transport passengers), but the true figure could have been far higher. In keeping with this, concerns have been raised about the veracity of official data from Statistics SA and the RTMC – Chiumia (2014) of the Africa Check fact-checking agency asks, "In South Africa at least 5,000 people are killed on the country's roads every year. Or is it closer to 14,000?" (unpaginated). Chiumia notes that one source of difficulty is that South Africa's definition of a road death has changed from the previous "death within 7 days of a crash" to the current (and

[46] As per WHO's "Death on the Roads" interactive map.

internationally favoured) “death within 30 days of the crash”[47]. She also notes that the RTMC is dependent on hospitals to follow up and accurately record which patients died and for what reasons and has to adjust its figures to correct for underreporting.

The 2018 mortality report of Statistics South Africa (StatsSA, 2018a) reflects that transport accidents are at the very least the third most common cause of non-natural deaths in South Africa, making up 12.5% of *all* non-natural deaths and 1.4% of *all* deaths. However, major flaws in the death certification process result in nearly three quarters of non-natural deaths being inadequately classified, which obscures the true count in relation to road deaths – at best, official mortality figures thus provide a broad-brushstroke picture. Nonetheless, the most recent estimate of 13 802 deaths per annum is only 4% different from WHO’s algorithm-based figure of 13 273, suggesting a slight *over-count* rather than an undercount[48]. That South Africa’s road deaths have been problematic for a lengthy period is well illustrated by the literature, which also highlights the unusually serious nature of our crashes. Peltzer and Renner (2003) cite Forjuoh et al (1998) in noting that in the late 1990s our death rate (11.7 per 100 million kilometres) was more than 10 times the rate in the United States. They also cite the 1998 report of the Directorate of Traffic Safety (DOTS, 1998) which reflects 9 068 road deaths, 36 246 cases of serious injury and 84 358 cases of light injury. I note that the latter figures suggest a ratio of roughly 1:4:9 (deaths: serious injuries: light injuries) – in other words, for every death there were about 13 injured survivors. The Association for Safe International Road Travel (ASIRT) reflects an average ratio of 15 to 39 injured people per road death around the world, with the United States ratio being particularly high at 64 casualties per

[47] The current road death definition used by IRTAD is “any person killed immediately or dying within 30 days of an injury accident, excluding suicides, per 100 000 population”. See www.compareyourcountry.org.

[48] As reflected on WHO’s “Death on the Roads” map, at http://who.int/violence_injury_prevention /road_traffic/death-on-the-roads/en/#country_or_area/ZAF.

death[49]. This confirms that South Africa's fatality rate per crash is extremely high, in keeping with the generally greater crash severity in LMICs. IRTAD confirms this, noting that we have high numbers of serious injuries and "many survivors of severe crashes will never recover completely, often resulting in grave consequences for their quality of life and ultimately negatively affecting the economy" (OECD/ITF, 2016, p.459).

In 2013 South Africa's road crash rate was almost double the world average (Thomas, 2013) and our road deaths were not dissimilar to our murders and our HIV deaths (Ollis, 2013). IRTAD's most recent estimate of 26 deaths per 100 000 people (OECD/ITF, 2016) and WHO's marginally lower figure of 25 per 100 000 (WHO, 2015) is almost four times the average rate in IRTAD countries (OECD/ITF, 2016).[50] Expressed in relation to our vehicle population, we have about a dozen road deaths per 10 000 vehicles, 10 times higher than the average for IRTAD countries (OECD/ITF, 2016).

The figures provided by the RTMC and collated into the graph below by the Automobile Association reflect an encouraging downward trend in the number of road deaths from 2006 to 2013, when absolute deaths reached a low of 11 844 (AA, 2018) despite population growth over the same period. This downward trend has unfortunately reversed in recent years, mainly related to an increase in pedestrian and cyclist deaths and ongoing deaths of drivers (making up an average of 28% of all deaths in the past 5 years) and passengers (making up an average of 33% of all deaths in the past 5 years). This picture of a shortlived decline in road deaths, followed by a steep reversal of this trend, closely mirrors the international situation as reflected earlier in this chapter. The return to an upwards trend suggests that we will not achieve the general UNDA aim by 2020 – namely, a 6.7% reduction per

[49] I base these on ASIRT reporting 1.3 million global road deaths and 20-50 million global casualties per year, as well as 37 000 USA road deaths and 2.35 million USA casualties per year. See http://asirt.org/initiatives/informing-road-users/road-safety-facts/road-crash-statistics. Kimber (2003) mentions a ratio of 1:11:70 between fatalities, serious injuries and minor injuries

[50] It is worth noting, however, that South Africa's 1990 rate was markedly higher, at 36.5 people per 100 000 (OECD/ITF, 2016).

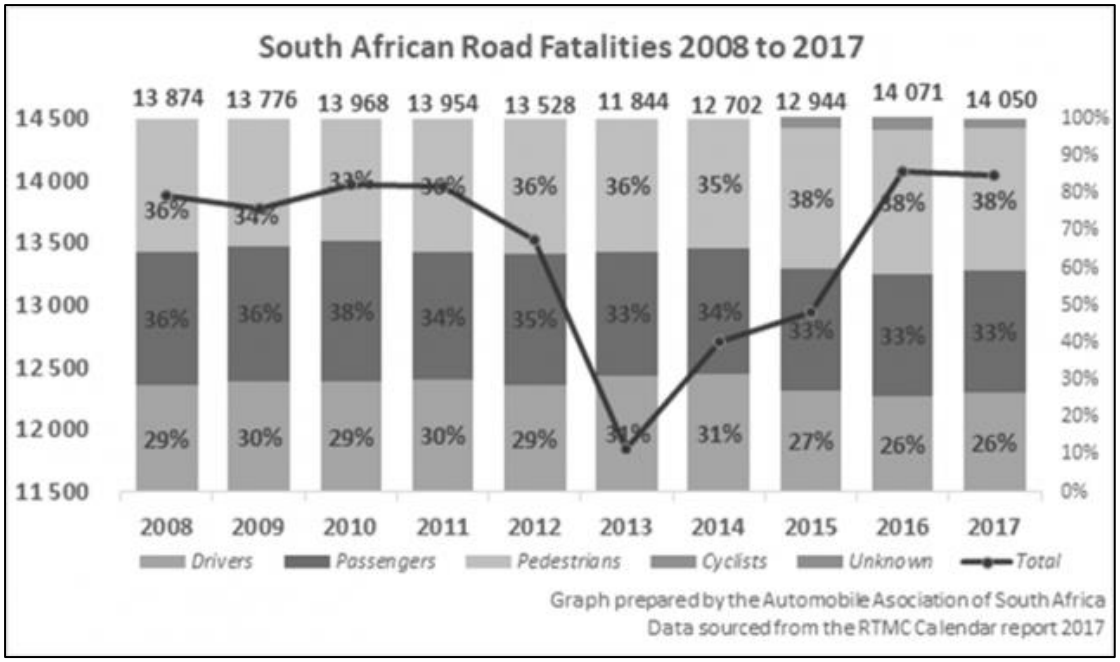


Figure 3.8: South African road fatalities, 2008-2017
(reproduced with permission from Automobile Association of South Africa, from AA, 2018, unpaginated press release).

annum; instead, from 2007 to 2016 our death rate decreased by an average of only 1.49% per annum (DoT, 2017c).

In June 2017 the then Minister of Transport listed the following 5 factors as the most prominent crash contributors (Maswanganyi, 2017):

- Speed too high for circumstances (leading to loss of control and inability to avoid hazards)
- Abuse of alcohol by drivers and pedestrians
- Dangerous overtaking
- Vehicle fitness defects in relation to tyres, steering and brakes (especially on public passenger transport and freight transport)
- Pedestrian negligence (jaywalking, walking on freeways, drinking and walking and “failing to wear clothes” (sic))

High levels of RTID are associated with high costs, as I noted earlier in this chapter. The DOT suggests that in South Africa these equate to 3.4% of GDP (DOT, 2017c) but some authors argue that if *all* costs are taken into account road crashes in this country consume an effective 10% of GDP, much higher than the average of 2.2% in LMICs (Ensor & West, 2013; Ardé, 2015). The costs are inconsistently quantified by government – for instance, estimates range from R143 billion per annum or 3.4% of GDP (DOT, 2017c) to R487 billion per annum (RTMC, 2016). The first of these figures is based on updated Cost of Crashes (COC2016) methodology developed by the Council for Scientific and Industrial Research (CSIR) and takes into account human casualty costs, vehicle repair costs and incident costs (adjusting the road death count upwards by 5% to correct for under-reporting). COC2016 methodology suggests that, on average, a fatal crash in 2015 cost R5.4 million, a crash causing major injuries cost R765,664 and one causing minor injuries cost R152,244 (DOT, 2017c). The DOT notes that the *opportunity* costs associated with road crashes are so high that they "could easily pay for free higher education" or be used as "incentive funds to stimulate the economy"[51] or put towards "any other national treasury requirement that could yield a far greater return to South African society" (DoT, 2017c, p.37). Discovery Insure (reported by Ardé, 2015) surmises that reducing road accidents by one third "could increase GDP by more than one percent a year", which would "free up resources for improving the roads, among other things"; Discovery Insure also blamed road crashes for 80% of the cost of vehicle insurance (Ardé, 2015, p.52).

3.6.2 Road safety policy

A 2007 African Road Safety Conference held in Ghana and attended by most African countries resolved that national action plans for road safety should be developed, with each country setting up a lead agency, implementing quick-

[51] The #FeesMustFall movement called for government to fund tertiary education for needy South African students, while the notion of an economic stimulus relates to the virtually stagnant South African economy and resultant joblessness of numerous people, especially the youth.

win enforcement plans in respect of serious traffic violations and committing to road safety education and management; it was also agreed that action plans should be harmonized at sub-regional level (DOT, 2013). South Africa, as a signatory, duly proposed new road safety measures including a National Rolling Enforcement Plan containing, inter alia, a focus on the fitness of passenger transport vehicles.

Since the advent of democracy in 1994, South Africa's successive road safety policies have had different focal points and the political will to implement them has fluctuated in accordance with the skills, knowledge and energy of the incumbent minister of transport. Much hope was vested in the Arrive Alive campaign launched in the early 2000s, the source of a Road Safety Strategy 2011-2020 focusing on the "4 Es" approach (Enforcement, Education, Engineering and Evaluation) (Arrive Alive, 2011). However, since 2005 the lead agency role has been held by the Road Traffic Management Corporation (RTMC), with its mission being: "Ensure Safe, Secure and Sustainable Roads in South Africa" (DOT, 2013). The RTMC is responsible for the following functions (OECD/ITF, 2016, p.462-463):

- enhancing the overall quality of road traffic service provision to ensure safety, security, order, discipline and mobility on the roads
- protecting road infrastructure and the environment through adopting innovative practices and implementing innovative technology
- introducing commercial management principles to inform and guide road traffic governance and decision making in the interests of enhanced service provision
- optimising the utilisation of public funds
- regulating, strengthening and monitoring intergovernmental contact and cooperation in road traffic matters
- improving the exchange and dissemination of information on road traffic matters
- stimulating research into road traffic matters and effectively using the resources of existing institutes and research bodies

- developing human resources in the public and private sectors that are involved in road traffic

IRTAD notes that a Road Safety Advisory Council was set up in 2014, including representatives from NGOs, transport operators, the automotive industry, road engineering, motor insurance companies and civil society organisations (OECD/ITF, 2016). In addition, a National Traffic Anti-Fraud and -Corruption Unit was created by the RTMC in 2012 to address irregularly acquired learner's licences, driver's licences and roadworthy certificates (DOT, 2017c). IRTAD also notes that the RTMC works with the police, the Hawks (specialist investigations unit), the Health Professions Council, the Medicines Control Council and other entities to deal with fraudulent fitness-to-drive certificates which lead to Professional Driver Permits (PrDPs) being issued irregularly[52] (RTMC, 2017).

It is difficult to evaluate the RTMC's performance in relation to addressing South Africa's RTID burden. Despite its stated commitment to producing National Rolling Enforcement Plans containing monthly targets, I could find only one such plan (for 2009/2010) via an internet search (RTMC, 2009). It is patently obvious that many proposed actions have not been taken – for instance, a Graduated License System for new drivers (with tighter BAC limits and a ban on transporting of passengers and applying for PrDPs during a 3-year probationary period) which was proposed in 2012/2013 (DOT, 2013) has still not been implemented. Although the National Council of Provinces (NCOP) committee for Public Services advised the RTMC to work with "the taxi councils" in February 2013 (PMG, 2013), an internet search yielded no documentary evidence that this has happened. The RTMC has pointed to a number of factors to explain its poor performance, including budgetary limitations (with lack of public funding resulting in a need for private sector investment), fragmentation of efforts, blurred lines and 'contestation' between the various entities entrusted with road safety, an over-concentration of its activities in Gauteng and a shortage of enforcement officials (with 17 000

[52] A figure of 32 000 irregular PrDPs is mentioned in the RTMC's 2017 report.

officers policing a 750,000 km road network) (see for instance DOT, 2013; RTMC, 2016)). GroundUp, a news agency jointly run by the Community Media Trust and the University of Cape Town's Centre for Social Science Research[53] has challenged the veracity of some of these reasons – for instance, it noted in 2016 that the latest annual report reflected that the RTMC's income was R630 million but it spent less than half of this, at R317 million (Maregele, 2016). It also noted that the RTMC failed to publish road death statistics regularly and that the Justice Project South Africa, after trying unsuccessfully to obtain statistics for the period 2012 to 2015, queried whether there was a deliberate withholding strategy, "media blackout" and attempt to mislead the public. The RTMC has a legislative responsibility to report road statistics (OECD/ITF, 2016) but its website[54] is user-unfriendly (making it difficult to search for reports and up-to-date statistics on RTID). It is also devoid of any guidance material relating to road safety – for instance, there are no flyers, videos or fact sheets which can be downloaded by members of the public. On the several visits I made to that site I also found that it contained dead links (such that some reports were irretrievable) and the only copy I could retrieve of the 2017 report was a poorly scanned version which was illegible in some areas, particularly in relation to charts and tables; it also contained numerous typographical and formatting errors to the extent that some sentences were nonsensical. The Frequently Asked Questions (FAQ) section was also inadequate – for instance, despite there being a tab labelled "PDPs", clicking on this instead brought up information on International Driving Permits and the site was devoid of any information on PrDP requirements.

For a government entity with a sizeable budget (and, according to its website, 660 personnel), especially one tasked with something as critical as road safety, these are marked deficiencies[55]. They are also a source of

[53] https://www.groundup.org.za

[54] See www.rtmc.org.za

[55] For an example of a particularly useful government road safety website, rich in data suitable for use both by researchers and by ordinary members of the public, see that of New Zealand's Department of Transport (https://www.transport.govt.nz).

international embarrassment, given South Africa's membership of IRTAD and the fact that the UNDA has resulted in signatory countries being subjected to scrutiny by the UN and WHO. For the purposes of my study, I had little option but to rely more heavily on international reports than on locally generated data.

After the RTMC eventually released 2017 road death statistics (along with statistics from previous years) in April 2018 the Automobile Association of South Africa responded in a scathing manner, noting that the figures from 2008 to 2018 "prove that current road safety initiatives are simply not working" (AA, 2018, unpaginated). It pointed out that since 2008 "almost 135 000 people died in road crashes in South Africa", "a shocking number which, without urgent intervention, genuine commitment from all role-players, and a complete change in the attitude of all road users, will never significantly decrease". The AA also noted that the 'stabilising' of the fatality rate at just over 12 000 deaths per annum is "unacceptable, and should be seen as a national crisis". It pointed to pedestrian fatalities as a particular area of concern, noting that decreasing these by 50% would save about 2 700 lives and bring down the overall number of deaths by 20% or thereabouts.

Government's current road safety policy, strongly informed by the UNDA's five pillars and the Safe Systems approach, is contained in the National Road Safety Strategy 2016-2030 (DOT, 2017c), which I will henceforth refer to as the NRSS. This is noted to be "part of government's efforts to ensuring a safer, better and secured life for all" (DoT, 2017c, p.6) and rests on an understanding that "the dreadful consequences of road crashes" (p.6) could reverse gains made in terms of job creation, social housing, improved health care and social grants. It is aligned to the National Development Plan 2030 (NDP), which classifies road crashes as a health issue (NPC, 2012) and commits the government to reducing injuries and accidents by 50% from 2010 to 2030 (with attention to vehicle roadworthiness, driver behavior, alcohol and substance abuse and weaknesses in law enforcement). This is also in line with the SDGs and adheres to the Road Traffic Safety Management System standard (ISO39001) of the International Standards Organisation (ISO), which

has been developed for use by government, state-owned entities and the private sector.

The overt aim of the NRSS is to achieve a 4% year-on-year reduction in road fatalities up until 2030 (implying at least 400 fewer deaths per annum)[56] – this is considered by the government to be more realistic and feasible than the UNDA target of a 6.7% reduction, which would equate to about 700 fewer deaths per annum. Thus, compared to the baseline of 13 967 road deaths in 2010 the NRSS envisages that no more than 6 984 people will die on the roads in 2030 (DOT, 2017c).[57] This figure reportedly takes into account that South Africa's human population is growing by at least 1.4% per annum, the vehicle population is growing by 4% per annum and the number of driver's licences issued is rising by 4.5% per annum. The Strategy focuses on prioritizing actions which are both "capable of being implemented with ease" and promise to deliver "high impact" (p.9) (the "star interventions" I mentioned in chapter 1) and recognizes the need for "greater efficiency in the application of resources and better tracking of progress" (p.11). It incorporates the following short-term, medium-term and long-term strategies (RTMC, 2016):

Short-term (June 2016 – February 2018): ENABLE AND IMPROVE

- establish solid foundation for safety management
- build institutional credibility and improve road-user behavior

Medium-term (March 2018 – February 2020): ADVANCE

- significantly reduce crashes

[56] Confusingly, the 2018 Estimates of National Expenditure (ENE) document relating to the Budget Vote for Transport reflects an RTMC target of a 2% per annum reduction in road fatalities, declining from 12 431 in 2016/2017 to 11 700 in 2020/2021. The same document indicates that the RTMC staff complement will rise from 609 in 2016/2017 to 838 in 2018/2019 (a 36% increase). See https://data.vulekamali.gov.za/dataset/nat-transport-2018-19/resource/01df6d3b-b0d0-4957-b815-4b23866f710/download/vote-35-transport.pdf.

[57] This may be an error – according to my calculations, a 4% reduction per annum would actually achieve a better figure of "only" 6 173 deaths in 2030. The NRSS figure of 6 984 implies an average reduction of only 2.5% per annum.

- minimize injuries and their consequences

Long-term (2020 – 2030): LEAD

- become the best in Africa through greater incorporation of global trends

Although resting within a Safe System approach, the NRSS also places importance on improving road users' behavior through education, training and awareness-raising, as well as on discouraging law-breaking through better enforcement and lower levels of corruption.

Luke and Heyns (2013) point out that aligning of government policy with public opinion is vital in a democracy and the need for public participation is entrenched in the South African Constitution – however, South Africa has significant difficulties in relation to misalignment between public opinion and government policy, as well as in relation to the government's failure to properly implement its policies and be open, accountable, transparent and responsive to the public's needs. The track record of the RTMC, in my opinion, suggests a high degree of failure in relation to its responsibilities – in particular, in relation to under-spending of its budget and its unreliable and unprofessional production of reports and statistics.

There is also an extremely muddy picture with regards to the government's road safety aims, with poor tie-in between key documents and between those documents and reality. I will demonstrate this briefly using the issue of road deaths and extrapolating from real data to predict the number of road deaths in 2030, using different methods. Thus,

- As noted previously, the NRSS uses 2010 (with 13 968 road deaths) as the base year and sets a target of a 4% decline in deaths per annum, which would imply that **in 2030 the number of deaths will be 6 984**.

- According to the recent Estimation of National Expenditure (ENE) budget[58] vote for Transport, the RTMC is now aiming to achieve a *2%* decline in deaths per annum, from 12 431 in the 2017/2018 year to a projected 11,700 in the 2020/2021 year. Continuing this projection suggests that **in 2030 the number of deaths will be 9 560**.

- According to actual road death figures from 2010 to 2017 (as provided in the RTMC's 2017 report), the average decline per annum was only 0.3%. If this decline is projected up until 2030 (using 14,050 road deaths in 2010 as the baseline), this implies that **in 2030 the number of deaths will be 13 512**.

- According to figures provided by the DOT in 2017 (DOT, 2017c), the average decline per annum from 2007 to 2016 was 1.49%. If this decline is projected up until 2030, using as a baseline the 13 841 road deaths reported by the RTMC in 2017/2018[59], this implies that **in 2030 the number of deaths will be 11 559**.

In summary, the above scenarios range from a best-case proposition of fewer than 7 000 deaths in 2030 (based on the NRSS target of a 4% decline per annum) to a worst-case proposition of more than 13 500 deaths in 2030 (based on a continuation of the 0.3% per annum decline which took place from 2010 to 2017). It is worth noting, too, that all of these figures fall far short of the 6.7% decline per annum which would have been required to meet the UNDA target by 2020 – if South Africa could have achieved (and could sustain) a decline at this level, based on 13 968 deaths in 2010 we would see only **3 490** road deaths in 2030. This illustrates the major role slight shifts in policy and practice play, and the need for clear leadership on the part of government. If it is assumed that there are multiple affected people per death (including, for instance, injured survivors and bereaved family members), the

[58] See https://data.vulekamali.gov.za/dataset/nat-transport-2018-19/resource/01df6d3b-b0d0-4957-b815-4b23866f710/download/vote-35-transport.pdf.

[59] Again, see the 2018 ENE for the Budget Vote for Transport, at https://data.vulekamali.gov.za/dataset/nat-transport-2018-19/resource/01df6d3b-b0d0-4957-b815-4b23866f710/download/vote-35-transport.pdf.

human impact of the different numbers in the various scenarios is very significant.

The problem of under-delivery and inefficiency extends beyond the RTMC and the NRSS in that South Africa lacks coherent cross-sectoral programmes to address RTID. For instance, the Department of Transport and its subsidiaries like the Road Accident Fund (RAF) and Road Traffic Infringement Agency (RTIA) do not seem to work hand-in-hand with the Department of Health and other government departments in relation to crash reduction or the treatment and rehabilitation of crash survivors. Similarly, the prescribed curricula of the Department of Basic Education focus little attention on road safety, while the Department of Social Development has no specific programme for identifying or supporting road crash survivors. In general, government seems to "talk the talk" in relation to road safety, without "walking the walk". This leaves road safety interventions heavily reliant on non-governmental organisations and social responsibility initiatives by private companies – for instance, the Arrive Alive website offers high levels of information and advice regarding road safety, South Africans against Drunk Drivers (SADD) and other NPOs provide educational interventions, South African Breweries (SAB) has run campaigns to enhance road safety, Imperial Car Hire spearheads a child seat initiative and advertising agency Brandhouse previously sponsored a Taxi Driver of the Year competition.

3.6.3 Transport and road safety research

A number of transport- and road safety-related programmes and units are located within South African universities and at the Council for Scientific and Industrial research (CSIR). The university-based units include the African Centre for Excellence in Transport (ACET), located at the University of Cape Town under the leadership of Professor Roger Behrens; this has a strong focus on paratransit and collaborates extensively with researchers elsewhere in Africa and around the world. Another particularly active unit is ITLS-Africa, based at the University of Johannesburg under the leadership of Professor Jackie Walters and having strong linkages with similar units elsewhere,

especially in Australia. The DOT also has a Transport Research Activity Centre (TRAC) which interacted with more than 1.3 million science, engineering and technology learners over a 5-year period in relation to transport-related tertiary disciplines (DOT, 2015).

3.6.4 The South African road traffic system as a crashogenic environment

I have presented information relating to the vehicle-driver-road system and the Safe System approach to road safety, as well as on several key aspects of road safety best practice (noting the degree to which South Africa is compliant with these). I note that, as a country, we can be said to score 1/3 for the human factors I have addressed, scoring another 1/3 in relation to vehicle standards. An overall score of 2/6 seems dismal, and the picture gets even worse when we consider that even when good laws and vehicle standards are in place, we will not achieve 100% compliance with these – I have illustrated this in relation to our markedly low level of seat-belt use, and could equally have focused in the fact that despite our speed laws and drink-driving laws being partly compliant, this alone does not stop South Africans from speeding and drink-driving. In relation to vehicle standards, even though we scored 1/3 I must note that the standards we do have apply only to new vehicles, and our vehicle population contains many elderly vehicles – in 2011, the average vehicle was 10 years old (Arrive Alive, 2011). All in all, we must therefore admit that our true score in relation to our road safety *practice* must be considerably worse than 2/6.

I have also set out South Africa's road safety policy (with various targets set for reducing road deaths per annum) and contrasted this with actual road death figures and trends within the past two decades or so. Thus, I have shown that the government's stance towards road deaths and its targets for reducing these present a muddy rather than clear picture. Furthermore, I have commented that the various targets set – as well as the actual realities on the roads – fall far short of the 6.7% per annum reduction which would have been required to meet the UNDA goal of halving road deaths by 2020.

My study is not an in-depth review of our road traffic legislation or road safety policy, nor is it an inquiry into the degree to which South Africans obey traffic laws – or, for that matter, into their reasons for disobeying them. It is also not an inquiry into the proportion of vehicles on our roads which are "up to standard", or an attempt to resolve the discrepant figures and targets shown in official documents. Instead, for the purposes of my study I have simply presented a number of issues which seem to reflect the general state of South Africa's road traffic system, the context in which the MTI operates. There are clearly reasons to be concerned about deficiencies in our laws – for instance, our too-high BAC allowances for young and novice drivers and our too-high general urban speed limit – and there are reasons to be concerned about the degree to which people disobey even "good" laws (eg: our seat-belt laws). Even though our vehicle standards are better than, say, our African neighbours (an issue to which I will return a little later), this does not mean much if those standards apply to only a small fraction of our vehicles. Most worryingly, government policy documents seem to contain confusing discrepancies and there is no single clear aim in relation to reducing the number of deaths on our roads by 2030. All in all, the information I have presented strongly suggests that our laws, policies and vehicle standards (or limited application thereof), together with people's behavior on the roads, combine in a way which is "**crashogenic**" or "likely to cause crashes". As I mentioned in chapter 1, this is a term I have coined during the course of my study and is akin to the word "obesogenic" which is used in relation to the public health problem of obesity (see for instance Fairbrother, 2009; DOH, 2015).

The road traffic system consists of more than just laws, vehicles, traffic officials and people's behavior. It is indeed shaped by physical factors (for example, road design and vehicle features), legal factors (for example, laws which do or do not comply with best practice, traffic officials and courts which may or may not identify and punish wrongdoers) and sociocultural factors (for example, people's level of awareness of and adherence to road rules and their beliefs and attitudes regarding risk). However, it is also shaped by political factors like presence or absence of political will and clear leadership

in the face of the crisis of RTID, and the levels and quality of resources devoted to road safety. I argue that the many deficiencies in South Africa's road traffic system, in combination, render it a **crashogenic environment**. I define this as follows:

a crashogenic environment	a road traffic context or system in which physical, legal, sociocultural and political factors together create a high likelihood of road crashes, with resulting deaths and injuries

3.7 Comparison of South Africa with other countries

3.7.1 Importance of benchmarking

Given the high prevalence of RTID in South Africa, coupled with the associated high costs in economic and human terms, it is useful to compare South Africa with other countries to assess how far we have come and how far we still have to go to optimize road safety. Benchmarking helps identify best practices and regional benchmarking allows countries with shared characteristics or similar histories to learn from each other's experiences and innovations (Wegman & Oppe, 2010; ITF, 2017). This helps policymakers to identify their own countries' weaknesses, strengths and priorities and develop appropriate policies and programmes to improve road safety.

The first road safety benchmarking was carried out in the early 2000s amongst three European countries with the lowest crash rates, namely Sweden, the United Kingdom and the Netherlands – the so-called SUN countries (Koornstra et al, 2002; Wegman et al, 2008). This study supported a three-level conceptualisation of road safety provided by Rumar (2000). Thus, the first level of analysis involves crash and injury statistics, the second level of analysis probes causative factors like unclear or poorly enforced legislation and unsafe road design, while the third level of analysis considers

the way in which road safety is approached (both from an operational point of view and in terms of how much awareness citizens have of road safety problems and solutions).

Learnings from the SUN countries led to 10 South American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Mexico, Paraguay and Uruguay) carrying out a 2-year benchmarking study after developing suitable benchmarking methodology (ITF, 2016b; ITF, 2017). Fatality rates in Latin America were markedly higher than in Europe (other than in Cuba, which had a low level of motorization). Particular problems were found in relation to VRUs like motorcyclists and pedestrians and it was noted that despite all 10 countries having adequate legislation, adherence to this was poor – common offences being speeding, drink driving and non-use of seat-belts and helmets. An attempt was made to group the countries according to characteristics like population density and rural/urban distribution and motorization (as a proxy for exposure to risk) – however, too much heterogeneity between the countries hampered this and data was frequently lacking or was not easily harmonized (for instance, due to differing definitions of road deaths). Despite the difficulties, the benchmarking study drew two over-arching conclusions, namely that public transport is relatively safe but must increase its quality and attractiveness and be aligned to people's travel behavior and needs, and that there must be synergies between road safety policy and other public policies (eg: mobility management policies and land use planning) (OECD/ITF, 2016). The study recommended that each country have a strong national lead agency for road safety and a national road safety strategy with ambitious targets, set up a road safety observatory with good data systems, prioritise VRUs (eg: motorcyclists, pedestrians), address speeding, drink-drinking and non-use of seat-belts, tackle weaknesses in post-crash management, invest in safe road infrastructure and adopt UN regulations on vehicle safety

Having noted the importance of benchmarking (and its difficulties), I will devote the rest of this chapter to a desk-based benchmarking exercise, comparing South Africa's road safety "lay of the land" against three sets of

comparison countries by using data from the WHO "Death on the Roads" interactive online map. Firstly, due the potential importance of the BRICS (Brazil, Russia, India, China, South Africa) collaboration, I will compare us to our fellow BRICS countries. Secondly, I will compare us with our neighbouring countries as well as two selected countries elsewhere in Africa which have well-documented paratransit systems. Thirdly, I will compare us with a group of "aspirational" countries (ie. those with significantly low RTID rates, some of which were early adopters of Safe System approaches to road safety). For ease of reading I round figures off, where relevant. In most instances I use the WHO data "as is", but in three respects I extrapolate additional metrics from it. Thus,

- I obtained a rather crude **"motorization" measure** in the form of a rough count of vehicles per 1 000 people (using the motor vehicle population and human population of each country).[60]

- I derived a measure of the **accuracy of country road death counts** by comparing country counts with WHO's algorithm-derived calculations of the likely true road deaths in that country. This gave a sense of whether countries over- or under-counted road deaths.[61]

- I calculated **vehicle user deaths** as a percentage of all deaths, as MTI drivers and passengers would fall into this category rather than the categories "motorcyclist deaths", "cyclist deaths" or "pedestrian deaths".

[60] While overly simplistic (as the data available may disregard non-motorized vehicles and almost certainly excludes unregistered motor vehicles), this provides some ability to compare countries with each other and comment on death rates in relation to this crude motorization figure.

[61] For instance, in South Africa's case the Death on the Roads map indicates a country count of 13,802 deaths whereas the WHO count is 13,273 – suggesting that South Africa may be slightly *over-counting* road deaths, at 104%. In the case of other countries the reverse is true – country counts are lower than what WHO perceives as likely to be the true situation, thus those countries seem to be *under-counting* their road deaths (eg: Mozambique, at 25%).

On the basis of the three comparisons I argue that South Africa is in some respects leading the way in southern Africa, while falling far short of the situation in most other BRICS countries and even further short in relation to the aspirational countries.

3.7.2 South Africa in comparison with other BRICS countries

South Africa compares favourably with its fellow BRICS countries in some respects, and very unfavourably in other respects. It and Brazil outstrip the others in terms of road deaths per 100 000 population, being well above the world average at 25.1 and 23.4, respectively. The other three BRICS countries are slightly above or below the world average, with Russia at 18.9, China at 18.8 and India at 16.7. Expressed in terms of vehicles per 1 000 people, South Africa's level of motorization (at 190) far exceeds Brazil's level (10), is not very dissimilar to the levels of India (130) and China (180) and falls far beneath that of Russia (350). Russia's high level of motorization is congruent with it being a high-income country, while all other BRICS countries are middle-income countries. A high proportion of fatalities in Russia and South Africa are vehicle users, rather than motorcyclists, cyclists or pedestrians – the Russian figure being 57% and the South African figure being 67%. Surprisingly, in largely non-motorized Brazil some 24% of fatalities are vehicle users, while in China they make up 19% of fatalities and in India they make up 17%.

With regard to country counts of road deaths, WHO perceives these as most accurate in Russia (100% matching WHO's algorithm-based calculation) and least accurate in China, at 22%. Brazil (at 90%) and India (at 66%) are also thought to under-count their road deaths, while South Africa (at 104%) seems to slightly over-count its road deaths.

When it comes to road safety related legislation, neither South Africa nor any of the other BRICS countries fares particularly well. We have broadly acceptable (albeit not ideal) seat-belt laws but our laws on drink-driving, speeding, child seats and helmets are all sub-standard. Brazil comes closest to meeting all the legislation requirements, having acceptable laws in relation

to drink-driving, child seats, helmets and seat-belts – however, it has inadequate laws in relation to speeding. Russia is compliant in three areas (child seats, helmets and seat-belts) but has sub-standard laws on drink-driving and speeding. China is compliant only in relation to drink-driving and seat-belt laws, while India complies only in relation to seat-belt laws.
With regards to vehicle standards, only Russia is fully compliant, scoring 7/7 in relation to ESC, FI and PP standards. Brazil and China both lack ESC and PP standards but score some points for having FI standards (Brazil scoring 5/7 and China 4/7). South Africa scores 4/7, having ESC and PP standards in place but no FI standards. India scores only 2/7, having no fully compliant standards in place.

The data are summarized in a table overleaf.

Table 3.1: Comparison of South Africa and the other BRICS countries
(source: Death on the Roads, WHO's interactive map)

	Deaths/ 100k	Pop	Vehicles	Vehicles/ 1 000 people	Income class	Deaths (WHO)	Deaths (country stats)	% of WHO stats	Laws					Vehicle standards			
									DD	Sp	CS	H	SB	score	ESC	FI	PP
SA	25.1	52.8m	9.9m	190	Middle	13,273	13,802	104%	N	N	N	N	Y	4/7	Y	N	Y
Brazil	23.4	200.4m	1.6m	10	Middle	46,935	42,291	90%	Y	N	Y	Y	Y	5/7	N	Y	N
Russia	18.9	142.8m	50.6m	350	High	27,025	27,025	100%	N	N	Y	Y	Y	7/7	Y	Y	Y
India	16.7	1,252.1m	159.5m	130	Middle	207,551	137,572	66%	N	N	N	N	Y	2/7	N	N	N
China	18.8	1,385.6m	250.1m	180	Middle	261,367	58,539	22%	Y	N	N	N	Y	4/7	N	Y	N

Key: Laws DD = drink driving Sp = speed CS = child seats H = helmets SB = seat-belts

Vehicle standards ESC = electronic stability control
FI = frontal impact
PP = pedestrian protection

Table 3.2: Fatality breakdowns in the BRICS countries (per 100k population)
(Source: Death on the roads, WHO's interactive map)

	Car users		Motorcyclists	Cyclists	Pedestrians
SA	16.7	(66.5% of all)	No data	No data	8.4
Brazil	5.5	(23.5% of all)	6.6	0.8	4.6
Russia	10.8	(57% of all)	0.8	0.3	5.5
India	2.9	(17.4% of all)	5.6	0.6	1.5
China	3.6	(19% of all)	5.1	1.5	4.9

3.7.3 South Africa in comparison with neighbouring and other African countries

An overt aim of the NRSS is for South Africa to "Become best in Africa through greater incorporation of global trends" during the period 2020 to 2030 (DoT, 2017c, p.48). In the first place, it is thus useful to gain a sense of how we are currently faring in relation to our abutting neighbours, with whom we shares certain commonalities including cross-border road infrastructure and traffic. The other two countries I have selected for comparison are Kenya, with its paratransit *matatus*, and Tanzania, with its paratransit *daladalas.*

I will focus first on our neighbours, with whom we compare favourably in some respects and unfavourably in others. All, like us, have death rates per 100 000 population which are well above the world average – Mozambique is highest at 32, followed by Zimbabwe and Lesotho (each with 28). We are in the middle of the group, at 25, and are followed by Swaziland, Namibia and Botswana (all with 24). Botswana has the highest level of motorization, at 250 vehicles per 1 000 people, followed by South Africa (190). Swaziland (160) and Namibia (130) are in the middle of the group and the remaining countries - Zimbabwe (60), Lesotho (50) and Mozambique (20) – have low levels of motorization. Mozambique and Zimbabwe are low-income countries, while South Africa and the other countries fall into the middle-income category. In general, a high proportion of fatalities (57-67%) are vehicle users, rather than motorcyclists, cyclists or pedestrians. However, Zimbabwe (with its low level of motorization) stands out, with only 21% of fatalities being vehicle users.

With regard to country counts of road deaths, WHO perceives these as most accurate in South Africa (at 104% of WHO's algorithm-based calculation), followed by Botswana (86%). The remaining countries are thought to significantly under-count their road deaths – these are Swaziland (65%), Namibia and Lesotho (each 56%), Zimbabwe (45%) and Mozambique (21%).

When it comes to road safety related legislation, neither South Africa nor any of its neighbours meets WHO's criteria for good legislation in more than 3 of

the 5 areas covered. South Africa is on the worse end of the spectrum, having compliant legislation in only one area (seat-belts). Botswana scores best (3/5), having good laws in relation to child seats, helmets and seat-belts but substandard laws on drink-driving and speeding. Mozambique (2/5) meets the criteria for child seats and seat-belt laws but not for laws relating to drink-driving, speeding or helmets. Like South Africa, Namibia (1/5) meets WHO criteria *only* in relation to seat-belt laws, while Zimbabwe and Lesotho (each 0/5) do not meet the criteria in any of the five areas.

With regards to vehicle standards, South Africa stands out as the only one to achieve any degree of compliance. We score 4/7 overall due to having ESC and PP standards in place but lacking FI standards. All our neighbours score 0/7, having no vehicle standards whatsoever. As South Africa is an economic hub in the region and there is significant cross-border traffic, substandard vehicles from neighbouring countries do spend time on South African roads and are not compelled to comply with South African vehicle standards – in addition, as I have mentioned previously, these standards only apply to new vehicles and many South African vehicles are elderly.

The data are summarized in the table overleaf.

Table 3.3: Comparison of South Africa and its neighbouring countries
(source: Death on the Roads, WHO's interactive map)

	Deaths/ 100k	Pop	Vehicles	Vehicles/ 1 000 people	Income Class	Deaths (WHO)	Deaths (country stats)	% of WHO Stats	Laws					Vehicle standards			
									DD	Sp	CS	H	SB	score	ESC	FI	PP
SA	25.1	52.8m	9.9m	190	Middle	13,273	13,802	104%	N	N	N	N	Y	4/7	Y	N	Y
Botswana	23.6	2m	0.5m	250	Middle	477	411	86%	N	N	Y	Y	Y	0/7	N	N	N
Namibia	23.9	2.3m	0.3m	130	Middle	551	308	56%	N	N	N	N	Y	0/7	N	N	N
Mozambique	31.6	25.8m	0.5m	20	Low	8,173	1,744	21%	N	N	Y	N	Y	0/7	N	N	N
Zimbabwe	28.2	14.1m	0.9m	60	Low	3,985	1,787	45%	N	N	N	N	N	0/7	N	N	N
Lesotho	28.2	2.1m	0.1m	50	Middle	584	327	56%	N	N	N	N	N	0/7	N	N	N
Swaziland	24.2	1.2m	0.2m	160	Middle	303	197	65%	N	N	N	Y	N	0/7	N	N	N

Key: Laws DD = drink driving Sp = speed CS = child seats H = helmets SB = seat-belts

Vehicle standards ESC = electronic stability control FI = frontal impact PP = pedestrian protection

Table 3.4: Fatality breakdowns in South Africa and its neighbouring countries (per 100k population)
(Source: Death on the roads, WHO's interactive map)

	Car users		Motorcyclists	Cyclists	Pedestrians
SA	16.7	(66.5% of all)	No data	No data	8.4
Botswana	16	(67.8% of all)	No data	No data	6.4
Namibia	14.8	(61.9% of all)	0.1	0.1	7.7
Mozambique	No data		No data	No data	No data
Zimbabwe	5.8	(20.6% of all)	1.7	1.0	4.6
Lesotho	16	(56.7% of all)	0.3	0.2	8.5
Swaziland	15.1	(62.4% of all)	0.5	0.5	8.1

Turning attention to Kenya and Tanzania as additional comparison points, I note that both have death rates per 100 000 population which are considerably higher than South Africa's 25 – namely, 29 for Kenya and 33 for Tanzania. This is despite their far lower levels of motorization – compared with South Africa's 190 vehicles per 1 000 people, Kenya has 50 and Tanzania only 30. Both are classified as low-income countries and both are thought to very significantly under-count their road deaths (at 25% of WHO's algorithm-derived calculations).

Tanzania's laws are sub-standard in relation to all five priority risk areas (scoring 0/5), while Kenya (scoring 1/5) has acceptable seat-belt laws but sub-standard laws in relation to drink-driving, speeding, child seats and helmets. Both Kenya and Tanzania score 0/7 in relation to vehicle standards, having no standards in place for ESC, FI or PP. In both cases, about a third of road deaths involve vehicle users.

Thus, on the whole Kenya and Tanzania have significantly worse road safety situations than South Africa. Given the similarities between their paratransit systems and our MTI (which will be explored in more depth in the next chapter), it may be fruitful for the three countries to collaborate on developing specific paratransit road safety strategies.

Once again, the comparative data are provided in a table on the next page.

Table 3.5: Statistics for Kenya and Tanzania
(source: Death on the Roads, WHO's interactive map)

	Deaths/ 100k	Pop	Vehicles	Vehicles/ 1 000 people	Income Class	Deaths (WHO)	Deaths (country stats)	% of WHO stats	Laws					Vehicle standards			
									DD	Sp	CS	H	SB	score	ESC	FI	PP
Kenya	29.1	44.4	2.0m	50	Low	12,891	3,191	25%	N	Y	N	N	Y	0/7	N	N	N
Tanzania	32.9	49.3m	1.5m	30	Low	16,211	4,002	25%	N	N	N	N	N	0/7	N	N	N

Key: Laws DD = drink driving Sp = speed CS = child seats H = helmets SB = seat-belts

Vehicle standards ESC = electronic stability control FI = frontal impact PP = pedestrian protection

Table 3.6: Fatality breakdowns in Kenya and Tanzania (per 100k population)

	Car users		Motorcyclists	Cyclists	Pedestrians
Kenya	10	(34% of all)	1.4	4.2	13.5
Tanzania	11.5	(35.0% of all)	7.1	3.7	10.3

3.7.4 South Africa in comparison with aspirational countries

Finally, it is instructive to compare South Africa's road safety statistics with those of aspirational countries (countries with particularly low road deaths). While the road traffic system in those countries may differ substantially from the road traffic system in South Africa and most of them are HICs, the RSTF suggests that LMICs can benefit from insights derived in HICs. The NRSS (DOT, 2017c) is benchmarked against 7 "Best Practice Countries" which are seen as pioneers or global leaders in road safety – they are Sweden, the Netherlands, Ireland, the UK, Wales, Australia and Argentina (of which Argentina is a middle-income country and the others are all high-income countries). Due to the "Death on the Roads" map not presenting separate information for Wales, my comparison focuses on 6 of the 7 countries. Two (Australia and Argentina) are in the southern hemisphere while the other five are European countries locaded in the northern hemisphere.

My crude "motorization" metric is probably relatively accurate for the aspirational countries, given that most developed countries have good vehicle registration systems and relatively low levels of non-motorized vehicles (with the possible exception of the Netherlands, with its very high levels of bicycle use). This metric had weaker usefulness in relation to some of the other reference countries (particularly the African ones) due to the possibility of poor quality or absent vehicle registration systems and the possibility of high levels of non-motorized transport. One striking feature of the aspirational countries – not apparent from "Death on the Roads" but rather from my general knowledge – is that they are arguably much less multicultural than South Africa. Indeed, Sweden and Australia are known to be fairly *monocultural*. In addition, whereas South Africa has 11 official languages all of the aspirational countries have a single dominant language.[62] Most of the aspirational countries also have far lower populations than South Africa, which the World Bank ranked 24th in the world in 2016, with its

[62] Information derived from https://www.internetworldstats.com/languages3.htm.

population of 56 million (World Bank, 2018) – the notable exceptions being the UK (ranked 22nd, with 66 million) and Argentina (32nd, with 44 million). The figures for the remaining countries are: Australia (53rd, with 24 million), the Netherlands (65th, with 17 million), Sweden (88th, with 10 million) and Ireland (121st, with 5 million)[63]. These are important factors to take into consideration, in that high levels of language diversity and larger populations can complicate road safety efforts. This is both from a practical point of view (for instance, resulting in a need for road safety materials and training to be bi- or multi-lingual for maximum effort) and from a sociocultural point of view (for instance, due to diverse value systems and religious beliefs which require road safety messages to be framed in different ways).

I will also briefly note – without providing detailed figures – that the fact that South Africa has the highest Gini coefficient (measure of inequality) in the world may make for road safety differences in relation to the aspirational countries. Socioeconomic inequality is likely to result in the national vehicle "fleet" containing widely differing vehicles (ranging from luxury cars to donkey carts, for instance) and could also result in road users having widely differing levels of education[64]. This would make an interesting bioethical study in itself.

Consideration of the 6 aspirational countries reveals that, on average, they have only 5 road deaths per 100 000 population – just over one fifth of South Africa's road deaths. If Argentina (an LMIC with 14 deaths per 100 000) is excluded, the remaining countries (all HICs) have an even lower average death rate of 4 per 100 000. The "motorization" rates are generally high (even in the Netherlands, famous for its high number of bicycles), averaging 600 vehicles per 1 000 people.

[63] It must be noted, though, that population size as a determinant of road safety effectiveness is not in itself a very helpful concept – indeed, South Africa's neighbouring countries also have smaller or much smaller populations than South Africa but do not have a better road safety status on the whole. They are Mozambique (28.8 million), Zimbabwe (16.2 million), Namibia (2.5 million), Botswana and Lesotho (each with 2.2 million), and Swaziland (1.3 million). (World Bank, 2018).

[64] This would make for an interesting bioethical study in itself.

Thus, they significantly outstrip South Africa's 190 vehicles per 1 000 people. The deemed accuracy of the country death counts (when compared to WHO's algorithm-derived figures) is consistently high, including in Argentina, with an average of 97%. When it comes to road safety legislation, however, Australia is the only country which "ticks all the boxes" in relation to drink-driving, speeding, child seats, helmets and seat-belts (scoring 5/5). Another three countries tick 4 of the 5 boxes, with the UK not having adequate drink-driving laws, Ireland not having adequate helmet laws and Sweden (surprisingly) not having adequate child seat laws. The remaining two countries show greater legal "gaps" – these being Argentina (3/5), which lacks adequate laws on drink-driving and speed, and the Netherlands (3/5) which lacks adequate laws on speed and helmets.

With regards to vehicle standards, 5 of the 6 countries score 7/7, the exception being Argentina which scores only 3/7 (lower than South Africa) due to not having ESC or PP standards. In relation to the proportion of all deaths which is made up of vehicle users, this is highly variable and may relate to factors other than "motorization". Thus, in Australia and Ireland vehicle users account for 63-66% of fatalities (a little lower than South Africa's 67%), while in Argentina the figure is much more significant at 88%. The Swedish and UK proportions are intermediate, at 57% and 45%, respectively. Unsurprisingly, in the Netherlands only 38% of fatalities involve vehicle users while 32% involve cyclists (the latter figure being above-average for the aspirational countries and presumably relating to the Netherlands' famously high bicycle use).

Table 3.7: Comparison of South Africa and 6 aspirational countries
(source: Death on the Roads, WHO's interactive map)

	Deaths/ 100k	Pop	Vehicles	Vehicles/ 1 000 people	Income class	Deaths (WHO)	Deaths (country stats)	% of WHO stats	Laws					Vehicle standards			
									DD	Sp	CS	H	SB	score	ESC	FI	PP
SA	25.1	52.8m	9.9m	190	Middle	13,273	13,802	104%	N	N	N	N	Y	4/7	Y	N	Y
Australia	5.4	23.3m	17.2m	740	High	1,252	1,192	95%	Y	Y	Y	Y	Y	7/7	Y	Y	Y
UK	2.9	63.1m	35.6m	560	High	1,827	1,770	97%	N	Y	Y	Y	Y	7/7	Y	Y	Y
Ireland	4.1	4.6m	2.5m	540	High	188	188	100%	Y	Y	Y	N	Y	7/7	Y	Y	Y
Argentina	13.6	41.4m	23.1m	580	Middle	5,619	5,209	93%	N	N	Y	Y	Y	3/7	N	Y	N
Netherlands	3.4	16.8m	9.6m	570	High	574	570	99%	Y	N	Y	N	Y	7/7	Y	Y	Y
Sweden	2.8	9.6m	5.8m	600	High	272	260	96%	Y	Y	N	Y	Y	7/7	Y	Y	Y

Key: Laws DD = drink driving Sp = speed CS = child seats H = helmets SB = seat-belts

Vehicle standards ESC = electronic stability control
FI = frontal impact
PP = pedestrian protection

Table 3.8: Fatality breakdowns in South Africa and 6 aspirational countries (per 100k population)
(Source: Death on the roads, WHO's interactive map)

	Car users		Motorcyclists	Cyclists	Pedestrians
SA	16.7	(66.5% of all)	No data	No data	8.4
Australia	3.4	(63.0% of all)	1.0	0.2	0.7
UK	1.3	(44.8% of all)	0.6	0.2	0.7
Ireland	2.7	(65.9% of all)	0.6	0.1	0.7
Argentina	11.9	(87.5% of all)	No data	0.3	1.4
Netherlands	3.4	(38.2% of all)	0.5	1.1	0.3
Sweden	1.6	(57.2% of all)	0.5	0.2	0.5

3.8 Closing remarks

In this lengthy chapter I have thoroughly explored the topic of RTID and why this is a public health *ethics* problem rather than simply a public health problem. Although I began with an international overview in order to provide a context, I have devoted a good part of the chapter to an analysis of South Africa's road safety "lay of the land" – as I noted in chapter 1, this is typical in bioethical research, which first tries to understand the status quo. Thus, I have described the burden of RTID in South Africa and have examined some strengths and weaknesses in our road safety laws, practice and policy. I have also put forward an argument that our road traffic system represents a **crashogenic environment**, which is the context in which the MTI operates.

This leads logically to chapter 4, in which I briefly discuss paratransit in general – including its chief characteristics and the need for (and difficulties of) reform – before turning my attention to the South African MTI and then the Johannesburg MTI.

In chapter 3 I have touched on ethically-based shifts in thinking about road safety – specifically, the development of Vision Zero type policies and the Safe System approach – and this will also serve as a lead-in to chapter 5, in which I will address moral considerations in relation to road safety in greater depth.

The next two chapters will thus finish what I have started in this chapter, which is to provide a foundation for the presentation of my empirical results in chapters 6 and 7. The same foundation will assist with the integrated discussion of my results, which I will set out in chapter 8.

CHAPTER 4: PARATRANSIT AND THE JOHANNESBURG MTI

4.1 Preamble

In this chapter I focus on that space in the road traffic system which is filled by paratransit (informal public transport), with its peculiar road safety challenges. Thus, I define and describe paratransit in general, offering an overview of its characteristics, strengths, weaknesses and variability, as well as the need for reform (which is difficult and can proceed in a number of ways).

Next, I bring the focus to South Africa and briefly address travel patterns and current government policy regarding public transport, before offering a highly condensed history of the South African MTI. Despite having much in common with other paratransit systems, the MTI contains unique elements by virtue of its birth in the apartheid era and its place in the post-apartheid democratic state. Having outlined its origins, informal nature and operating principles – including the endemic violence which characterizes the industry to date – I argue that it is appropriate to borrow the term **contra-constitutional** from the legal sector and apply it in a novel way to the MTI. This relates to documented realities associated with the industry, which in some respects violate the Bill of Rights which forms part of the South African constitution.

Finally, I narrow the discussion to the MTI as it operates in Johannesburg, South Africa's economic hub and the geographic focus of my study. In this section I provide background information regarding the city itself before explaining what is known – and not known – about the Johannesburg MTI, the dominant public transport mode.

The main purpose of this chapter is to provide a contextual foundation for the empirical data which will follow in chapter 6 (in which I set out the results of my survey) and chapter 7 (in which I set out the results of my interviews).

4.2 Paratransit (informal public transport)

4.2.1 Definition

The brief definition of paratransit I use in this thesis – listed with other acronyms and terms at the beginning – is based partly on the more extensive definition provided by Behrens, McCormick and Mfinanga (2016). To refresh the reader's memory, the brief definition is as follows:

> **paratransit**: flexible, non-scheduled/informal passenger transport

Behrens et al (2016) note that the prefix "para" denotes that paratransit operates alongside or in parallel to formal public transport systems. It includes "all passenger travel modes falling between autonomous private transport and scheduled, fixed-route public transport" (p.1), in which the passenger "neither owns the vehicle, nor determines its route, service times and occupancy" (p.5). Drawing partly on the work of Halcrow Fox (2000) and Bayliss (2002), Behrens et al conceptualise paratransit as situated within a three-dimensional cube bound by:

- a vertical axis reflecting the **continuum of regulation** (from a completely unregulated service to a fully regulated monopoly)

- a horizontal axis reflecting the **continuum of service planning** (from completely flexible routes and service frequencies to fixed routes and schedules/headways)

- a diagonal axis reflecting the **continuum of business formality** (from complete informality to formally registered, compliant, tax-paying businesses)

This is diagrammatically represented below.

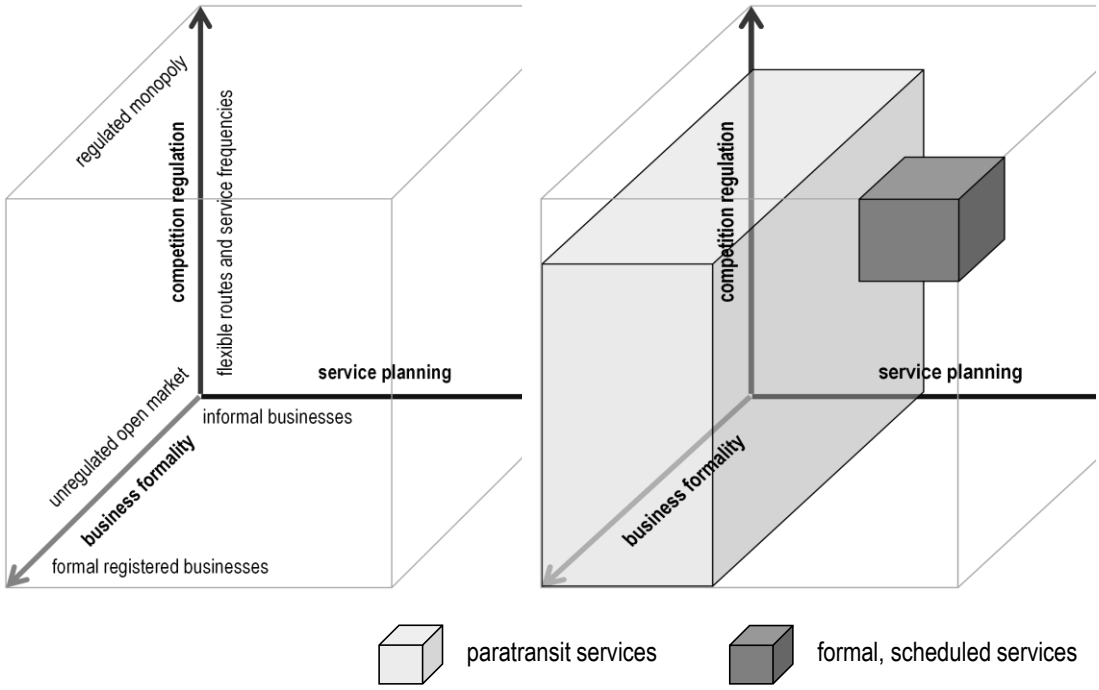


Figure 4.1: Paratransit attributes compared to formal, scheduled services: (reproduced with permission of Roger Behrens, from Behrens, McCormick & Mfinanga, 2016, p.6)

Paratransit in HICs often centres on niche services like dial-a-ride for people with disabilities and (some may argue) the increasingly prominent app-based e-hailing services like Uber, Lyft and Taxify. However, in LMICs it tends to consist of large-scale services aimed at the general public and typically using small or medium-sized buses. This aspect of the paratransit sector – what can be described as its mass transit or public transport aspect – is what has relevance for my study and will be the focus of the next few sections.

4.2.2 Characteristics of paratransit systems

Klopp and Mitullah (in Behrens et al, 2016) describe the distinct characteristics of paratransit as its flexibility and demand-responsiveness (with a lack of schedules, designated stopping places and, in some cases, fixed routes), its fluctuating fares, competition on the roads (with formation of cartels) and poor work conditions for drivers.

Schalekamp, Golub and Behrens (also in Behrens et al, 2016) note that paratransit services are often found in under-resourced cities with limited management capacity, which allow the private sector to provide “public” transport services to one degree or another. Thus, market forces tend to result in the services being designed according to people’s ability to pay for them. This may mean that they are not optimal from the point of view of safety or efficiency, despite the benefits they offer.

4.2.3 Paratransit strengths and weaknesses

McCormick, Schalekamp and Mfinanga (in Behrens et al, 2016) highlight the strengths of paratransit, the first of which is its demand-responsiveness which allows it to respond quickly to new service demands and cater for multiple passenger markets – an asset in rapidly urbanizing cities. Cervero and Golub (2007) also refer to this, calling paratransit a consummate gap-filler (Cervero & Golub, 2007). Other strengths of paratransit include its capacity to create jobs and foster entrepreneurship, especially in relation to people who cannot be absorbed into the formal labour market – UN-Habitat (2013) notes that it is a particularly important source of gateway employment for new market entrants with few skills. Furthermore, UN-Habitat points to the jobs which paratransit creates indirectly – for instance, in relation to touts, change-handlers and providers of services like cleaning, maintenance, vehicle repairs and construction. UN-Habitat does, however, acknowledge the difficulties paratransit workers experience in trying to break the cycle of poverty, with owner-operators struggling to access credit (due to banks being reluctant to make loans to informal businesses) and experiencing high interest rates (up to 40%+ per month) and short payback periods (sometimes under 3 years); this causes some to resort to micro-lenders. With regards to those who lease the vehicles, “often half or more or their daily intake” must be paid over to the vehicle owners.

A final strength of paratransit is the fact that it typically operates without direct subsidies and is largely self-financing (McCormick, Schalekamp and Mfinanga, in Behrens et al, 2016).

Dimitrov (2012) notes that paratransit is an important low-cost mechanism for preventing social exclusion and travel disadvantage (also known as travel poverty) – for instance, in cities in India and South Africa. She comments that the transport mix in such cities tends, however, to be skewed towards the urban elite, namely middle-class users of private cars. This has markedly increased the vehicle population, with associated high crash rates and high energy consumption. Dimitrov recommends that cities in LMICs provide multiple transport modes, ranging from low-cost paratransit services to high-cost formal transport services and also considering the potentially high proportions of foot commuters and users of two-wheel vehicles. She concludes that proper planning, based on extensive user needs analyses, can help ensure appropriate energy use and reduce social exclusion when it comes to accessing services and employment.

UN-Habitat (2013) too notes that in LMICs, due to the lack of affordable formal transport services, paratransit is an important source of mobility for the poor – this has resulted in a proliferation of informal minibus- and midibus-based services, especially in sub-Saharan cities. It offers low-density, frequent services with low waiting times and high flexibility (even including door-to-door services), able to enter narrow streets in poor areas and capable of moving rapidly on congested roads. Furthermore, trips are often polycentric, complementing formal transport modes involving trunk lines and bigger vehicles, and the vehicles may be more energy-efficient due to high load factors.

Despite its strengths and the benefits it can offer to passengers – especially the poor – paratransit is associated with significant problems and weaknesses. Chief amongst these are on-the-road competition for passengers, poor service, unfair labour practices, lack of constructive relations with authorities and poor safety (McCormick, Schalekamp and Behrens, in Behrens et al, 2016). The last of these is the *raison d'etre* for my study. Wegman (2015) describes well-designed and appropriate public transport systems as valuable assets in both urban and rural areas, regardless of whether these are situated in HICs or LMICs, but stresses the

need for road safety to be considered across the board – not only for paratransit passengers but also for other road users. UN-Habitat (2013) identifies minibuses as a particularly injurious vehicle class and one which must be addressed as a priority.

UN-Habitat (2013) notes that paratransit services in LMICs typically rely on vehicles owned by private operators, which are often unlicensed and sub-standard with respect to factors like insurance cover, vehicle quality and driving standards. It also notes the disadvantages associated with informality, including disregard of government regulations, drivers making route deviations and fares sometimes exceeding the expected level. Weak enforcement capacity and limited resources leads governments in many LMICs to acquiesce with the paratransit sector and allow it to self-regulate and police itself in relation to issues like market entry, vehicle roadworthiness and driver fitness (UN-Habitat, 2013; Behrens et al, 2016). In sub-Saharan Africa market entry may be entirely self-regulated through route associations, leading to some routes being overtraded and resultant violent competition (including “aggressive driver behavior, unsafe operations and unfair labour relations” (Behrens et al, 2016, p.12). Apart from anything else, this affects the viability of operations.

From the literature reviewed here (and much other literature which has not been specifically reviewed due to its very extensive nature), it is clear that many paratransit systems are only weakly regulated by governments, and that their externalities – including most importantly RTID – are not being effectively addressed.

4.2.4 Paratransit research

Empirical research into the operational aspects of paratransit services is limited, and Wegman (2015) specifically notes a dearth of road safety research. Cervero and Golub (2007) offer a global overview of paratransit systems but I have not reviewed this in depth because it has been supplanted to some extent by the work of Behrens et al (2016). Additionally, a number of

researchers have carried out localized studies into different aspects of the paratransit world. These include Couto's study of workplace violence amongst Maputo taxi drivers (2011), Sauti's ethnographic study of perceptions of MTI drivers on the Johannesburg-Randfontein route (2006), Mongezi's study of the environmental impact of the MTI in Butterworth, South Africa (2002), and several studies by Khayesi, Nafukho and other authors in relation to paratransit services in various parts of Kenya (see for instance Khayesi, 2001; Khayesi, 2002; Khayesi & Nafukho, 2002; Khayesi, Nafukho & Kemuma, 2015). In addition, Sekhonyane & Dugard (2004) have written extensively about the South African MTI, likening it to the *jeepneys* in the Philippines, *matatus* in Kenya and *trotros* in Ghana, and as already noted Behrens, McCormick and Mfinanga (2016) have contrasted paratransit services in Cape Town, Nairobi and Dar es Salaam.

Paratransit literature tends to be diagnostic rather than recommending systems improvements (Behrens, McCormick & Mfinanga, 2016) but a few studies have focused on road safety either directly or indirectly. Thus, Dixey (1999) documents the intersection of fatalism and road safety in Nigeria, Khayesi and Nafukho (2002) touch on road safety in their case study of the *matatus* in Kenya, Peltzer and Renner (2003) address superstition amongst South African MTI drivers, Khayesi and Peden (2005) consider road safety as part of the broader development process in Africa, Azetsop (2010) addresses road safety in Kenya from a social justice perspective and Luoma and Sivak (2012) describe road safety management in Brazil, Russia, India and China. I will make reference to some of these studies in chapter 8, when I provide an integrated discussion of my empirical results and develop my normative argument with respect to road safety in the Johannesburg MTI.

One difficulty with understanding paratransit services comes from their variability. Noting their dominance in sub-Saharan Africa, Behrens et al (2016) engaged in a comparative study of services in Cape Town (South Africa), Nairobi (Kenya) and Dar es Salaam (Tanzania). These differ in several respects, including vehicle size and type (ranging from 4-seater sedans to 9- to 16-seater minibuses and 17- to 35-seater midibuses),

ownership-operation structures and fare-setting mechanisms. Three dominant owner-operation models are owner-employee, owner-lessee and owner-driver, of which the last is least common. With respect to fare-setting mechanisms, in some instances fares are set by government agencies while in other instances they are set by route association federations covering particular parts of the city or even by individual drivers. Fares sometimes fluctuate according to time of day, passenger demand or the weather, and in some cases special fares are offered to certain passengers like school learners, pensioners, police or people with disabilities.

Despite the areas of variability, Behrens et al (2016) also identified similarities between Cape Town, Nairobi and Dar es Salaam. These related to the source of the drivers' income and the use of the fill-and-go principle, whereby vehicles only depart from termini once they are fully occupied by passengers. With respect to drivers' income, in all three cities this was found to be derived from fare revenue, less vehicle rental and operating expenses – however, in some instances drivers also receive a fixed wage or some type of commission-based payment.

4.2.5 The need for paratransit reform

Behrens and Salazo Ferro (in Behrens et al, 2016) note that there are multiple barriers preventing the complete replacement of paratransit, and in any event it may be impractical and inappropriate to try and eradicate it. Barriers to doing so include resistance from incumbent paratransit owners and lack of institutional capacities and financial resources which would allow governments to offer alternative modes. Thus, despite paratransit's problems it appears likely to persist well into the future.

This implies a need for reform, particularly in relation to the most troublesome aspects such as RTID. Schalekamp, Golub and Behrens (in Behrens et al, 2016) point to three axes along which reform can be pursued, these being regulation of competition, addressing of ownership structures and re-designing of services. They note that reform efforts can be specifically

directed at paratransit, form part of broader transport developments (like multi-modal systems which include a paratransit component) or result in paratransit being gradually absorbed it into other modes. The importance of using localized strategies sensitive to their contexts is stressed, with transferring of strategies and technologies from elsewhere tending to be dangerous and ineffectual. Behrens, McCormick and Mfinanga (2016) note that the literature regarding paratransit reform in recent years has been "arguably more nuanced than that from the previous decades in so far as it more explicitly acknowledged the difficulty of rationalizing paratransit from a public policy perspective, and raised concerns around the potential dangers of 'in the market' competition" (p.9).

Since paratransit is typically one element of a broader multi-modal public transport system, I will now move on to describing travel patterns and government transport policy in South Africa. This is in preparation for narrowing my focus to a consideration of the South African MTI and its place in the economic hub of Johannesburg.

4.3 South African travel patterns and government transport policy

South Africa has been deeply affected by its colonial past, the apartheid system which was formally in place from 1948 until the early 1990s and the transition to democracy in 1994. What Croucamp (2003) refers to as the post-apartheid state-building project is still underway, and apartheid's persistent spatial legacy has kept most poor, black people living on the periphery, far from centres of employment and commerce.

Traditional travel analysis methods tend to underestimate poor households' trip-making (due to disregarding trips made on foot) and thus do not identify 'equity gaps' in relation to transport access (Behrens, 2004). However, a fair amount of information is available regarding South Africans' travel patterns, much of this derived from two National Household Travel Surveys (NHTSs) which were carried out in 2003 and 2013 (StasSA/DOT, 2004; StatsSA/DOT, 2014). it is clear that most South Africans rely on walking and public transport

as their mobility 'lifeline' (Pillay & Seedat, 2007), and mode shares differ amongst different socioeconomic groups (DOT, 2017b). Behrens (2004) refers to this as a "highly differentiated pattern of private mobility" (p.335) – at one end of the spectrum, he found that 58% of high-income households had access to *two* or more vehicles, while at the other end 97% of low-income households had no vehicle whatsoever.

IRTAD (OECD/ITF, 2017) notes that South Africa's vehicle population growth has averaged 3.6% per annum from 1990 to 2015, with a sharp rise in 1994 reflecting new purchasing power post-democracy. The vehicle population is dominated by passenger cars at 65%, followed by light duty vehicles (22%), trucks (3%), motorcycles (3%) and buses and minibuses (3%).

Two main types of transport- and travel-related public opinion polls or surveys have taken place in South Africa in recent years. The first of these is the National Household Travel Survey (administered in 2003 and 2013). The second is the STOPSA (State of Transport Opinion Poll South Africa) which has been administered by the Institute of Transport and Logistics Studies (Africa), or ITLS-Africa, and is based partly on a similar Transport Opinion Survey (TOPS) administered by the University of Sydney in Australia.

Luke and Heyns (2013) report that the 2012 STOPSA poll indicated that transport was the third highest priority for South Africans, after education and health. *Public* transport was highlighted as a critical issue by 35% of the 2012 STOPSA respondents and 19.8% felt that accidents, safety and irresponsible driving required priority attention (Luke & Heyns, 2013, p.5). "Too many accidents" was cited by 7.5% of respondents as a reason for the worsening of local transport while 11% felt that it had worsened because it was too expensive; 6.7% noted that it was of bad quality and 2.9% indicated that there was not enough local transport. Only 32% perceived local transport in their area as having improved over the previous year – the other 68% perceived little change or indicated that it had worsened over that timeframe. While many acknowledged that local government is responsible for transport provision, most viewed national government as also having transport-related

responsibilities. With regards to the modes used, the highest mode share amongst regular public transport users went to taxis: 73% of those who travelled by public transport 4-7 times per week indicated that they used taxis, compared with 18% who used buses and 9% who used trains (the last group including 1% of respondents who reported using the Gautrain). A fairly similar breakdown was noted amongst slightly less regular public transport users (2-3 times per week), with 58% reporting that they used taxis, 23% reporting that they used buses and 19% reporting that they used trains. For very sporadic users (eg: once every 2 weeks or less), buses were the more dominant mode but taxis were still reportedly used by many respondents (eg: 27% of those who used public transport on a fortnightly basis, and 17% of those who used it on a monthly basis). Whereas only 14% of respondents reported never using taxis, 40% reported never using buses, 65% reported never using ordinary trains and a very high 85% reported never using the Gautrain, specifically. All in all, 86% of the respondents reported having used taxis at some point. Luke and Heyns note that the 2012 STOPSA results pointed to transport being a "critically unaddressed issue in South Africa", with little progress having been made since 1996. They conclude that public transport is "unquestionably the prevailing means of achieving mobility" (p.8) despite respondents' concerns regarding travel times, customer service, accessibility, safety, infrastructure quality and the availability and frequency of services.

A summary of the general travel patterns in South Africa does as follows:

- **many poorer people use walking as a dominant mode** – Behrens (2004) found that this was true of 61% of low-income households and 43% of middle-income households. In 2013, 42% of quintile 1 (the lowest earners) walked to work (DOT, 2017b)
- **public transport use is high** – an estimated 70-80% of the population depends on public transport (Competition Commission, 2017)
- **amongst public transport users, the MTI is the dominant mode** – while Sekonyane and Dugard (2004) recorded its mode share as 60% and Sauti (2006) recorded it as 65%, the two NHTSs indicated that 73% of people

used it in 2003 and this increased to 79% in 2013. Buses and trains have a much lower mode share, with 3.67 million work trips made by minibus taxi in 2013, compared with 1.06 million bus trips and 700 000 train trips. The MTI also dominated in relation to education trips, with 2.28 million trips in 2013 (compared to 797 000 trips made by bus and 172 000 trips made by train)[65].

- **most MTI users are poorer people** – the MTI is the dominant mode for 12% of low-income, 8% of middle-income and only 2% of high-income households (Behrens, 2004). In 2013, 25% of quintile 1 (the lowest earners) travelled to work via minibus (DOT, 2017b).
- **transport is especially expensive for the poor** – in 2003 most poor people spent over 10% of their income on transport and almost 50% of the poorest households (monthly income under R500) spent over 20% of their income on transport.
- **cars are the preserve of the wealthy** – 88% of high-income households use cars (Behrens, 2004); 66% of quintile 5 (the highest earners) travelled to work by car in 2013 (DOT, 2017b). Countrywide, only 30% of households own cars (Competition Commission, 2017).
- **car use has decreased only marginally** – 34% of people used cars in 2003 and 33% in 2013, according to the NHTSs. This is despite government's hope that 20% of car work trips would shift to public transport by 2020 (Pillay & Seedat, 2007).

In response to these realities the DOT has produced a number of transport action plans in the past 2 decades, aimed at fostering an urban transport mix which promotes social transformation and access to opportunities (DOT, 2005; DOT, 2006a; DOT, 2015; DOT, 2017b). These prioritize the historically disadvantaged and reflect a paradigm shift from past policy, which was mainly focused on transporting workers from the periphery to places of employment – the new focus is on improving people's access to the full range of amenities in

[65] For work travel in Gauteng, the modal share of minibuses fell from 73% in 2003 to 71% in 2013, which may have related to the advent of rapid rail and bus systems in the intervening period. (DOT, 2017b).

urban centres, DOT overtly affirms that people have “a right to be transported safely, on suitable and well-maintained vehicles driven by trained and responsible drivers who form part of the value chain” (DOT, 2005, p.2). South Africa’s transport needs over the very long term are addressed by the National Transport Master Plan 2050 (loosely known as NATMAP) which was commissioned in 2005, finalized in 2010/2011 and more recently refined by means of a Cabinet Synopsis update (DOT, 2017a). Its overall vision is as follows:

> *An integrated, smart and efficient transport system supporting a thriving economy that promotes sustainable economic growth, supports a healthier life style, provides safe and accessible mobility options, socially includes all communities and preserves the environment (page 0-3).*

For the purposes of my study, the fine-grained details of NATMAP are less important than the general principles conveyed in the various documents put out by DOT. I sum these up as follows:

- 85% of people in a city should have access to a public transport network within 1km (15 minutes’ walk) of their homes
- on average, people’s trips to work should take 1 hour
- transport costs should be less than 10% of people’s disposable incomes
- public transport should be available 16-24 hours per day, at frequencies of 1-3 minutes in peak periods and 20-30 minutes off-peak
- designated stopping places should be provided every 200-400 metres
- electronic fare integration should allow for transfers between modes
- all citizens should have free basic mobility access regardless of their ability to pay, with mobility allowances loaded onto smart cards
- drivers’ work conditions should be regulated, with better enforcement of their legality (operating licences), driver fitness (drivers’ licences and Professional Drivers’ Permits) and driver behavior (adherence to the Road Traffic Act)

- travel demand management strategies should restrict the use of private cars

In general, the DOT's vision for the MTI over the past decade or so has involved it becoming part of a feeder system for the BRT system, along with midibuses, bicycles, metered taxis, park-and-ride facilities and pedestrian access (Pillay and Seedat, 2007, p.403). Browning (2017) notes that this constriction vision for the MTI was resisted by operators, who viewed it as a threat to their livelihoods, and at a Taxi Summit between SANTACO and DOT in November 2008 the government thus committed to involving the taxi industry as the core or nucleus of the BRT services, to ensure that there would be no loss of MTI jobs or profits.

As noted by Dimitrov (2012), "public transport in South Africa remains beset with serious problems" (p.149). Browning (2017) notes a number of new issues affecting the transport sector, such as Transit-Oriented Development (TOD), tele-commuting practices and disruptive technologies like ride-hailing. Furthermore, the Competition Commission launched a market inquiry into the Land-based Public Passenger Transport Sector in June 2017 (Competition Commission, 2017), motivated by concerns that the sector has features which may prevent, distort or restrict competition[66] (Competition Commission, 2017). The inquiry was spawned by 10 complaints which suggested to the Commission that there are inconsistencies in pricing, creating an uneven playing field (with DOT setting metered taxi prices, Uber operators and MTI taxi associations setting their own prices) and inconsistencies in regulation and subsidization (with selectively applied subsidies leaving unsubsidized modes at a competitive disadvantage)[67]. The inquiry also relates to high

[66] The then Competition Board in the 1980s conducted an inquiry specifically into the MTI, focused on the high levels of conflict over routes and illegal entry into the industry. One outcome from this inquiry was recommendation for deregulation of the MTI (McCaul, 1990).
[67] For the sake of clarity, I should mention that the terms of reference of the inquiry define a "minibus taxi" as a "motor vehicle designed or modified solely or principally for transporting more than nine but not more than 23 seated persons, including the driver, offering unscheduled public transport services operated on a specific route or routes" and operating "on commuter corridors, charging a fixed local rate…set by local taxi associations" (p.13). The other modes covered by the inquiry are "localised taxis" [eg: 7-seater MPVs operating

transport costs and the impact these have on South African households, with such costs having more than doubled from the first NHTS to the second and with half of public transport users (most of whom are from low-income households) spending 40% upwards of their hourly earnings on transport. The inquiry seeks to explore the possibilities of integrating different transport modes to be complementary rather than alternatives and to regulate them via a single intermodal transport regulator. It also aims to address inadvertent barriers and segregation resulting from previous government initiatives – for instance, the Gautrain services which are unaffordable for most commuters. Finally, in line with the government's commitment to enhancing the spread of business ownership amongst the historically disadvantaged, the inquiry aims to identify barriers to entry which leave the market "inaccessible and uncontestable" (p.22). This inquiry, which is expected to wrap up in May 2019, could result in sea-changes within the public transport sector.

Having given an overview of paratransit systems, followed by a synopsis of South African travel patterns, public transport policy and the current market inquiry, I will now turn my attention to the South African MTI.

4.4 The South African MTI: a condensed history

In this section I will provide background information regarding the MTI, including a highly abbreviated overview of its origins and development over the better part of 5 decades. To avoid overloading the reader who is already familiar with its history, and yet cater to the reader who is not, I provide a bare-bones outline in this chapter and supplement this with optional extra reading in the form of an appendix which contains a greater depth of information. Thus, I have divided my short history into three eras, naming these according to the dominant issues of the time, and I use the same sub-headings in the appendix. This method allows the interested reader to first

within townships], commuter buses (carrying 35+ people and travelling up to 100 km), long-distance buses (carrying 35+ people and travelling 200km or more), metered taxis, app-based taxis and tuk-tuks (three wheeled vehicles which transport up to 3 seated people including the driver. Confusingly, the terms of reference omit vehicles seating 24-34 people, as well as buses travelling between 100km and 200km (Competition Commission, 2017).

read each relevant sub-section here before turning to the appendix for further information on that era. In both cases, wherever I mention legislation I provide the references for this in footnotes rather than in the text itself – this is to allow for greater ease of reading.

Before launching into the history itself I should note that the literature makes it clear that the MTI in South Africa is a vast and complex system and its present-day realities have been strongly shaped by its history. It has been examined by a very wide range of authors from technical-engineering, financial-economic, political and social science backgrounds, with road safety frequently meriting oblique attention although it has barely been addressed as a core issue. I must note a number of authors to whom I am indebted for my own understanding of the industry, whether or not I specifically refer to them in this chapter. They include the early authors McCaul (1990) and Bank (1991), the ILO and Barrett (2003) (who conducted a thorough exploration of MTI drivers' work conditions through the Community Agency for Social Enquiry (CASE)), and the authors from the first decade of this century – namely, Croucamp (2003), Sekhonyane and Dugard (2004), Sauti (2006) and Ingle (2009). Within the past decade and a half, what has been of particular importance is the extensive paratransit research of Roger Behrens, Herrie Schalekamp and colleagues at the African Centre of Excellence for Studies in Non-motorized and Public Transport (ACET) at the University of Cape Town. The comprehensive book, "Paratransit in African cities: Operations, Regulation and Reform" (edited by Behrens, McCormick & Mfinanga, 2016) became available during the later stages of my study and has acted as a key reference. Mashishi (2011) and Fobosi (2013) are amongst the other more recent authors who offer useful perspectives on particular aspects of the MTI; as I mentioned in chapter 1, Fobosi describes it as "the servant of the urban poor".

4.4.1 1970s to late 1980s ("pirate industry")

The precursors of today's MTI emerged in the 1970s and 1980s as a survival mechanism for black South Africans who, under the racial segregation

enforced by the apartheid government, lived far from their workplaces and were poorly served by existing public transport systems like trains and buses (McCaul, 1990; Bank, 1991; Magubane, 2003; ILO, 2003; Ingle, 2009; Vadi, 2013; Fobosi, 2013). Early sedan-based taxi services gave way to minibus-based services, eventually coalescing into the beginnings of today's MTI. Strict laws and enforcement – coupled with extreme difficulties in obtaining the scarce legal operating permits issued by government – meant that most operators were illegal and the industry was of a pirate nature (Sekhonyane & Dugard, 2004). It was also associated with illegal or deviant activities such as theft and hijacking (Sauti, 2006). Nevertheless, during the 1970s and 1980s the industry began coalescing, with formation of local taxi associations as well as a national body in the form of the South African Black Taxi Association (SABTA) (McCaul, 1990; Croucamp, 2003; Ingle, 2009).

In response, government set up more than one commission of inquiry into the sector, vacillating between regulating and deregulating it (see for instance McCaul, 1990; Croucamp, 2003; Ingle, 2009; Mashishi, 2011; Fobosi, 2013). Relaxation of legislation during the 1980s saw the MTI grow substantially, cornering a large sector of the black commuter market which viewed it favourably due to its flexibility and relative affordability and convenience. Toyota and Nissan were the dominant suppliers of vehicles during this era, with the early predominance of 10-seater minibuses giving way to a predominance of 16-seater buses which managed to compete effectively with the bus industry's 24-34 seater midibuses (see in particular McCaul, 1990; also Mashishi, 2011).

4.4.2 Late 1980s to mid-1990s ("free-for-all")

During this period regulations were lax and the MTI proliferated, aided by government corruption and police collusion (at least in part due to civil servants becoming taxi owners themselves) and possibly also as a deliberate destabilization strategy by the increasingly strained apartheid government (see for instance McCaul, 1990; Sekhonyane and Dugard, 2004; Ingle, 2009; Croucamp, 2013). Safety issues were disregarded and "taxi wars" regularly

broke out due to competition over routes and ranks (McCaul, 1990; Croucamp, 2003; Ingle, 2009; Fobosi, 2013). By the early 1990s the MTI had developed bargaining power in relation to the state, which was beginning to transition away from apartheid, and was also well connected to anti-apartheid political structures (see for instance Croucamp, 2003). At the same time, black businesspeople gained increased access to financing, and the restrictions which had been imposed on their entrepreneurial activities by the apartheid government began to fall away.

Post-1994, with the advent of a democratic political structure (with a nascent constitution focusing strongly on equality and human rights), the violence within the industry worsened rather than improved; hit squads, drive-by shootings and protection rackets became even more widespread and "strongmen" persisted within the association and motherbody system[68] (Croucamp, 2003). In response to the violence a National Taxi Task Team (NTTT) was set up jointly by the government and the MTI in 1995. This held 36 public hearings and received 1,100 submissions, with the industry demanding the right to continue self-regulating (at least to some extent), that it be involved in policy-making, and that it be subsidized in the same way that bus services were – albeit with no requirement to pay taxes (Croucamp, 2003).

4.4.3 1996 onwards ("dancing with the state")

The NTTT report was released in 1996 and made a number of recommendations, including that the industry urgently be re-regulated; these were echoed in the Department of Transport's White Paper "Vision 2020" the same year (Croucamp, 2003). Few of the recommendations were implemented, however, due to resistance from the powerful "motherbodies" (alliances of taxi associations) (Sekhonyane & Dugard, 2004). Nevertheless, numerous new transport-related laws were passed at national and provincial

[68] "Motherbodies" are amalgamations of local taxi associations, such as the current structure known as the South African National Taxi Council (SANTACO).

level, together with municipal by-laws; these were aimed at re-regulating and formalizing the MTI and also at bringing existing road-related legislation into compliance with the new constitution (Croucamp, 2003). Violence within the industry initially dropped but later soared once more, possibly due to taxi owners pulling away from the mother-bodies and setting up new associations. At the same time the industry continued to grow – in Gauteng alone, there were almost 21 300 operators (with almost 35 000 vehicles) registered by late 1997, with many more remaining unregistered (Croucamp, 2003). Associations were increasingly dominant, commanding high joining fees from operators in return for access to routes and ranks, particularly the more lucrative, high-density ones; they also demanded *ad hoc* fees from operators, including protection fees (Croucamp, 2003). Croucamp notes from a political perspective that the MTI's engagement with the state, as a significant social formation led by "strongmen" rather than by democratically elected representatives, had the potential to derail the state-building project within the newly democratic South Africa.

In 2000, after protracted negotiations with the industry, government launched what was envisaged as a 4-year taxi recapitalization programme (TRP), aiming to replace elderly 9-16 seater minibuses with newer, safer 18-35 seaters (see for instance Sekhonyane & Dugard, 2004; Ingle, 2009; Mashishi, 2011, Croucamp, 2003). This was agreed to by the industry in return for "scrapping allowances" which would allow operators to discontinue their old vehicles and purchase new ones; government noted that this was also a corrective measure in relation to bus operators having received subsidies for many years (Croucamp, 2003). The TRP simultaneously aimed to bring in smart card (cashless) fare payment systems, make the new vehicles accessible for people with disabilities and introduce an electronic management system for the industry (Sekhonyane & Dugard, 2004), while requiring the existing associations to disband in favour of collectives (Croucamp, 2003). Croucamp notes that the moral justification provided by government in relation to its promised major cash injection into the industry related to its contribution to black economic empowerment and its provision of services for poor communities.

Croucamp (2003) notes that the MTI remained characterized by violence in the early 2000s and lingering allegiances between it and the new government hampered the state's ability to re-regulate the industry as envisaged by the NTTT. Despite its good intentions the TRP met with very limited success, even though it was extended up until 2012 (see for instance Sauti, 2006; Ingle, 2009; Mashishi, 2011). Sauti (2006) notes that Toyota – so long dominant in the MTI market – did *not* bid to supply the new vehicles; successful bidders offering a Russian-made vehicle called the Gazelle discovered that their vehicle was unsuitable, which further delayed the process. Over time, the financial viability of the scrapping allowance (which did not keep up with the rising costs of new minibuses) was questioned by operators, there was resistance to using larger-sized vehicles (which were perceived as likely to cause job losses) and the need for accessibility for people with disabilities was disputed (Sekhonyane & Dugard, 2004). The situation was not helped by the global recession, nor by internal disputes over whether the industry was best represented by the South African National Taxi Association (SANTACO) or the National Taxi Alliance (NTA) (Sekhonyane & Dugard, 2004). All in all, the impact of the TRP has been limited (Mashishi, 2011).

Since 2009 the MTI has been regulated by the National Land Transport Act (NLTA),[69] with the Department of Transport (DOT) being the regulating authority which is empowered to issue operating licences. The most recent development relating to the MTI is its inclusion, over the past 10 years or so, in Integrated Public Transport Networks (IPTNs) which are being established in major cities around South Africa and have Bus Rapid Transit (BRT) services as their core. UN-Habitat (2013) notes that BRT services have proliferated in Latin America and are increasingly being implemented in other LMICs. With the initial impetus for South Africa's IPTNs coming from the hosting of the Soccer World Cup in 2010, they were initially hotly contested by the MTI. However, negotiations between the industry and government has led to agreement that displaced taxi operators will be absorbed into the

[69] Act 5 of 2009

system or receive compensation for the loss of their businesses (the fair value of which will be determined). IPTNs have been implemented unevenly around South Africa, with Johannesburg's Rea Vaya BRT system and Cape Town's MiCiti BRT system launching in 2009 and 2011 respectively but remaining incomplete. Along the way, significant problems have been encountered – for instance, in relation to financial agreements, representivity and ownership structures on the part of the MTI (Behrens et al, 2016).

4.5 Quantifying the South African MTI

With regards to the current status of the MTI in South Africa, firm statistics are difficult to come by and this creates a reliance on informal and potentially biased or inaccurate data sources. This situation is longstanding, as reflected by McCaul (1990) commenting, "the scale of this vigorous new industry is the subject of wildly varying estimates" (p.v). Without indicating or dating all its sources of information, a Wikipedia search using "South African minibus taxi industry" leads to a page[70] which portrays the MTI as having 200 000 officially registered vehicles countrywide, with an average of 7 taxis per owner and with each taxi driving an average of 8 000km/ month. This page reflects that the MTI is used by 14 million people on a daily basis, equating to 3 161 passenger trips per month, and notes that the average passenger makes 2.3 trips per day, spending an overall 65 minutes per day in a taxi.

I will briefly address the figures which are available from sources other than Wikipedia. Firstly, in relation to the number of minibus taxis in South Africa, this was reported in the 1980s and 1990s as 60 000 – 80 000 (Bosman & Browning, 1989, cited by Sauti, 2006) and 100 000 (McCaul, 1990). By the early 2000s the number seems to have risen significantly, with Croucamp (2003) and Sauti (2006) both reflecting it as 126 000 – this figure being based on the DOT's 2000/2001 estimation[71]. In 2011 a blogger visiting South African

[70] https://en.wikipedia.org/wiki/Taxi_wars_in_South_Africa

[71] Croucamp refers to the difficulty of estimating the true size of the taxi fleet as lying in particular with the possibly greater number of unregistered taxis, compared to registered taxis.

from abroad[72] wrote a post entitled “In praise of South Africa’s Minibus Taxis” which noted (without indicating the source of the information) that there were about 100 000 minibus taxis and that they made up two thirds of the nation’s public transport. A far higher figure was provided by SANTACO in 2016, namely 300 000 (Business Tech, 2016). Official figures are not particularly helpful – for instance, in 2010 the RTMC reported that there were 284 879 registered minibuses countrywide (RMTC, 2010) but did not specify what proportion of these were taxis and what proportion were owned by families or used by businesses as staff, airport or tourist shuttles. Extrapolating from the Automobile Association’s estimation of South Africa’s vehicle population at 12 million[73] and IRTAD’s indication that minibuses make up 3% of this (OECD/ITF, 2016) yields a figure of 360 000 – but this too provides no clarity as to what proportion are used as taxis. For the purposes of my study, I have presumed that the true number of functioning minibus taxis in South Africa may be in excess of 300 000, especially if both registered and unregistered taxis are counted.

Insofar as the number of passengers is concerned, Bosman and Browning (1989) estimated that the MTI transported about 0.5 million passengers (cited by Sauti, 2006), which seems reasonably congruent with McCaul (1990) mentioning a figure of “some 625 000 African commuters” travelling by taxi and fewer and fewer travelling by bus and train. By the early 2000s it was estimated that the MTI carried over 60% of all commuters (Sekhonyane & Dugard, 2004) and the aforementioned blogger suggested in 2011 that 10 million people per day used minibus taxis (again, without indicating the source of the information) and in 2016 SANTACO claimed that the MTI transported 15 million people per day (Business Tech, 2016). These figures suggest a marked degree of growth in passenger numbers over the space of three to four decades.

[72] http://www.hedgehogswithoutborders.com/blog/entry/in+praise+of+south+africa+minibus+taxis (posted on 21 February 2011).

[73] https://www.aa.co.za/insights/being-insured-even-a-little-is-better-than-not-being-insured-at-all - press release estimating that 65-70% of vehicles on South African roads are uninsured. [accessed 2013]

The MTI has been a significant source of jobs, not only directly but also indirectly in spin-off industries. McCaul (1990) quotes Clem Sunter (then a director at Anglo American) as saying that the MTI had directly or indirectly created 300 000 jobs, while the ILO study in 2003 found that about 185,000 people were directly employed within the industry, with drivers being the largest group and the other groups being queue marshalls, car washers, administrative workers and fare collectors; 95% of the workers were African and more than 98% were male, with women mainly doing administrative work (ILO, 2003). In 2016 SANTACO reported that the industry employed 600 000 people countrywide (Business Tech, 2016). Sekhonyane and Dugard (2004) note that by the early 2000s the MTI was a multi-billion rand industry and had resulted in economic empowerment for significant numbers of black South Africans along with a "web of survivalist activity" (p.17); they warned that failing "to invest in this critical industry is a short term financial strategy that could cost the government dearly in the long run" (p.17). Mashishi (2011) notes that the MTI's "business operations and activities … [are] a fabric of economic relations between taxi owners, taxi drivers, taxi users, government, vehicle manufacturers" (p.1) as well as other transport-related businesses like "vehicle manufacturers, fuel, insurance and advertising companies, finance houses, *stockvels* (informal mutual cooperatives), taxi licence consultation agencies, music shops, motor mechanics and auto electricians" (p.16). In addition, Mashishi notes that many people eke out a living at taxi ranks, selling "fruit, vegetables, small appliances, clothing and other consumables to taxi users" (p.18).

4.6 Minibuses as a vehicle class with high traffic offence rates and RTID

South Africans' social perceptions of minibus taxis being dangerous – "monsters" and dangerous "unsafe mobile coffins" (Sauti, 2006, pp. xviii and 1) – are borne out by worldwide data on paratransit services. UN-Habitat (2013) notes that formal public transport passengers have 1/10th the fatality rate of private car occupants, and formal public transport vehicles (on a per passenger-kilometre basis) cause less than 50% of the road deaths caused

by private cars (p.25). Unfortunately, the same is by no means true in relation to *informal* public transport such as minibus services, with many crashes attributable to inappropriate, poorly maintained vehicles and drivers with inadequate training. UN-Habitat also points out that the *impact* of paratransit crashes is exacerbated by few operators having vehicle or passenger insurance.

Khayesi (2002) notes in relation to *matatus* that their involvement in road crashes must be viewed against the background of "the struggle for livelihood by a wide range of stakeholders, extremely difficult working conditions and a hotly contested field of control" (p.241).

Eli Louw, South African minister for transport affairs in 1988, stated that "kombitaxi accidents" needed to be viewed in relation to the overall accident rate – minibuses had a lower accident rate than private cars, but the fatality rate per crash was higher due to minibuses carrying more people (McCaul, 1990). A similar pattern seems to prevail to date, with Joe Maswanganyi (minister of transport in 2017) announcing that minibus taxis account for 9.7% of fatal crashes whereas private cars account for 48%. However, Maswanganyi also noted that buses account for only 1.3% of fatal crashes, confirming that minibuses are a comparatively dangerous form of public transport (Maswanganyi, 2017).

As I noted in chapter 3, human factors are significant crash causation factors and most crashes are preceded by traffic offences. The RTMC noted in 2010 that offence rates on South African roads were unacceptably high, with the most significant offences being alcohol use, barrier line offences, defective tyres and speeding (RTMC, 2010). However, there was an encouraging decline in overall levels of offending, as measured using the Combined Traffic Offence Index; the factor of change for the country as a whole (and across all vehicle classes) was 0.84 (no change would have scored 1.0 while a *rise* in offending would have resulted in a figure higher than 1.0, for instance 1.2). Despite lower levels of offending, fatal crashes had increased, with a factor of change of 1.01. In the province of Gauteng total offences decreased by 43%

and fatal crashes by 30% – however, minibuses as a vehicle class bucked the trend and showed *increased* levels of lawlessness (RTMC, 2010). In keeping with this, the Gauteng Department of Roads and Transport (GDRT) notes that minibus taxis have historically been associated with high offence levels, crash rates and fatalities, with major unlawfulness in relation to "speeding, alcohol abuse, unroadworthy or unregistered private and public transport vehicles, general driver attitude, overloading [and] operating without an operating license or a valid operating license" (GDRT, 2013, Abridged brochure, p.94). Further concerns have been raised about the MTI by Arrive Alive (undated), which notes that minibus drivers' attitudes are one of the most important issues to address in order to improve commuters' safety. Sauti (2006) notes in relation to her ethnographic study that MTI drivers are perceived as reckless and negligent, and that these social perceptions have some basis in fact.

The industry itself has acknowledged its problematic crash rates. McCaul (1990) notes that SABTA's ambitious plans to expand into related industries and other southern African countries in the 1980s were put on hold due to its top priority being "to deal with the accident rate in the industry" (p.ix). At that time, crash rates were increasing steadily, with 26% of all minibuses being involved in accidents in 1986, rising to 29% in 1987 and 33% in 1998 – in the latter half of 1988 an average of 103 crashes took place per day, with 2 fatalities (on average) and 30 people sustaining injuries. McCaul notes that in response to this crisis SABTA established Project Spear, which was to set up 300 training centres for taxi drivers. My internet and literature search elicited no information about this project and it appears that it never came to fruition. Sauti (2006) notes that the government has publicly promised to address taxi driver training but has not lived up to this – for instance, she was told that each of the 160 West Rand taxi associations was allowed to send only 10 drivers for training ("a drop in the ocean"), the training they received was not relevant to their needs and they were given "a valueless certificate which is not accredited" (p.86). She notes that the government "boasted" at press conferences that "they had trained many taxi drivers" (p.86); a taxi official, however, commented that training does "not serve much purpose when it only benefits two to four out of sixty drivers" (p.96).

Despite widespread concerns regarding crash rates and RTID associated with the South African MTI, there has been little or no research specifically relating to road safety in the industry apart from that of Peltzer and Renner (2003), which specifically explored connections between superstition and risk taking amongst MTI drivers. Much of the research carried out within the industry to date has been rooted in disciplines such as development planning, engineering, economics, environmental sciences, transport science, political science and labour relations (eg: Barrett, 2003; ILO, 2003; Fourie, 2003; Magubane, 2003; Croucamp, 2003; Ingle, 2009; Mashishi, 2011; Behrens, McCormick & Mfinanga, 2016). Sekhonyane and Dugard (2004) note that "one of the most pressing transport-related challenges facing government is to establish a taxi industry that is safe and reliable; an industry that will contribute to its own growth and that of the country's economy" (p.13). Due to MTI's substantial contributions to the economy and its carrying of 60% of commuters, they strongly recommend that it be subsidized in the same way that bus and rail services are subsidized.

4.7 The MTI and industrial action

The MTI is frequently a scene of strike action or becomes involved in transport-sector industrial action – for instance, MTI drivers themselves strike at times, and when there are bus or rail strikes they opportunistically corner extra business due to high numbers of stranded bus and rail commuters[74]. As commuters and other road users tend to be negatively affected by these situations this can perpetuate the public vilification of MTI drivers and

[74] Cornering of extra business does not only happen during strikes – for instance, recent press reports reflect that MTI officials in the East London area have targeted hitchhikers and forced them (sometimes violently) to use minibus taxis instead (Gilili, 2018). During an April 2018 bus strike in Tshwane, Maromo (2018) quoted an MTI driver as saying "This is business my brother. We are working and is it bad if we make more money? Let the bus drivers strike". Some motorists complained of being intimidated or even attacked by taxi drivers when they wanted to ferry stranded colleagues or relatives. One motorist asked, "South Africa is a free country - is it a crime to help out our fellow community members? Why can't I be allowed to take a few passengers in my car? We get intimidated by taxi drivers when we ferry these stranded people. Is it a crime to help out our fellow community members? Why do taxi drivers have to enforce the law - if it's a law" (Maromo, 2018, unpaginated).

stereotyping of them as lawless thugs. During the lifespan of this study numerous MTI protests took place in relation to a variety of issues, some of these being instigated by taxi operators or associations and others by drivers. These included protests about e-tolling (see Duvenage, 2015), the impounding of taxis without permits in Durban[75] (Patrick, 2016), the allocation of routes (see for instance Dipa, 2016; Moatshe, 2018)[76], non-rescindment of traffic fines issued to drivers in Tshwane (Tlhabye, 2017) and new MTI developments in Cape Town (including elections of SANTACO officials) (see for instance Jacobs, 2017). Such protest action is frequently accompanied not only by withdrawal of MTI services but also by blockading of public roads, stations and railway lines, stoning of buses and cars, torching of trains and buses, taxis driving contraflow (ie. against the traffic), withdrawal of services and threats of or actual violence perpetrated against commuters who attempt to use other travel modes (eg: buses, private cars, trains). Occasionally violence is meted out by commuters against MTI drivers and officials – for instance, Moatshe (2018) reported that commuters in Hammanskraal torched a taxi association's offices this after MTI drivers had attempted to barricade the nearby highway with burning tyres, brought bus operations to a halt and left commuters stranded.

[75] The impounding of Durban taxis which did not have permits was felt to go against an agreement which had been reached between taxi associations and the Department of Transport due to delays in issuing of permits – in protest, MTI drivers blocked Umgeni train station and various roads and drove contraflow in Durban's CBD.

[76] Dipa (2016) reports that during a taxi driver strike in Diepsloot (which is not served by buses or trains) private vehicle owners who attempted to transport commuters were threatened by "the enraged taxi drivers" and told that no commuters were to leave the township; some commuters were pulled physically out of private vehicles and those taxis which were not part of the strike. The situation was compounded by 6 MTI drivers having been gunned down in the area the previous week, apparently due to conflict over the lucrative Forest Hill Mall route. Dipa quotes Ralph Jones, secretary general of SANTACO, as stating that the drivers were "scared of also being killed" and wanted "assurance that they and their passengers [would] be safe on the road" (unpaginated).

4.8 The Johannesburg MTI

4.8.1 Background information on Johannesburg

Census 2016 reflects the population in the Johannesburg Metropolitan Municipality as about 4.9 million, with this having grown 11.6% since Census 2011 (StatsSA, 2018b). According to the interactive website of the World Council for City Data (WCCD)[77], Johannesburg contains 8.9% of the country's population, covers a land area of 1 645 square kilometers and has a population density of about 3 008 people per square kilometer. Its low density presents challenges in relation to public transport – cities with high public transport usage tend to have far higher density (over 5,000 people per square kilometre in London, over 14,000 in Buenos Aires and close to 16,000 in Barcelona) and are much less spread out (for instance, London covers slightly less land than Johannesburg, while Buenos Aires and Barcelona cover fewer than 300km). Johannesburg residents also have far more limited incomes than residents in these other cities – the gross capital budget per capita being just over US$200 in Johannesburg, compared with almost US$350 in Barcelona, about US$450 in Buenos Aires and over US$1,200 in London (WCCD, 2017). In Johannesburg, the unemployment rate is 28.4% and 38.2% of its people live in poverty, with 18% living in slums. The lingering spatial realities of apartheid mean that many poor black people live in outlying townships and informal settlements and must commute lengthy distances to and from their workplaces – for instance, the distance between Soweto and the Johannesburg CBD is about 25km.

UN-Habitat (2013) notes that Johannesburg was the first African city to launch a BRT service as well as the first African city to implement a high-speed passenger rail service (the Gautrain); however, numerous commuters continue to use private cars, regular buses and the MTI. Johannesburg is situated (along with the city of Pretoria/Tshwane) in Gauteng, the province which is South Africa's "economic heartland" and generates around 35% of

[77] open.dataforcities.org/

the country's GDP. Although it is the smallest of South Africa's 9 provinces, Gauteng is the most populous, with about 13 million residents (24% of the country's total population). Gauteng is also the fastest growing province, with its population increasing by 2% per year (StatsSA, 2018b).

Johannesburg is one of 21 Foundation Cities on the Global Cities Registry of the World Council on City Data (WCCD), with the only other African city on the registry being Minna in Nigeria (WCCD, 2017). Johannesburg and Minna also serve as WCCD data hubs[78] and provided an African perspective when the United Nations spearheaded the process of moving from the eight Millenium Development Goals (MDGs) which expired in 2015, to the seventeen Sustainable Development Goals (SDGs) which have been set for 2016-2030. Johannesburg also contributed data towards the development of ISO 37120, "Indicators for Sustainable Cities and Communities" and is a signatory to WCCD's Dubai Declaration 2017[79], "A commitment to city data as the universal language". Thus, it has expressed support for the 2030 agenda for the creation of "Inclusive Cities", which recognizes the central role of cities in providing equitable access to services and quality of life for all residents. Johannesburg is also bound to the WCCD indicator regarding transportation fatalities (Indicator 18.8 of ISO 37120) and the United Nation's goal (UN Target 3.6) of halving RTID by 2020. The WCCD report of 2017 reflects widely varying road deaths in cities around the world, from a high of more than 40 per 100 000 in Makkah (Saudi Arabia) to fewer than 5 per 100 000 in most of the Foundation Cities found in in Europe, Asia, the United States and Australia. Unfortunately, no data is provided for Johannesburg but Vanderschuren (2006) has pointed to unusually high road deaths here – at a level of 25 per 100 000 at a time when the international city average was 6.9 per 100 000. Exactly how many deaths in Johannesburg are due to road crashes can not be made out from Statistics South Africa's mortality data; while in 2016 12.8% of all deaths in the City of Johannesburg were non-

[78] The other six data hubs are Los Angeles (USA), Toronto (Canada), Buenos Aires (Argentina), Cambridge (UK), Dubai (UAE), Haiphong (Vietnam) and Makati (Philippines).
[79] Source: news.dataforcities.org/2017/03/dubai-declaration.html

natural (ie. due to “external causes of morbidity and mortality”), these deaths are not broken down into sub-categories (StatsSA, 2018).

4.8.2 Public transport in Johannesburg

Johannesburg is characterized by a range of transport options including private cars, minibus taxis, buses (both regular and BRT) and, to a limited extent, metro rail and high-speed passenger train services. Walking and cycling are also common, particularly for shorter distances. Around 1 million people per day use public transport in Gauteng as a whole, particularly in the two large cities of Johannesburg and Pretoria/Tshwane (GDRT, 2013, Annexure F, p.17).

Hoffmann (2012) notes that within the Gauteng City-Region poor transport contributes to high unemployment and inefficient labour market functioning and perpetuates the “lynchpin of the apartheid project”, namely denial of free movement (unpaginated). She points out that the spatial configuration of Johannesburg embodies apartheid’s socio-economic inequalities and the lack of good transport “redraws the racial fragmentation of the city”. Thus, while “[t]he wealthier part of society is multicultural and multiracial”, the “rich do not use minibus taxis” and “most taxi commuters are black”. Thus, in her view Johannesburg’s MTI provides a “crucial economic and social service”, with “the sprawling city’s 6.6 million residents” using minibus taxis to get to their workplaces, schools and other destinations.

As public transport systems in South Africa have undergone development, and particularly as bus rapid transit (BRT) systems have come into being in the metropolitan cities (for instance, the MyCiti in Cape Town, Harambee in Ekurhuleni and Rea Vaya in Johannesburg), so too have there been evolutions within the MTI. Seftel (2013) was involved in the process of negotiating with taxi leadership in Johannesburg regarding the implementation of the Rea Vaya BRT) service. The negotiations began in 2008/2009 and tried to address what taxi operators were earning at that time, so that government could honour its commitment to offer them something which did

not result in their being “worse off”. However, as Seftel notes, “It was very difficult to obtain and verify operator information due to the fact that they were informal operators, mostly not paying tax and most likely paying bribes and/or protection money to their association leaders” (Seftel, 2013, unpaginated).

‘Gauteng on the Move’, an Integrated 25-year Transport Master Plan (ITMP25) released by the Gauteng Department of Roads and Transport in September 2013, proposes a broader public transport network underpinning the movement system in the province (GDRT, 2013, Abridged brochure). This plan acknowledges that the consequences of “doing nothing” to address the current situation could include Gauteng’s vehicle population rising from 3.65 million vehicles to 6.75 million within the next 25 years, peak hour person-trips increasing from 2.2 million to 3.9 million and average public transport speed declining from 38km/h to below 14km/h – with resulting gridlock and negative effects on the economy and people’s quality of life (2013, p.15). Amongst other benefits, implementing of the ITMP25 is predicted to maintain an average vehicle speed of 29km/hour, reduce greenhouse gas emissions by 22%, reduce transport costs and congestion, improve “liveability” in Gauteng’s cities, enhance economic opportunities and productivity, and reduce accidents and their related financial and social costs (GDRT, 2013, Annexure F, pp.44-45). The ITMP25 is also aimed at transforming the current “individual conscience” ethos – a paradigm of “my rights, my convenience” – to a “social inclusion” ethos, by reducing private vehicle usage. Furthermore, the ITMP25 is in line with South Africa’s broader land passenger transport policies, with their focus on previously underserved areas.

A transformed MTI is included in the ITMP25, envisaging the grouping of operators into commercial entities whose operating licences would be linked to contracts and subsidies. The plan notes that contractual arrangements might include right-of-way options such as dedicated lanes and will also be associated with upgrading of ranks and holding areas. It proposes minimum service standards, such 18-hours-per-day availability at frequencies of 1-3 minutes in peak periods and 20-30 minutes off-peak. It also proposes that

routes and schedules become more formalized and designated stopping places be provided every 200-400 metres. Furthermore, it indicates that MTI drivers' work conditions will be regulated and there will be better enforcement of their legality (operating licences), driver fitness (licences and PrDPs) and driver behaviour (adherence to the Road Traffic Act), as well as in relation to vehicle quality (certificates of fitness).

A Gauteng Minibus Taxi Summit (or "Imbizo") was held by the GDRT in July 2016, to address issues relating to the proposed formalization of the MTI and its role over the long term, as well as issues relating to violence, crime and corruption (GDRT, 2017). A Summit Declaration was signed by the Premier of Gauteng and taxi industry leaders from SANTACO and the Gauteng branch of the National Taxi Alliance (NTA). This indicates the parties' joint commitment to "facilitate improved co-operation, collaboration and co-ordination to ensure a safe, integrated and regulated public transport system that is inclusive of the minibus taxi sector and which seamlessly, efficiently and safely transports the commuters and residents of Gauteng". It also expresses support for establishing of a Gauteng Transport Authority with representation from all municipalities (Government of South Africa, 2016). The GDRT mandated the Minibus Taxi Working Group, together with the Cabinet Committee comprising the MECs for Roads and Transport, Community Safety, Economic Development, Human Settlements and Social Development, to finalise a memorandum of agreement and implement an 8-Point Intervention Plan. Seven commissions were set up to explore different issues, including regulation of the MTI; its formalization, empowerment and transformation; its integration into the public transport system; taxi violence; fraud and corruption; and road safety (GDRT, 2017). After the summit a GDRT initiative called the Ntirhisano Taxi Outreach programme reportedly led to 4 209 taxi operators in five regions being helped to resolve problems with their operating permits – 199 operating licences were issued, 224 were referred for adjudication to the Provincial Regulatory Entity (PRE), 979 were accepted for processing, 1 248 were referred to municipalities for 'concurrency', 122 applications were rejected due to false documents or fake

permits and another 96 were flagged as having outstanding documentation from the applicants (GovSA, 2016).

4.8.3 The MTI's market share in Johannesburg

UN-Habitat (2013) cites research by UITP (2010), showing that as cities in developing countries become wealthier, the mode share of informal transport tends to decline. This is illustrated in the figure below, which shows that Johannesburg (as one of the wealthier cities in Africa) has a lower paratransit component in its transport mix compared to many other African cities.

In keeping with this, Behrens et al (2016) note that in Johannesburg paratransit services command a market share of 72%, which is substantially lower than that of many other African cities. For instance, paratransit has a market share of 100% in Kampala (Uganda) and at least 85% in Kigali (Rwanda), Dar es Salaam (Tanzania), Lagos (Nigeria), Nairobi (Kenya) and Accra (Ghana). The MTI's market share in Johannesburg is, however, higher than in Cape Town (58%) as well as in Cairo (Egypt) (52%) and Casablanca (Morocco) (38%). Extrapolating from the information provided by Behrens et al in relation to 21 African cities, the average mode share of paratransit is 78% – thus, Johannesburg is below-average but still fits the common pattern of paratransit carrying more than half of all public transport users in African cities. Ismail Vadi, MEC for Transport in Gauteng, notes that despite the advent of new formal transport modes like the Gautrain and BRT, 42% of commuters in Gauteng province continue to use the MTI (Vadi, 2013).

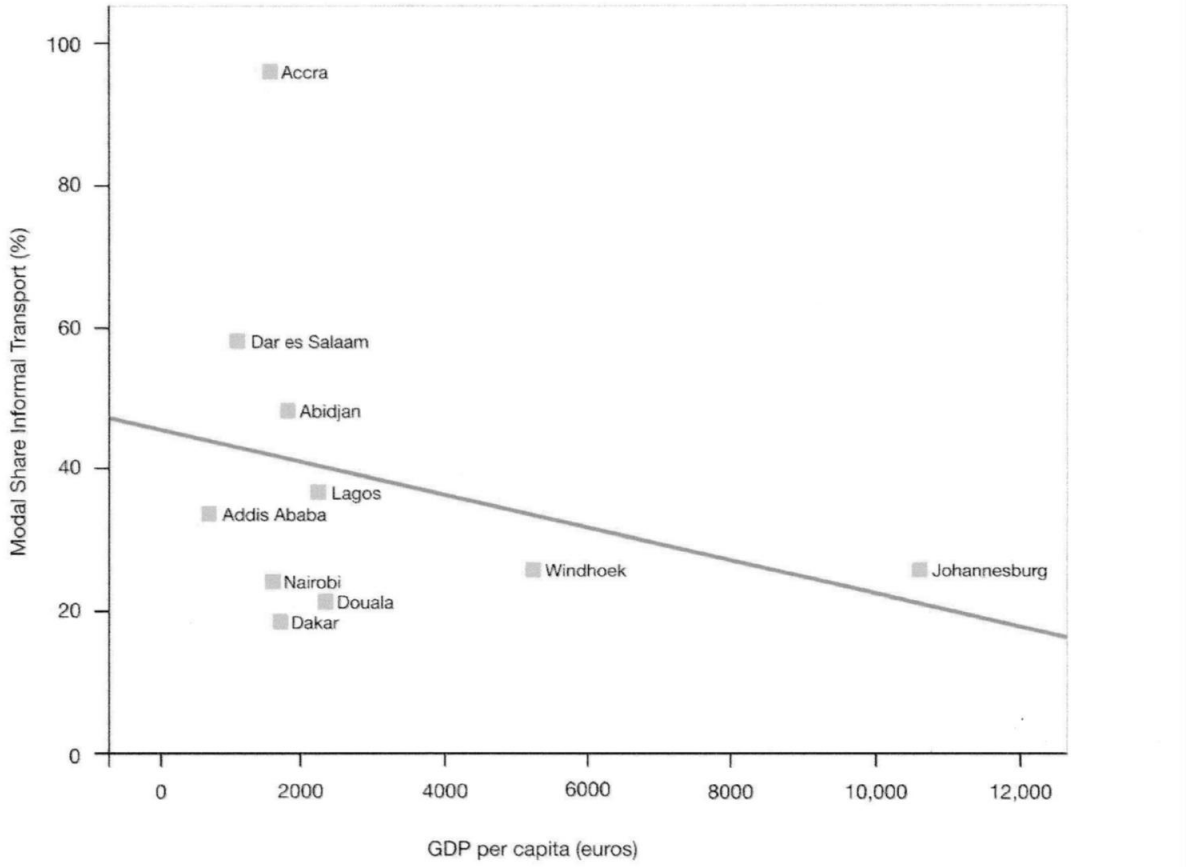


Figure 4.2: Informal transport market share and GDP per capita in ten selected cities in Africa, *sourced from UITP, 2010*
(reproduced from UN-Habitat, 2013, p.28; document in the public domain)

As I noted in chapter 1, the precise number of minibus taxis plying the roads of Johannesburg is unknown. In 2010 the RTMC reported that there were 112 060 minibuses in Gauteng, making up 39% of all registered minibuses countrywide – however, not all of these would have been minibus taxis, the figure excludes unregistered vehicles and there is no breakdown given between Johannesburg and other areas (RTMC, 2010). Sauti (2006) noted that 60-65 taxis served the Johannesburg-Randfontein route, with the Randfontein rank hosting 500-600 taxis and the Johannesburg rank 1 000 or more. Hoffman (2012) noted that 100 taxi associations in Johannesburg served to control supply of vehicles and punished free-riding “pirates”; by her estimation, over 80% of taxi operators were not registered. The following

year, the MEC for Transport stated that there were approximately 180 taxi associations and 62 000 taxi owners in Gauteng as a whole, but provided no breakdown for Johannesburg (Xaba, 2013). The best available information suggests that there are 10 880 short-distance minibus taxis operating within greater Johannesburg (COJ, undated-b), with 5 800 operating in the inner city alone (COJ, 2010). As I noted in chapter 2, I roughly estimated the population of Johannesburg MTI drivers as 11 000. However, the number of taxis may not correlate with the number of drivers as some drivers drive more than one taxi, and some taxis have more than one driver. There are also people who are pressed into service as relief drivers from time to time (for instance, when a driver falls ill or has a family crisis), as well as drivers who "freelance" (working as and when work is available rather than for a single operator). Finally, owners who do not usually drive their own taxis may resort to doing so under certain circumstances (eg: to maximise profits when the usual driver is unavailable).

4.8.4 Perceptions of MTI driver behavior in Johannesburg

As I noted previously, RTMC statistics from 2010 suggest that Gauteng minibus drivers – many of whom are likely to be MTI drivers – were then bucking the general trend of declining traffic offence rates in Gauteng and the country at large (RTMC, 2010). There are strong social perceptions in Johannesburg that MTI crashes are related to drivers' behavior and lawlessness, as evidenced in letters to the press and inputs to radio and television talk shows. For instance, in 2013 several people sent letters to the editor of the North Eastern Tribune (a free local newspaper) – Mallinson (2013) commented that MTI drivers showed "complete disregard for the rules of safe driving and the safety of their passengers" (p.5), while Gordon-Brown (2013) described the drivers as "essentially untouchable", Katz (2013) referred to them as "kings of the Joburg roads" and Moatshe (2013) described Johannesburg residents as "hooting mad at taxi drivers" because of the way they sound their hooters to attract passengers . Mama and Solomons (2013) and Kaplan (2013) wrote to the Saturday Star, the former expressing the view that "SA road safety needs an urgent revamp" and making particular mention

of minibus taxis while the latter suggested that “government dithering is responsible for road deaths”. Chris Moerdyk (2012) wrote a column about MTI drivers entitled “When the law is nowhere to be seen” while CatCrazy (2013) wrote on social media that they are “smug, self-righteous” and a “menace to society” due to their “‘we deserve’ mentality”. Olifant (2013) referred to minibus taxis as “coffins on wheels” when reporting on licensing scams at Gauteng testing stations. CatCrazy (2013) described the MTI as “the laughing stock of SA transport” and cartoonists have frequently lampooned the industry in their work – for instance, several cartoons related to SANTACO announcing its intention of launching a national airline, cartoons sometimes use the image of a broken-down taxi to highlight the “broken” state of government, and one memorable cartoon depicts a prominent politician driving a taxi into a tree while insisting that he is in control.

The City of Johannesburg has acknowledged that the MTI is associated with road safety risks and poor driving behavior, attributing the latter to pressure on the drivers to make a profit. Thus, on its official website it has noted under “Taxi tips” (COJ, undated-a):

> *The success of any taxi driver depends on the number of passengers he can ferry on any given day. To maximize profit, drivers often overload their vehicles, drive at high speed and stop without warning on awkward spots to pick up passengers, much to the annoyance of other motorists. Rules of the road are suspended as drivers compete for the bottom line. Passengers are sometimes treated to the spectacle of two taxis driving dangerously close to each other as one driver asks for change from another. This recklessness has not endeared taxi drivers to law enforcement agencies.* (unpaginated)

4.9 Closing remarks

In this chapter I have acquainted the reader with paratransit systems in general and the South African MTI in particular, with the final focus being on Johannesburg.

I have noted the comments of various authors with regards to the potential for better public transport to address apartheid's spatial legacy. I have also reviewed a number of sources dealing with the inequitable provision of passenger transport in Johannesburg and Gauteng, with poor people incurring significant costs and being disproportionately dependent on the MTI with its high rate of crashes and RTID. Furtthermore, I have noted the stance taken by the government in "Gauteng on the Move", namely that the emphasis of the road traffic system needs to shift from a private vehicle, individual convenience ethos to a "greater good", community-oriented ethos.

Together with the introductory comments I made in the previous chapter regarding ethically-based shifts in road safety thinking, this leads naturally to chapter 5 in which I will review the philosophical literature and outline a number of moral considerations in relation to road safety.

CHAPTER 5: MORAL CONSIDERATIONS IN RELATION TO ROAD SAFETY

5.1 Preamble

The bioethical nature of this study makes it necessary to more closely examine what I loosely referred to as the moral road safety movement in chapter 1. Moral considerations in relation to road safety shaped my central research question and the aim and objectives of my study, as well as my research approach and my choice of a driver-centric focus. In chapter 2 I positioned RTID as not only a global public health problem of major import but also a public health *ethics* problem, before describing the ethically-based paradigm shift in road safety thinking which is taking root around the world in Vision Zero-type policies and Safe System approaches. In this chapter I will return to these moral issues and review what philosophers have had to say about the road traffic system and RTID. I also make reference to Hans Jonas's argument regarding the imperative of responsibility, which has relevance to my topic despite his not having focused specifically on RTID.

5.2 Introductory comments

As I stated in chapter 1, the road traffic system is ethically charged due to the life-and-death situations which play out daily on the world's roads. Roads and transport are public goods and safe mobility is an enabler in relation to other public goods like labour market access, education, recreation, health care and social and religious participation, but private rights also come into the picture. The situation is dangerous enough that Kimber (2003) questions whether the risks are simply too high to justify road travel at all – could the total deaths and injuries be "simply too big for comfort"? (p.8). He notes that the lifetime risk of dying on the road, for any individual, is high, at 1 in 200, but this is obscured by a tendency not to weigh up the risks in a rational sense. Thus, given that at any given moment the imminent risk of dying is very small and "the overwhelming everyday experience of driving is that of arriving unharmed", leading people to disregard the fact that "the integrated risk over significant time periods is high" (p.8).

Despite this, the risks and costs of RTID seem to be becoming better understood by members of the public. I surmise that this is due to a wide range of factors – the existence of Big Data, higher levels of literacy (allowing people to read and access such data), the global village phenomenon (with news from distant places reaching us within seconds via social media and online news channels), the fading from attention of some other major causes of death (think HIV/AIDS, starvation, malaria), the now well-entrenched motorization in most countries resulting in almost everyone knowing someone who died or was injured on the roads, or rising levels of democracy around the world being accompanied by a focus on human rights. The advent of "new mobility" (Milam & Riggs, 2018b) has also significantly awakened moral debates around RTID and road safety, especially in relation to dilemma situations in which there is a need to determine, "in the case of an unavoidable collision, what behavior will cause the least amount of harm to the persons involved both inside and outside the vehicle" (Maurer et al, 2016). As Lin (2016) notes, programmers of AVs have to determine, very literally, "who gets to live and who gets to die" (p.73) – thus, the programmers cannot work in a "moral bubble" as this will make AVs "less likely to deliver results that are acceptable to society" (p.75). They could also open themselves to criminal liability, for instance if they programme a vehicle for self-sacrifice of its occupant (under certain circumstances) without this being known to the eventual driver.

Setting aside the "mobility revolution" and returning to the lower-tech world of the South African MTI, more basic ethical issues can be noted. For instance, while other externalities associated with the road traffic system – particularly congestion but also noise pollution and environmental damage – do arouse emotions and consideration of moral issues, RTID (especially when many 'innocent passengers' are killed in a single taxi crash) seem to elicit a more acute kind of moral pain. This is probably because the harm is highly personal and visible and has an immediate impact on others in a here-and-now sense. It is thus unsurprising that MTI crashes (and especially those involving overloaded, unroadworthy or recklessly driven vehicles) elicit heated feelings from members of the public, as I noted in chapter 4.

It has become increasingly clear that RTID waste enormous amounts of resources, hamper development in LMICs, disproportionately affect the poorest of society and are difficult to eradicate even with advances in vehicle technology. Many people now appreciate that the road traffic system is a mixed bag of benefits and harms. The moral road safety movement (my term) is not yet as clear and coordinated as, for instance, the "nature conservation movement", the "anti-smoking movement" or the "feminist movement". However, the coming into being of Vision Zero and related policies around the world suggests a groundswell of support for treating road use and RTID as moral issues.

As I noted in chapter 1, the dominant moral theories of consequentialism, deontology, ethics-of-care, virtue ethics and ubuntu ethics all offer some ideas which help us understand the notion of moral road use, but none appears to offer answers for every situation[80]. It seems logical to assume that the adherents of all of these theories would support the labelling of road crashes and RTID as "bad", "wrong", "undesirable", "something worth reducing" and so on. It also seems likely that people in general – regardless of their allegiances to any particular moral theory – see road safety as something "good", "desirable" and "worth striving for". If there is widespread agreement that road safety is a good thing, and if it is not feasible for most of us to remove ourselves from the road traffic system (or to remove the road traffic system from our postmodern societies), then as rational and conscious people who are interested in the good life and a workable society we must find ways to minimize the externality of RTID by improving road safety. Accordingly, disagreements between moral theories would seem to relate not to the *why* of road safety, but rather to the *how*. Given that reducing crashes and saving lives requires the use of society's resources and these resources are constrained, there is also a need to develop arguments regarding the most *ethically justifiable* measures for improving road safety (Nihlen Falquist, 2005).

[80] This is echoed by Gerdes and Thornton (2016), who note (in relation to ethical programming of autonomous vehicles), that "no single ethical framework appears sufficient" (p.88)

This is a paradigm shift from the thinking which dominated the previous era of road safety, in which RTID were seen as an unavoidable trade-off for the benefits offered by the road traffic system like mobility, economic productivity and individual convenience and freedom. It is important to acknowledge how people around the world gradually became inured to RTID and accustomed to road safety interventions being based on consequentialist interventions with a strong financial focus. Kimber (2003) points out that compared to rail and air travel, different standards have been applied to road travel, which he surmises is due to its open nature (with low barriers to entry) and a reduced sense of contractualism (as against, say, the "contract" between an airline or a railway service and its paying passengers). Because so many engage in road travel, and on such a frequent basis, it has taken on an "ordinariness" which complicates debates around "how much should be invested to save one life?" Thus, as Kimber notes, a life lost on the roads was under-valued relative to a life lost in a train crash or airline disaster. Deontological approaches which produced increasingly complex and refined sets of laws have also not proven to be sufficient, as many people defied these laws and it is simply not possible to police individual driver behavior everywhere and all the time. Despite some barriers to entry being imposed – with learner training programmes and drivers' licences being required in all HICs and most LMICs and the need for professional drivers' permits supposedly presenting a further barrier – these are permeable rather than perfect. This is particularly true in a country like South Africa, with high levels of corruption and fraudulent or improperly acquired licences and permits.

Thus, for the most part the road traffic system around the world has been managed in a consequentialist and deontological manner. As long as the system seemed to serve the greater good, and offenders could be punished to stop them re-offending (that is, if they survived the consequences of their offences), there was no real outcry about RTID. Now that the situation has reached crisis point it has become imperative to incorporate other ethical perspectives like virtue ethics, ethics-of-care and ubuntu ethics. By jeopardizing individual survival and bodily integrity, which are widely seen as an integral part of the quest for the good life and a workable society (except,

perhaps, in groups which value self-sacrifice), road crashes have finally aroused us to action.

5.3 Review of the philosophical literature relating to the road traffic system

Having laid out an initial broad conceptualization of moral considerations in relation to road safety I will now turn to a review of the philosophical literature which is relevant to my topic. My initial focus will be on why there is a paucity of such literature, as well as possible reasons for ethical reasoning regarding road safety being flawed – in both respects, I will draw on the work of other authors because this is not the central purpose of my own inquiry. Next, due to religion being one possible source of moral guidance relating to the road traffic system, I will set out the Vatican's guidelines for the pastoral care of the road as an example of this. I will then visit Hans Jonas's theory regarding responsibility and ethics in a technological age, written in the 1980s – although to my knowledge he never focused overtly on road safety, there are many linkages between his theory and my topic. In the next section of the chapter I will deal with the more recent philosophical literature, reviewing a number of papers dealing with the regime of automobility, the ethics of vehicle use, the ethics of road safety interventions, how determinism can affect people's responses to such interventions, and what factors can affect people's ability to be responsible road users. I will finish up with an overview of Nihlen Falquist's moral responsibility ascription framework (MRAF), which I will use later in the thesis to develop my argument regarding the ascription of road safety moral responsibilities in the Johannesburg MTI.

5.3.1 Paucity of literature dealing with moral issues in relation to road safety

The philosophical literature is surprisingly limited when it comes to moral perspectives on road safety, as noted by Nihlen Falquist (2009) and Husak (2004). In her paper, "Saving lives in road traffic: ethical aspects", Nihlen Falquist notes that that moral issues related to road traffic "have not received the philosophical attention they deserve" (p.385). She ascribes this to the fact

that “[p]eople in industrialised societies are so used to road traffic that it is almost seen as part of nature” (p.385) and they thus overlook the possibilities of effecting change on the system. She asserts that there is a need for ethical scrutiny not only of “the role of road traffic” but also of “the measures used to combat deaths in traffic” (p.385).

Husak (2004) provides a more detailed explanation for the limited moral theorizing on vehicle use and road safety in “Vehicles and crashes: why is this moral issue overlooked?”. He notes that his search through the Philosopher’s Index for the previous 20 years turned up only one article featuring “vehicle”, “automobile” or “car” in the title. In that article, “The ethics and politics of private automobile use” (published in *Environmental Ethics*), authors Meaton and Morrice (1996) argue on environmental grounds that private vehicle use should be immediately and completely banned. Husak comments that the virtual absence of moral theory dealing with vehicle use and road crashes is a “mysterious” omission, noting that:

> *None of the dozens of anthologies assigned to undergraduates in courses in current moral and social issues mention the behavior most likely to actually kill these students—which, coincidentally, is the very behavior in which these same students are most likely to kill others*. (p.364)

Husak goes on to offer a multifaceted explanation for why moral philosophers have neglected the area of road safety. Firstly, he surmises that contemporary moral theorists “may be disinclined to direct their focus to new areas of ethical import” and away from “issues on which philosophers have worked for centuries” (p.365). Secondly, he acknowledges that it may be difficult on a practical level to persuade drivers that certain types of vehicle use are morally wrong, thus preventing the problem from actually being solved. Thirdly, he notes that a degree of self-serving wilful ignorance may be operating, given that most drivers are primarily focused on themselves and their passengers rather than on how their conduct affects others.

Husak also points to the difficulties of ethical reasoning in this area, noting that the most widely employed philosophical methodology (intuition countered by reflective equilibrium) may, in the road safety sphere, lead to flawed ethical reasoning and resultant rejection of a thesis which seems counter-intuitive. He draws on an example of this, provided by McCarthy (1997):

> *Each Sunday morning I go for a drive in the country just for pleasure and thereby impose a one in a million risk of death on Jones, who lives near the road. That is clearly permissible. But suppose that I were to get an equal amount of pleasure from playing Russian roulette on Jones, with a bullet in one of a million chambers. Many people would find that impermissible.* (p.211)

Husak argues that very strong intuitions tend to be "preserved by elaborate refinements of the abstract considerations with which they are in tension" (p.366), suggesting that intuitive rejections of a thesis should be viewed with suspicion for four main reasons. Firstly, intuitions may simply reflect the characteristics of those who hold them and thus be inaccurate or irrational, in the same way that people may make irrational judgements about risks.[81] Secondly, people "tend to generalize from their own experience" – thus, after years of driving with no serious accidents "they are inclined to believe it is less dangerous" (p.368). Thirdly, when people see something (for instance, driving) as beneficial they downplay its risks, while they overestimate the risks associated with activities which "they believe to have no utility" (p.368). Finally, people tend to see risky conduct as acceptable when it is something they and their social circles engage in, being quicker to view it as

[81] In this regard, Husak notes that evidence shows that people overestimate risks which are new or unfamiliar, uncommon, beyond their control, heavily reported, have catastrophic effects and affect multiple people – examples being tornadoes, floods, air crashes and nuclear accidents. On the other hand, people *under*estimate risks which are common, less publicised, affect fewer people at one time, are less obvious and are perceived as under their control – examples being heart disease and vehicle crashes. As most drivers also see themselves as having above-average skills, are highly accustomed to driving and are not fully aware of the crash risks presented by their vehicles, their intuition suggests to them that they are at low risk of crashes.

impermissible when people unlike themselves engage in it. Husak thus postulates that academics who engage in the driving behavior he examines (which he terms “frivolous driving in crash-incompatible vehicles”) may be subject to “errors and irrationalities in risk assessment” (p.368) and may intuitively (and inaccurately) reject his thesis that such driving is wrongful. By virtue of their professional status, their intuitions may then be elevated to the level of theories. To break the cycle, he suggests that “the obvious long-term solution is for moral philosophers to rely less on intuition and more on empirical evidence” (p. 369) when it comes to moral theorizing about vehicle use and road safety. He also warns against complacency, given that crashes cost lives and road safety improvements take time to implement – philosophers *need* to tackle this topic and to do so timeously. He notes the importance of trying to change even a few minds, despite changing people’s driving behavior possibly being “more difficult than convincing carnivores to become vegetarians” (p.370).

While academic philosophers may be disinclined to theorize on morality and the road traffic system, for practicing Catholics there is a readymade moral code provided by the Vatican, which I will review next.

5.3.2 The Vatican’s guidelines for the pastoral care of the road

The Vatican sets out a clearly articulated argument regarding morally acceptable behavior on the roads, beginning with a description of the longstanding phenomenon of human mobility – “moving from place to place, and transporting goods using different means, [having] characterized human behavior since the beginning of history” (Vatican, 2007, sI.1). The guidelines note that roads “should be at the service of the human person, as tools for facilitating life and the integral development of society…a link between peoples, through which both our human and economic horizons are changed” (sI.2). They then point out that the rapid development of the road traffic system (and idolising of cars) means that human mobility has become “full of consequences” (sI.3) including grave dangers to human life, traffic congestion, noise, air pollution and high use of raw materials. Vehicles and

roads offer many benefits (including helping people engage with those from other cultures, helping people travel for religious purposes and transporting of sick and injured people to health services) (sI.9), but adherents to the Catholic faith should exercise "theological and cardinal virtues" as they experience the "contemporary phenomenon of mobility". In this way, "for the faithful, the road also becomes a path to holiness" (sI.10).

The Guidelines go on to note that "a vehicle is a means of transport that may be used in a prudent and ethical way, for 'coexistence', solidarity and serving others, or it may also be abused" (sIII.21). While vehicles allow one to escape daily reality and experience driving pleasure, they can also be used for domination, vanity or personal glorification. Drivers may show "unbalanced behavior and related consequences" (sIII.26) *even* when they have no psychological pathology, as cars "tend to bring out the 'primitive' side of human beings" (sIII.29). Moral aspects of driving entail controlling oneself and coexisting with others, and ethical road use demands "professionalism" as well as adherence to laws laid down by the government – "[f]ailure to comply with basic ethical rules prevents road users from enjoying their own personal rights and also puts their property at risk" (sIII.33). Careful and thoughtful driving involves bearing in mind the risks of the road, attending to proper vehicle maintenance, avoiding driving when physically or mentally incapacitated (eg: due to fatigue or the influence of alcohol or drugs) and knowing and obeying the law. The Guidelines point to an increasing need for education "in favour of a culture of life and in defence of the 'Thou shalt not kill' commandment" (sIII.37). With regards to the moral responsibility of all participants in the road traffic system, the Guidelines note:

> *Obviously, careless motorists, motorcyclists, cyclists and pedestrians do not wish for the fatal consequences of an accident they cause, nor do they intend to harm the life and property of others. However, as these consequences are the product of a conscious action, we may rightly speak of moral responsibility.* (sIII.46)

> *The moral responsibility of road users, both drivers and pedestrians, derives from the obligation to respect the Fifth and Seventh Commandments: "Thou shalt not kill" and "Thou shalt not steal".* (sIII.47)
>
> *Moral law prohibits exposing anyone to grave danger, without serious grounds, as well as refusing assistance to a person in danger.* (sIII.48)

The Guidelines also point to the virtues of Charity, Prudence, Justice and Hope, which should manifest in the behavior of Christian road users. A set of 10 drivers' commandments is provided, as follows (sIII.61):

I. You shall not kill.
II. The road shall be for you a means of communion between people and not of mortal harm.
III. Courtesy, uprightness and prudence will help you deal with unforeseen events.
IV. Be charitable and help your neighbour in need, especially victims of accidents.
V. Cars shall not be for you an expression of power and domination, and an occasion of sin.
VI. Charitably convince the young and not so young not to drive when they are not in a fitting condition to do so.
VII. Support the families of accident victims.
VIII. Bring guilty motorists and their victims together, at the appropriate time, so that they can undergo the freedom of forgiveness.
IX. On the road, protect those who are more vulnerable.
X. Behave responsibly in relation to others.

Describing traffic accidents as "a serious and alarming situation", the Guidelines note that people commonly blame them on road-related, environmental or vehicle factors; however "the vast majority of car accidents are the result of serious and unwarranted carelessness – if not downright stupid and arrogant behaviour by drivers or pedestrians – and are therefore

due to human factors" (sIII.63). The Guidelines stress that both the Church and the State should engage in road safety education with a variety of target audiences, noting that "society has the obligation and the right to deal with this issue, because it concerns the common good" (sIII.70). They assert that children should come first, receiving such education from a young age, and that driving licence candidates (as well as all other road users) should also be offered road safety training.

As promised, I now turn my attention to the theory of Hans Jonas (1984) and suggest ways in which this is relevant to the issues of road crashes and RTID.

5.3.3 Hans Jonas's theory on the imperative of responsibility in a technological age

In his 1984 book, "The imperative of responsibility: In search of an ethics for the technological age", Jonas argues for "lengthened foresight" or a "scientific futurology" in relation to modern technology (p. x). He notes that technology has immensely increased human capability, including in relation to life-and-death matters, and foresees it advancing rapidly to what may become a tipping point towards disaster. He notes that, in the past, ethics dealt with narrower "horizons of space and time" (p.x) – thus,

> *The good or bad of the action is wholly decided within the short-term context. Its authorship is unquestioned, and its moral quality shines forth from it, visible to its witnesses. No one was held responsible for the unintended later effects of his well-intentioned, well-considered, and well-performed act.* (p.6).

Jonas suggests that this reality "has decisively changed" (p.6) as a result of modern technology. Thus, a new ethics is required to deal with "the lengthened reach of our deeds" (p. x), including the impact on our "distant posterity". This, in his view, "moves *responsibility*, with no less than man's fate for its object, into the center of the ethical stage" (p.x) (original emphasis). In setting out his theory of responsibility he notes that this has as its axiom

that “responsibility is a correlate of power and must be commensurate with the latter’s scope and that of its exercise” (p.x). As present data allows only an uncertain, incomplete prediction of the future, “fall[ing] short of the causal pregnancy of our technical deeds”, he suggests a “pragmatic rule [giving] the prophecy of doom priority over the prophecy of bliss” (p.x). Thus, he advocates for allowing “an imaginative ‘heuristics of fear’ [to replace] the former projections of hope” (p.x), as a way of dealing with the enormity of what may be at stake. He also argues that there is a need “to discriminate between legitimate and illegitimate goal-settings” in relation to “the inherent technological dangers of over-straining nature”. This is also relevant in relation to “the more modest and fitting goal”, namely “to save the survival and humanity of man from the excesses of his own power” (p.x).

In my view, the concepts raised by Jonas apply well to the road traffic system and particularly well to the “new mobility” I have referred to earlier in this thesis. Major technological advances have changed – and will change further – the means of human mobility and action and, as Jonas points out, “novel powers to act require novel ethical rules and perhaps even new ethics” (Jonas, 1984, p.23). Jonas’s concerns regarding the effects of our actions on our “distant posterity” are also relevant to the topic of RTID, in light of the potential inter-generational impact of a family member dying or being severely injured on the roads.

There is no doubt that the mobility revolution is improving road safety. Even entry-level vehicles are increasingly equipped with a wide range of safety devices such as I mentioned in chapter 3, like airbags, ESC and ABS, and affordable telematic devices can monitor drivers’ behavior – for instance, warning of a decrease in alertness or loss of lane control. In South Africa, the field of telematics is seen as having “enormous potential to inspire behavior change in motorists” by providing feedback on risky behaviours like speeding, harsh cornering, sudden braking, rapid accelerating, night-driving and use of cellphones while driving (Ardé, 2015, p.51). Discovery Insure, a key implementer of incentive systems to help clients reduce risks, claims that telematics cause a 20% improvement in clients’ driving – for instance, they

are 20% less likely than the average South African driver to use cellphones while driving, an activity which increases crash risks four-fold (Ardé, 2015). Discovery Insure's free trial offer of their smartphone application to non-clients also yielded useful information – for instance, showing that drivers aged 50 and older scored 14% higher than those aged 30 and younger and that women scored better than men due to cornering more gently, accelerating more steadily and speeding less (although women were more prone to harsh braking as well as cellphone use while driving) (Ardé, 2015, p.52). Discovery Insure reports that amongst their more than 120,000 telematically-monitored clients, as driver behavior improves so does claims behavior as the clients have *smaller* and *fewer* accidents. While money-saving is clearly one of the driving factors (no pun intended) in its offering, Discovery Insure also promotes its system as being about "shared values" – "if we all manage our risks, it's not only good for us, it's also good for the wider community; everyone benefits" (Ardé, 2015, p.51). It denies using the system as a "stick", noting that punishing consumers would be diametrically opposed to incentivizing them – instead, to promote behavior change it helps users review their own driving and also offers "carrots" such as fuel discounts (Ardé, 2015, p.52). That the South African driver population seems ready and willing to embrace this kind of technology is apparent from a survey (Towers Watson, 2015), conducted worldwide – South African participants showed high interest in smartphone applications to monitor driving, with more than two thirds acknowledging that they could benefit from changing their driving behavior. Most expressed willingness to adapt their driving behavior in relation to speed limits (78%), the care with which they drove (68%) and their following distances (55%). Compared to respondents from other countries, the South African sample reported lower levels of concern in relation to the privacy issues associated with having one's vehicle whereabouts and driving behavior remotely monitored by an insurance company; this was felt to be related to the fact that anti-theft tracking devices are already in widespread use in this country.

Fairly basic technology seems able to improve driver behaviour and lower crash risks but we are now on the cusp of significant new developments –

ones which Jonas had no way of foreseeing – which are claimed to have *radical* potential to reduce road crashes and RTID. These include not only fully-fledged AVs but the general infiltration of autonomous driving features into everyday cars. Greenough (2016) notes that vehicle manufacturers like Tesla, Mercedes and BMW already incorporate self-driving features which allow cars to accelerate, brake, and steer with little driver involvement, and if regulatory and insurance issues can be resolved there could be 10 million fully self-driving cars on the world's roads by 2020. Greenough notes that these could significantly decrease RTID – by one estimate, AVs will have prevented 2 500 road deaths in the UK alone, by 2030. Milam and Riggs (2018a) note that computer-aided and sensor-aided AV technology is expressly aimed at avoiding crashes and if connected vehicle (CV) technology is added, the enhanced environmental awareness this provides will further reduce crash risk. Lin (2016) points out that even when crash-avoidance is not possible, an AV will be capable (if programmed appropriately) of achieving crash-optimisation – ie. minimizing the level of harm which results.

Despite these examples of what Jonas refers to as the "prophecy of bliss", his warnings to err on the side of pessimism and apply the "prophecy of doom" and "heuristics of fear" seem apt. There have been recent media reports about AVs of various makes (Google, Waymo, Tesla, Uber) being involved in road crashes – see for instance Ziegler (2016) and Marshall and Davies (2018). The first and well-publicised fatal crash killed the human 'driver' (or, in AV terms, its 'engineer') while the vehicle was on autopilot (Vlasic & Boudette, 2016). Cost considerations have caused some paring down of the prototypes' features, and a deliberate redesign to decrease the number of lidar and radar sensors fitted to an AV has been implicated in another well-publicised crash which killed a woman who approached the vehicle from the side and was not detected (Wakabayashi, 2018). As noted by Meurer et al (2016) and specifically by Lin (2016), the advent of AVs has also heightened a long-running "moral machine" debate, given that they use artificial intelligence (AI) programmed with moral algorithms which can be brought to bear on hazardous or potentially injurious situations. Due to the world being non-unitary in relation to people's moral standpoints and reasoning processes, and

due to road contexts differing vastly, it is challenging to identify the most desirable and acceptable moral algorithms. However, as I mentioned in chapter 3, Lin (2016) notes that programmers of AVs cannot work in a "moral bubble" and must instead endeavor to explore what society values in terms of crash-avoidance and crash-optimisation. Just such exploration is taking place via a global online open field study (or thought-experiment (Lin, 2016)) which has been set up by researchers at the Massachusetts Institute of Technology (MIT)[82]. This re-frames the famous trolley dilemma, used by philosophers to highlight different approaches to moral reasoning in a life-or-death situation – is it preferable for an observer of a runaway trolley to switch it onto a different track so as to kill two people rather than four, or is it preferable that the observer do nothing and thus not actively kill anyone, while passively allowing four to die?[83] In MIT's web-based 'game' the 'players' select one of two possible AV actions ('behaviours'), based on the perceived likely consequences of those actions. For instance, they may have to select between an action which would lead to the death of one or more passengers in the AV and an action which would lead to the death of one or more pedestrians. Limited and superficial information is offered regarding the passengers and pedestrians – for instance, gender, age, relatedness to the driver, pregnancy, occupation, criminal versus non-criminal status, social standing (eg: rich versus homeless) and physical appearance (eg: fat versus thin). At the end of a game players receive immediate feedback about trends in their responses, such as the dominant characteristics of those they most often chose to 'save'. A related MIT study by Bonnefon, Shariff and Rahwan (2016) found that participants approved of AVs programmed with utilitarian algorithms if *others* were to drive these, while for their *own* use they favoured AVs programmed to prioritize protecting their occupants. Bonnefon et al thus note that utilitarian programming may deter people from purchasing AVs, delaying the introduction of safer technologies with their promises of

[82] See moralmachine.mit.edu.

[83] Lin (2016, p.78) explains that the trolley dilemma effectively juxtaposes "killing" (which "implies that you are directly responsible for a person's death: had you not done what you did, the person would have lived") with "letting die" (which "involves much less responsibility on your part, if any, since some causal process was already underway that was not initiated or otherwise controlled by you").

decreasing RTID. In other words, self-driving technology may be resisted unless it is seen as a means to saving “me and mine”. Lin (2016) notes that programmers and manufacturers of AVs “do not operate under the sanctuary of reasonable instincts” – they “make potentially life-and-death decisions under no truly urgent time-constraint and therefore incur the responsibility of making better decisions than human drivers reacting reflexively in surprise situations” (p.75) – and this could lead to legal liabilities which are not yet fully understood. This too could influence the production and uptake of AVs in the future, unless industry helps “set expectations by debating and explaining in advance its reasoning behind key algorithms that could result in life or death” (p.79). Lin also points out the difficulties which could arise when AVs share the roads with legacy vehicles which lack their advanced technology and connectedness, as well as problems which could result from things going wrong with AVs (as they will) – these realities make advance-thinking about ethics necessary, so as to “help guide us responsibly into the unknown” (p.81).

These types of issues were the focus of a Symposium on Trust and Ethics of Autonomous Vehicles (STEAV) at MIT in May 2018, at which over 70 international experts representing disciplines like philosophical ethics, law and policy, city planning, insurance and computer science discussed how the now inevitable deployment of AVs can be carried out in a way which makes “our world…more livable and fair” (Weinberger, 2018). In effect, their task was to deal with what Jonas refers to as “the causal pregnancy of our technological deeds” (Jonas, 1984, p.x). Symposium participants acknowledged that at this point it is unclear how cars, trucks and other motorized vehicles will evolve in future as numerous issues will impact on this – not only road safety but also the need for energy conservation, pollution control and minimizing of congestion. The transferability of new technologies from the HICs in which they are being developed to LMICs with completely different road traffic systems also remains to be seen. Jonas notes that it is of ethical importance that “predictive knowledge falls behind the technical knowledge that nourishes our power to act”; thus, the “gap between the ability to foretell and the power to act creates a novel moral problem” (p.8). As we firmly enter the Fourth

Industrial Revolution[84] (Schwab, 2016) we are cautioned to ensure that this is "a force for good", and that we establish "guardrails to keep [its] innovations …on track to benefit all of humanity" (Bennioff, 2017, unpaginated).

A final comment is in order regarding Jonas's vision of a "tipping point" beyond which disaster lies. In my view, in light of all the negative externalities of the road traffic system we have already reached some sort of tipping point. RTID have become a global public health crisis and the goal of reducing road crashes has proven very difficult to achieve, despite international cooperation, individual countries' best efforts and major advances in roads and vehicles. Congestion and road traffic pollution (noise and air) have also reached unworkable levels in many cities around the world, severely disrupting quality of life. This is certainly true in Johannesburg, if IBM's Commuter Pain Index (based on a survey conducted in 20 cities around the world) is to be believed[85] - in 2011 the survey ranked Johannesburg the 5th worst city globally (after Mexico City, Shenzen, Beijing and Nairobi) in relation to the economic and emotional toll associated with commuting. As we approach or pass a tipping point in relation to the road traffic system Jonas's theory (despite having been developed well before the current era) has a great deal to offer in relation to our understanding of the moral issues connected to the road traffic system.

[84] The Fourth Industrial Revolution is a name given to the current era, in which disruptive technologies and digital networking are prominent features and, some say, are changing the notion of what it means to be human. Schwab (founder of the World Economic Forum) argues that these developments are fusing the physical, biological and digital worlds and impacting on all industries and disciplines – resulting in a time of "great promise and great peril".

[85] See the results of the survey at https://www-03.ibm.com/press/us/en/photo/35360.wss. On a scale from 0 (least pain) to 100 (greatest pain), Johannesburg's score was 83 while, for instance, London scored 23, Madrid and New York City both scored 28 and New Delhi scored 73.

5.3.4 Review of the more recent philosophical literature dealing with the road traffic system and moral aspects of road safety

I will now present a number of relevant moral theories and concepts, drawn from more recent philosophical writings. These will be clustered under sub-headings for ease of reading.

(a) The regime of automobility

Since Jonas wrote his seminal work in 1984 the world has become increasingly dominated by what has been termed the "regime of automobility" (Böhm, Jones, Land & Patterson, 2006), or what the Vatican has described as the idolization of mobility as symbolized by the car (Vatican, 2007). Böhm et al note that the notion of autonomous mobility is seductive and there is a tendency for people to accept it unquestioningly – however, the very concept is problematic, a misnomer. Truly autonomous mobility is in fact impossible, as vehicle use depends on a complex supporting structure in the form of roads, regulations and training.

The idolization of vehicular transport is also reflected in motorization rates being viewed as a proxy for economic development. Within many societies, the pinnacle of mobility is seen as the privately-owned car – preferably an upmarket one. The integrated 25-year transport master plan (ITMP25) for Gauteng, known as "Gauteng on the Move", notes that private car use tends to be associated with an "individual conscience" ethos, a paradigm of "my rights, my convenience" while public transport use can foster more of a "social inclusion" ethos (GDRT, 2013). UN-Habitat (2013) also notes the "transport bias of urban mobility", with private motor vehicles seen as the "most desirable travel option" (pp.viii, 3) and with this having triggered a "meteoric rise" in the world's vehicle population (p.5). As pointed out by UN-Habitat, "car dependency is also served by a cultural and commercial system, which promotes the car as a symbol of status and personal freedom" and leads to people in LMICs perceiving motorization as essential for progress. Thus, "the private car has become firmly fixed as the icon of the twentieth century"

(p.36), a “status symbol, depicting affluence and success in life” (p.5). Unsurprisingly, single occupant vehicles are now an increasing problem, occupying significant road space and helping to set “global urbanization on a collision course with the world’s pressing equity and environmental concerns” (UN-Habitat, 2013, p.154). Many cities suffer from the results of car-centric transport planning and urban sprawl, leading to unsustainable situations which “render the dream of personal freedom of mobility as theoretical fantasy – or as an unrelenting urban nightmare” (p.161). Partheeban et al (2008), writing from the perspective of Chennai in India, note that the “automobile boom” is “becoming a curse in disguise by killing and injuring millions of people all over the world” (p.59), and as I noted previously Khayesi (2005) has pointed out that development aid which funds road-building also funds road deaths. The unchecked regime of automobility is thus of great ethical concern.

(b) The concept of wrongful driving

Just as the road traffic system as a whole raises moral questions, so does the act of driving itself. Husak (2004) argues that this is a topic worthy of moral attention, firstly because vehicles cause “tremendous amounts of harm” and secondly because “much of this harm is caused culpably” (p.351) (though he acknowledges the controversial nature of his second contention). To illustrate that personal motor vehicle use has moral consequences he mentions its health effects (eg: obesity due to lack of physical activity), environmental effects (degradation, pollution), social effects (eg: racial segregation due to vehicle owners leaving inner cities and moving to suburbia), international policy effects (policies being distorted by the need to purchase oil from other countries) and legal effects (relating to “erratic and discriminatory” traffic law enforcement which compromises government’s impartiality and effectiveness). He then hones in on the problem of vehicle crashes and contends that “a surprising amount of driving in the United States…is morally

problematic" because it causes such harm in a culpable fashion[86]. He excludes instances where the wrongfulness of particular driving conduct is generally accepted, such as drink-driving or speeding, and instead develops an argument regarding the moral acceptability of "trips taken for *frivolous purposes* in *crash-incompatible* vehicles" (p.352). He first sets out a case for drivers in general being culpable because there is now widespread awareness that vehicles cause significant harm. Despite the drivers themselves facing a risk of being killed or injured, he argues that driving is "an extraordinarily dangerous activity" (p.354) and drivers thus subject others (including pedestrians) to substantial harm through their driving. He points out that although vehicle safety has improved road crashes are the biggest cause of death for people aged 4 to 33 in the United States, and also result in high costs to society. By way of illustrating the magnitude of the problem, he notes that the number of deaths in the September 2001 terrorist attacks in New York was outstripped by road deaths in the United States that same month.

Husak goes on to argue that personal vehicles "pose a *public* health problem" and one which is "fundamentally different from the hazards of smoking or excessive eating" – this is due to the fact that in the latter cases, "the victims…are the same persons who engage in and benefit from" (p.354) the activities in question[87]. With regards to culpability, he notes that no other type of activity comes close to driving, which injures millions of other people – whenever an individual kills or seriously injures someone else this most likely involves a motor vehicle. On the other hand, he notes that the actual probability of harm (ie. that a vehicle crash will occur) on any given occasion is small – on average, "Americans travel two-thirds of a million miles before causing a fatality" (p.355). Again using smoking as an analogy, he points out, however, that the *aggregate* of the activity over time must be considered.

[86] Husak uses "culpable" in the legal sense, centred on negligent conduct which creates a high and unjustifiable risk of harm and deviates from a reasonable standard of care, or demonstrates recklessness in the sense that the person concerned is aware of the unreasonable risks created through that conduct. (Husak, 2004, p.352).

[87] I suggest that this is not entirely true, given the now well-established dangers of passive smoking and also the fact that an obese individual can affect others – even if only by taking up more than their "fair" share of seat space in an airplane or public transport vehicle.

While the harm caused by a single cigarette might be negligible, smoking as a whole creates substantial harm since most smokers consume thousands of cigarettes over their lifespans. On this basis, he concludes that driving *per se* "should probably be thought to create substantial risks of harm to others" (p.355). He acknowledges that the potential to create harm does not mean that all driving is wrongful, and instead argues that wrongful driving involves two conditions: the first is driving of crash-incompatible vehicles (ie. those which, as an encroaching vehicle, have an undue impact on the crash partner vehicle), while the second is driving for a "frivolous" purpose. He elaborates as follows:

- **Crash incompatibility**

  Vehicle height, stiffness and especially weight are key factors in crash incompatibility – tanks, buses and heavy trucks, for instance, are understood by most people to have high crash incompatibility with ordinary cars. The "net consequences of crash incompatibility are lethal" (p.356). SUVs, designed for off-road driving, are associated with high fatality rates due to their crash incompatibility with other vehicles; their design features are difficult to justify given that very few are actually driven off-road in the United States[88]. In the case of vehicles like buses and heavy trucks, these also have crash incompatibility with ordinary cars but their designs are justified by the valuable purposes they fulfil.

[88] Husak also notes in relation to SUVs that commercial factors influence their manufacturing and how they are "sold" to buyers. Specifically, their safety features are exaggerated in relation to single-vehicle crashes (causing 50% of road deaths in the US at the time of his writing), with no acknowledgement that the features which make them unsafe for crash partner vehicles also make them unsafe for their occupants. For instance, they are very susceptible to rollovers which, despite happening in only 1% of crashes, cause 25% of road deaths. Husak asserts that the lack of safety of SUVs is obscured by many of their initial buyers being cautious, experienced drivers who were middle-aged people with children and had safer travel patterns (eg: with less nighttime driving) than other groups of drivers. He suggests that only an ethical egoist would find it justifiable to purchase an SUV in the belief that it would be safer for oneself and one's family, if it has a heightened chance of causing substantial harm to others.

- **Frivolous driving**

  Driving and driving behaviour may be justified or unjustified – the textbook case being an ambulance speeding to avoid "a more imminent or serious harm than it causes" (p.358). *Frivolous* driving is vehicle use which is not strictly speaking necessary – including driving extra distances because one chooses to live far from one's workplace, driving to distant shops in search of a bargain or distant restaurants in search of a pleasant meal, or driving just for the sake of driving. Some 82% of trips in the US fall into this category and are not necessity-based.

Husak postulates that two categories of vehicle use – "operating crash-incompatible vehicles" and "taking journeys for frivolous purposes" – are "probably culpable" (p.362). He selects the weaker of two arguments by suggesting that *both* conditions should be present for driving to be considered wrongful (the stronger argument requiring only one condition to be met). He notes that even this weaker thesis suffices to demonstrate that "an astounding amount of personal motor vehicle use in the United States…is morally wrongful" (p.363).

Reminiscent of Husak's argument is a recent interview featured on the blog usastreetsblog.org (7 August 2018), in which Neil Arason of the British Columbia Ministry of Health sought to explain why the US had more than double the road deaths of its northern neighbor Canada. He attributes this partly to Americans driving more than Canadians and also to their driving style, commenting:

> *The US is a bit obsessed with freedom. There's two kinds of freedom: "freedom to" and "freedom from." There's freedom to drive fast. And there's freedom from death and injury on the roads…Looking at "freedom from" effects on population health is kind of a starting point*. [89]

[89] See https://usa.streetsblog.org/2018/08/07/heres-why-canadas-traffic-safety-record-so-much-better-than-ours/.

(c) The ethics of road safety interventions

Apart from theorizing about the moral rightfulness or wrongfulness of driving itself (given its potential consequences in the form of road crashes and RTID), it is also important to address moral issues relating to *road safety* strategies. These are typically designed not to limit driving (as Husak seeks to do) but to limit crashes and their effects. Nihlen Falquist (2009) notes that the "gravity" of the problem of road crashes is sometimes disregarded by moral philosophers – however,

> *By acknowledging the ethical aspects of road traffic and illuminating the way the choices society makes are ethically charged, it becomes clear that there are alternative ways to design the road traffic system….just as transportation is analysed from economic, technological, political and geographic perspectives, its ethical dimensions should be thoroughly and continuously analysed and discussed.* (pp.385-386)

Nihlen Falquist selects five important areas in moral philosophy which are of relevance to road safety and puts forward the arguments I summarize below.

- **Criminalisation**
  The main aim of criminalizing something is to stop people engaging in it. Society determines which road traffic conduct should be punished, and how, with moral theorists being divided into two camps: retributivists see punishment as necessary and deserved, while consequentialists view it as appropriate only if it results in greater benefits than would its absence. Sociocultural beliefs and norms affect how people treat different traffic offences – for instance, although speeding is a major cause of road crashes (and the higher the speed, the worse the injuries), it is often not viewed as a very serious offence. By contrast, drink-driving is commonly seen as immoral and, if it results in a fatality, may be equated to murder. Punishments might need to reflect different levels of the offence – for instance, harsher penalties for driving with a BAC above a certain

threshold. As criminalisation is just one of several possible ways that a road risk can be addressed, before a law is passed and penalties are set (or made harsher) other options should also be considered in a careful, open-minded manner. For instance, alcohol interlocks could be a solution to drink driving, but people may resist a requirement that all vehicles be fitted with these.

- **Paternalism**

  Laws compelling people to use safety devices like seat-belts and cycle and motorcycle helmets may be described as paternalistic in that they reduce people's freedom and responsibility when it comes to choosing what risks they take. However, such laws can be justified on the grounds that they save costs (preventing deaths and reducing the seriousness of injuries) as well as on the grounds that they are in people's best interests. In relation to the first of these, to avoid paternalistic laws those who decline to use such devices could be required to purchase insurance to cover their own risks and prevent a cost burden falling on society. In relation to the second, it could be argued that paternalistic laws should only be put in place if they protect *others* from harm. The important thing is to debate what level of paternalism society finds acceptable.

- **Privacy**

  Driving a car, for many, provides autonomy and freedom of movement and the notion of surveillance and control may be distasteful. On the other hand, people wish to be safe in traffic, and safety-oriented technology usually causes a degree of surveillance and privacy invasion. This raises the concept of "privacy in public" and the need for norms which deal with this – for instance, agreements as to what is appropriate and how information (eg: licence plate numbers and vehicle owner details) should be distributed. These norms need to be critically examined, however, as much safety-oriented technology is also associated with gathering of increasing amounts of data and "we run the risk of adjusting to less and less privacy" (p.388) over time. There is a conflict between safety and

individual liberty and the question arises as to whether on-road conduct is public or private, given that “many people drive their cars in order to escape the public sphere for a while” (p.388). Treating cars as private spaces may disregard the harm they can do but treating them as public on the grounds that people may die otherwise seems to contradict the home being viewed as a private space even though domestic violence kills many women at home. It is important to consider whether people’s views of the car as a private space are simply due to habit and culture, or whether they are morally justified.

- **Justice**

  Management of traffic safety has historically fallen to departments of transport and has focused mainly on mobility involving vehicles. Thus, it has shown less regard for VRUs like pedestrians and cyclists. Intuitively, some road users appear to be deserving of greater attention – for instance, children or the elderly, or “innocent road users” as opposed to those who are “deliberate offenders”. It can be argued that NMT users should have similar rights to users of motorized vehicles, and that policies should take account of their lesser ability to influence the road system. Imbalances in power and risks need to be addressed and it must also be considered that allowing vehicle users to dominate the road system causes environmental and public health problems. Resource limitations mean that road safety interventions must be selective, but methodology like cost-benefit analyses, Willingness-to-Pay calculations, considering the Value of a Statistical Life (VSL) or focusing on Disability-Adjusted Life Years (DALYs) are all problematic. For instance, they may overlook differences in people’s priorities and ability to pay, distastefully attach a monetary value to human life, or undervalue groups like children, the elderly and people with disabilities. As RTID fall along a social gradient, fairness may dictate that extra money be spent on the worst affected – poor people, VRUs – and their needs should perhaps be paramount in infrastructure design. The road safety gap between HICs and LMICs is also important to note, with their differing ratios of motorized to non-motorized traffic affecting what road safety strategies are most

appropriate. The philosophical debate on distributive justice and human rights may need to treat issues of health inequality as particularly important and consider at what level these rights should be protected – whether by individual governments or by the United Nations, for instance.

- **Responsibility**

  Historically, driving has been seen as a matter of individual responsibility and road crashes as strongly related to human error. The focus has been on backward-looking determination of whether agent A was responsible for event E and, if agent A was responsible, whether she/he was also blameworthy. However, there is now a growing awareness that "road safety is a joint effort and responsibility [is] distributed between different actors" (p.391), as well as an appreciation that road design plays an important role in preventing crashes. These principles are embodied, for instance, in Sweden's Vision Zero road safety policy. This shifts the focus to the forward-looking responsibilities of vehicle manufacturers and road maintainers, with attention being paid to the underlying causal factors for crashes rather than just the triggering factors (while not removing individuals' responsibility to comply with traffic rules). This is both practical and reality-based, given that many people do not take responsibility and do not obey traffic rules. As blaming (and either punishing or helping) specific individuals will not solve the more general problems, system designers have responsibilities to address the situation. For instance, vehicle manufacturers can make cars more "crashworthy" and install safety technology to lessen the effects of "the second collision" that occurs inside the vehicle after a crash, while road designers and maintainers can strive for safe road infrastructure that will minimize both crashes and RTID in the event that a crash occurs.

Having set out Nihlen Falquist's views on these five philosophical areas to consider when designing road safety programmes, I now address factors which can render such interventions less effective.

(d) The impact of determinism on road safety strategies

Peltzer and Renner (2003) note that Western approaches to accident prevention tend to reflect a view that "all events are controllable and all accidents preventable" (p.619), but there are other worldviews which employ "non-rational" or deterministic explanations for road crashes. Thus, road safety messages must be tailored to different cultural, social, economic and political contexts (Dixey, 1999). I will briefly review the literature relating to three types of determinism:

- **Fatalism (universal determinism)**
  In this worldview life events are perceived as predetermined and beyond human control. Dixey (1999) concludes that in Nigeria, fatalistic views of accident causation render health promotion messages "framed within a secular, individualist and rationalist" (p.197) Western culture ineffective. A study by Peltzer and Renner (2003) in relation to superstition and road crashes amongst MTI drivers in the South African city of Pietersburg (modelled on a similar study carried out by Kouabenan (1998) in the Ivory Coast) found that high levels of superstition were linked to risk-taking and accident involvement, independent of formal education. Drivers with "deep rooted mystical and superstitious attitudes" were noted to make "systematic errors in the appraisal of risks and possible causes" (p.619) of road traffic accidents, a factor which needed to be considered in the design of road safety programmes. Kayani (2011) studied fatalism and road crash involvement in Pakistan, where many people hold "strong worldviews in which predestination persists as a central idea, i.e. that one's life (and death) and other events have been mapped out and are predetermined" (piii). These worldviews influenced road safety in a number of ways including poor reporting of accidents to the police, perpetuating of risky behavior on the roads and disregarding of health promotion messages. This indicates a need for a different "blueprint" to enhance the effectiveness of road safety interventions. Finally, Rothe and Elgert (2003) examine the relationship between risk, determinism and safe driving behaviour in rural northern Alberta, Canada, a sparsely populated area

with a high rate of fatal crashes. They define determinism as "the philosophical position that all events are completely settled by previously existing causes" and "preclude individual choice and agency" (p.274) and note that holders of this worldview explain road crashes on the basis of luck or "an unspoken and often ill-defined scheme of events in the universe" (p.5). The view that some drivers are "pre-destined, or programmed, to crash, get injured, or die" (pp.5-6) results in a need for appropriate road safety messages which de-emphasize the concept of personal responsibility.

- **Religious or theological determinism**

  The study of Kayani (2011) in Pakistan deals not only with fatalism but also with the impact of Islamic religious worldviews, which he describes as theological fatalism – a belief system in which God (or a moral process such as karma) controls people's destinies and the outcomes of their actions. Kayani notes that Islam is often associated with an extreme type of fatalism but Muslims actually have diverse views and practices and road safety strategies must take this diversity into account. The aforementioned study of Rothe and Elgert (2003) also considers religious determinism (not connected to a particular denomination) which results in people perceiving that "God, or some supernatural being, controls people's destinies [and] determines people's choices on driving and establishes the context in which driving events happen" (p.271). In this worldview, the individual has no real freedom or ability to influence events, and road safety messages must be tailored accordingly.

- **Humanistic determinism**

  Rothe and Elgert (2003) also address humanistic determinism, which holds that people behave in certain ways based on a natural order, centred on instincts and "unconscious urges and desires" (p.273). This implies a need to understand how people perceive responsibility, as this is pivotal in addressing their road crash risks. Road safety strategies may

need to be focused on passive elements in the road traffic system, rather than active attempts to change road users' behaviour.

To be effective, road safety interventions must be tailored to the worldview and ethical reasoning processes of the people involved. The central message is that there is no single right strategy for all aspects of the road traffic system.

(e) Misalignment between morality and road traffic legislation

As morality and the law are not necessarily perfectly aligned – a fact perfectly captured by the immoral laws of the apartheid era – this raises another area of moral complexity in the road traffic system. What is legal (for instance, travelling at a certain speed) may not be ethical (for instance, when weather and road conditions make that speed unsafe). Possession of a driver's licence (conferring on someone the legal right to drive) does not automatically mean that the person concerned will engage in safe (and thus ethical) driving behavior – as noted by Heng (2013), "morality on the road is as important as a licence".

Although from a deontological perspective it may be appropriate to drive strictly according to the law (which may also be considered "the right thing to do" from a virtue ethics viewpoint), this does not in itself necessarily prevent road crashes. A crash may occur due to unexpected events like a tyre blowout or an animal or child running into the road, *even* when everything about the vehicle and the way in which it is being driven is legally compliant. Equally, it is conceivable that a crash may be *prevented* through actions which, technically, break the law – for instance, a driver may avoid a collision (and thus harm to self and others) by exceeding the speed limit, changing lanes without indicating or even temporarily driving on the wrong side of the road. A consequentialist perspective suggests that whatever action achieves the best possible outcome will be the correct moral action, while a virtue ethics or ethics-of-care approach may favour careful, considerate, "best practice" driving (for instance, driving at no more than 50km/hour even though the legal limit is 60km/hour). An ubuntu ethics approach views all road users

as part of a community, and manifests in behavior such as letting another driver into the stream of traffic even though he or she does not have right of way at that moment[90].

A strict deontological perspective will result in prioritizing obedience to the law, but this is complicated by the fact that road safety knowledge is dynamic and evolving, major shifts are happening in vehicle technology (with a rush to "catch up" in terms of road regulations in many HICs) and a *prima facie* obligation to obey the law is not sufficient in itself to ensure safety. Laws easily become outdated but it takes time to develop and promulgate new laws, leaving legal loopholes which make it difficult to police "new" risky behaviours (like using portable devices or in-vehicle infotainment features whilst driving). Just as the law catches up, so the technology advances further and statutes and regulations (or at least some clauses within them) again become inappropriate or outdated. The interaction between self-driving technology and human drivers is already adding a further layer of complexity. AV crashes which have already occurred point to the difficulties of switching over from machine control to human control, and the delay involved in this may in itself cause a crash (Lin, 2016).

As Husak (2004) notes, traffic laws are also enforced in an erratic manner – for example, not every speedster will be caught, and some who are caught may be let off with a fine while others may face more serious consequences and yet others face no consequences at all. Husak argues that this uneven enforcement is problematic in that it takes away from the notion of good and sound governance and the purpose for which laws exist. Nihlen Falquist (2009) adds a further element to the discussion by pointing to the need to debate all laws to ensure that they are acceptable to the highest number of people and that they make real-life sense. In South Africa, given our history of apartheid laws which were *not* acceptable to most people and were enforced by an oppressive government, I venture to suggest that we have a

[90] In Johannesburg, this often elicits a "thank you" from the "let in" driver, by means of a brief display of the hazard lights. This practice has been known to confuse outsiders not familiar with Johannesburg's honour code on the roads.

disturbed relationship with the law; people may thus lack a sense of trust, ownership and allegiance in relation to laws – including road traffic laws – despite these being intended to serve their best interests.

WHO's online Road Safety Legislation course (see Murphy, undated) notes that legislation, regulations, ordinances and standards are tools aimed at achieving particular public health goals, apply broadly and with few exceptions, are enforceable and carry consequences for non-compliance. Thus, they can be an effective way of preventing road crashes – however, this breaks down when the law itself contains flaws, internal conflicts, vague provisions, gaps and unrealistic elements. For laws to guide individuals to make morally correct road safety decisions they need to fulfill several criteria: they must reflect road safety best practice (as currently understood), contain clear mechanisms for enforcement and unambiguously spell out the consequences for non-compliance. They should also be developed in a consultative manner, incorporating stakeholders like government, academia and civil society. Key terms should be defined and consistently used, loopholes should be avoided, new legislation (or amendments) should be properly reconciled with existing legislation and the effective dates of implementation should be clear. In addition, there should be a way to track both process and progress in relation to particular laws, and the enforcement culture and resources of the country concerned must be considered before a law is implemented. Finally, laws must be feasible in a particular context – for instance, a demerit points system may be desirable but would not be realistic and manageable in given setting[91].

[91] This is highly relevant in South Africa, where a demerits point system has supposedly been on trial in parts of the country for a very long period, with occasional warnings that it will be extended to the rest of the country "soon". The impression gained is that our vehicle registration system, eNatis, is simply not capable of administering such demerits points. In any event, the high proportion of South African drivers without any licences or with improperly acquired licences makes a mockery of the notion of a demerit points system.

(f) Conflicting values and rights in the road traffic system

The road traffic system brings up conflicts between values – for instance, between the values of life and bodily integrity on one hand and the values of autonomy and privacy on the other (Nihlen Falquist, 2005). There is a need to balance values such as individual freedom of movement, choice and pleasure with values which relate to caring for others and taking care of property and the environment (Vatican, 2007). There is also a tension between the private and public sphere, with conflict between mobility as a *private* good (centred on privately owned vehicles and competition for road space, for instance) and as a *public* good (as an enabler, facilitating access to opportunities and allowing for the realization of social progress and human rights) (UN-Habitat, 2013).

The gradual development of the road traffic system as we know it today was largely seen as a benign and liberating process, assisting humans with their mobility needs. However, as noted by numerous authors it has become skewed in favour of motorized vehicles and this has been to the detriment of VRUs and users of NMT– in Jonas's terms, this "*techne* in the form of modern technology" has become "an infinite, forward-thrust of the race, its most significant enterprise" (Jonas, 1984, p.9). Future generations (Jonas's "distant posterity") will be left dealing with some of the residual effects of the system's worst externalities. Through colonialism and other mechanisms HICs have strongly influenced the mobility systems of LMICs in a way which can be critiqued as both beneficial and damaging, analogous to other "imported inventions" from HICs like water-borne sewerage and plastic[92]. These technological developments have been represented as aspirational, symbolic of "civilization" and "advancement" (or, in Jonas's term, "the promise of bliss"), even in contexts for which they were not the most appropriate systems. For

[92] Although there is belated recognition of the problem of plastics – particularly single-use plastics which are now banned in some parts of the world – it seems likely that micro-plastics entering the food chain and plastic pollution affecting the oceans will be one of the legacies of the current times which will have to be dealt with by future generations. Against this must be balanced some of the benefits of plastic, which is used in medical devices and can help address public health challenges like the need for hygienic food storage.

instance, water-borne sewerage is an ethically dubious choice in arid and semi-arid countries like South Africa, where composting toilets (for example) may be a better option.[93] Due to its severe externalities (of which RTID is the most prominent) it can be argued that the road traffic system as it exists violates human rights – both in relation to this generation and in relation to future generations. UN-Habitat (2013) notes that mobility and accessibility are critical to the full realization of human rights, and "[u]rban transport is socially sustainable when mobility benefits are equally and fairly distributed, with few if any inequalities in access to transport infrastructure and services" – all groups need to have equal opportunities to access "basic goods, services and activities – such as work, education, medical care, shopping, socializing [and participating] in civic life" (p.10). Thus,

> *For many urban dwellers in developing countries, the availability of reliable and affordable public transport services can be the difference between being integrated into the economic and social life of a city or not. Unaffordable mobility prevents the urban poor from breaking out of the shackles of inter-generational poverty.* (p.10)

Khayesi (2005) notes that road safety needs to be recognized as "an important and valuable public good" (p.711), while Horn (2015) argues that, especially in "low-income contexts where social injustice and poverty often impact significantly on the overall health of the population, the link between public health and social justice should be a very firm one" (p.26). Thus, public health – which Horn notes is "generally a public enterprise undertaken by organisations and governments" (p.29) – must adequately address "patterns of systematic disadvantage" which contribute to ill-health (p.26). However, Horn notes that even if a theory of justice as accepted as the moral

[93] This is aptly illustrated by the recent severe drought affecting parts of South Africa, particularly Cape Town (which had to prepare for a possible "Day Zero" when municipal water supplies would run out). Interestingly, the notion of a "Day Zero" in relation to Cape Town's traffic congestion has now been raised – this being the day on which traffic on its highways will simply come to a gridlocked halt, with zero forward movement being possible (Kretzmann, 2018). This is a good example of why Jonas implores us to use "the heuristics of fear" when embracing technological advances.

underpinning for public health programmes, there is no consensus with regard to “whose moral responsibility it is to deliver on the promises articulated by such a theory” (p.28).

While South Africa’s Constitution and Bill of Rights create a foundation for improving public health – indeed, they *oblige* government to improve it as part of the progressive realization of rights – the degree to which different public health problems are tackled depends on the visibility of each problem, the public’s understanding of the nature of the problem, the availability of skills and funding to address it, and the presence or absence of political will to prioritize it. Many public health measures which have been put in place are inefficient and under-funded, and there is a tendency towards reactive rather than proactive approaches. For instance, the recent countrywide drought as well as the recent listeriosis outbreak have highlighted the inequitable access to clean drinking water and safe food for different groups and areas, as well as government’s general unpreparedness in relation to dealing with public health threats. The drought has raised concerns about the limited monitoring and control of farmers’ usage of groundwater for irrigation, as well as about well-to-do residents in water-scarce cities like Cape Town and Johannesburg being allowed (even encouraged) to sink boreholes for private use (Gabi, 2015) – Day Zero fears obscured the fact that millions of South Africans lack access to piped water in any event. The 2017/2018 listeriosis outbreak, traced eventually to processed meat products, also raised a number of social justice issues. For instance, it has highlighted how well-to-do urban dwellers have greater access not only to safer food but also to information regarding the outbreak (including product recall notices) and to the means of responding to it (by travelling to medical facilities for treatment and to stores to return meat products and obtain refunds).

UN-Habitat (the human settlements programme of the United Nations) has noted that the “purpose of ‘transportation’ and ‘mobility’ is to gain access to destinations, activities, services and goods” (UN-Habitat, 2013, p.vii) and roads and transport are mostly a means, rather than an end in themselves. The specific form of transport is less important than the end it allows someone

to achieve. UN-Habitat takes an overt human rights approach to sustainable urban mobility and thus supports the existence of paratransit systems which "serve the public and are essentially providing a public good", providing affordable alternatives to people who may otherwise be 'captive walkers' (p.7). It notes:

> *The underlying premise – within a human rights perspective – is that mobility is not simply about reaching destinations; in the final analysis, it is about accessing opportunities. In this regard – and acknowledging that access is a tacit right that all human beings are entitled to – there is a need to ensure that any constraints to enjoying this fundamental entitlement are removed*. (p.3)

> *…restrictions in access to urban opportunities may imply an abuse of human rights, most notably economic, social and cultural rights (such as the rights to free choice of employment; the right to public health, medical care, social security and social services; the right to education and training; and the right to equal participation in cultural activities) and the right of access to any place or service intended for use by the general public… …where (transportation) inequities persist, these exacerbate social exclusion and poverty, both at the individual and at the society level.* (pp.107 & 109)

Nihlen Falquist (2009) notes in relation to a social justice or human rights view of road safety, that "[i]f we have an absolute right not to be exposed to the risk of being killed or severely injured by traffic, this would effectively mean that road traffic, in its current shape, would not be allowed….that right is severely infringed upon everywhere in the world". She surmises that most people "would probably not approve of such a right since it would dramatically reduce mobility and have serious effects on the economy" – thus, "either the concept of a right is not appropriate for road traffic safety or it has to be modified" (p.390). She suggests that people could instead be considered to have a right to live in a place where whatever is practically and financially feasible is done, to reduce the risk of RTID (particularly in relation to VRUs). She also notes

that HICs may have a duty to assist LMICs when it comes to safe vehicles and safe road infrastructure, with due regard for the fact that sociocultural and political differences can complicate the transfer of successful programmes from HICs to LMICs.

The Bill of Rights contained in the Constitution of South Africa (GovSA, 1996) must be adhered to by government and all corporate, non-governmental and private entities and individuals in the country. Based on the arguments that road safety brings up issues of human rights, I will now address the sections in the Bill of Rights which appear to me to be most relevant to road safety and the public health ethics problem of RTID. These are:

- **The right to life** (Section 11) – everyone has the right to life
- **The right to security of the person/bodily integrity** (Section 12) – everyone has the right to bodily and psychological integrity
- **The right to human dignity** (Section 10) – everyone has inherent dignity and the right to have their dignity respected and protected

To support the achievement of the above three rights a number of other human rights must also be considered, due to the way the road traffic system is set up. These are:

- **Labour rights** (Section 23) – everyone has the right to fair labour practices, including:
    - every worker having the right:
        - to form and join a trade union
        - to participate in the activities and programmes of a trade union
        - to strike
    - every employer having the right:
        - to form and join an employers' organisation
        - to participate in the activities and programmes of an employers' organisation

- every trade union and every employers' organisation having the right:
    - to determine its own administration, programmes and activities
    - to organise
    - to form and join a federation
- every trade union and every employers' organisation having the right to engage in collective bargaining

- **The right to property** (Section 25) – no one may be deprived of property except in terms of law of general application, and no law may permit arbitrary deprivation of property

- **The right to justice in administrative action by the government** (Section 33) – everyone has the right to administrative action that is lawful, reasonable and procedurally fair.

The Constitution also gives special recognition to **children's rights**, with Section 28.2 of the Bill of Rights indicating that "A child's best interests are of paramount importance in every matter concerning the child". This right is particularly relevant in relation to scholar transport, and I will not deal with it to any significant degree in this thesis.

Apart from impacting on the above individual rights, the road traffic system impacts on social or collective rights due to its externalities or costs. Kalaŝová and Stacho (2006) note that these costs are not reflected in the price paid by users of the system and are generally not taken into account by the market, and "as they are not met by the parties responsible, they must be borne by society as a whole" (p.29). Some of these costs in turn impact on road safety – for instance, Kalaŝová and Stacho point out that congestion increases crash potential, particularly when it comes to multi-vehicle crashes. The relationship is complex, however. Thus, they note that an Intelligent Transportation System (ITS) (such as has been implemented in many congested cities around the world) can improve traffic flow and reduce the *number* of road

crashes – however, if it *increases* crash severity due to promoting faster vehicle speeds, it increases RTID.

(g) The limits of individual responsibility

Elvebakk (2005) notes that applying moral theories to the road traffic system rests on an assumption that people can reasonably distinguish right from wrong, and that moral intuition or "ethical gut reaction" can be subjected to moral reasoning in order to come up with correct solutions. Whatever the precise laws and regulations which may be used to guide people's actions in the road traffic system, reliance is placed on individuals being "responsible traffic users". She argues that this can be problematic for the following reasons:

- People **may lack knowledge** – for instance, of the greatest road risks and how to avoid them
- People **may have weakness of will** – which leads them to not do what they actually want to do (eg: walking more and driving less)
- People **may not realise** that their transport behaviours have unwanted consequences – like obesity due to being sedentary
- People **may go ahead with actions** even when they know the long-term consequences will be unpleasant
- People **may join the collective**, rather than acting as individuals – for instance, if they see other people engaging in speeding or driving in no-driving zones, they may opt to do the same
- People **may be ignorant of all their options**

Elvebakk's discussion of the limits of individual responsibility provides a fitting lead-in to the final section of this chapter, in which I focus particularly on the moral responsibility ascription framework proposed by Nihlen Falquist (2005) in relation to Vision Zero in Sweden.

5.4 Nihlen Falquist's Moral Responsibility Ascription Framework (MRAF)

Nihlen Falqhuist (2005) has argued that moral responsibility ascriptions have three conceptual components and that Vision Zero can be analysed accordingly. She noted that there are two aims which need to be fulfilled when ascribing responsibility to someone. Firstly, this ascription should be fair and morally justified. Secondly, it should facilitate progress in relation to solving a particular problem.

In her argument, Nihlen Falquist does not address the issue of determinism on the one hand and free will on the other – instead, she holds that whether or not determinism is true, "the concept of responsibility that human beings use everyday is worth a careful analysis" (p.3). Thus, she focuses on the following type of responsibility ascription:

agent A is responsible for problem P

She notes that debates about responsibility ascription frequently get caught up in different questions, namely:

- What are the underlying causally relevant factors?
- What were the triggering causal factors?
- Who is to blame?
- What should be done, and by whom, in order to prevent it from happening again?

With regard to blameworthiness, she explains that this applies to the situation where A being responsible for E includes A causing E. When E is something bad (and especially if A acted voluntarily and knowingly), then A is held to be blameworthy. In her view, deontological philosophers tend to use this kind of merit-based conception of responsibility, combining causal responsibility and blameworthiness. On the other hand, consequentialists favour a notion of

forward-looking responsibility (also known as task responsibility). She finds neither conceptualization to be superior and asserts that *both* must be borne in mind during moral debates about who is responsible for social problems. Thus, she proposes that responsibility ascriptions clearly specify the following three components:

Causal responsibility
Blame responsibility
Forward-looking responsibility

Nihlen Falquist also notes that it is possible that one agent holds all three types of responsibilities while another agent holds fewer, and that responsibilities vary in degree. Thus, two agents could both be responsible in all three ways, but at different levels. This way of understanding responsibility resolves the criticism some level at Vision Zero – namely, that it absolves people of individual responsibility (something which would not meet with general acceptance in society).

Nihlen Falquist counters libertarian arguments that Vision Zero *transfers* all individual responsibility to government, noting that responsibility is not a zero-sum game and the new distribution of responsibility allows for different components of responsibility. Vision Zero effectively adds a new responsible agent in the form of the system designers – this does not remove causal responsibility (and possibly blame responsibility) from individuals and still allows for them to be sanctioned when acting recklessly and breaking rules on purpose. As blaming individuals is insufficient to resolve problems, the system designers inevitably hold forward-looking responsibility (ie. the responsibility to design a road traffic system which reduces RTID) and they may in addition be blameworthy.

Using the analogy of smoking and obesity, Nihlen Fahlqist notes that people would tend not to find it morally acceptable to entirely blame external parties for those complex problems – for instance, to blame tobacco companies and McDonalds – if this means that individuals would be absolved of holding any

responsibility at all. Instead, most would intuitively ascribe at least some responsibility to those external parties, *and* ascribe some responsibility to the affected individuals. By using her three-component model of responsibility ascription, she asserts that both consequentalists and retributivists will be satisfied. The former will accept that an effective distribution of responsibility has been made in order to move forward – ie. in order to improve the situation. Retributivists, on the other hand, focus on the degree to which someone *deserves* to be held responsible and will be satisfied by the fact that individuals are not released from all responsibility.

I will use Nihlen Falquist's framework towards the end of my thesis, to graphically represent the road safety responsibilities I reason should be ascribed to different roleplayers in the Johannesburg MTI. This will allow for visualization of both the **types** and the **levels** of responsibility which, drawing on quantitative/qualitative empirical results, can reasonably be ascribed to different role players in the Johannesburg MTI.

5.5 Closing remarks

In this chapter I have reviewed the philosophical literature – scanty though it is – which explores key moral issues pertaining to road safety as a public health ethics problem. In this way, I have put in place the third of the three building blocks which make up the foundation of my interpretation of my empirical results and formulation of my closing argument. I have also introduced the moral responsibility ascription framework (MRAF) proposed by Nihlen Falquist (2005), preparatory to using this as a tool to graphically represent my responsibility ascriptions.

The reader will now move on to chapter 6 (containing the results of my taxi driver survey) and then chapter 7 (containing the results from my interviews). Chapter 8 will follow, with an integrated discussion of the results together with my closing arguments.

CHAPTER 6: EMPIRICAL RESULTS - SURVEY

6.1 Preamble

In this chapter I explain the response rate and results of the taxi driver survey administered at ranks and confluence points in greater Johannesburg. The empirical results from my interviews are set out separately, in chapter 7.

6.2 Response rate and fieldwork time

As noted in chapter 2, even with the expansion of the survey venues to 20 ranks across greater Johannesburg and with increased flexibility in relation to the timing of the survey, the response rate was poorer than hoped for[94]. This seemed to be related to the uptick in violence in the MTI during the survey period. Thus, although 148 drivers were approached only 59 (39.9%) agreed to participate. Unfortunately, 9 of the 59 completed surveys had to be discarded from the analysis due to a printing error which resulted in the drivers concerned signing a faulty consent form. The fieldworker unfortunately did not pick this error up timeously and due to ethical concerns I decided to omit those surveys in their entirety. Thus, the *effective* yield rate was only 33.8%, giving a final sample size of 50.

To put the survey's response rate into context and consider whether a higher response rate might have been achieved with a different approach (for instance, had it been possible to obtain lists of drivers' cellphone numbers from the various taxi associations), it is useful to consider the response rate achieved during the State of Transport Opinion Poll South Africa (STOPSA) survey in 2012. Luke and Heyns (2013) report that over 47 500 SMSs were sent to subscriber phone numbers during four recruitment drives and this process yielded about 2250 positive returns – an overall response rate of 4.7%. From these returns 1 000 participants were successfully recruited, with

[94] Past studies did not provide useful guidance as to what response rate may be expected with MTI drivers. For instance, study of Peltzer and Renner (2003) makes mention of 130 Pietersburg drivers being approached and completing their survey but gives no indication as to what percentage (if any) of the drivers approached *declined* to complete the survey.

the response rates to the different campaigns ranging from 27% to 51% and averaging 41%. Luke and Heyns note that while a bigger sample would have had a lower sampling error, trade-offs had to be made in relation to costs – fortunately, the sample which was utilized did approximate the demographic breakdown of the South African population relatively well.

Harsher realities prevailed in relation to this study, with no database of drivers' contact details being available so that preliminary contact could be made from a distance, and with very limited funding available for the more intensive face-to-face approaches which were the only feasible option. The total fieldwork time required during this study was 59 hours, of which 20% (approximately 12 hours) consisted of the fieldworker's travel time to and from the ranks and 80% (approximately 47 hours) was spent with drivers. Thus, on average the equivalent of 48 minutes of fieldworker contact time were required to obtain one survey – this rose to the equivalent of 56 minutes when only the *usable* surveys were taken into account.

A summary of the survey details – including venues, dates, timing and response rates – is provided in the table overleaf.

6.3 Participants' language profile and demographics

6.3.1 Language profile

The drivers were not asked to indicate their home language, but as noted previously they were given a choice between English, IsiZulu and Sesotho for the purposes of the survey. English was the predominant choice, at 67.8% – a similar phenomenon was recorded by Sauti (2006) in relation to her interviews with MTI drivers on the Johannesburg-Randfontein route. The second most common choice was IsiZulu, at 22.0%, while the remaining 10.2% of the participants opted for Sesotho.

Table 6.1: MTI driver survey – venues, dates, timing and response rates

Rank		Date	Start time	Drivers approached	Surveys completed	Response rate
1	Nancefield	23 Jul	19h00	3	2	66.7%
2	No. 1 Office Park	25 Jul	19h00	6	1	16.7%
3	Jabulani Mall	26 Jul	15h00	5	2	40.0%
4	Park Station	28 Jul	09h30	6	0	0.0%
5	Bree Street	28 Jul	10h30	5	0	0.0%
6	Von Brandis	28 Jul	11h30	4	1	25.0%
7	Carlton Centre	28 Jul	12h30	2	1	50.0%
8	Morafe	11 Aug	13h30	5	0	0.0%
9	Dube West	12 Aug	21h30	8	2	25.0%
10	Baragwanath	19 Aug	14h30	11	5	45.5%
11	Kempton Park	23 Aug	09h00	15	7	46.7%
12	Wanderers	1 Sep	08h00	5	0	0.0%
13	Hancock	1 Sep	10h00	5	3	60.0%
14	MTN	1 Sep	12h00	6	1	16.7%
15	Faraday	1 Sep	13h00	3	3	100.0%
16	Westgate	6 Sep	08h00	15	8	53.3%
17	Sandton	10 Sep	14h00	6	2	33.3%
18	Eastgate	14 Sep	10h00	11	5	45.5%
19	Rosebank	19 Oct	08h00	13	6	46.2%
20	Corlett Drive	20 Oct	08h00	14	10	71.4%
			TOTAL	148	59	37.1%

6.3.2 Gender

In keeping with other research with MTI drivers (for example, Peltzer & Renner, 2003; Sauti, 2006), 100% of the survey participants were male. Indeed, the fieldworker encountered no female drivers at all at any of the ranks he visited.

6.3.3 Age

The surveyed drivers ranged in age from 18-24 to 55-64, with 14% falling into the “novice” or “young driver” group (aged 18-24) and the remaining 86%

being over 25 years old. There was a striking preponderance of drivers who were younger than middle-aged (92% being 44 or younger) and very few (2%) fell into the “pre-retirement” group, aged 55-64. The age distribution of the participants is shown below.

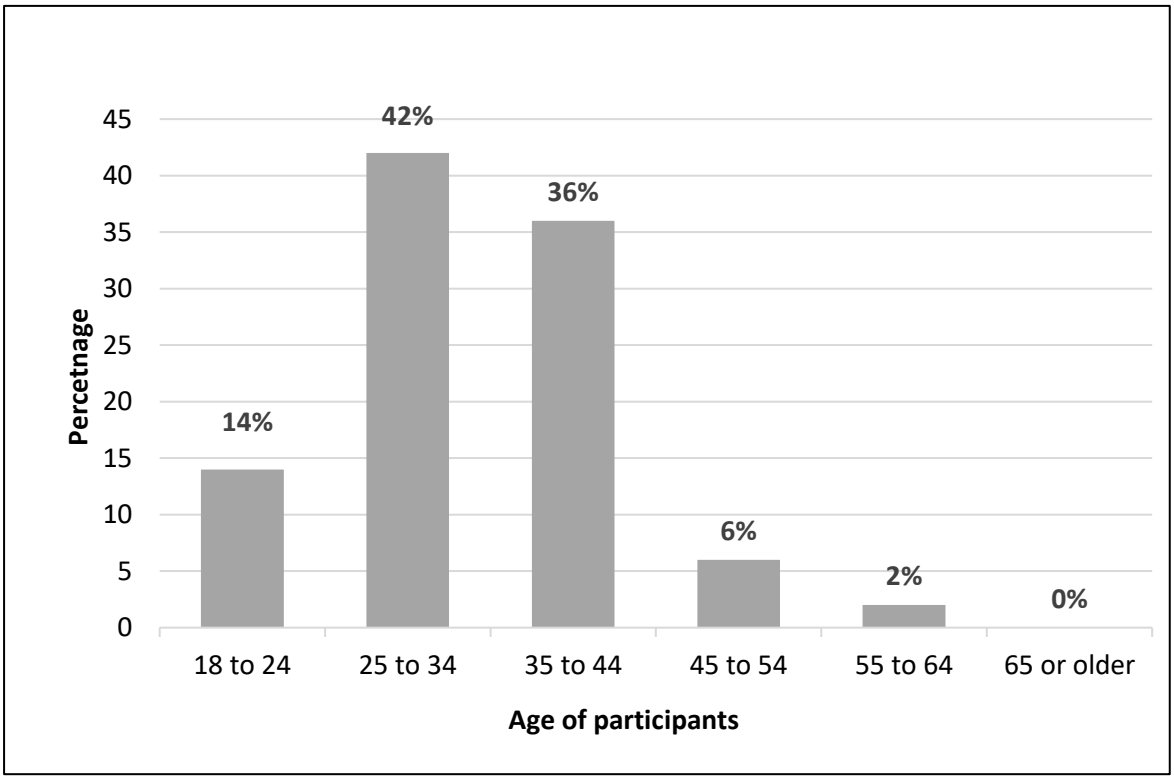


Figure 6.1: Age distribution of survey participants (answered: 50, skipped: 0)

6.3.4 Level of education

None of the drivers reported having less than a Grade 5 (formerly Std 3) level of schooling, and 98% reported having Grade 8 (Std 6) or higher. Some 82% reported having Grade 11 (Std 9) or higher, and 18% reported that they had at least some tertiary education. Their educational levels are depicted in the figure below.

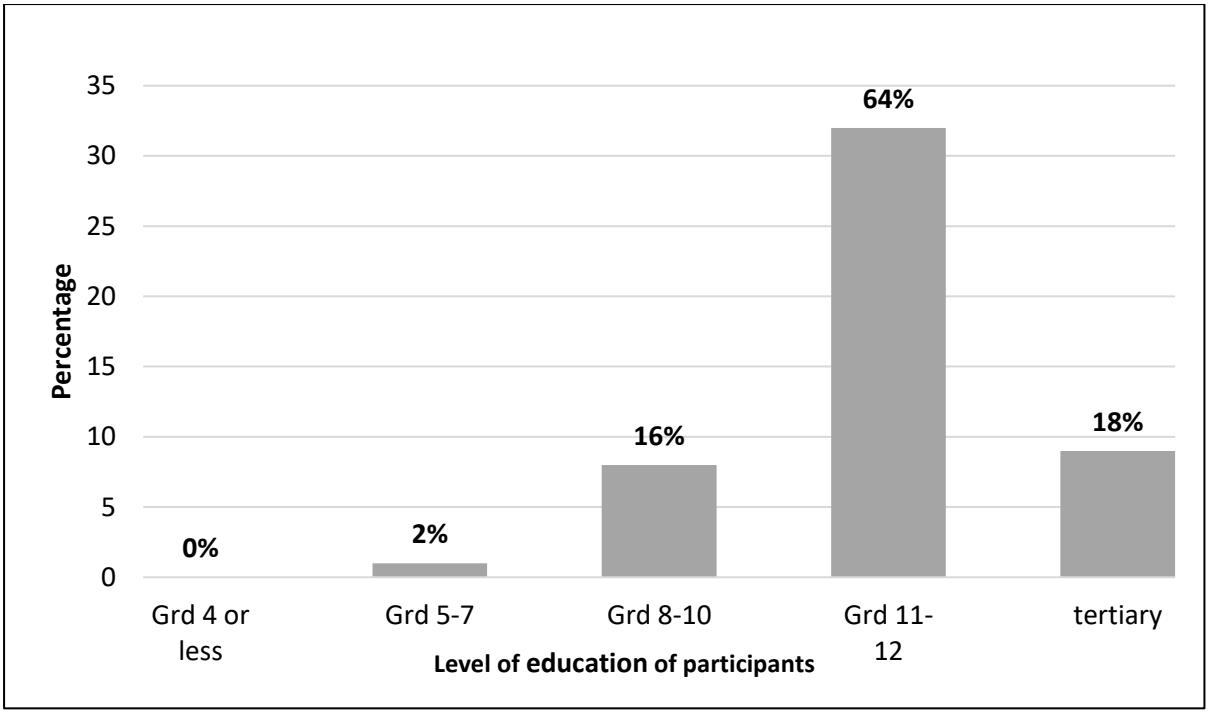


Figure 6.2: Level of education of survey participants
(answered: 50, skipped: 0)

6.3.5 Length of MTI driving experience

Some 60% of the participants reported having worked as an MTI driver for at least 5 years, with 30% reporting 10+ years of driving experience. It was striking, given that well over a third of the sample (specifically, 44%) were 35 or older, that the majority (70%) had accrued less than a decade of MTI driving experience. In a traditional formal labour market in a "normal" economy characterized by school leavers entering the working world in their late teens or early 20s, someone aged 35+ has typically already accrued 15 years or more of working experience. The drivers' profile probably reflects the abnormal nature of the South African labour market, in which many people enter the labour market late due to an absolute lack of job opportunities, and many who initially seek preferred work in the formal sector eventually fall back on less favoured occupations in the informal sector. Whether the older drivers who had limited driving experience were late entrants to the labour market as

a whole, or entered MTI driving late (for instance, as a fall-back option), is not clear from the survey data. The overall profile of the sample is depicted below.

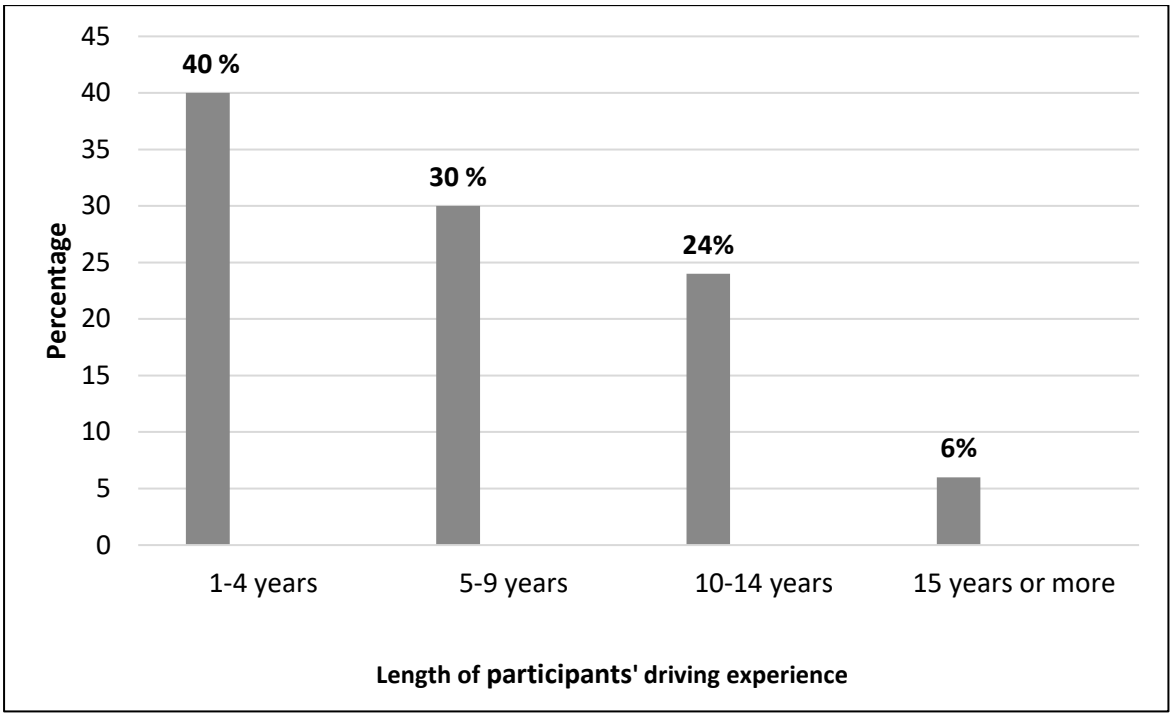


Figure 6.3: Length of MTI driving experience of survey participants (answered: 50, skipped: 0)

6.4 Responses to questionnaire items (excluding demographic items)

6.4.1 Work hours

The drivers generally reported lengthy work hours, with 84% starting work before 06h00 and 98% reporting that they knock off after 18h00. Substantial numbers reported starting work at or before 05h00 (43%) and knocking off at 19h00 or later (74%). The distribution of starting times and ending times is shown below.

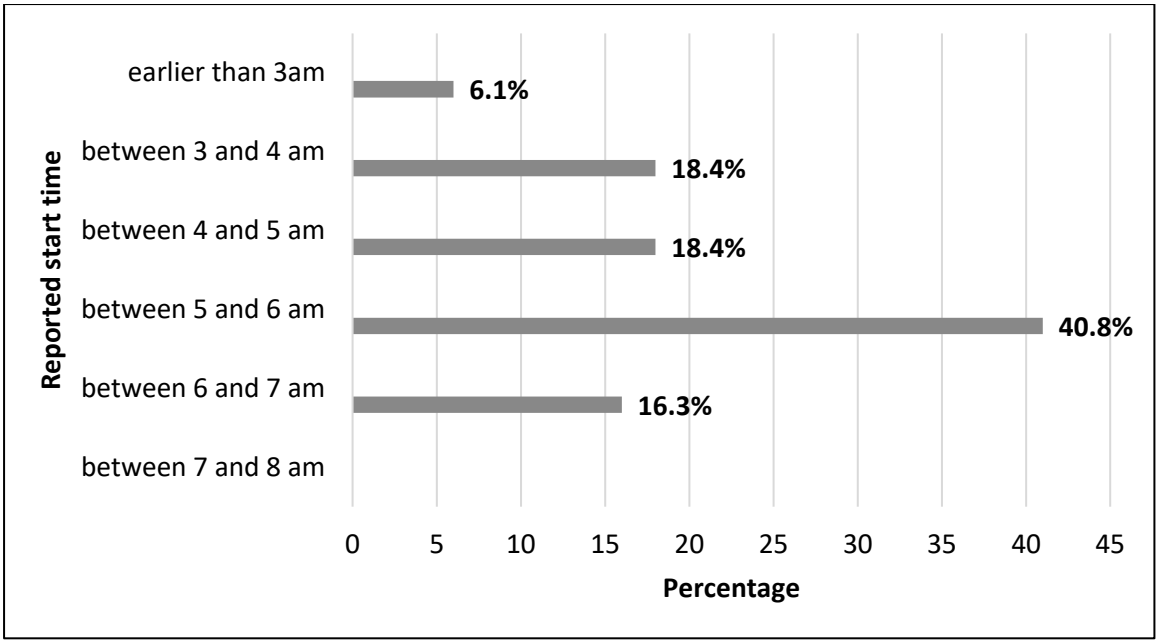


Figure 6.4: Work shift start time of survey participants
(answered: 49, skipped: 1)

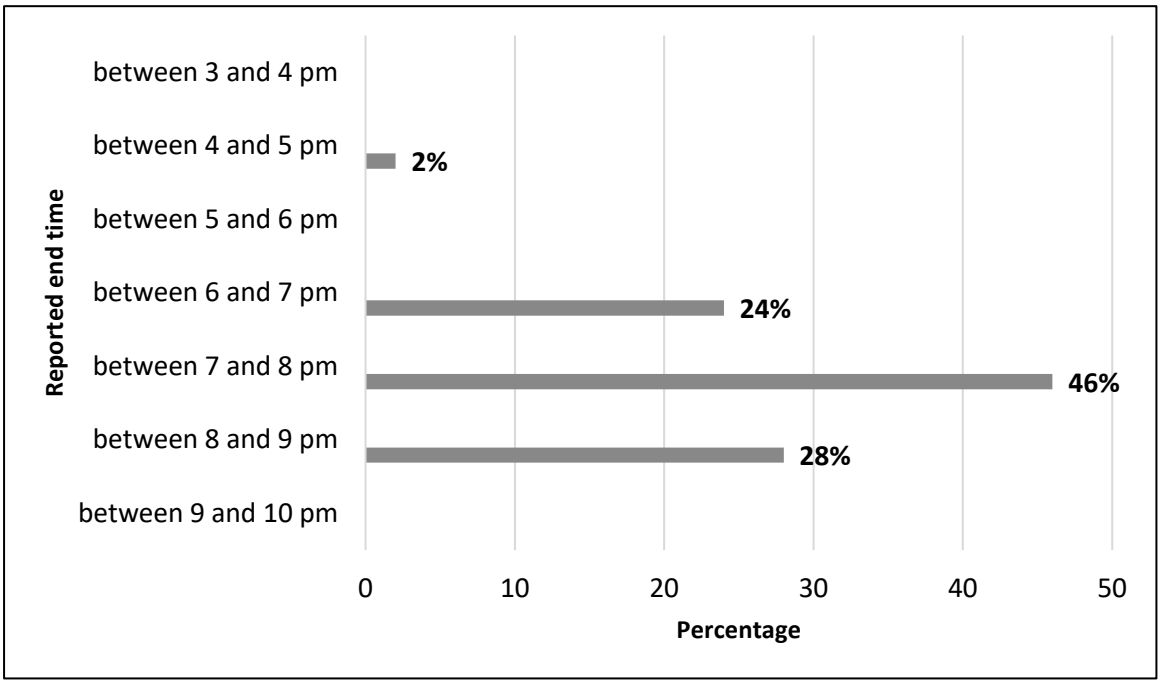


Figure 6.5: Work shift end time of survey participants
(answered: 50, skipped: 0)

On average, the participants reported working 14.6 hours per day.

When their starting and ending times were mapped onto an area plot (see below) it was apparent that *all* of the drivers reported being on duty by 07h00 and *none* reported knocking off before 19h00.

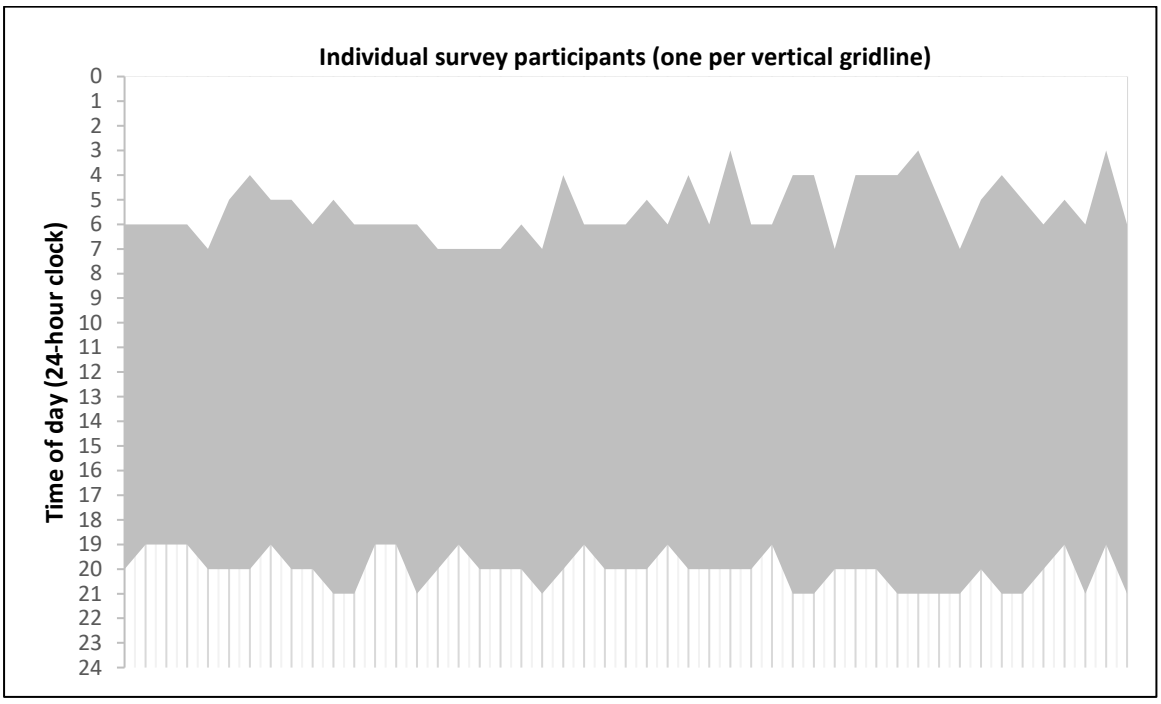


Figure 6.6: Work shifts reported by survey participants (start time to end time) (answered: 49, skipped: 1)

Although 34% of the drivers indicated that the taxis they drove were kept where they slept or less than a 10-minute walk away, the survey revealed that 66% were ‘commuters’ in their own right – ie. they required 10-15 minutes or longer to reach their taxis in the morning and to return to their homes at the end of the day. Of these, 18% reported a round-trip commute of more than 60 minutes. Various transport mechanisms were utilised, with 50% of the ‘commuters’ reporting that they caught a bus or taxi, 47% reporting that they walked and 3% reporting that they either got a lift or drove in their own vehicles in order to reach the taxi. Given that most of the drivers indicated that they started work before sunrise and knocked off after sunset, their

commuting journeys may expose them to risks such as criminal incidents or pedestrian hazards in the dark.

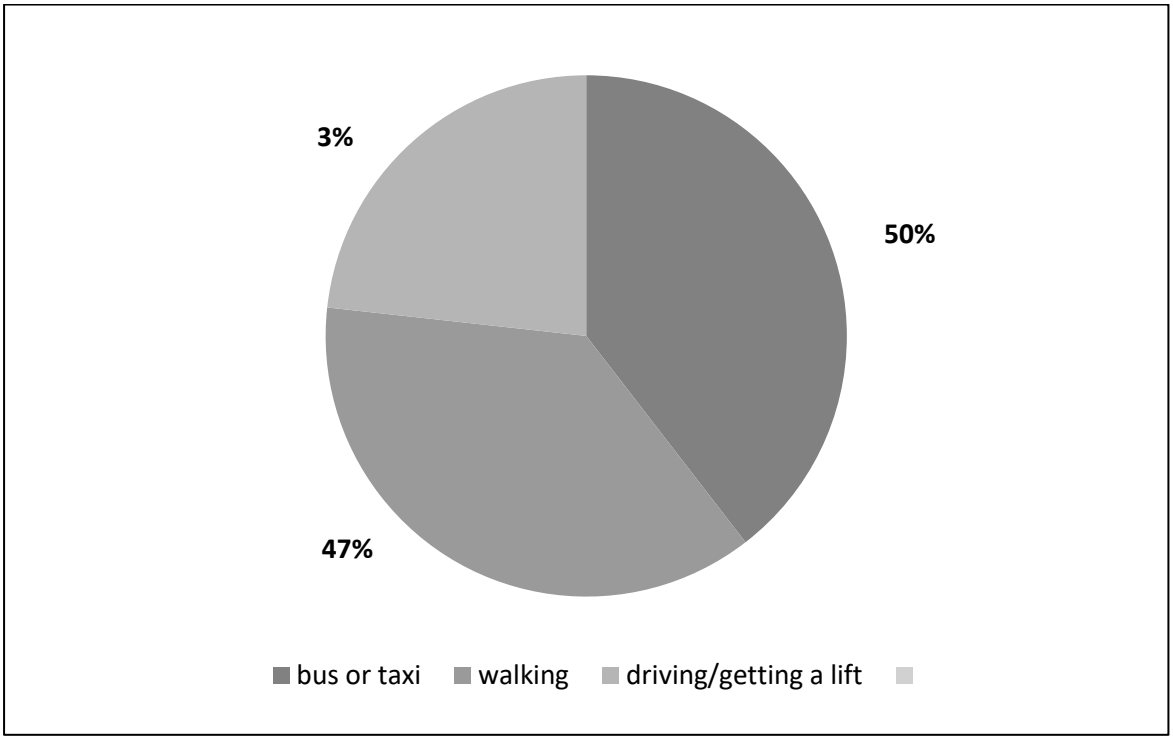


Figure 6.7: Transport mechanisms reported by commuting survey participants (n=33)

6.4.2 Duration of typical work week and provision and use of breaks

All the drivers surveyed reported working more than a 5-day week, with 100% indicating that they worked on Saturdays (88% for the whole day) and 86% indicating that they worked on Sundays (69% for the whole day).

With regards to breaks, 96% of the drivers reported having at least one break during the work day but 4% reported having no breaks at all. Some 35% indicated that they took short breaks throughout the day, while 61% reported having a lengthy middle-of-the-day break (between the morning rush and the afternoon rush).

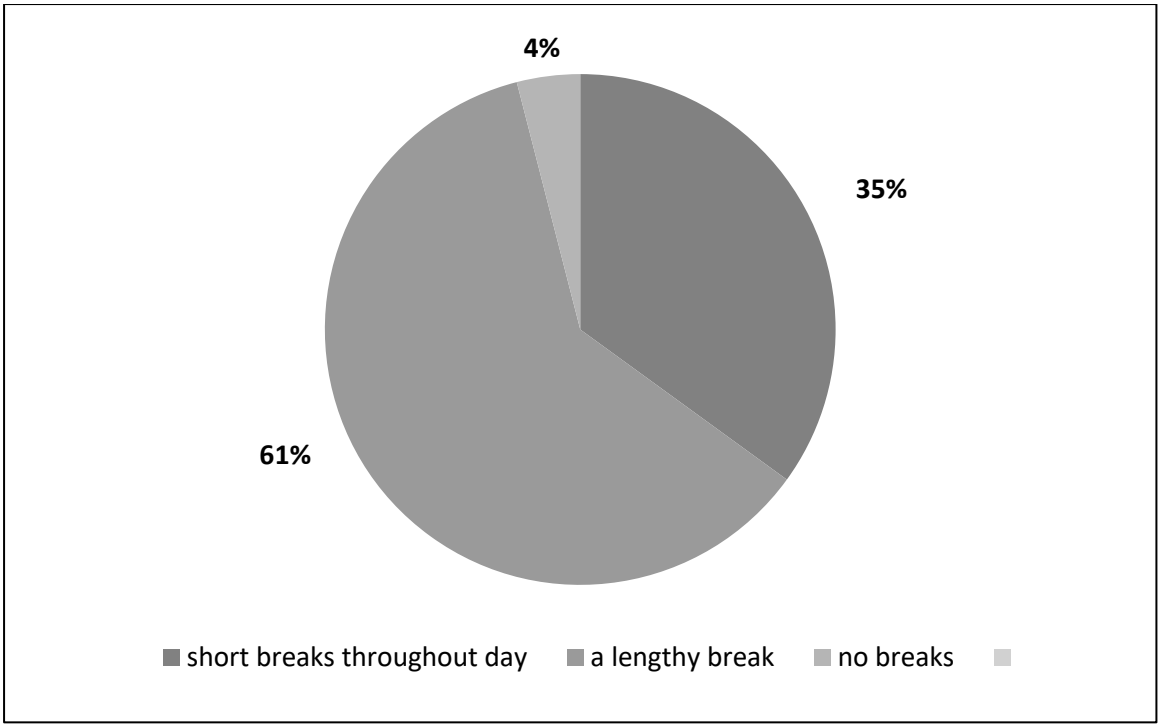


Figure 6.8: Breaks taken by survey participants (answered: 49, skipped: 1)

The drivers were asked to rate the degree of ease they experienced when using their breaks to perform certain tasks. Overall, they reported mild difficulties. The most difficult task was doing errands (eg: shopping, going to an ATM) (rated as difficult or very difficult by 8%), followed by going to the toilet (rated as difficult or very difficult by 6%) and chatting to other people (rated as difficult or very difficult by 2%). While 2% indicated that it was somewhat difficult to get out of their taxis and relax, 0% reported having difficulties with getting something to eat and drink.

Conversion of the answer options ("very difficult", "fairly difficult", "fairly easy" and "very easy") to a 1-4 numerical scale where 1=very difficult and 4=very easy yielded the following rank ordering from most difficult to least difficult:

- Performing errands 3.6
- Going to the toilet 3.8
- Chatting to other people 3.9
- Getting out of the taxi and relaxing 3.9

- Getting something to eat and drink 3.9

6.4.3 Vehicle-related issues

A large majority of the drivers (92%) reported driving 11-16 seater vehicles (including the driver's seat), with 4% respectively indicating that they drove vehicles which seated 10 or fewer people and vehicles seating 17-25 people. None reported driving midivan type vehicles with seating for more than 25. With regards to vehicle makes, 88% indicated that they drove Toyotas, 2% respectively indicated that they drove Nissans, Volkswagens and Mercedes and 6% indicated that they drove other (unspecified) makes.

When asked about the ages of the vehicles they most commonly drove, there was a striking preponderance of older vehicles. While 26% reported driving taxis younger than 5 years, 28% reported driving 5- to 8-year old taxis, 22% reported driving 8- to 11-year-old taxis and 24% reported driving taxis which were more than 11 years old. In all, nearly half (46%) of the taxis were reportedly at least 8 years old.

While 100% of the taxis used by the drivers were reported to offer driver seat-belts, a far lower proportion offered airbags (28%) and passenger seat-belts (42%) – the latter being important for preventing injuries not only to the passengers but also to the driver, by preventing passengers from being flung around the vehicle in a collision. In terms of driving ease, convenience and comfort, fewer than half of the taxis were reported to offer power steering (42%) and airconditioning (44%) and very few (10%) offered electric windows. By contrast, more than half (52%) offered sound systems.

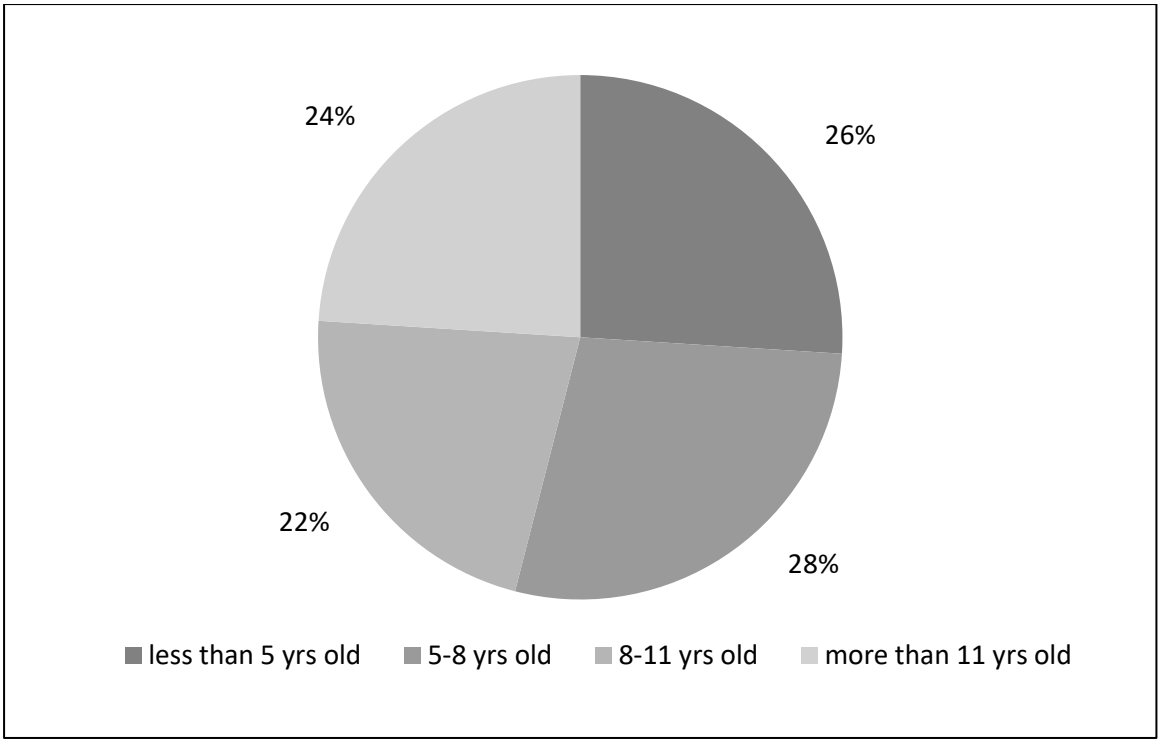


Figure 6.9: Age of taxis driven by survey participants
(answered: 50, skipped: 0)

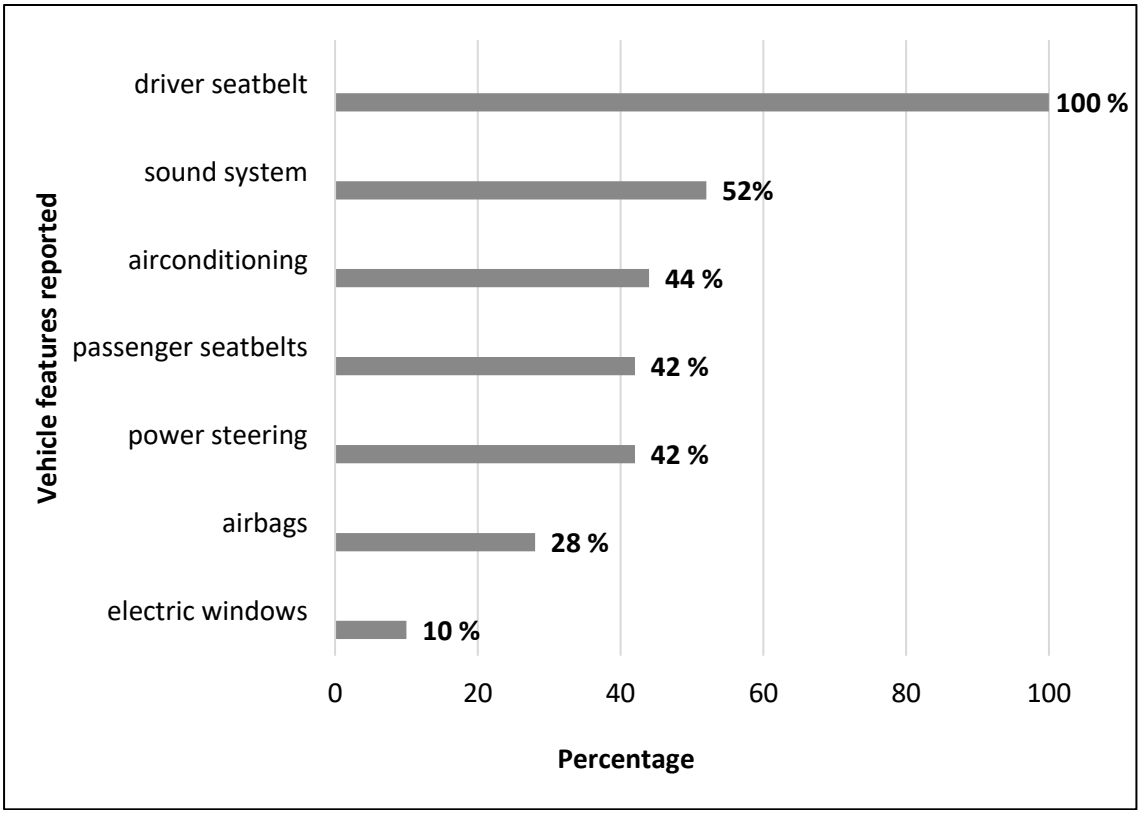


Figure 6.10: Vehicle features reported by survey participants
(answered: 50, skipped: 0)

The most common vehicle defects the drivers reported experiencing were broken windscreens or wipers (frequently encountered by 4% and occasionally encountered by 65%), followed by brakes not working (8% and 55%), broken passenger seats (2% and 65%) and faulty lights/indicators (2% and 64%). Moderately common defects were doors not opening or closing properly (occasionally encountered by 67%) and tyre problems (eg: punctures, worn tyres) (frequently encountered by 4% and occasionally by 54%). The least common defects were steering wheel problems (frequently encountered by 4% and occasionally by 44%) and broken or uncomfortable driver's seats (4% and 31%). Conversion of the answer options ("often", "sometimes", "never") to a 1-3 rating scale (where 1=never and 3=often) allowed the defects to be rank-ordered as shown below, from the most commonly encountered defects to the least commonly encountered ones.

- Broken windscreens or wipers 1.7
- Brakes not working 1.7
- Broken passenger seats 1.7
- Lights or indicators not working 1.7
- Doors not closing or opening properly 1.7
- Tyre problems (eg: punctures, worn tyres) 1.6
- Steering wheel problems 1.5
- Broken or uncomfortable driver's seats 1.4

The frequency with which defects were encountered is presented in visual form below.

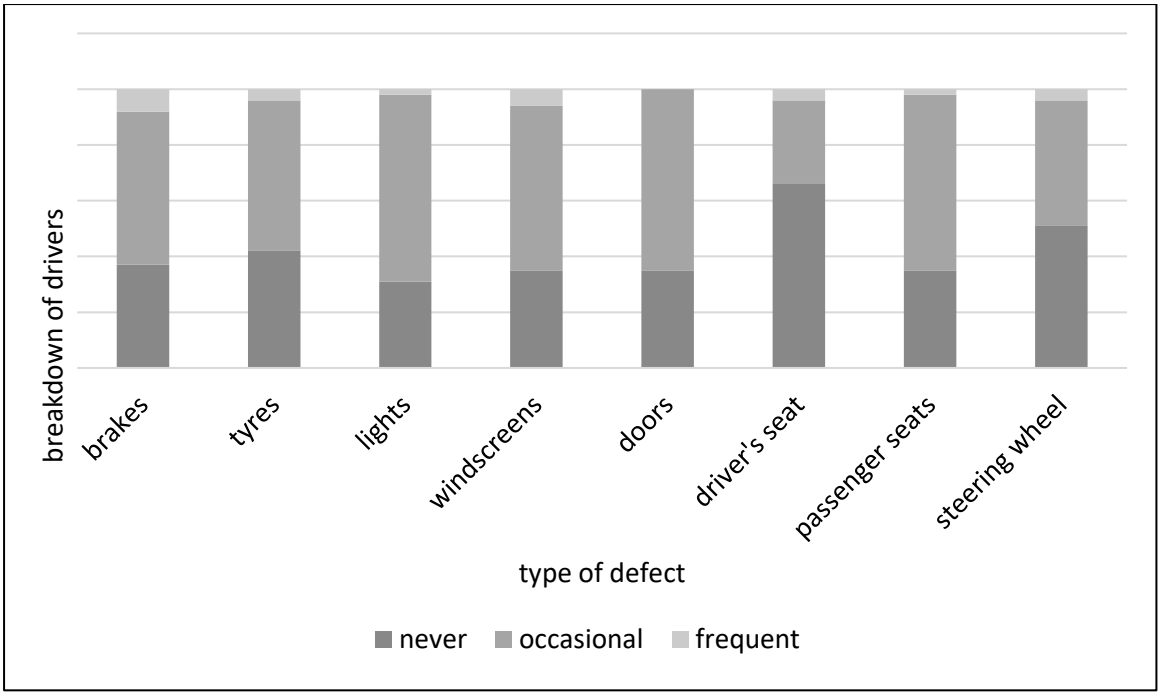


Figure 6.11: Frequency of vehicle defects encountered by survey participants

6.4.4 Drivers' employment status and pay arrangements

Only 3 drivers (6% of the sample) reported that they owned the taxis they drove. Of the other drivers, the majority (67%) indicated that their employment relationships did not comply with labour law requirements in that they did not have employment contracts, paid leave, payslips or UIF cover. There was also a general lack of job-related benefits, with 0% reporting having a pension plan, medical aid/hospital plan or funeral plan. However, 67% reported that they had accident insurance as part of the job.

Once the owner-drivers were excluded in order to focus solely on the employed drivers, 94% of the latter indicated that they received a fixed salary or wage, 4% selected the option "I get a share of the checkings/income every day" and 2% selected the option "I get what is left of the income after paying the owner a certain amount".

The employed drivers all indicated that they were expected to cover certain costs themselves. These include fuel (reported by 100% of the participants),

vehicle washing (94%), fines (70%), touts/queue marshalls (43%), vehicle servicing and repairs (41%) and tyres and vehicle licences (2%, respectively). None reported having to pay for operating permits.

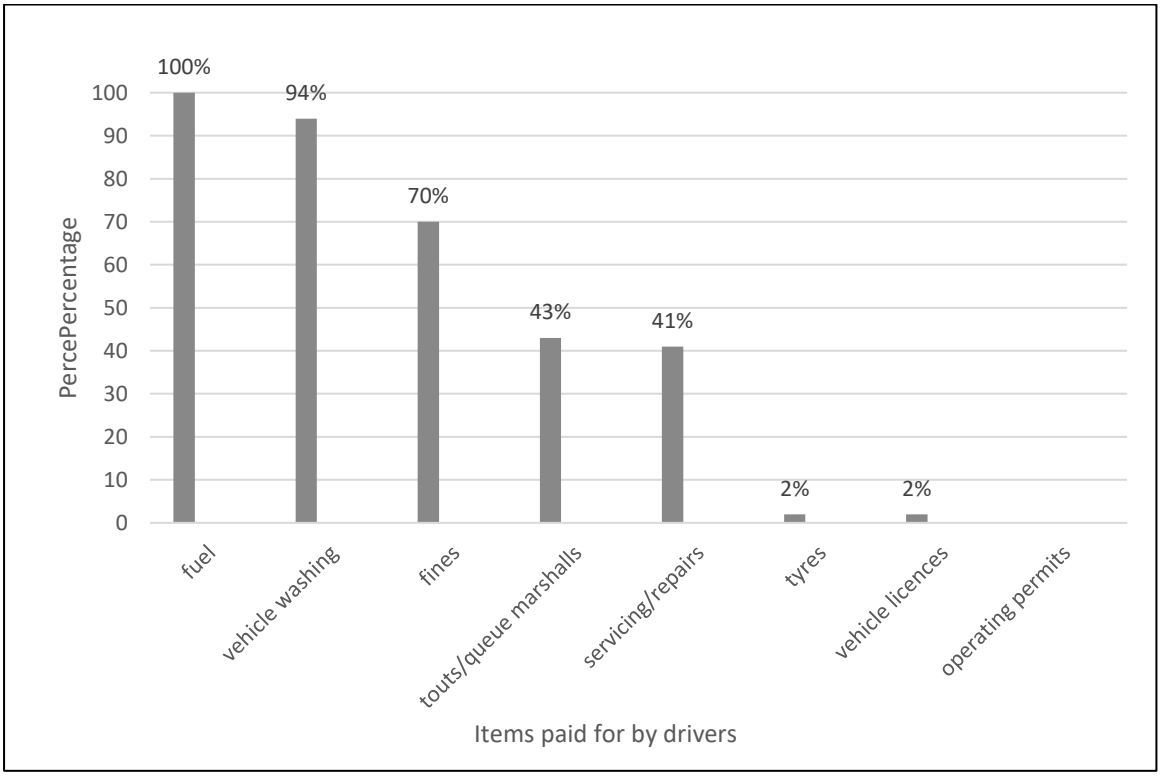


Figure 6.12: Items paid for by *employed* survey participants (n = 47)

6.4.5 Drivers' health concerns and job-related stressors

When asked about their major health issues, the drivers indicated that they had serious health problems related to worrying about not having enough money (reported as a serious problem by 92% and a minor problem by 2%), safety issues related to accidents/criminals/taxi wars (88% and 6%), tiredness because of long work hours (78% and 12%) and using of drugs or alcohol (80% and 2%). They also reported moderate health problems related to pain (eg: sore back, sore neck, headaches) (reported as a serious problem by 61% and a minor problem by 14%) and not getting enough breaks (54% and 10%). The issues about which they expressed the least concern were not having enough time to wash/bath properly (which was nevertheless reported as a

serious problem by 16%) and not getting proper meals while working (reported as a serious problem by 12% and a minor problem by 2%). Conversion of the answer choices (“not a problem”, “a minor problem” and “a serious problem”) to a numerical rating scale of 1-3 (where 1=not a problem and 3=a serious problem) allowed a group rating to be assigned to each issue. This in turn allowed for the issues to be rank-ordered as shown below, from that perceived as the most significant problem to that seen as the least significant.

- Worrying about not having enough money 2.9
- Poor safety (accidents/criminals/taxi wars) 2.8
- Tiredness because of long work hours 2.7
- Using of drugs/alcohol 2.6
- Pain (eg: sore back, sore neck, headaches) 2.4
- Not getting enough breaks 2.2
- Not having enough time to wash/bath properly 1.3
- Not getting proper meals while working 1.3

When asked about the interpersonal stress they experience on the job, the drivers indicated that they experience moderate stress related to their interactions with other road users (eg: car drivers, bus drivers), with 46% indicating that these interactions cause a lot of stress and 30% indicating that they cause some stress. They also reported moderate stress associated with interacting with taxi association officials (34% and 38%), traffic cops (27% and 37%), passengers (20% and 34%) and taxi owners (14% and 44%). The interactions rated as least stressful were with other taxi drivers (4% reported a lot of stress and 8% some stress) and with rank officials/ queue marshalls (0% and 10%). Converting the answer choices (“no stress”, “some stress” and “a lot of stress”) to a numerical rating scale of 1-3 (where 1=no stress and 3=a serious problem) allowed a group rating to be assigned to each issue and this yielded the rank-order shown below (from the most stressful to the least stressful type of interpersonal interaction).

- Other road users 2.2
- Taxi association officials 2.0
- Traffic cops 1.9
- Passengers 1.7
- Taxi owners 1.7
- Other taxi drivers 1.2
- Rank officials/queue marshalls 1.1

6.4.6 Drivers' concerns regarding roads and ranks

In relation to roads and ranks, the drivers reported serious problems due to insufficient safe stopping places (reported as a serious problem by 90% and a minor problem by 6%), passengers wanting to stop anywhere/anytime (86% and 12%), bad roads (eg: potholes, broken traffic lights) (88% and 6%) and heavy traffic jams (79% and 13%). They also indicated that they experienced moderate problems relating to delays caused by traffic cops/road blocks (reported as a serious problem by 69% and a minor problem by 20%), dirty or inadequate toilet facilities at ranks (70% and 8%), having to drive too fast (56% and 15%), overcrowded ranks (49% and 23%), a lack of good lunch/rest areas (48% and 13%) and having to count money/give change while out on the road (42% and 8%). Once again, the answer options were converted to a 1-3 numerical scale, resulting in the following rank-ordering of the issues from those perceived as most serious to those seen as least serious.

- Insufficient safe stopping places 2.9
- Passengers wanting to stop anywhere/anytime 2.8
- Bad roads (eg: potholes, broken traffic lights) 2.8
- Heavy traffic jams 2.7
- Delays caused by traffic cops/road blocks 2.6
- Dirty or inadequate toilet facilities at ranks 2.5
- Overcrowded ranks 2.2
- A lack of good lunch/rest areas 2.1
- Having to count money/give change while out on the road 1.9

6.4.7 Drivers' experiences of and concerns about MTI crashes

A large majority (96%) of the drivers expressed concern about MTI crashes, with 84% indicating that they worried about crashes *a lot* and 12% indicating that they worried about them *a bit*.

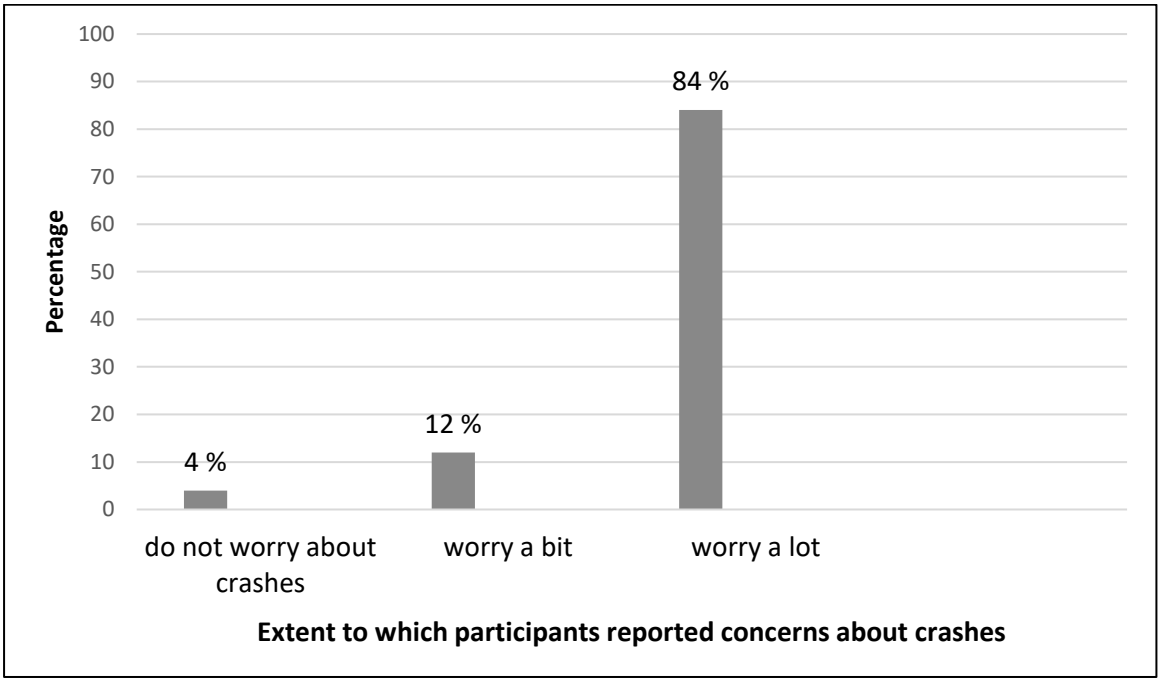


Figure 6.13: Concerns regarding crashes reported by survey participants (answered: 50, skipped: 0)

While 56% reported never having been in a crash which caused injuries to themselves or others, an overall 44% reported having experienced at least one injurious crash. In all, 12% reported being involved in 2 or more such crashes.

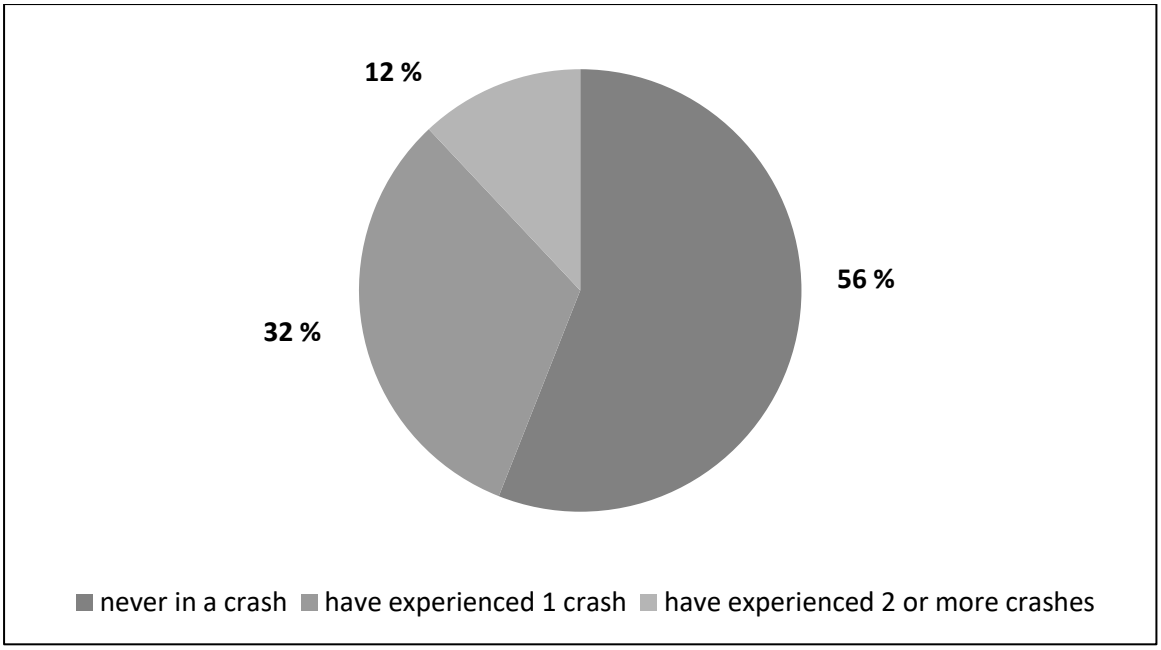


Figure 6.14: Injurious crash experience reported by survey participants (answered: 50, skipped: 0)

6.4.8 Drivers' perceptions of the factors which lead to MTI crashes

The drivers were asked what factors they perceived as contributing to MTI crashes, being allowed to select as many items as they chose from a multiple-choice list. The top factors chosen were bad weather (chosen by 90% of the participants), drivers breaking laws (88%), taxis being in bad condition (70%), drivers speeding or making too many trips (66%) and drivers using alcohol or drugs (62%). Other items selected by at least half the participants were unsafe pedestrian behaviour (52%) and other road users' behaviour around taxis (50%).

The items offered included both human factors and non-human factors. Of the seven items which were selected by 50% or more of the participants, five (71%) reflected human factors. Most of these were driver-related – specifically, lawless driving, speeding and driving under the influence – but two were related to other human role-players in the form of pedestrians and other road users. Bad weather and vehicle defects were the only non-human

factors selected by at least 50% of the participants as possible causes of taxi crashes.

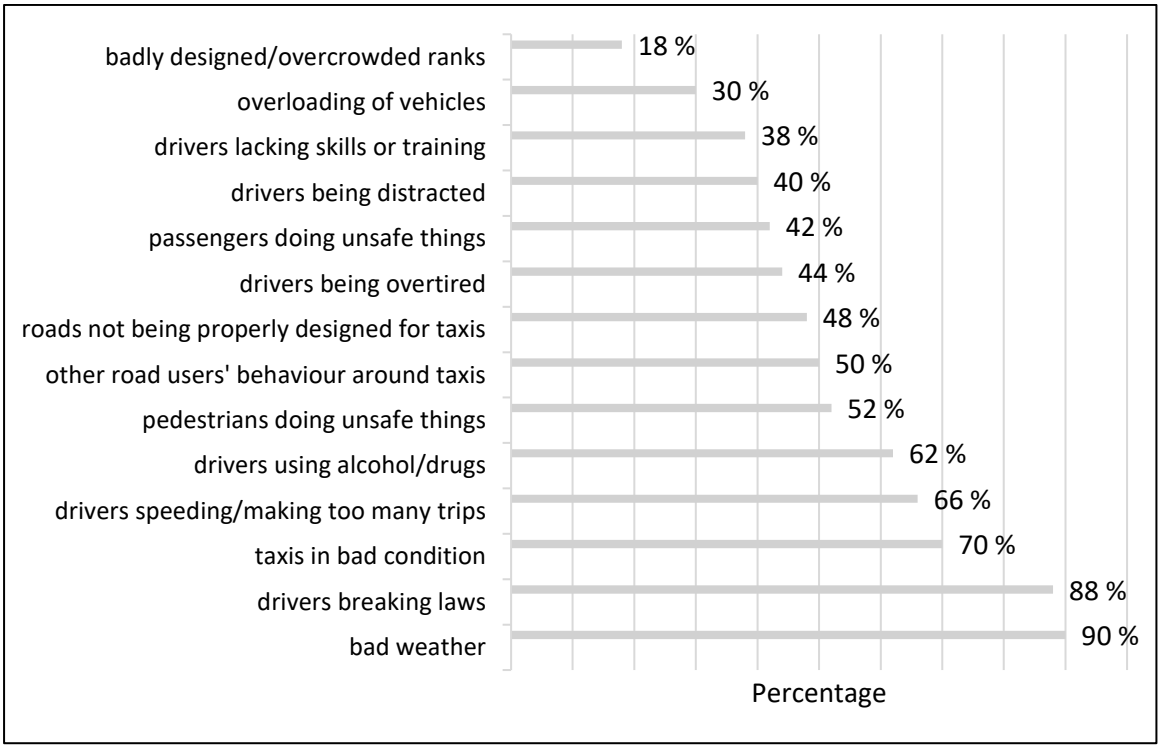


Figure 6.15: Crash causation factors selected by survey participants (answered: 50, skipped: 0)

6.5 Correlational analyses

To determine whether there were meaningful relationships between particular elements of the survey data, a correlational technique was used to calculate correlation coefficients. Such coefficients may fall anywhere between -1 (perfect negative or inverse correlation) through 0 (no correlation at all) through to +1 (perfect positive correlation). A correlation describes a relationship, not a cause, and the higher the absolute value of the coefficient, the stronger the association between two variables.

The specific relationships of interest were those between the following variables:

1) age and level of concern regarding MTI crashes
2) age and experience of injurious crashes (1 or more)
3) driving experience and level of concern regarding MTI crashes
4) driving experience and experience of injurious accidents (1 or more)
5) educational level and level of concern regarding MTI crashes

As all data on the dimensions listed above were ordinal in nature (ie. response scores indicated rank without magnitude) a non-parametric test was used. The Spearman-Rho (ρ) was considered to be the most suitable for the purpose because the sample was not exceptionally small and this test has been designed specifically to deal with ranked data. All computations were carried out on an Excel spreadsheet to establish the correlation coefficients, and an online calculator programme[95] was used to establish the statistical significance of these coefficients. The overall results were as shown below:

Table 6.2: Correlation coefficients for relationships between variables

Relationship	**P**	**Interpretation**	**t***	**Significance**
age and concern regarding MTI crashes	0.217	Weak positive correlation	1.537	NS p>0.05
age and experience of injurious crashes	0.235	Weak positive correlation	1.674	NS p>0.05
driving experience and concern regarding MTI crashes	0.437	Moderate positive correlation	3.367	P<0.001
driving experience and experience of injurious crashes	0.210	Weak positive correlation	1.489	NS p>0.05
educational level and concern regarding MTI crashes	0.388	Moderate positive correlation	2.914	P<0.01

*df=n-2=50-2=48

[95] http://www.danielsoper.com/statcalc/calculator.aspx?id=61

6.5.1 Relationship between age and concern regarding MTI crashes

The relationship between age and concern regarding accidents showed a **weak positive correlation** of ρ=0.235, with the coefficient failing to reach statistical significance (t(48)=1.674;p>0.05). This would indicate very little, if any, relationship between age and concern regarding accidents.

6.5.2 Relationship between age and experience of injurious crashes

The relationship between age and experience of injurious crashes (1 or more) showed a **weak positive correlation** of ρ=0.217, with the coefficient failing to reach statistical significance (t(48)=1.537;p>0.05). This would indicate very little, if any, relationship between age and experience of injurious crashes.

6.5.3 Relationship between driving experience and concern regarding MTI crashes

The relationship between driving experience and concern regarding MTI crashes showed a **moderate positive correlation** of ρ=0.437. This coefficient was statistically significant (t(48)=1.537;p<0.001), indicating a moderate relationship between driving experience and concern regarding MTI crashes. Specifically, greater concern regarding MTI crashes was associated with higher levels of driving experience.

6.5.4 Relationship between driving experience and experience of injurious crashes

The relationship between driving experience and experience of injurious crashes (1 or more) showed a **weak positive correlation** of ρ=0.210, with the coefficient failing to reach statistical significance (T(48)=1.489;p>0.05). This would indicate very little, if any, relationship between driving experience and experience of injurious crashes.

6.5.5 Relationship between educational level and concern regarding MTI crashes

The relationship between educational level and concern regarding MTI crashes yielded a **moderate positive correlation** of $\rho=0.388$. This coefficient was statistically significant ($t(48)=2.915;p<0.01$), indicating a moderate relationship between educational level and concern regarding crashes. Specifically, greater concern regarding crashes was associated with a higher education level.

6.6 Closing remarks

In this chapter I have set out the results from my survey of 50 MTI drivers at 20 ranks in greater Johannesburg. The descriptive information obtained from this survey provided a foundation for the next phase of the research, namely in-depth interviews with individual drivers. The results of the interviews appear in the next chapter.

CHAPTER 7: EMPIRICAL RESULTS - INTERVIEWS

7.1 Preamble

In this chapter I explain the response rate and results of the one-to-one interviews conducted with MTI drivers during 2016/2017.

7.2 Response rate and interviewing time

As noted in the previous chapter, a high proportion (86%) of the 50 participants in the survey phase of the study expressed interest in being interviewed but there were significant difficulties with actual recruitment of interviewees and completion of interviews. Ultimately, apart from one interviewee recruited via a direct approach at a taxi rank, 11 interviewees were recruited from the survey participants (representing a 22% response rate in relation to the 43 survey participants who gave consent to being contacted).

The single face-to-face rank-based interview lasted approximately 35 minutes (including interruptions), while the telephonic interviews varied from 15 to 49 minutes in length (including interruptions due to dropped calls or the interviewee requesting to continue the interview during a second call). Overall, the average interview duration was 29.1 minutes, with some time being lost to preliminaries including ascertaining the interviewee's language preference (English, isiZulu or SeSotho), verbally presenting the participant information sheet and obtaining verbal consent to proceed with the interview.

7.3 Participants' language choices

None of the interviewees was conducted solely in one language, in that the participants tended to use words from languages other than the one they named as their preference at the outset. However, isiZulu was the predominant language used in 7 of the interviews (58.4%), English was the predominant language used in 4 (33.3%) and Sesotho was the predominant language utilized in one (8.3%).

7.4 Overview of the *data corpus*

The interviews varied widely in quality and duration but together created a *data corpus* containing vivid and in-depth information which honed my understanding of the issues raised by the survey results. Just as the survey allowed for some correlational research, the interviews uncovered the "co-occurrence of particular themes" which is described by Bless et al (2013, p.57). The participants spoke very readily and in some cases quite volubly, as though they were pleased to have a chance to air their views. Several went to some lengths to ensure that they completed a full interview – for instance, phoning me back after network problems caused call-dropping and even (in two cases) saying that they would like to be contacted again at a later stage when they ran out of time to continue the interview during an initial call. In one of those cases, all further attempts to reach the driver were unsuccessful whereas in the second case a further fairly lengthy discussion was held, revisiting the same questions put to the driver in the first session. Only one of the drivers (Participant 1, interviewed at a rank) tended to give very short answers and superficial information – most of the others provided deep and broad responses and some needed hardly any prompting before airing their views. In the case of Participant 10, he was obviously keen to contribute to the study and spoke in a highly organized and considered fashion, but he was very voluble and it was impossible to capture all the finer elements of what he said without breaking the flow of the interview – nonetheless, main concepts he raised were all noted down in what was an unusually short transcript for such in-depth responses. Participant 11 likewise spoke almost non-stop after the first question had been put to him, and to avoid disrupting his flow of speech very little further questioning was done – ultimately, he spontaneously "answered" all of the planned interview questions. Participant 12 seemed to be Tsonga-speaking and had little ability to converse in isiZulu (the language he chose) – this interview was relatively short, perhaps because of language barriers, but nevertheless offered some important points. The other participants fell somewhere between Participant 1 and 12 on the one hand, and Participants 10 and 11 on the other hand, in relation to the volume and richness of the information they provided.

Once I judged data saturation to have been reached by the 12th interview (helped along by several very "rich" interviews), this phase of the research was closed. As noted in chapter 2 the English thread of the transcripts was typed up from my handwritten notes, after which I subjected the transcripts to a recursive process of thematic content analysis. In summary, I initially deconstructed the data and then organized and re-organised the data segments within an evolving framework. This process eventually distilled out the key messages which the interviews seemed to contain, which (after input from two independent reviewers and with oversight from my supervisors) led to the development of 7 final themes. I will outline these in turn below, with illustrative quotes drawn from the interviews as needed.

7.5 Interview themes

7.5.1 Theme 1: It's all about the money

In chapter 2 I explained that I commenced the thematic content analysis with a simple frequency count of words appearing in the interview transcripts. The words "money" and "target" were the most commonly featured, being used by 92% of the participants at some point in their interviews. As the interviewees also sometimes provided monetary information without using these two words, this is in fact an under-count of how significant the issue of money was in the interviews as a whole. This theme is best illustrated by the following quotes:

> Mental stress….if I don't get enough money, I'm in trouble…
> It might cause a quarrel or a physical fight between the owner and driver.
> The owner wants money regardless.

Participant 1

> Everything is time and money, which causes reckless driving…it is a pressure to work and get money.…In a situation where a driver is in front at the rank and loads first, he may then travel a certain route but on the way someone who was further back at the rank may pass him, which means he has to chase that guy to get back into the first position.

Participant 9

> [Taxi] bosses are difficult as most of them have different levels of education…most bosses are very illiterate. They used force instead of sitting around the table and they don't worry about inflation etcetera – they just want their money.
> …As a business one must go and hustle and at the end of the day the boss wants R500-R700 a day. The money situation puts pressure on the drivers as they are not concentrating on the roads.…It's just about money, money circulating.
> …When there is a shootout, drivers are blamed. But it's all about money for the owner.

Participant 11

> Speeding happens during peak hours – for example, you may need to hurry and do 3 trips in the morning in peak period to cover the target…the owner needs the money.

Participant 12

Participant 2 referred to "capitalist bosses wanting a lot of money", commenting that this "can cause drivers to be more reckless", while Participant 7 noted that "some owners are just pushing the drivers to bring money" and don't even "want to take the vehicle out of service [to fix it]".

Participant 11 commented on the impersonal relationship between owners and drivers, noting that "some drivers even put the money [the owner's dues] in at an ATM and never even see the owners – they can't even remember

when they last saw the owner". He also commented that owners "are not concerned regarding [the drivers'] safety, they are just concerned regarding the money"; he added, "we earn the money, but we are not called to [association] meetings". With regard to SANTACO, he commented, "it's only bosses and they are just concerned regarding how much money will be made, there are no concerns regarding drivers".

Participants 3 and 4 drew a direct link between money pressure and crashes:

> Rushing causes accidents…the checkings cause accidents…you want to put together the money required by the owner.
> Rushing to position yourself in the queue at the rank causes accidents.

Participant 3

> The cause [of accidents] might be the pressure we encounter on a daily basis. The income we pay to the owners causes accidents.
> Taxi owners play a big role. To them, what matters is money.

Participant 4

The business imperative behind taxi driving was particularly focused on by Participant 7, who alluded to "a *spaza* shop versus a big shop" (suggesting that taxi operators should "aim big"); he noted that this takes time and it is "not easy to reach the top level if you want to be rich in a few minutes". He added that "you must be patient as an owner…customers must be satisfied, so the business will last over time. In 2, 3, 4 years, a *spaza* shop can evolve into a big business". He went on to comment that "an owner may have 1 taxi, his friend has 10 taxis…so the first one pressurizes his driver to make money". He added the following comment, noting that he had been driving a taxi for 15 years and thus knew the job well:

> Some owners don't care about the lives of the drivers, and about the condition of the car…[Under pressure], you as a driver will forget something – like that the rear indicator is not working…and this can cause an accident.
> Owners are selfish – they want money only, they don't care about the taxis, what's going on with the passengers.
> …Some owners even take *nyaope*[96] people…because they will drive the whole day, they don't care how they drive, but the make the owner a lot of money.
>
> Participant 7

Although for the most part the focus of the interviewees was on the money-centric behavior of taxi owners, there were occasional mentions of the drivers themselves being money-orientated. For instance, Participant 7 noted that "some [drivers] are just looking for money – they haven't learned to take good care of passengers".

During several of the interviews the notion of different fare payment systems came up. With regard to cash-based fares Participant 4 expressed the view that implementing "a bus system – with coupons – could play a big role" in terms of reducing pressure on the drivers. Participant 5, likewise, commented that "cash is part of the problem", noting that "buses don't use cash", "tickets would be much safer" and "a tag will tell the owner how many loads per day, how much money you make". However, he also remarked that "some drivers want to make more money" – seemingly implying that cash-based systems create extra earning opportunities for MTI drivers. Participant 9 felt that a ticket/card-based fare payment system would be safer as it would "avoid pressure, having to use cash and find change…the cash-exchanging situation can contribute to crashes as you have to do everything fast". However, Participant 6 was *not* in favour of a cashless system, noting as follows:

[96] *Nyaope* is a strongly addictive, highly intoxicating illicit drug manufactured from various substances which can include antiretroviral drugs and rat poison, and is particularly prevalent in South African townships.

> It's better that [the passengers] pay in cash…owners are very stubborn and drivers must maintain the taxi financially. We need money for [vehicle] washing, lunch, etcetera…the driver needs cash.
> …The taxi owners don't want to pay for anything – even garage cards. They don't want the responsibility.
>
> Participant 6

7.5.2 Theme 2: It's not a proper driving job

Several drivers noted that members of the public react differently to MTI drivers and other kinds of drivers, while others contrasted their work conditions with those employed in formal jobs, such as bus drivers. Theme 2 is best illustrated by the following quotes:

> Driving for taxis is not a normal driving….
> It's not a proper driving job…[People] have better attitudes to bus drivers.
> Minibus taxi drivers are very stressed, especially from 7 to 8 or 9 and at '*tjaila time*'[97], 4-6 pm. Taxis make accidents at that time.
>
> Participant 1

> We are far different from bus and truck drivers – a taxi boss can hire and fire me at any time, with no intervention.
>
> Participant 4

> Proper drivers get money from companies/bosses….if we were working in good conditions, we wouldn't be getting these accidents.
>
> Participant 11

[97] "tjaila time" is South African slang for "knocking off time".

A strong sense of disempowerment was evident amongst the interviewees as a group, and several referred specifically to their vulnerability and lack of recourse. For example:

> The unions are not that helpful. Drivers must be registered first and foremost, and unions also should be registered. You can't just walk up to a union like COSATU if you're not even registered in the first place.
>
> Participant 4

> The owner just hires you, then gives you whatever he sees fit. Owners can just dismiss drivers when they don't need them anymore.
>
> Participant 6

> The drivers should be given the attention they deserve. I sometimes speak to the owner – for instance, about being stopped by a traffic cop and told that the vehicle has a defect…owners sometimes behave like people who are out of their minds, saying "that traffic cop is insane" and "I owe nothing".
>
> Participant 10

> When you report problems to the owner, they take the keys and give them to someone else – there's always someone else to do the work! Another driver may then take over, but after 2-3 weeks may die or be a cripple…if they don't know the realities, know what's possible.
>
> Participant 11

Participant 11 stressed that "taxi drivers don't have any unions…No one is there for the taxi drivers and no union will represent you for free". Participant 7 felt that unions *should* assist the drivers, commenting, "Unions are meant for each and every worker – they should force associations to uplift their drivers, and should protect them if anything happens". He also alluded to drivers' vulnerability to injury and to criminal incidents, as follows:

> Owners have insurance for the cars – for panelbeating, spraypainting etcetera, [but] what happens if there is an accident and my leg is broken? Who is going to take care of it?
> …You may be driving at night and see three people at a bus stop and think they are passengers and stop for them…but they are thieves.
>
> Participant 7

Participant 11 also commented on drivers' risks of injury and their difficulties with securing insurance cover. Thus, he noted "In an accident, some [drivers] are injured and some will die" and added, "even the insurance doesn't pay if drivers don't have PDPs".

Very long working hours were mentioned during almost all of the interviews, with some of the drivers giving detailed information about how many days per week they work and what starting times and knocking off times they have. For instance:

> Sometimes at 3 [am] I'm at the rank already – I start loading at 4.30 or 5.00. I must be at the rank early to get a place in the queue.
> I work 7 days a week.
>
> Participant 1

> We work 6 days, or some work every day of the week….you may get one day off per month. You must be at work at 5 [am] until 8 [pm], daily. This might be one cause of accidents – drivers are so exhausted, they don't get a rest.…Driving for 12-13 hours per day is very far different from the standard rate of 8 hours per day.
>
> Participant 4

> You don't get paid days off…You work 6-7 days per week.
> It's abnormal hours – like 4am to 7pm. You get home exhausted – can't even check your kids' [school] books. It causes lots of accidents. Need to limit driving to 10 hours per day. It's not reasonable to work 7 days per week.

Participant 5

> You work "can't see" to "can't see" [ie. you start in the dark and end in the dark]. I start 5am…I work 15-17 hours per day. Most drivers work 7 days per week – you maybe get time off if the car is broken or needs a service…then you get a day off.

Participant 6

> Myself, I work 6 days per week…I told my boss I need some time to rest and be with my family. The owner drives my car on Sundays… But most drivers do 7 days per week – they only get time off if they have problems, and [then] they have to find someone to relieve them.

Participant 7

> Drivers also work very long hours. I start work 4 o' clock, knock off at 9pm. I work Monday to Monday.
> [Drivers] work 7 days a week unless the vehicle breaks down. If the car is functioning, one works the full 7 days a week.

Participant 8

> The working hours at my rank…taxis begin to gather from 4.30 am, to get good positions. I leave my house at 4.30 and start driving at around 5.30 to 6am.

Participant 9

Participant 9 noted that "the hours differ from one association to another" and described his association as "not so busy" – thus, "[his] line is very unique" in that he takes the taxi to the car wash at 3.30 pm and then knocks off around

5pm. He also commented, “I do work on weekends, one on and one off, and I only work on Sundays…I know my situation is different from most drivers’”. The interpreter commented after interviewing this participant (and recalling him from the survey phase) that he seems to have been in the industry a long time and to have learnt to “work smart”.

Participant 8 indicated that working very long hours is not his choice – instead, he is “compelled by the commuters…I can’t knock off while people are still at the rank waiting for transport home”. When asked about the *typical* starting time and knocking off times for MTI drivers he said that “4, 4.30 [am] is the starting time for most taxi drivers, especially for [those transporting] security guards etcetera”, while the knocking off time “can be 8, 9, 10 or 11 pm”. He added, “the standing law is that work continues as long as there are passengers waiting”.

With regards to opportunities to rest during the day, several drivers indicated that these are not always available and that rests are not always of good quality. Participant 4, for instance, commented that “In the middle of the day…sitting in the minibus – it’s not a rest. You are actually on duty”. Participant 5 noted that “After 8am, there’s no-one on the street” and drivers should get a rest then – however, this does not happen. Participant 8 noted that he manages to rest “to some extent – maybe 11 o’ clock to 2 o’ clock; but it’s not a proper rest”.

Participant 5 went on to lament that MTI drivers lack work/life balance, commenting as follows:

> There are lots of things you need to do at home – be a father, check kids' books, go to school meetings. We are human beings…a father, an uncle, having problems at home – how do you attend to them? Your wife needs support – you can't always send the mother to school. Our kids are in detention due to meeting attendances [fathers not attending school meetings]…Yet the owners get to *their* kids' school functions.

Participant 5

Several drivers expressed concerns about the lack of training or advanced qualifications available to them, but there were some dissenting voices in this respect. These opposing views are captured in the following two quotes:

> It's not like we're in an organization….like a corporate firm. What is required is to count money, recognize road signs – no extra training is needed.

Participant 2

> Training could help. My suggestion is that the Department of Transport should require a 2-month course prior to issuing a PDrP. It should include why you benefit by obeying the rules of the road, how to treat passengers…Most of the drivers are from very, very rural areas – so a driver's licence and PDP is not enough. Customer care is so important.

Participant 4

Participant 5 felt that training (eg: "weekend sessions") could assist with the fact that "attitudes need to change" – however, he qualified this by noting that "you can't train someone who doesn't have a driver's licence". He also mentioned that age and driving experience is important, explaining, "I read a certain article…in India, people who drive taxis must be over 40; must have lots of experience". Participant 7 felt that "for owners, it should be obligatory [for their drivers] to undergo driver training…drivers should get lessons to

drive safely with other road users". He reported that he had undergone training through his particular taxi association, "to learn to take care of the public, other drivers, to drive safely with other road users", but noted that "not all associations care about this; they just want to load people". He also commented that he received no certificate after his training, adding "the certificate is in my heart". He later recalled the survey phase of the research and suggested that "the information from the survey could be used to give lessons to drivers, with a small certificate". He also specifically suggested in relation to drivers found to be "guilty of reckless driving – those people could have to have lessons, to try and reduce road accidents". He added that "some people know how to drive…because they can move the car…but they don't know how to use the road, understand road signs, etcetera". Participant 12 noted that "some drivers are stubborn and lack understanding…there are others, though, who do understand and do follow safety rules". He felt that "training would do [the drivers] good", adding that "there was once a training programme, a long time ago, but only a selected few drivers went on it" (this was "offered by a company which is not in existence anymore" and he cannot recall its name). When asked about a recent suggestion which was publicly made by Phillip Taaibosch of SANTACO – namely, that *all* taxi drivers should undergo training – he commented "I am in full agreement that this would bring a great change, in decreasing accidents".

Some of the participants drew comparisons between passengers of formal transport services like buses and MTI passengers, blaming some of their own driving behavior on how they are treated by their passengers. For example, during several interviews reference was made to passengers distracting the drivers or otherwise increasing the risk of crashes. Participant 2 noted that if a passenger says "sho't left" (ie. requests him to stop suddenly on the left side of the road) he "would not immediately stop" but would instead "give [him]self an allowance" – however, he commented that this may not be true of all MTI drivers as "it depends on the state of mind of other drivers". Participant 3 acknowledged that "passengers do sometimes want to stop suddenly, and cause accidents", while by contrast Participant 4 felt that passengers had little influence on the drivers, commenting that "passengers or commuters don't

really cause accidents… perhaps 10% are related to passengers". Participant 9 also noted that passengers can pressurize the drivers by claiming that they are late, while Participants 6, 8, 10 and 11 were certain that passenger behaviour *can* contribute to crashes:

> Passengers rush drivers, tell them they will be late for work. I don't like it…I tell them they must rather wake up early. If I speed the taxi might be in an accident and that will be terrible. I *engage* people, I don't submit to their command.

Participant 6

> If passengers can stop complaining – like that they are late. They must rather get to the rank 30 minutes or 1 hour earlier…that will reduce the pressure on drivers and reduce accidents.
> …Passengers, they don't want to be late, so they speak up and tell you as the driver to hurry and try and make them be on time for work. They say "sho't left" or "after robot", and say it immediately, rather than on time. They may say it when it is not appropriate. If the driver does not do what they request, they insult him. This is why drivers end up breaking the law.

Participant 8

> Maybe passengers would mistreat the driver, and the driver ends up with negative feelings or gets upset, which causes one to end up losing concentration in driving.

Participant 10

> Accidents can result from peer pressure from the passengers…
> A quick example – like the Soweto to town [route]: in my experience the passengers will talk among themselves, like "he will make us late", "where does this guy come from?" No-one cares about what the driver is going through…drivers are not emotionally strong – one might get angry and cannot control his emotions, and may then lose concentration.
> …Drivers must learn emotional control…one needs to be professional and concentrate on the road.
>
> Participant 11

Participant 8 felt that bus passengers show very different behavior towards their drivers and the whole system of bus transport offers better work conditions for drivers:

> At the bus stop – no-one in the bus will shout and insult you if you don't stop wherever they want. If one is late, as the bus travels on prescribed time…the passengers won't yell "we are late", etcetera – they would have chosen that bus. Also, the route factor – on their route, they may have dedicated lanes so they don't have to deal with other traffic as much. Also the working hours – taxi drivers work longer hours, bus drivers have the standard working hours of a general work. In the taxi industry, you don't finish your work until there's no one left at the ranks. Bus drivers can knock off when their shift ends.
>
> Participant 8

Participant 9 also felt that crash rates are lower in relation to buses because they have dedicated lanes – "that is why buses don't crash onto each other but taxis can crash into each other and private cars". When asked whether MTI drivers could adjust to being bus drivers, Participant 8 felt that, "yes, they would adjust and it would be better for them, as they don't really like being taxi drivers and all the innuendos they get from people regarding taxi drivers". This was congruent with the general impression I gained from the

interviewees, namely that taxi driving was not their first choice of occupation but was something that they had to resort to for financial survival and due to lack of alternative options. Participant 1, for instance, stated “We’re just driving because we’re forced to get money”. With regards to whether bus drivers earn better than taxi drivers, Participant 8 noted, “the bus driver’s income…I’m not sure about it, but I think it’s much better – the money will enable [a bus driver] to nourish his family, whereas taxi drivers don’t earn enough for that”.

7.5.3 Theme 3: Taxi drivers drive like delinquents

This theme encapsulates two issues – firstly, the way members of the public perceive (and stereotype) MTI drivers, and secondly, the drivers’ own acknowledgment that at times they break the law and drive under the influence, and this can contribute to crashes. The theme is partly illustrated by the following quotes:

> Private users treat taxi drivers like they’re a bunch of insane people…so drivers confirm their perceptions; we behave like delinquents.

Participant 2

> Yes, I can admit that is true [that taxi drivers break the law]….
> Drivers are different people, with different mental states and attitudes. Some love speeding, some love jumping red lights and stop streets – they may even hit schoolgoing children.

Participant 6

> Eish, ja…drivers can be negligent or oblivious regarding other cars, the environment…

Participant 12

Several drivers alleged that passengers push the drivers to commit traffic offences:

> I don't deny that statement [that taxi drivers break the law]. Taxi drivers are pressured, commuters are complaining, there's traffic – so the drivers end up driving in the yellow lines and things like that.
>
> Participant 8

> Yes – it does happen that the law gets broken, but it's usually the passengers who pressure the drivers to do this.
>
> Participant 9

> Passengers may also want you to drive on the gravel outside the yellow line…so you push yourself for them, to keep them on time, and also to earn the money.
>
> Participant 11

Participant 12 related traffic offences to the targets set for drivers by the taxi owners – "They drive fast sometimes which can cause accidents at any time…they drive fast as they are pushed by wanting to cover their loads…make their target for the day".

Participant 10, while noting that crashes may relate to the fact that "a driver is reckless or careless in the way he drives the taxi", asserted that "the perception held by the public is incorrect" and elaborated as follows:

> There was an instance when I was driving peacefully and in a correct manner but another taxi came up from behind me at a great speed and I had to move to the right to avoid a crash. A traffic cop accused me of wrong behavior or reckless driving and said "all drivers are shit". They have that thought pattern. I told them I moved to the right to prevent a crash but they didn't believe me.
>
> Participant 10

Participant 11 also referred to stereotyping and generalisations about MTI drivers, noting:

> Everything that happens on the road is the taxi's fault as that concept is always on people's minds. The drivers go into these jobs with different backgrounds but people treat us all the same. Some of us have university studies, and we are just doing this job as a temporary measure.
>
> Participant 11

Participant 11 alluded to traffic officers tending to "think to themselves, 'this is a taxi driver' [and assuming] most drivers are not fit to drive, don't have relevant papers", and noted that "if there's a roadblock [the drivers] run away". He commented that "the other stakeholders [in the MTI] always say how bad are the drivers, talk about "putting them into order"…they don't hear their problems or put themselves in the drivers' shoes".

The distinction between MTI drivers and "the privates" came up strongly in relation to this theme – for instance, Participant 1 commented that private drivers view MTI drivers as "rough" and "reckless", while Participant 4 noted that "private cars…don't recognize taxi drivers per se". Several drivers pointed out the unfairness of all MTI drivers being perceived as lawless, with Participant 4 commenting, "Not every driver breaks the law – a certain percentage do, [and] cause problems" for the rest. Participant 5 was readier to acknowledge that drivers engage in "recklessness, disobeying of road signs" and this gets them into trouble – however, he added that "The problem is the driver – working under pressure". Participant 6 noted that "private cars are at fault as well – for example, a private driver will use a cellphone and not notice other cars…will change lanes without checking and that can cause accidents".

Some participants drew an overt link between their work conditions and passengers' demands and their "delinquent" or lawless driving. For instance,

> Breaking the law] is due to the pressure I'm speaking about. You need to reach a certain target…the more trips I make, the more the pressure lowers…[in relation to] the target I must reach at the end of the day.

Participant 4

> It is a sad thing, however I will admit that [drivers] do break the law…but it is because of the public that they break the law. Passengers cause pressure – citing that they are late…the driver tries to save their job by speeding.

Participant 8

> Yes [laughs]…of course I can agree [that taxi drivers break the law. More especially, yellow line [offences] when there's traffic. And speeding – it relates back to the need to meet the [owner's] target.

Participant 12

Participant 1 described himself as someone who tries "to drive safely despite the pressures", implying that he does not want to be like other MTI drivers. Participant 2, like Participant 4, viewed job pressures as direct causes of drivers breaking laws ("like skipping the traffic lights"), while Participant 3 commented that even though "some drivers are neglectful and others pay attention", the general norms in the MTI can shape one's behavior – "the industry can corrupt you". He added,

> We may drive in the yellow lane, overload, ride on the wrong side of the road with oncoming traffic…It's something we can easily do, without even thinking twice.

Participant 3

Participant 7 commented that "those who break the law don't take the job seriously…don't look to have permanent careers [as drivers]; 'piece job' drivers are not serous". He also noted, "Our IQ – the way we think – is not the same…If you break the law, it shows you didn't go to school, never learnt to

care for people". After noting that "crossing the yellow line etcetera" causes accidents" he explained that "some do still break the law – in a hurry, wanting to make more loads rather than taking care of people".

The issue of negative public perceptions of MTI drivers raised some ire amongst the interviewees, with Participant 2 describing "private drivers" as tending to be "haughty" and Participant 8 noting that "private drivers usually have negative attitudes to taxi drivers, and make it difficult for them to drive". Participant 1 commented in a somewhat envious manner that, in comparison with MTI drivers, "private drivers have no stress". Participant 4 noted that private drivers "have a tendency to say 'all taxi drivers are rude', and actually *not* all are rude". Participant 6 stated:

> People have negative attitudes to taxi drivers…
> They say ***asigezi***…we don't wash. [They think] we don't wash, don't respect, use crude language, [are] uneducated, give bad customer service – not interacting in a good way with passengers.
>
> Participant 6

Participant 7 made mention that when people use the nickname *mageza empompini* ("they who wash at the tap") to refer to MTI drivers, "you have to channel yourself, calm down, ask them not to use that language".

Several interviewees raised the issue of drivers not being in possession of necessary prerequisites like driver's licences and PDPs. Participant 2 noted that "if you don't have such documents, it's easy to run away from crimes you may commit", which was echoed by Participant 5 commenting that "drivers run away after accidents because they don't have licences, PDPs etcetera".

Participant 3 stated categorically, "most taxi drivers don't have driver's licences" and also made mention of taxi owners "just taking anyone". For instance, he remarked that some owners fail to check whether the drivers have licences or PDPs and some hire foreign drivers without even knowing if

they have a criminal record in their country of origin. Participant 5 raised a very similar viewpoint, questioning how an owner can "hire a driver without even checking their CV?" and commenting that "the most important thing is a driver's licence – that is so, so critical". He added,

> A typical example – someone [a driver] comes from Namibia…there's no checking of his criminal record, whether he is fit to drive. Or maybe he has a Ghanaian licence. You must check it, and the driver must get a South African licence.
>
> Participant 5

Participant 7 raised concerns about the quality of PDPs, commenting that they are "now for everybody", whereas "before, the PDP was meant for drivers of trucks, taxis, etcetera…I did my PDP training before 1999, when traffic officers had to come to the rank and test you to see how you drove with passengers, how you behaved with passengers. Before, it was much better to be given a PDP – now you can be a reckless driver with a PDP…it's no longer meaningful".

The problem of distracted driving came up during some of the interviews, but the drivers had varying views in relation to how serious a problem this is. Participant 1, for instance, claimed that it is "not so difficult" to do lots of things while driving (eg: focusing on passengers, looking out for new passengers, making change, etcetera); he specifically mentioned that "the first passenger is in charge of handling change". Similarly, Participant 2 stated that having to count money "doesn't disturb [him] at all", commenting that whilst being interviewed he could simultaneously be "driving, counting money and hooting for passengers". As noted earlier, Participant 9 viewed "the cash-exchanging situation" as contributing to crashes and Participant 10 commented that drivers must be alert to prevent accidents. Participant 3 felt that "Taxi drivers should face heavy penalties for talking on the phone", while Participant 4 raised the issue of distraction due to mobile devices being a problem not only amongst MTI drivers but in society in general:

> Drivers using cellphones without handsfree kits…things like that…we need to train about the dangers of this. It's a collective issue…not drivers per se.

Participant 4

A few participants mentioned the issue of driving under the influence of alcohol and drugs – Participant 8 listed this second in relation to the factors he perceived as causing crashes, with the first of these being "bad weather"; he noted that "maybe the consumers [passengers] are complaining…the pressure leads drivers to resort to alcohol or drugs". Other participants made the following comments:

> Drugs – like dagga – play a role [in taxi crashes]. They can be found all over the taxi ranks. Liquor, alcohol…you can't drive under the influence. But drivers are stressed the whole day, pressure comes from the owner…they use drugs or liquor because of that. A lot of responsibility lies with the owner of the vehicle.

Participant 5

> …you might have two drinks because you're about to knock off. You must not drink and drive…[but] the more you drink the more you need, so you become drunk.

Participant 7

> [When you travel] from point A to point B, sometimes you can see in the driver's eyes that they are using something…[they're] not in a good state. Those people are dangerous, yet they are driving every day. …Young guys take substances…

Participant 11

As noted under Theme 1, Participant 7 also expressed the view that some owners purposely hire *nyaope* addicts as drivers to maximise profits. Participant 11 expressed a similar view, noting:

> Owners take drivers even if they know they are unfit [to drive]; they just rely on them to drive and earn money. The owners know that the drivers use substances – eg; they may be drunk…the owners are ignorant, they don't even check the drivers.

Participant 11

7.5.4 Theme 4: The taxi is scrap, a *skorokoro*

Several drivers raised concerns about the state of the vehicles they are expected to drive on a daily basis, with three asserting as follows:

> Maybe 50% of the vehicles are unroadworthy…[the owners] don't maintain their vehicles. Like tyres, etcetera.
> The driver may be a good person, obeying the rules of the road, but a mechanical fault can still cause an accident.

Participant 4

> Most taxi owners care less to service or fix their taxis….Being pressurized by passengers regarding torn seats or old "scrap" taxis (*skorokoro*), the driver ends up driving with a negative spirit and changes in mood.

Participant 10

> Negligence should stop in regards to owners not attending to the taxis fully…minor and major services don't happen. If the vehicles were maintained better this would decrease crashes – like fixing the brakes. Before, the owners used to service the cars correctly, like at the dealerships where they bought them. Nowadays they just use their [own] mechanics. This reduces the costs, which is why they favour informal mechanics over the vehicle manufacturers.

Participant 12

As noted under Theme 2, Participant 10 recounted how when drivers report vehicle defects (eg: after these have been pointed out by traffic cops) the owners sometimes refuse to take any action. He added,

> The drivers are not satisfied with their work conditions – why? It is because they know that the cars they are using to do their work are not in good condition, but at the same time they can't let go of their way of earning a living.
>
> Participant 10

Participant 9 listed "the vehicles are in bad conditions" as a key reason for crashes and Participant 8 echoed this, referring for instance to situations where "the tyres are not changed in time". Participant 8 also commented, "the Zola Budd[98] - its typical problem is brakes, but mostly engines will collapse because of being overused". He felt strongly that "government should assist with better vehicles…government should provide *more* cars and in better condition – SABS approved". He also noted that "when vehicles break down, a break in customer service occurs; full-time services are disrupted". He also briefly commented on some taxis not being "fit for purpose", but when asked whether he was aware of the so-called "Killer Quantums" (Toyota Quantum panelvans which are illegally converted to "lookalike" Quantum minibuses) he denied having heard of these. Participant 12, by contrast, was aware of this alleged practice, commenting that "at first Quantums were not designed for passengers and then later Toyota was producing Quantums for passengers, giving the impression that all Quantums *are* minibuses". There was a brief discussion between the participant and the interpreter regarding the term used for Quantums which are not designed for passengers – with the participant stating that they are "stationery vans" and the interpreter referring to them as "panelvans" or "delivery vans".

[98] "Zola Budd" is a slang term given to particularly small, fast taxis – named after a slightly-built female barefoot runner, who was born in South Africa and became known internationally for her sporting achievements in the 1980s. I recall that in that era bigger taxis were sometimes termed "Mary Deckers", a reference to a taller female US athlete who claimed that she was tripped by Zola Budd during a particular race.

Participant 9 made the following comments regarding the lifespan of a taxi:

> It depends on how it's driven by some drivers – for a reckless and negligent driver it takes 3-4 years. The lifespan should be 5 years for a careful driver who takes care of the vehicle.
>
> Participant 8

Participant 10 pointed to the lack of assistive technology playing a role in crashes – for instance, he commented that at times "you may have to hit the brakes hard and not all brakes are ABS, so this may cause an accident".

The mismatch between the vehicles and their human "cargo" was alluded to by some participants – for example,

> Some people are driving wrecked cars, like they're selling Cola.
>
> Participant 2

> Some owners don't [even] fix the vehicles. Public transport vehicles must be regularly fixed…Some owners are just pushing the drivers to bring money…they don't want to take the vehicle out of service [to fix it].
> …Some owners have 80 taxis, but each and every one has problems – you can't keep them all fixed all the time.
>
> Participant 7

Participant 3 expressed the view that due to "industrial relations" between taxi owners and drivers being poor, the owners are "very negative towards drivers" and do not act on their feedback when they report vehicle defects. As noted under Theme 2, Participant 11 also referred to owners responding to feedback about vehicle defects by simply taking the keys away and giving them to another driver.

Participant 7 reported rather a different experience, however, noting that he had submitted ideas to his association (for instance, for “daily passenger cards”, a type of loyalty programme) and these ideas were being considered.

7.5.5 Theme 5: We are not transporting Coca Colas

As noted under the previous theme, Participant 2 commented that when drivers drive “wrecked” taxis, it’s as if they are “selling Cola” rather than transporting people. Another participant made the following points:

> We’re moving *people*…We are not loading animals…how many people will be affected if one person dies? And you can have three family members travelling in one taxi.
> How do you carry people without a valid licence? Even if a mechanic must drive your car [to the workshop] for repairs, you should check he has a licence before letting him drive your car…what if a person driving your car gets an accident? It’s not a matter of how far [or] how close [you drive] – you must have a licence regardless of how far you drive when you get into a vehicle.

Participant 5

Several of the interviews contained references to customer service and a few of the drivers alluded to the customer rights and human rights of MTI passengers. Participant 3 commented that the drivers tend to “give bad customer service to passengers”, adding that the practice of “4x4, 5x5” does not help the situation. The interpreter (familiar with this practice from his use of the MTI) explained to me that this was a reference to commuters being instructed to squeeze up during peak periods – for example, drivers may exhort their passengers to squeeze 4 people onto a seat designed for 3, or 5 passengers onto a seat designed for 4. The same participant noted that passengers “have little power – they can’t choose which taxi to use, for fear of being barred from ranks…the queue marshal may send that person away”. Participant 5, who felt that “Accidents you don’t plan – they can happen any

time", noted that as "taxi accidents are a risk to people's lives" traffic officers should play a role in reducing them. Another interviewee equated law-breaking with not caring about human beings:

> I know the value of human beings…I must take care of myself, of human beings.
> …Some drivers do break the law – in a hurry, want to make more loads rather than taking care of people.
> I must obey road signs and road rules to care about people.

Participant 7

The same participant quoted above commented that drivers learn their values partly from their parents, and also noted that drivers can play a role in shaping how passengers behave:

> The way I'm handled by my father and mother is the way we behave outside – learn to respect humans [and] cooperate with different people.
> … Some [drivers]…their fathers and brothers have ranked before…but some don't even respect their elders in the taxis.
> As a driver, I used to fight with different passengers – but I must respect them, so they give me respect too. I must be respectable…in this industry, the driver must handle the situation in a good manner. For example, when a passenger closes the door very badly, you have to ask them nicely, "please don't hit the door". That passenger might have her own problems. If you don't treat her in a good manner, she will run away from you tomorrow.

Participant 7

Participant 11, however, noted that passengers may have contrary expectations – for instance, "the very same passengers who are pushing the driver to speed, now complain that they will be sitting for 3 hours due to being stopped by a cop".

Customer service was noted by Participant 7 to be part of the sustainability of the industry – he commented that "if you are standing in line in the taxi rank, you will meet the same people, especially in the early morning when people are on the way to work – you must build relationships, have good customers". He reported having raised with his association's chairman an idea for producing "small cards for passengers who use the service every day January to December, "daily passenger cards" – the idea being to prioritize those passengers so that "in the queues of people going to different destinations, the daily passengers don't have to have plenty of people in front of them…they don't have to queue with the visitors". He felt that "you must prioritize the daily passengers to make it easier for them". Participant 8 expressed a similar view, commenting simply, "The driver needs to encourage commuters to use his taxi again the next day – no commuters, no bread".

7.5.6 Theme 6: We push the economy – we should own the road

The drivers appeared keenly aware of the important role they play in getting people to work and other destinations in greater Johannesburg. Two offered particularly pertinent comments in this regard:

> What would happen if there were no taxis? When there are taxi strikes, some people just stay at home.
> …I am the one who took people to work, and I'm the one who takes them home. A huge number of people rely on the taxi industry.

Participant 7

> We are the ones pushing the economy…everywhere, you see what happens when the taxi drivers are on strike – people get stuck and this interrupts the corporate world.
> …In rush hours, there has to be a difference between a public taxi and a private car…if you are loading 15-16 people, we should own the road.

Participant 11

As mentioned under Theme 2, there were some suggestions that special dispensations should be offered to taxis (similar to those offered to rapid bus services) because of the valuable role they play. For instance, the following suggestions were offered by two interviewees:

> There must be a special lane for taxis – like on Louis Botha Avenue – to avoid "the privates".…one line to Johannesburg, one line back.
>
> Participant 1

> Taxis don't travel alone – they [should] use the same lane as the Rea Vaya…The government should be greatly concerned regarding 15-16 people in a vehicle, not private cars with 3-4 people – they should open up a lane for taxis in rush hour. Private cars can cruise in their own lane.
>
> Participant 11

Participant 11 also referred to the broader MTI as an important source of employment, not only for drivers but for a range of other workers – he commented, "You can't sabotage the industry – there are drivers, car washers, rank mamas…lots of people work in this industry". He noted, "this industry can even employ ladies [as drivers], people who are passionate".

In general, conflict points between the MTI and other road users (including "the privates") were mentioned as a stressor faced by the drivers as well the cause of some accidents. For instance,

> Private cars…[we drive] along with them, share the same road – gets a mix-up. Like that rank near Eastgate – there are lots of office parks there….if government could create a lane so taxis could move more swiftly.
>
> Participant 6

> The Rea Vaya…for example, Albertina Sisulu Drive feeds into Bedfordview and the Rea Vaya [getting] its own lane there has made matters worse for minibus taxi drivers. There was a recent accident…when the Rea Vaya [bus] didn't brake in time.
> The freeways [in Joburg] are too small for the magnitude of vehicles – that's why taxis drive in the yellow line.

Participant 6

> Accidents result from bigger trucks, Putco buses in the location…

Participant 11

Several interviewees pointed out that even when other road users – such as individual vehicle drivers – are at fault, taxi drivers tend to be blamed for crashes. Some commented on how quickly the public and traffic officials make assumptions about who is to blame for crashes, and how prone they are to blaming MTI drivers. Participant 3 described coming across a crash scene involving a taxi and other vehicles and finding himself surmising how it may have happened:

> Like last Friday at 5.30 or 6.30 at Xavier, I saw an accident had happened with a truck, a taxi, a private car…maybe the private driver was chatting on a cellphone – I think he caused the accident. The taxi driver, maybe he was trying to avoid the private car, and collided with the truck…I'm not sure how many were injured.

Participant 3

Some of the drivers suggested that their behavior is legitimate and that they should have allowances made for them by other road users – as captured, for instance, in the following quotes:

> Driving on the shoulder lane – you end up forcing in front of a private car…ignorance can cause the private driver not to give you access. A guy driving a big car doesn't allow you access to squeeze in.

Participant 4

> When the other drivers want the right of way, they may ask taxi drivers to let them in. But when the driver needs to stop and let the passengers out, some drivers would not let them in. There's poor communication between taxi drivers and other drivers.
> Some other drivers cause accidents intentionally as they don't think about [taxis] carrying 15 people – they go in front of them and then brake, without thinking about the passengers' safety.

Participant 11

Rather provocatively, Participant 4 questioned me, "you, as an ordinary driver, how would you treat a taxi driver who wanted to cut in front?" On hearing my response ("I would see that you had a lot of passengers, like a bus driver, and I am a solo driver, so I would probably let you in") he laughed several times and then commented,

> If everyone was like you we would minimize this kind of thing! If a minibus is loaded with 22 passengers…give space to the driver. It can play a major role in saving lives..,About 40% of the [taxi] accidents could be avoided, if road users respected one another and gave right of way. Every road user at the end of the day has a role to play…At the end of the day, we're all drivers.

Participant 4

He added, "Thank you for this study, dealing with the carnage", before indicating that he had run out of time and needed to end the interview.

Participant 11 referred to the fact that even when stakeholder meetings are held to address transport and road safety issues, MTI drivers are not included

– “every time there is a meeting with the stakeholders the drivers are left out…other stakeholders don’t call them to raise their concerns”. Thus, far from “owning the road”, he expressed a sense of the drivers being “poor cousins” within the transport sector.

7.5.7 Theme 7: Government needs to put its eyes on the industry

For the most part, the drivers perceived government as having a major degree of responsibility in relation to improving the industry and protecting the drivers, through better regulation and other measures. Many expressed a desire for government intervention, both to regularize their work conditions and to enforce road traffic rules and vehicle roadworthiness requirements. This is captured, for instance, in the following quotes:

> The government doesn’t care about us. They need to put eyes on and see what is happening, and protect us.

Participant 7

> The government must take the industry very seriously and engage with the drivers who have been in the industry a long time.

Participant 11

The participants as a whole seemed to favour formalization and upliftment of the MTI, chiefly by means of government interventions and changes to the design of the road and transport system – with the exception of one participant who felt that the MTI should cease to exist altogether (as discussed a little later). Participant 12 was a little unusual in his comment, “I don’t have a real idea of what the government etcetera should do” – instead, he felt that a strong degree of responsibility lies with the drivers, who must “adopt safe driving habits”. Participant 1 felt that crashes could perhaps be reduced “if government can check vehicles for safety…[and] if government can order owners to pay drivers properly”, while Participant 2 agreed that government should “ensure that taxis are in good condition” and also

suggested that government ensure that “drivers have licences…permits”. Similarly, Participant 3 felt that “the government should be stringent in laws” and should ensure “that taxis are in good condition, with enough space, seat-belts…in perfect condition”. Participant 6 pointed to the importance of police visibility, noting that “when any driver sees police, he is more likely to adhere to the speed limit, whether it’s a 60km zone or a 120km zone”. Participant 8 commented on the need for improved road infrastructure, particularly in relation to repairing of potholes – he noted, “maybe a car is trying to avoid potholes…and another car is following too close behind; sometimes, in trying to avoid a pothole you might hit another vehicle”. Participant 9 felt that taxi routes should be formalized – for instance, “on the Johannesburg-Eastgate route it should be timed, with travel schedules…the driver shouldn’t be early or late – in both cases he will have broken the law”. As noted under Theme 6, some participants suggested dedicated taxi lanes (at least at rush hour) and government prioritizing of vehicles with many passengers. Participant 11 suggested that this would allow “people [to] leave their own cars at home” and commented that “people will rely on public transport if taxis are safe and neat and drivers are clean, uniformed, trustworthy – people will then leave private cars at home, except on weekends”. He added that “people prefer taxis as buses are very full [and the] routes are different” – however, as things stand currently “people say “I’d rather kill myself than die in a taxi”””. In relation to the issue of drivers wearing uniforms, Participant 12 was unsure that this would be feasible in Johannesburg even though it has been implemented in, for instance, Nairobi. He paused for a lengthy period (“Mmmmm…”) before commenting, “I’m not sure about it, I don’t know if taxi drivers in this country – knowing them – would accept it, although I think it could be a good thing”. He then mentioned that once before his taxi association “announced that drivers should wear formal clothing like a proper shirt, with a shirt and a tie on Fridays” – however, that idea was short-lived in that “the drivers [only] did it for maybe 2, 3 months”.

A strong message emerged in relation to the need for the Department of Labour – more so than the Department of Transport – to address the drivers’ work conditions and labour relations. For instance:

> The government and Department of Labour should intervene to minimize pressure and reckless driving. Drivers need to be treated according to the law – the Department of Labour should assist.
>
> Participant 4

Participant 5 focused on labour relations, noting that "Owners must be registered, pay tax, pay UIF, give sick leave, etcetera". He also commented that "it would be reasonable to work 5 days per week, and some drivers could work only on weekends". He viewed the variability between operators as a problem, noting that when there are "different companies on one route, everyone comes with his own rules – if there was *one* rule, that would improve things". Participant 11 voiced the following opinion:

> [Crashes are caused by] the way we operate – between the government operations and the stakeholders…and the new transport systems they introduced. Taxi drivers are not difficult to regulate – the problem is with our bosses, which the government could regulate. For example, to ensure all the drivers earn a weekly wage, to put bread on the table…the government keeps making promises but taxi owners don't adhere to those guidelines.
>
> Participant 11

Some interviewees referred to more than one government department having responsibility for improving the situation, as expressed in the following quote:

> [Traffic cops] could issue penalties to taxi bosses for working [drivers] overtime, not being registered with the Department of Labour, things like that.
>
> Participant 4

There was also an acknowledgement by several participants that fraud and corruption on the part of government officials is a problem which must be addressed. Participant 4 commented, "Traffic cops are humans – money is

involved, and money is a source of evil", while Participant 6 commented that "visibility is important but the way police do their job is a problem…for example, by paying a bribe you can get away with murder". The importance of local government intervention was stressed by Participant 10, who commented that "the traffic department and the community safety department should continue with the programme of impounding non-roadworthy vehicles" – he too noted the existence of corruption, however, noting that due to this "some vehicles are back on the roads within a week". Participant 11 also mentioned instances of fraud and corruption which are partly related to "fighting over routes" and include "traffic officers [letting] you go after paying R20". He commented,

> Some [taxi] bosses are thugs. Bosses from certain associations may be traffic cops, so they stage a roadblock to cripple their competitors. They use their powers as they can't combat them directly…they use their partners [with the traffic police], so drivers may then have to use other routes.
> …Even when the taxis are not good…like at Ennerdale testing station…the certificates are given in the house – the vehicles don't even go for testing. Government must check if the taxis are valid, and hire people who will be on the road – traffic officers should pull vehicles off the road if they're not fit for the job. But officers just take bribes…those who are saying they are offering solutions are actually just looking to line their pockets, make money, do investments.
> The owners are corrupt, forgetting that they are going to kill their own people in the accidents…16 dead, 15 dead…
>
> Participant 11

In addition, Participant 11 referred to the shadowy or invisible role of taxi owners:

> The owners are not upfront – some are traffic cops, some are government officials, some are business owners…they are behind the scenes. They don't show up – the *isinduna*[99] just collect the money. You just deal with the 'frontman', not the owners.
>
> Participant 11

Two participants had a clear vision of how government should intervene on a broad level to promote sustainability and widespread economic empowerment within the MTI:

> If I were a president in South Africa, I would allow taxi owners to have limited quotas – like one owner could only have 10 vehicles…no owner should own more than 10 taxis. I will provide that law for owners, looking forward to future generations. For the future of my kids, I am accepting that I would like to grow up and own taxis myself in future…where am I going to operate, if I can't find space for my taxis? My family needs my support…I want to own 1 or 2 taxis. My brothers must have something tomorrow. That's the rule I would be applying first and foremost – 10 drivers would be upgraded at the end of the day.
>
> Participant 7

> The government needs to regulate [the industry] as it can lift people out of poverty…but the government doesn't take it seriously and says "we're not benefiting"….This is a big problem – government must engage with drivers, go from the bottom.
>
> Participant 11

As noted under Theme 2, Participant 7 felt that unions should intervene and "force associations to uplift their drivers", as well as "protect [the drivers] if anything happens". Through this and other comments he made, he clearly

[99] "*Isinduna*" is isiZulu for "chiefs", a reference to taxi association officials.

perceived upliftment of the drivers as a necessary part of improving road safety in the MTI. Like other participants, he viewed labour relations in the industry as key, commenting:

> If there is a minister of unions, they should do the right thing for *all* people, even those who are not registered. We [taxi drivers] are not equal with other workers.
>
> Participant 7

Participant 11 held a similar opinion – he noted that "if you can improve the [drivers'] jobs…whether it's by 20% or 80%...we can advance for everyone. You must start from the bottom – improve from the bottom up". He expressed the view that "professional drivers must be protected by the government", which he acknowledged should go hand-in-hand with "renewing the permit every 2 years, getting a licence every time". With regards to unions, he noted, "Taxi drivers don't have any unions. As a member of a union, you must pay something every month…so with no payslip and no bank, one can't be part of a union".

In the opinion of several participants, the key responsibilities lie not so much with external parties like unions or the government but instead sit squarely on the shoulders of the taxi owners and taxi associations. For example,

> Taxi owners are part of the problem…they are not right (but I'm not talking about my particular owner). They are *baluhlaza*[100], greedy…the way they work is a problem.
>
> Participant 6

[100] After this interview was over the interpreter tried to further clarify the meaning of the term *baluhlaza* by likening it to two English idioms – namely, a "take it or leave it" attitude, or "it's my way or the highway".

> …if taxi owners can attend to their cars, like fixing and servicing them when that is needed…Constant meetings must be held every day at the ranks, to address issues of car crashes.
>
> Participant 10

However, there was some cynicism about whether the associations are up to the task – for instance, Participant 11 commented, "Some associations claim to be good, to monitor, drive around in squad cars – but they are lying, they don't take their job seriously". Participant 8 perceived a clear degree of responsibility on the part of owners and associations but stressed that he viewed government as having the larger responsibility both in relation to vehicle standards and in relation to drivers' work conditions.

As noted previously, one participant stood out amongst the interviewees in that he felt that the MTI *should be done away with* altogether in favour of a completely different transport system:

> Government should help – there is a shortage of taxis…buses need to be brought in by government. There are too many people needing to use taxis, which causes long queues at the ranks. It also makes the drivers *hamba* [go] over the yellow line…
> In my opinion, it would be better if the government implemented a bus system as that would improve the situation….I emphasize that the government should implement bus systems, so then there will be fewer taxis and people will eventually start to opt for buses instead. They should increase buses – for example, you need 10-15 buses from Tembisa to Kempton Park, as there are lots of people…The elderly people walk more than 2k from the bus route, so cars should collect them to take them to the bus routes….like in Alex and Tembisa, they are using Avanzas.
> …I don't support minibus taxis continuing at all.
>
> Participant 8

Finally, some participants talked in terms of *collective* or shared responsibilities for particular road safety problems – for example, after mentioning drivers using cellphones whilst driving Participant 4 stated that "this is something which must be taken up by the Department of Transport, Department of Labour, government, owners [and] drivers". Participants 5, 10 and 11 expressed their views as follows:

> At present this [government] is the problem in the whole system. It needs to be subsidized – but how do you subsidize someone who doesn't pay tax? …Owners, drivers, the government – they should all work to regulate the system.
> …It's everybody's duty to try and deal with [taxi crashes].

Participant 5

> The government and organisations must come up with a plan to reduce accidents in Johannesburg. They must call a meeting to address these issues, like "one, two, three…". For instance, taxis need to be fixed and serviced, and [we must] deal with the problems faced by the drivers on the roads.

Participant 10

7.6 Tentative financial calculations based on the interviews

The financial arrangements between MTI drivers and owners received substantial (and mostly spontaneous) airtime during the interviews, with all of the drivers volunteering information in this regard. Given the study's overt and stated focus on crash causation factors and ways of reducing MTI crashes in Johannesburg, I did not pre-empt a discussion of any particular crash causation factors and did not have any *a priori* concepts I was expecting would emerge during the interviews. Thus, it was striking that the "money side of the industry" occupied at least part of every interview, being raised first (either directly or obliquely) by the interviewee and then elaborated on – often in vivid detail – when I asked for clarification. This suggests that

the participants as a group perceived a strong link between financial factors prevailing in the industry, and the phenomenon of MTI crashes.

Due to all the participants providing at least some concrete figures to illustrate their points regarding the financial arrangements between drivers and owners, it was unexpectedly possible for some tentative calculations to be carried out. These yielded a "taste" of the typical owners' demands and drivers' wages, at least insofar as the interviewees reported these.

7.6.1 Owners' demands

Given the strong focus on money-related pressures by many participants, I deemed it useful to gauge just what sorts of demands taxi owners seem to place on drivers. Almost all of the interviewees reported that their first priority was to pay the taxi owner his/her due, then to cover essential operating costs (eg: filling up with petrol and washing the vehicle at expected intervals, as well as covering traffic fines) – only after these requirements had been seen to, could they keep whatever (if anything) was left of the day's takings. Previous researchers have referred to this as their "share of the checkings" (see for instance ILO, 2003).

Participant 1 reported that at times he makes "R500 for petrol, R600 for the owner, and nothing for [himself] except money to eat [lunch]". Participant 2 explained that "some bosses require a lot of money", naming the figures "R500, R600, R700 per day" and adding that "it varies". He elaborated that he "must provide R500 per day, on [his] route" and that "it also depends if it's a weekday or a weekend day". Similarly, Participant 3 reported that in his experience the owner's due is generally "R500 per day, every day of the week, plus a full tank"; however, he also noted that "It depends on the line you are operating on" – in Johannesburg, "the target can be R3,000 per week or even R3,500 per week". Participant 4 also explained that the income paid to owners "differs according to different routes, eg: township to town, town to town…"; he stated that on his route "the usual is R1,000 per day". He also mentioned that "towards month end" he is busier (implying that it is easier to

reach this target), but things are more difficult when things are less busy "in the second week" of the month. Participant 5 reported, "owners want R500 or R700 per day" and added that "there may be a target of R3,500 per week". Participant 6 noted that owners "may set a target of R3,500 or R4,000 per week". Participant 8 reported that targets vary according to the type of vehicle – "for the Siyaya, per day it's R500 to R600 that is expected by the owner. For the Quantum, per day it's R700 to R800. For the Sprinter per day is R1,500 to R1,800 – it carries 22 passengers". Participant 9 asserted that "the minimum amount that needs to be given to the owner per day is R500-R1,000". Participant 10 noted that "drivers maybe have to give the owner R4,000-and-something Rands per week" but also commented, "it depends, it's variable" and "not all associations are the same". He explained, "It also depends on if you are driving on a high volume route with lots of passengers". Participant 12 reported that "the target differs from owner to owner – for example, it may be R500 for a Quantum combi, but some are R600, R650 per day…it depends on the number of passengers in a combi – is it a 13-, 14- or 15-seater?"

Participant 11 raised the fact that in a climate of high unemployment, people are so desperate for work that they may accede to unrealistic targets: "drivers from elsewhere come to Johannesburg to make money for the kids and some come from other countries or provinces and undercut local drivers…desperate for work, they don't wash the taxi, they don't wash themselves, they just promise to earn R700 [per day] for the boss – even if they are not capable of this, even if it's not realistic".

The targets mentioned by the interviewees are summarized in the table overleaf. On a per-day basis these ranged from R300 to R1,800, while those mentioned on a per-week basis ranged from R3,000 to R4,000. The interviewees mentioned different work week durations, with almost all working 6-7 days per week – an exception was Participant 9, who acknowledged that his situation was atypical before explaining that he worked a 5-day week plus one day each alternate weekend (and also putting in an unusually short day, compared to the other drivers). Without knowing on how many days an owner

with a per-diem target would actually receive dues from the driver, it is difficult to calculate a total. However, to obtain a rough estimate the figures named by the interviewees were converted as best as possible to a daily target (based on a typical driver paying his dues on 5-6 days per week) and these figures were then graphed as shown below. This suggested a clustering of the targets in the R500-R700 range. This was the daily target range mentioned by Participants 2, 5 and 12, as well as by Participant 8 (the latter specified that he was referring to Siyayas, ie. excluding the bigger types of minibuses).

Table 7.1: Taxi owners' targets, as mentioned by interviewees

Interview number	MONETARY AMOUNT MENTIONED
1	R600/day
2	R500/day, R600/day, R700/day – it varies from owner to owner
3	R300/day (or R3,000 – R3,500/week)
4	R1,000/day
5	R700/day or R500/day
6	R3,500 – R4,000/week
7	Those who drive Siyayas check R400/day; my boss wants R600/day, Monday to Saturday
8	Siyaya: R500-R600/day; Quantum: R700-R800/day; Sprinter: R1,500-R1,800/day
9	Minimum R500/day, up to R1,000/day
10	Variable; it depends. At most R4,000 something per week
11	I must make R400/day and wake up with a full tank of petrol. Some drivers make unrealistic promises (eg: R700/day). At the end of the day, the boss wants R500-R700.
12	The target differs, eg: Quantum combis R500/day, but some owners want R600 or R650/day.

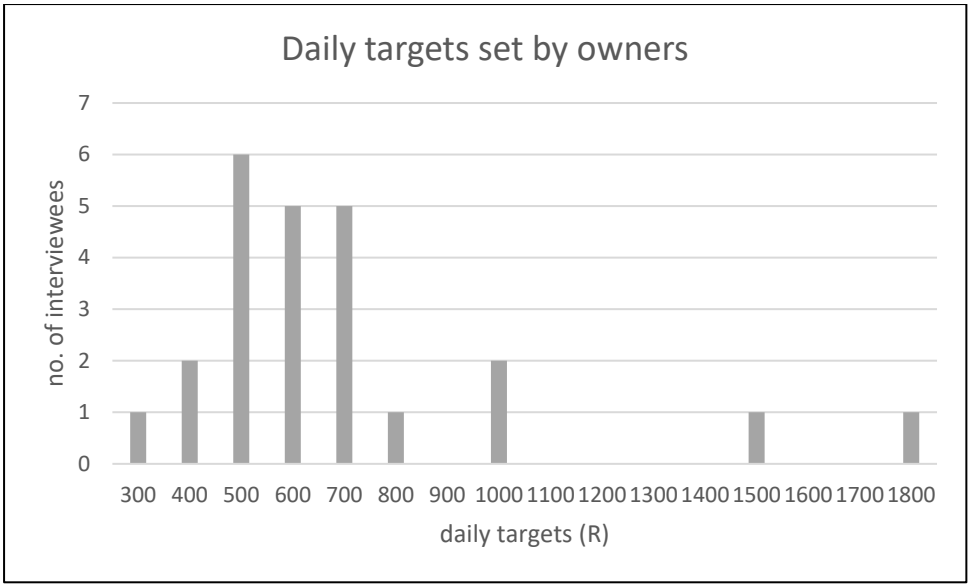


Figure 7.1: Estimation of daily targets, extrapolated from the interviews

As a cross-checking measure, the mean and median of the daily targets mentioned were also calculated and are reflected in the table below.

Table 7.2: Mean and median of daily targets mentioned during interviews

AMOUNT	NO. OF MENTIONS		
R300	1		
R400	2		
R500	6		
R600	5		
R700	5		
R800	1	Mean = R1,050	Median = R16,700/24 = R695.83
R900	0		
R1,000	2		
R1,100	0		
R1,200	0		
R1,300	0		
R1,400	0		
R1,500	1		
R1,600	0		
R1,700	0		
R1,800	1		
	24		

Based on the median of about R700 per day, and with the presumption that this would be paid over on at least 5-6 days per week by most drivers, it seems likely that an average owner would claim dues of R14,000 – R16,800 per month per vehicle. Based on the survey reflecting that the majority of drivers drive 11-16 seater vehicles, it is possible that the much higher daily dues mentioned by some interviewees related to much bigger vehicles – indeed, one interviewee specified that higher amounts are charged to drivers of Iveco taxis, which seat more than 16 people.

In addition to paying the owners their "dues" according to the targets, many of the interviewees indicated that MTI drivers are expected to cover certain operating costs out of the fares paid by passengers – thus, whatever is left from the day's takings after the owner has been paid is not entirely "income in the driver's pocket". For instance, Participant 1 noted that he "must get the taxi washed every other day at R70 a time" and "the driver must also pay fines…tickets – the owner gets the ticket and makes the driver pay". Participant 6 also reported covering vehicle washing costs – "every other day I do a full wash, which costs R90 including body polish and tyres…then I do minor cleaning on the other days, costing R20, or I pay R70 for soap and tyre polish only". Likewise, Participant 7 reported that "during the day, if I have made the R600 [that the owner requires] and if the taxi is very dirty, I have to wash it…that costs roughly R60 per wash". Participant 8 reported that drivers "pay for the tickets" and vehicle washing – in relation to the latter, "the driver covers it every day, a simple wash, and the cost depends on the type of the vehicle…like a Siyaya it's R50, a Quantum it's R70, and a Sprinter or Iveco is R120". He explained that in relation to "servicing and tyres the owners take care of it". Participant 10 noted that drivers must pay for "petrol, car washing (about R70 every day for inside and out) and airtime to communicate with the owner". Participant 11 noted that "one must wake up with a full tank of petrol". He did not mention how much he spends on "car washing" but suggested that "government should look after this" and that "it should be done overnight…so in the morning [the vehicles] will be clean".

Participant 6, quoted under Theme 1 in relation to his view that moving away from a cash-based fare system would be problematic, explained this view on the basis that “the owners would not give over money to drivers for what they need” and would not even take on the responsibility of providing garage cards (ie. credit or debit cards which can be used at petrol stations).

7.6.2 Drivers’ wages

The driver survey offered some indications that drivers tend to be paid weekly wages by the taxi owners, a surprising finding given that past researchers (eg: ILO, 2003) found that the drivers simply pocketed whatever portion they could of the day’s takings (“checkings”) and did not receive any formal wage or salary. I surmised that weekly wages may have come in as a result of the sectoral determination for the taxi sector (DOL, 2011), which was also referred to by Sauti (2006) as a relevant issue in relation to MTI drivers’ pay after its advent in 2005. This may have resulted in owners paying a weekly wage in some semblance of complying with the determination. However, some participants described this wage as tenuous rather than secure – for instance, Participant 5 noted, “On payday, if the owner is not around for 2 or 3 days, the driver might not even get paid”. Similarly, Participant 11 noted, “one may not even get a proper salary”.

With regards to the amounts paid, not all of the interviewees mentioned specific figures and for those who did the figures seemed to be highly variable. Participant 4 reported that drivers are paid “every 7 days – like R1,000 or R1,200 every Monday”. Participant 5 first noted that “companies [ie. taxi owners and operators] are not the same”, before reporting that some drivers get R1,400 per week while in other cases the wage paid varies with the degree to which the driver meets his target – thus, “if the driver comes up with R700 [per day], he gets R800 per week” in wages. Participant 6 also referred to the variability and unpredictability of the drivers’ earnings, as well as a degree of illogic in how they are calculated – he commented that owners “may set a target of R3,500 or R4,000 per week, but only sometimes pay the driver R200 per week”. He added that “mostly drivers get weekly pay” but

opined that the pay arrangements can be very arbitrary and unfair – thus, “it can happen that you get paid R1,700, or you can make R3,000 [for the owner] and [still] only get paid R400”.

Participant 7 reported that “those who drive Siyayas, can check R400 per day and get paid R600 per week”; he noted that his “boss wants R600 per day, Monday to Saturday” and that he gets paid R800 per week. He went on later in the interview to comment that “it’s a problem that we don’t get exact salary advices [and] we earn so little, like R800 per week, R1,600 per fortnight, R3,200 per month”. He added, “My son will be doing first year at university, and expecting me to provide – but it’s not possible [on such low earnings]”. Participant 8 stated that he gets “wages every week, on Sunday”, and earns “about R500 per week”, explaining “that’s typical for taxi drivers”. He also commented that the amount a driver is paid “depends on the owner’s attitude and mercy levels – those who lack mercy will give their driver R300 a week”. Participant 9 stated, “I am not sure about other drivers and what arrangements they have with the owners, but in my case I get R800 to R1,000 per week”; he explained that the drivers “get a percentage” of the daily target set by the owner, which he saw as ranging from R500 to R1,000. Participant 10 stated that “drivers’ earnings range from R600, R700 to R900 per week”; in his experience, wages are paid every Friday.

Participant 11 made reference to the need for drivers to receive “government’s minimum wage of R3,500 [per month]”. He commented, “Now the industry is too unstable, as you don’t know what you’ll earn”, and added “you have no provident fund, no pension, no union. If you die, they combine “50c and 50c” and just donate [for your funeral]”.

As with the owners’ targets, the wages mentioned by the interviewees are summarized in a table – see below.

Table 7.3: Drivers' wages, as mentioned by interviewees

Interview number	MONETARY AMOUNT MENTIONED
3	If you pay over R500/day, you will get paid R500/week
4	R1,000 - R1,200 every Monday
5	If you come up with R700/day, you get R800 - R1,400/week. Companies are not the same. There may be a target of R3,500/week
6	Owners will sometimes only pay the driver R200/week, or if you make R3,000 you only get paid R400. But sometimes it can happen that you get paid R1,700
7	I get R800/week
8	I get R500/week, on Sundays. That's typical for taxi drivers, but it depends on owners' attitude and 'mercy levels'. Those who lack mercy give only R300/week
9	I get R800 - R1,000/week
10	I earn R600, R700 or R900 per week, on Fridays
11	You don't know what you'll earn

The figures mentioned on a per-week basis ranged from R200 – R1,700, implying monthly wages ranging from R800 to R6,800. As with the owners' targets, the information extrapolated from the interviews was converted to graph form as shown below.

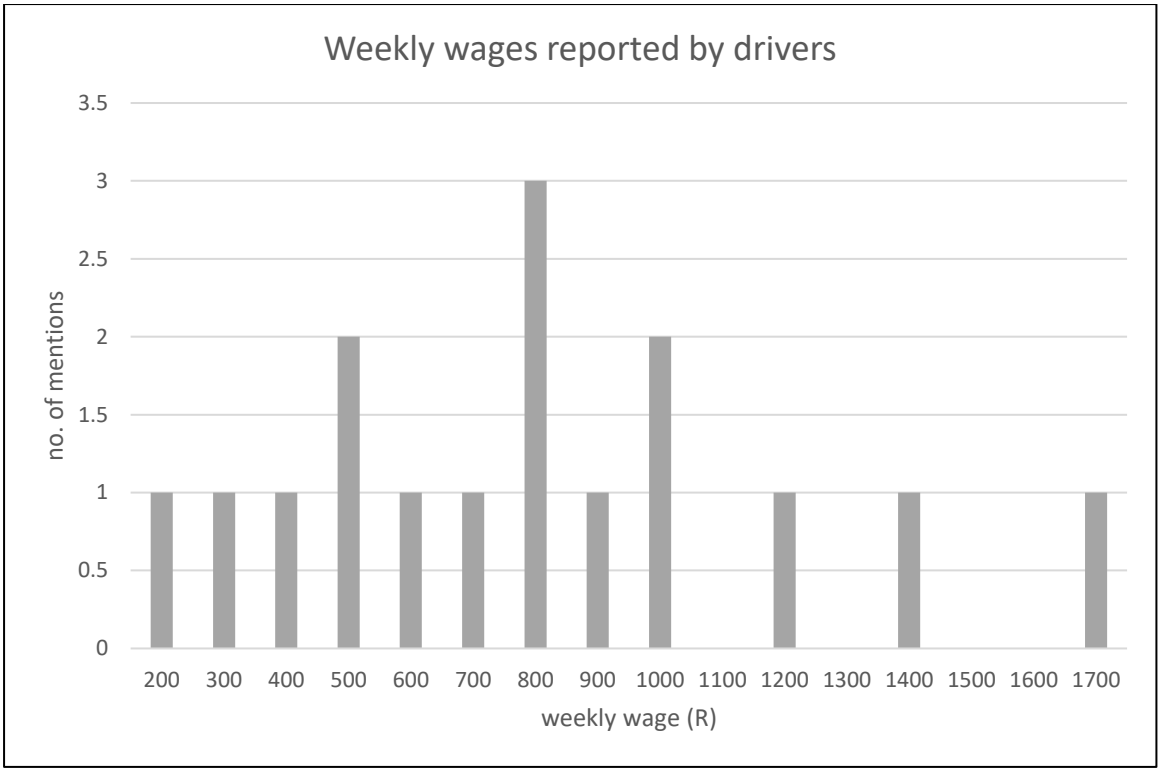


Figure 7.2: Estimation of weekly wages, extrapolated from the interviews

The graph suggested a clustering of the wages in the R500-R1,000/week range. As a cross-checking measure, as with the owners' targets the mean and median were calculated for the reported wages – see table overleaf.

Based on the median of about R750 per week, it seems likely that an average driver earns about R3,000 per month in wages. This represents about 18-21% of the previously calculated estimated income per vehicle per month, for a typical owner.

Table 7.4: Mean and median of weekly wages mentioned during interviews

AMOUNT	NO. OF MENTIONS		
R200	1	Mean = R950 (equates to R3,800/month)	Median = R12,000/16 = R750 (equates to R3,000/month)
R300	1		
R400	1		
R500	2		
R600	1		
R700	1		
R800	3		
R900	1		
R1,000	2		
R1,100	0		
R1,200	1		
R1,300	0		
R1,400	1		
R1,500	0		
R1,600	0		
R1,700	1		
	16		

The picture emerging from the interviews was perforce incomplete in that none of the drivers volunteered what amounts (if any) they are able to "pocket" from the daily takings, over and above their wages. My impression is that these amounts probably vary widely because of the drivers' needs to cover operating costs, as mentioned in the previous section of the thesis. These costs range and contain unpredictable components – for instance, traffic fines, unexpected needs to do minor repairs to the vehicles, the need for extra vehicle washing (eg: after bad weather or after driving through muddy areas) and the like. It fell beyond the ambit of the study to question the drivers about the specifics of these operating costs and in any event they may not have been able to give accurate figures due to marked daily variability and a lack of written records. They may also have preferred not to do so, due to a preference to conceal this aspect of their "earnings" from others such as the taxi owners.

Simply in relation to the wages mentioned during the interviews it is possible to come up with some estimations regarding the drivers' effective hourly pay,

using the mean of 14.6 work hours per day which was elicited by the survey. As the majority of drivers reported working at least 6 days per week, if a 6-day week is taken as average then this implies a work-week duration of about 88 hours and a total working month of about 352 hours. Based on their reporting of monthly wages ranging from R800 to R6,800 the drivers' effective wages (simplistically calculated) ranged from R2.27/hour to R19.32/hour.

The sectoral determination for the taxi sector which was introduced in April 2005[101] specifies that employees may only work 48 hours per week as their standard hours, or a maximum of 8 hours per day if they work more than a 5-day week. Over and above this, they should be paid at overtime rates, with overtime capped at 15 hours per week. No shift longer than 12 hours (including overtime) is allowed and extra pay is required for work performed on public holidays, Sundays and other days which are not usually a work day for that employee. For employees who normally work on Sundays, a shift of up to 5 hours must be paid at the standard daily rate whilst longer shifts must be paid at 1 ½ times the usual hourly rate for all hours worked. Work performed on public holidays must be paid at a rate which is at least double the usual rate. A nightshift allowance must be paid for work performed between 20h00 and 05h00, but no set amount is provided for this. The pay rates which applied from 1 October 2017 to 30 June 2018 specified an ordinary hourly rate of R16.41 for drivers, with the minimum monthly wage being R3,413.26[102]. Overtime and public holiday rates were equivalent to R24.62 - R32.82/hour.

If a proposed National Minimum Wage comes into existence this would peg the minimum wage at R20 per hour across all sectors, apart from the domestic sector and agricultural sector, where it is proposed that 75% and 90%, respectively, of the minimum wage will apply. The proposed National Minimum Wage implies that taxi drivers would receive R30-R40 per hour for overtime and special work hours, disregarding any nightshift allowances.

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[101] GNR.409 of 28 April 2005: Sectoral Determination 11: Taxi Sector

[102] Government Notice No. 1153, Government Gazette No. 41218, 1 November 2017

Some participants commented not only on how much they are paid, but also on *how* they are paid. Participant 8, for instance, was asked whether he receives a payslip and laughed before responding, “No – I get money, cash in an envelope…I can’t even think of a driver who gets a payslip!” Participant 11 commented: “Sometimes the owners are not even there when the driver puts the money on the table; they are just interested in getting the money…some don’t even come into contact with their own drivers – they think that as long as the money is on the table, [there’s] no problem”. This participant also noted that some owners “pay on Saturdays, or Tuesdays…they don’t give [wages] on Friday or Monday, which are good days’; he added, “they don’t care about the drivers”. Another participant commented that his wages are not secure and at times he receives no wages at all. These practices are deviations from the sectoral determination, which specifies that wages must be paid at regular intervals and must be accompanied by payslips or statements reflecting the names of employer and employee, hours worked and rates paid, as well as a number of other details.

7.7 Closing remarks

This chapter is the second of the two chapters which together contain the “meat” of my descriptive inquiry – the empirical results. In chapter 6 I explained what transpired during the taxi driver survey carried out at Johannesburg ranks in 2015, setting out the survey findings using simple descriptive statistics and a few correlational analyses. In this chapter I have described what transpired during the interviews and have set out themes which emerged. By using plentiful verbatim quotes drawn from the transcripts I have allowed the reader to judge the reliability and trustworthiness of my thematic content analysis. I have also offered tentative calculations in relation to taxi owners’ targets and taxi drivers’ wages, by extrapolating from financial information volunteered by the drivers. In relation to their wages, I have placed the self-reported information in context with the sectoral determination for the taxi sector, which has been in place since 2005.

Thus, I have now equipped the reader with enough familiarity with the empirical results to proceed to the next chapter. In this I will offer an integrated discussion of the quantitative-qualitative findings and compare them to road safety best practice. I will also use them to engage in a moral reasoning process and set out my closing argument regarding the ascription of moral responsibility to different roleplayers in the Johannesburg MTI.

CHAPTER 8: INTEGRATED DISCUSSION OF RESULTS

8.1 Preamble

In this chapter I will discuss my quantitative-qualitative results and interpret them in light of the literature and other information, before developing my closing argument. One comment deserves to be made before I commence with my discussion, namely that there was strong agreement, on the whole, between the survey and interview results. While the two data sets cannot be perfectly compared to one another, having tapped somewhat different information and at substantially different levels of depth, in many ways the interviews confirmed and deepened the preliminary insights I obtained from the survey. The interviews also satisfyingly answered many queries which arose in my mind while I was analysing the survey results.

As a lead-in, I will briefly refer back to the Road Safety Task Force (RSTF) which was set up by a range of commercial entities and road safety organisations around the launch of the UNDA (RSTF, 2010). The White Paper produced by this task force predicted that society at large would come to view RTID as unacceptable and that the "general belief in the inevitability of road deaths [will be] turned on its head" (p.93), with the public eventually supporting the notion that "everyone has a responsibility for road safety" (p.94). Thus, it noted that road safety principles will increasingly be promoted by top-level managers and safety champions within companies, with high-level executives "actively involved in combating work-related road deaths" (pp.94-95) and favouring "quick winner" projects (p.95). The White Paper embraced the pending ISO 39001 Road Safety Management Standard, which could ensure uniformity and become a yardstick for the awarding of public contracts to private companies. It also proposed that safety become an intrinsic principle in road design and infrastructure development and that all vehicle manufacturers should comply with harmonized global safety standards, consumers and fleet managers should be provided with safety information, safety should be the main priority when new fleet vehicles are purchased, importation of second-hand vehicles should be properly managed,

New Car Assessment Programs (NCAPs) should be implemented and non-compliant vehicles should be banned from public roads. In relation to road planning, it recommended that this should take into account the principles of protecting vulnerable road users. With regards to post-crash care, the RSTF noted that drivers involved in crashes are "on the front line" – they "may be victims, but they are also key players who alert emergency services or give first aid to the injured" and should thus "be trained as first responders in emergencies"; furthermore, companies should draw up "emergency preparedness and response procedures for road crashes" (p.85). In addition, the Task Force advised that a standard first aid kit should be available in all vehicles and viewed it as mandatory that drivers have access to communication devices and lists of contacts for emergency situations. It recommended that all companies develop reporting systems and engage in data collection and incident investigation in relation to all road incidents, including taking corrective measures when employees are involved in traffic violations. Finally, it pointed to the need to raise employees' awareness of the importance of complying with traffic rules, and the need to offer training programmes with behind-the-wheel components.

The PRAISE Project in the EU (ETSC, undated) further operationalized the field of Work Related Road Safety (WRRS) by developing norms and guidelines for work conditions, designed to reduce road crash risks.

8.2 General approach taken

I have organized much of this chapter by using the same seven themes which emerged from the interviews, due to my observation that between them five of those themes provided a "home" for *all* of the survey data. Only two themes (Theme 5 and Theme 6) were not foreshadowed by any particular survey responses and were instead derived solely from the interview data. The re-use of the themes allows me to take the reader systematically through the results, commenting on areas of congruence and dissonance. In each case, I will start off by indicating which survey items (if any) foreshadowed or had

relevance to the theme. Some of the survey items touched on more than one theme due to containing sub-items.

As relevant I will compare my empirical results with those of other MTI-related studies. That of Sauti (2006) is somewhat contiguous with mine, both geographically and in the sense that her fieldwork and mine occurred at the beginning and end (respectively) of the same 10-year period. My over-arching impression, viewing her findings and my results side by side, is that there has been strikingly little improvement within the Johannesburg MTI over the space of that decade. I will also, from time to time, frame my results against paratransit research in other countries. The multiple studies of the *matatu* industry in Kenya spanning a decade and a half (see, for instance, Khayesi in Alila & Pederson (eds), 2001; Khayesi, 2002; Nafhuko and Khayesi, 2002; and Khayesi et al, 2015) reveal the evolution of thinking about that industry, particularly by Khayesi, and also suggest that a steady process of reform has been happening in that country (contrasted with the more limited evolution of the South African MTI). The recent research of Behrens, McCormick and Mfinanga (2016), comparing paratransit services in Cape Town, Nairobi and Dar es Salaam, also provides a valuable point of reference, reflecting the similarities and differences in these services and offering a sense of how subtle variations in paratransit services may matter when it comes to road safety. The most pertinent chapter of their book is that authored by McCormick, Schalekamp and Mfinanga and for ease of reading I will refer to this chapter here as “McCormick et al, 2016” rather than using all three authors’ names each time. Finally, certain threads drawn from the international literature relating to road safety best practice (and particularly WRRS), as well as some references to the philosophical literature, will run through the discussion of my results. This piecemeal dissection of that literature is not intended to take away from the coherent whole provided by the original sources.

Having worked my way theme-by-theme through an integrated discussion of my results, I will then turn my attention in a more focused way to the moral issues raised by them, preparatory to answering my central research

question. Thus, I will use other authors' moral theories and arguments to reason about my own results in various ways. I will then proceed to suggest moral responsibility ascriptions for road safety in the Johannesburg MTI, with different types and levels of responsibility assigned to clearly identified roleplayers. To capture my closing argument, I will present this using a graphical tool I have created using Nihlen Falquist's MRAF.

8.3 Re-visiting the themes and integrating the survey and interview results

8.3.1 Theme 1: It's all about the money

There are two concepts encapsulated by this theme – namely, the centrality of money (especially in the form of cash) in the MTI's day-to-day operations, and broader financial issues such as business profitability and market forces in the shaping of MTI services. I will deal with these separately.

- **How money is handled on a day-to-day operational level**

The survey items which foreshadowed this sub-theme are those relating to the MTI drivers' pay arrangements, owners' dues, operating costs which must be covered by the drivers, and their perceived stressors. To refresh the reader's memory, only 6% of the survey participants were owner-drivers and, of the others, 94% reported receiving a fixed salary or wage. Thus, a very small minority indicated that they are not paid wages but simply receive a share of the day's takings (either on an agreed-share basis or in the form of whatever is left after the owner's dues are paid). All of the non-owner survey participants reported that they cover the cost of fuel and most (94% and 70%, respectively) reported that they cover vehicle washing costs and fines. Some 43% reported having to pay touts and queue marshalls and 41% reported spending money on vehicle servicing or repairs; however, only 2% reported covering the costs of tyres and vehicle licences, respectively, and none reported having to pay for operator permits. Some additional information

about operating costs covered by the drivers was elicited during the interviews and I have outlined this in Chapter 7.

During the survey, worrying about not having enough money showed up as a major concern for the drivers, being ranked first on a list of 8 job-related stressors and viewed as a serious problem by 92% and as a minor problem by another 2%. By contrast, the need to physically handle money whilst driving was of low concern – although 42% of the drivers reported that this creates moderate problems for them, overall it ranked last amongst 9 on-the-road difficulties.

The issue of money was highly prominent in the interview data. The words "money" and "target" constituted the most frequently used word cluster, with one or the other of these words appearing 50 times in the transcripts and being used by 92% of the interviewees at some point. Looking at these key words in context revealed that they were closely aligned with the second most frequently appearing word cluster, namely "pressure/stress/rush" – the latter words appeared 35 times in the transcripts and were used by 83% of the interviewees. The strongest impression gained from the interviews as a whole is that taxi owners are money-focused and place significant demands on the drivers to earn money on their behalf, and that this directly causes them to rush/chase/speed or otherwise engage in dangerous driving as part of the on-road competition for passengers. As noted by Participant 11, the job involves having to "hustle" to bring in the money required each day. There was also some mention of the drivers becoming caught up in money-related violence in the industry, including "quarrels and fights" between drivers and owners and conflicts between operators or associations. Two profit-maximisation strategies were mentioned which could have a direct bearing on road safety. Firstly, several interviewees described taxi owners as being reluctant to withdraw the vehicles from service to undergo maintenance and repairs, resulting in the drivers being expected to continue driving vehicles with known defects. Secondly, there was mention by some interviewees of taxi owners knowingly hiring substance-using drivers in the belief that this will increase their profits. Taxi owners were described using terms such as

capitalistic, greedy or stubborn, and only one interviewee mentioned that drivers themselves can be money-focused at times.

Two interviewees acknowledged that money can act as a distraction – either on a mental level (being preoccupied with having to meet the owner's demands) or on a practical level (having to handle cash while driving). Some interviewees, however, denied that cash-handling takes their attention off the road – for instance, one claimed to have no difficulties with simultaneously driving, counting cash and hooting to alert prospective passengers. Another shed light on this by mentioning that the cash-counting task is assigned to the "first passenger" (ie. the front seat passenger). This is congruent with the foreign blogger I mentioned in chapter 4[103] admiring the fare payment system – he commented, "As with most everything about them, the way that payment works on a minibus taxi is awesome" (p.6). He explained this as follows:

> *Here is a van full of complete strangers, and half of them are handling forward 20-rand notes when they only owe six, and just trusting that they'll get their change back. And yet they do, every single time. It's like a magic trick.* (p.7)

With regards to cash-based versus cashless fare systems, the interviewees who spoke about this were divided. Some favoured the idea of cashless systems on the basis that these could be safer and less distracting than having to deal with the "cash-exchanging situation" (Participant 9), but others felt that without cash in hand the drivers would struggle to cover operating costs like paying for fuel and vehicle-washing, paying fines (or paying bribes to corrupt traffic officials to *avoid* being fined). Participant 6 noted, for instance, that he did not think taxi owners would agree to strategies like providing a garage card with which to purchase fuel, intimating that there is a trust deficit between drivers and owners. Given the informality of the MTI it may also not be realistic to use anything but cash to pay for things like

[103] http://www.hedgehogswithoutborders.com/blog/entry/in+praise+of+south+africa+minibus+taxis (posted on 21 February 2011).

vehicle-washing – this is typically done at the ranks or on the side of the road, by an informal worker using a bucket and cloth; the same seems to be true for at least some minor repairs, which are done in the open by informal roadside mechanics rather than at a garage or formal workshop. Some interviewees spoke about how little cash they may have left at the end of the day, after covering the owner's dues and other expenses, suggesting that – at least on good days, such as at the end of the month – receiving fares in cash gives them a way to be left with *extra* cash on good days, which they can then pocket to supplement whatever wages they receive from the owners. McCaul (1990) notes that in the early years of the MTI drivers often pooled such additional "earnings" in order to buy taxis themselves, either collectively or individually. The NTTT report (1996) reflects taxi owners' views that as much as 50% of fare income was taken by the drivers, and research in the MTI in the early 2000s (for instance Croucamp, 2003; ILO, 2003; and Barrett, 2003) reflects that drivers engaged in pilfering or failed to declare all the fare income, pocketing an unspoken share for themselves. The ILO study reflects that the drivers simply received a share of the "checkings" (fare income") rather than being provided with any sort of wage or salary, while Croucamp (2003) notes that holding back some fare income was a way of supplementing their meagre wages, partly driven by the desire to eventually own taxis themselves. He also points out that one reason for drivers' resistance to the TRP was that it proposed to introduce smart-card fare payment systems which the drivers anticipated would "seriously erode their income in an environment where no social security is provided by either the taxi associations or the taxi owners" (p.4); cashless systems were perceived as comprising the economic mobility of drivers. Due to Croucamp's assertion that many taxi owners started off as drivers, presumably they are aware of these practices – I surmise that there may be an uneasy "truce", whereby owners turn a blind eye to pilfering and in turn expect the drivers not to complain about their wages being low. I will pick up on this issue again in the next section when I deal with the theme "it's not a proper driving job".

- **Broader issues of business profitability and market realities**

These issues did not come into the survey but were occasionally alluded to during the interviews – for instance, Participant 7 described in some depth how a taxi owner may wish to progress from a small, informal operation (which he likened to a *spaza*[104] shop) to having a large, fully-fledged taxi business. Other participants mentioned their own aspirations to acquire taxis, or to build family businesses, and one suggested a quota system which would prevent any owner having more than 10 taxis; there was mention of the difficulties of maintaining a large fleet of vehicles, but also a sense from some participants that it would be unfair not to spread the economic benefits of the industry more widely.

As I noted in chapter 4, Behrens et al (2016) found three ownership-operation models to be operating in the paratransit systems of Cape Town, Nairobi and Dar es Salaam – owner-employee, owner-lessor and owner-driver. They found the first model most prevalent in Cape Town, with drivers effectively renting the vehicle on a per-week or per-day basis – although they have "a fair degree of autonomy with respect to day-to-day operations", they have "very limited influence in business decisions and reform negotiations" and instead the "vehicle owners, or their associations, negotiate with public authorities around licensing, vehicle scrapping and renewal, corporatization and compensation" (p.16). In Cape Town, the daily fee paid to the owner by the driver is in some cases refined by additional stipulations – for instance, the driver may not have to pay a rental fee on "non-business days" (eg: Sundays and public holidays), or with the rental being set as a percentage of fare-box takings. The owner-employee model was highly apparent during my study too – as I have already noted, only 6% of the survey participants were owner-drivers, which Behrens et al note involves "all roles [being] combined in one

[104] *Spaza* shops are small-scale, informal and often home-based mini-supermarkets, found all over townships and poorer suburbs in South Africa. Although they tend to be expensive, people often make small day-to-day necessity purchases (eg: bread, milk, airtime, eggs, colddrink, matches, small quantities of paraffin) from them, while reserving their major household shopping trips for large, formal supermarkets.

individual" (p.16). There was no mention of an owner-lessor type arrangement[105] during any of my interviews.

As I noted in chapter 4, there is no doubt that the MTI is a large and lucrative roleplayer in the South African economy – estimates of just how many people work within the industry vary widely, but recent estimates have been in excess of 300 000 countrywide; see for instance Ingle (2009) and SANTACO quoted in Business Tech (2016). As noted by Ingle (2009), there are also upstream and downstream spinoffs in related industries like insurance, vehicle repair services and finance houses, and Croucamp (2003) notes that the MTI is the largest consumer of tyres and spare parts in the country. Croucamp points out that – despite its informal nature constraining its investment potential – the chance of financial gain has motivated police and government offficials to purchase taxis and even to engage in sideline businesses like hiring weapons and protection services to senior MTI executives. Ingle (2009) cites World Bank research suggesting that investment in the transport sector of LMICs yields 1 ½ times the returns yielded by other sectors.

To better grasp the money issues from a taxi owner's perspective, I will briefly consider some operational realities. The DOT (2017b) indicates that road-based passenger transport is providing by three competing modes – minibuses, regular buses and BRT buses. The operating costs per passenger are identical, at R1.06/km but the infrastructure costs per kilometer for BRT services are very high (at R35 million to R60 million per kilometer), whereas both minibuses and regular buses require an infrastructure spend at the level of R0.8 million to R4 million per kilometer. Congruently, the implementation timeframe for BRT is short-to-medium, whereas that for minibuses and regular buses is short. Significant differences exist in relation to the lifespan of the vehicles, being only 7 years for minibuses compared to 8-14 years for both regular and BRT buses. Minibuses' carrying capacity is also much lower, at

[105] Behrens et al (2016) note that the owner-lessor arrangement is most common in West Africva and involves operators leasing vehicles from their owners such that the "vehicle owner has little involvement in the running of the operation" and the drivrs are "effectively the business owners" (p.16).

10-16 passengers per unit compared to 40-120 passengers per unit in relation to either type of bus. Thus, during peak periods minibuses can carry only 1 300 - 2 500 passengers/hour, compared with regular buses' peak capacity of 2 500 - 6 000 passengers/hour and BRT buses' peak capacity of 4 000 - 10 000 passengers/hour (all figures from DOT, 2017b). While buses cost well over R1 million each, depending on their specifications, the current cost of a minibus is around R0.5 million – however, this *excludes* finance charges, which are as high as 28.5% and can reportedly take the cost up to over R1 million per vehicle (Steyn, 2017). In relation to both their shorter lifespan and their much lower carrying capacity, it seems that minibuses are a relatively expensive purchase for a transport operator, even with no need to outlay on infrastructure costs like ranking facilities (provided by the state). The operators also face some contentious operating costs such as the e-toll system put in place by the South African National Roads Alliance (SANRAL) as part of the Gauteng Freeway Improvement Project; while legally compliant taxi vehicles are supposed to be exempted from e-tolling, this has been disrupted by a backlog in processing of operator permits (Duvenage, 2015). Croucamp (2003) notes that the need to belong to taxi associations and motherbodies may involve paying extortionate amounts in joining fees, rank fees, protection fees and other contributions, but *not* belonging leaves the owners without the protection which these organisations can provide.

Other authors have commended on the relatively cheap fares charged by the MTI. For instance, Sauti (2006) recorded that the 45-minute trip between Johannesburg and Randfontein cost each passenger R10, compared with the R300 it would cost in a metered sedan taxi and the aforementioned foreign blogger notes with approval that his trip from Sandton to Johannesburg, costing only R9 via minibus taxi, would have easily cost "a couple hundred rand" in a private taxi. Using the Soweto-Johannesburg route as a loose example, I am told by commuters that current fares average about R15 one way, for a journey of 20-25km (ending in the Johannesburg CBD). Using the DOT cost of R1.06 per kilometre per passenger, this suggests that operating costs per passenger (R26-27 for that journey) substantially exceed what passengers actually pay. The only way to break even, let alone to turn a

profit, would thus seem to be to overload the vehicle and to make as many journeys as possible during the high-demand periods. This is particularly true on routes where the contraflow direction in peak hours typically involves an empty vehicle – ie. "dead miles" (from a business perspective), or what Professor David Hensher calls "carrying air"[106]. The purpose of my study is not to determine the actual costs and operating profits within the MTI, but the information I provide here shows that margins may be relatively slim or even non-existent, given that vehicles are half-full or even empty some of the time.

UN-Habitat (2013) notes that it is difficult to "balance the efficiency and social equity aspects of informal transport, i.e. to achieve the social benefits of free-market services without exceeding social costs" – thus, paratransit services "would benefit immensely from best-practice examples of successful regulation of service quality and safety while at the same time allowing the inherent advantages of private competition and entrepreneurship to flourish" (all p.36). With regards to how the MTI manages to be profitable despite the market being "hobbled and distorted by the excess of anti-competitive practices which characterize its operations, and its apparent indifference to the convenience of its consumers", Ingle (2009) explains this on the basis of "captive demand and the inability of the state and its organs to provide consumers with viable alternatives" (p.83). He argues that, rather than the state exerting more control over the industry, it should actually withdraw and allow taxi operators to be free agents from an entrepreneurial perspective, as over-regulation by government would be "the death knell of a market-driven taxi industry" (p.87). He also calls into question whether the state would, "by co-opting the present cohort of minibus operators", be able to "deliver a more focused and efficient supply of transport than that which has been achieved by the informal industry to date" (p.87). He suggests that the "stranglehold" of the existing "informal regulators" on the industry be broken in the interests of "opening up the market to all-comers", and asserts that the violent nature of the MTI as it stands rests on "the zero-sum notion that competition is

[106] Prof Hensher (Director of the Institute of Transport and Logistics Studies in Sydney) used this term during a talk on 'Shared smart mobility' at a Transport Forum event at the University of Johannesburg, 30 August 2018.

something to be suppressed", with "the societal 'rules of the game' [having given] way to the 'law of the jungle'" (p.87). In his view, MTI operators should be allowed to become "entrepreneurial free agents" who can develop and offer properly differentiated services to the market (p.86) – he argues that the "market is better able than any local authority to rectify oversupply and a much-needed differentiation of transport options could arise organically instead of being arrived at via a costly process of trial-and-error on the part of a state that tends to overrate its omniscient wisdom" (p.87). Croucamp (2003) counters Ingle's view, noting that "[i]nformal economic activities are often directly related to the survival strategies of deprived sectors of society" and that this "allows significant moral tolerance for inefficient practices of distribution" (p.16). He notes that during interviews he conducted with taxi owners in the late 1990s the reported profit was typically R3,000 to R5,000 per taxi, depending on the vehicle's condition, the route and rank facilities – some owners, however, reported profit margins of up to R10,000 per vehicle.

My tentative calculations regarding the owners' dues (targets), based on the interview data, have been reported on in chapter 7 and I will not repeat them here save to remind the reader that (based on median dues of about R700 per day) it seems possible that an owner could receive R14,000 to R16,800 per month per vehicle – depending on how many days per week the driver works and whether they are allowed any target-free days. Without any further information on the costs the owner must cover – the most significant of which is likely to be vehicle repayments, at least in relation to younger vehicles which are still being paid off – I cannot go any further than to comment that taxi owners may well perceive their businesses as profitable due to the amounts of cash which come their way on a weekly or daily basis (and especially if they do not declare these or pay tax on them). Seftel (2013) points to the difficulties of establishing the value of MTI businesses when the City of Johannesburg offered to buy out taxi operators displaced by the Rea Vaya BRT service. She notes that the City's first offer of R3 500/month (per vehicle taken out of service) was countered by the operators' demand for at least R7 700/month. She explains that it was "only after intensive negotiations, deadlocking, political intervention and a commitment from the

national government to make up the difference in what the City could afford, that an agreement was reached that the operators would receive R6 600 per month on average throughout the contract". She notes that this equates to a 28% profit margin and points out that similar gaps were identified between the MTI's demands and what could realistically be offered by other cities (Cape Town and Nelson Mandela Bay) during their BRT negotiations.

Based on the drivers' descriptions of infrequent servicing and repairing of the (mostly) older vehicles, and their description of exploitative labour practices (which I will discuss under the next theme), my overarching impression is that many taxi operations reflect a survivalist mentality with debatable efficiency and long-term sustainability. This makes it difficult to see them as innovative entrepreneurs rather than "necessity entrepreneurs". Some interviewees alluded to this, including describing taxi owners as uneducated. Rampant competition was apparent, which makes the current market inquiry of the Competition Commission unsurprising (Competition Commission, 2017). As I noted in chapter 5, this was triggered partly by concerns about the differential price-setting modes in the land-based public transport sector and partly by discriminatory subsidization practices. The outcome of the inquiry may change the business terrain in which the MTI operates, particularly if subsidies are implemented. In relation to bus companies, subsidies have historically been associated with strict limitations on operating models and firm expectations in relation to service quality and formalized business practices – for instance, the companies must be duly registered and tax compliant and must adhere to relevant labour legislation.

8.3.2 Theme 2: It's not a proper driving job

This theme was even more prominent than the previous one, being touched on by numerous survey items and spontaneously raised by many interviewees. The survey items which are particularly relevant relate to the drivers' employment arrangements, working hours, work week duration, level and use of breaks, plus items dealing with job-related stressors.

The ILO study in 2003 documented that drivers simply received a share of the "checkings" (ie. the fares received for the day), with no wages at all. I based question 9 in my survey on that research (the most detailed available at the time but substantially pre-dating the sectoral determination) and as a result the answer choices I provided did not really "hit the mark" in terms of the drivers' current pay arrangements – indeed, I reacted with surprise when the vast majority of my survey participants indicated that they receive a regular wage. The interviews provided a very useful opportunity to better understand the prevailing payment arrangements and, as noted in the previous chapter, unexpectedly allowed me to carry out tentative calculations to try and estimate the average level of wages paid and how these compare with the sectoral determination. The receipt of actual wages (albeit sometimes low and sometimes unreliably paid or badly timed) may reflect a slight improvement, compared to when the ILO study was carried out.

For manageability, I will break up my discussion of this theme into several sub-sections, which bear some relation to the key issues dealt with by the field of WRRS.

- **Excessive work hours and inadequate pay**

These issues are interconnected and I will thus deal with them as one. My survey revealed excessively long work hours and work week durations as the norm, with the drivers reporting a 14.6 hour day on average and with *all* of them working at least a 6-day week (86% reported working a 7-day week). While almost all the surveyed drivers reported having breaks (61% mentioning the expected midday lull between peak traffic periods), a small minority indicated that they simply keep driving all day with no breaks. Some drivers indicated that they are commuters in their own right, with almost a fifth reporting a round-trip commute of up to 60 minutes (typically on foot or via bus or taxi) in addition to their long work hours. My results suggest that the situation has worsened rather than improved since the ILO study of 2003, which documents an average shift length of 13 hours, with 21% of the drivers working a 6-day week and 70% working a 7-day week. Sauti (2006) notes

that in launching the sectoral determination setting out minimum wages in the taxi sector in 2005, then minister for transport Jeff Radebe alluded to the need for MTI drivers' work hours to be normalized as this would impact positively on road and passenger safety, due to fatigue resulting in lowered alertness and causing accidents. However, some years after the determination was put in place Ingle (2009) described MTI drivers' work conditions as continuing to be "almost Dickensian"; he recorded an even longer shift than my survey elicited, noting that many drivers worked "16- to 18-hour days for a mere pittance" (p.76).

As I noted in chapter 3, amongst the post-UNDA 2020-2030 road safety performance targets adopted by WHO member countries is one relating to professional drivers (Target 11 in WHO, 2017b). This aims to have all countries put in place regulations regarding driving time and rest periods or accede to regional or international regulations in this regard, by 2030. In line with this, the EU Working Time Directive (Directive 2002/1/EC) sets out "minimum requirements with regard to the organisation of working time for all people performing mobile road transport activities, including self-employed drivers" (cited in ETSC, undated, p.8). Bidasca and Townsend (2016) note that long work hours and high levels of fatigue are reported by taxi drivers in many settings in many countries, and this situation heightens their crash risks – as a rule of thumb, they suggest that no driver work for more than 2 hours without at least a 15-minute break, with average weekly hours over a 4-month period not exceeding 48. They note that in some EU countries not only active driving time is counted but also *waiting* time.

In chapter 7 I mentioned South Africa's sectoral determination for the taxi sector which, coupled with other labour legislation, clearly spells out legally acceptable work hours and rest periods. I will not repeat the information here save to note that my survey and interview results point to non-compliance with these requirements. Lengthy work hours and high levels of fatigue were mentioned by many interviewees – frequently identified as a crash causation factor – and none mentioned any means by which their hours are logged or their pay structured in a way which accords special recognition for overtime

work, weekend or public holiday work or nighttime work. The word cluster "hours/tired/exhausted" appeared 13 times in the interview transcripts, with one or more of these words being used by 50% of the interviewees. Besides fatigue, the consequences of these long hours (working "from can't see to can't see" in the words of Participant 6) were described as including a lack of work-life balance and an inability to attend to other life roles like being a husband or father. Lest I view the lengthy midday lull reported by over half of the surveyed drivers as "time off", some interviewees assured me that it does not afford them a true break as they are expected to remain with the vehicle and be ready to drive if called upon. That this does not happen often was suggested by the surveyed drivers reporting that they have only mild difficulties with using their breaks for activities like errands, going to the toilet, socializing and eating and drinking.

The PRAISE Project in the EU (ETSC, undated) has highlighted fatigue as a major risk factor associated with work-related driving – this being a significant contributor to about 20% of commercial road transport crashes, and with nighttime risks being 10 times higher than daytime risks. Essenburg (1999) and Kimber (2003) list fatigue amongst the most significant sources of driver impairment. The very lengthy work hours in the Johannesburg MTI are thus a significant ethical issue, affecting not only the drivers' safety but also that of their passengers and other road users.

With regards to earnings, I did not specifically enquire about the quantum of these during my survey, but – as I noted under the previous theme – a high proportion of the drivers reported receiving a fixed salary or wage. During the interviews, several drivers volunteered further information, with many providing actual figures and some intimating that their poor pay contributes to their sense that they are not "proper drivers"; one or two contrasted their earnings with the perceived better earnings of bus drivers. My tentative calculations, based on specific wages mentioned to me by many interviewees, appear in chapter 7 and I will not repeat the information here save to note that the median figure was R750/week (equating to R3,000/ month). I have already noted that the drivers' effective hourly rates, given their very long work

hours, are thus markedly beneath the sectoral determination's "ordinary" pay rates and even further beneath the extra amounts they should be remunerated for overtime, special or nighttime work. My impression is that the sectoral determination has thus had almost no impact, which is congruent with Ingle (2009) pointing out that when it was promulgated in 2005, despite minimum wages being much lower than MTI workers had hoped for it was unclear whether the MTI "could bear the cost of compliance". Ingle also notes that it was unclear whether the industry would be able to deal with "the administrative implications of the regulations". The drivers involved in my study largely suggested that it has not, and that their employment conditions are thus illegal.

McCaul (1990) found that most MTI drivers earned R80 to R150 a week (equating to R320 to R600 per month). Croucamp (2003) cites an oral survey amongst drivers in the late 1990s in which 84% claimed that they earned R150-R350/week (equating to R600 to R1,400/month), which he describes as "hardly a salary to die for". In 2003 the ILO found the average wage for drivers was R1,200/ month, while Croucamp (2003) was told by taxi associations that their drivers earned around R2,000/month. If my tentative calculation reflects reality and average wages have indeed only risen to around R3,000/month, and if the information obtained by the ILO and Croucamp was accurate (ie. if drivers' wages in 2003 were in the region of R1,200-R2,000/month), this implies that the drivers' pay has not kept up with inflation over the past 15 years or so. Taking a midpoint of R1,600 for 2003 and an average inflation rate of 4.9% over the past decade and a half[107], inflation-linked increases alone should have escalated the average salary to about R3,300 in 2018. This suggests that the drivers' earnings have worsened over the years. I have also pointed out that the intention of the sectoral determination was to set minimum wages and to specify conditions under which premium hourly rates should be paid. If the earnings figures

[107] Inflation figures derived from https://www.inflation.eu/inflation-rates/south-africa/historic-inflation/cpi-inflation-south-africa.aspx

provided by my study participants are anything to go by, the sectoral determination has had litte (if any) impact.

I must note that the South African MTI is not alone in terms of excessive driver hours and low driver pay, as this is a common feature of paratransit systems (Behrens et al, 2016). Khayesi's 2001 and 2002 studies in the *matatu* industry in Nairobi, for instance, reflect that drivers then typically worked 13-15 hours per day (longer than other *matatu* workers like conductors and stage-workers) and received low wages, disproportionate to the money they generated for the vehicle owners.

- **Lack of employment contracts, employment benefits and job security**

The majority of the surveyed drivers reported a lack of formal employment contracts and payslips as well as an absence of any employment benefits like paid leave, pension plan, medical aid or funeral insurance – however, about two thirds mentioned having accident insurance as part of the job (which may have reflected a misunderstanding about the general Road Accident Fund "insurance" which covers all road users). The fact that 33% of the survey participants reported having employment contracts actually seems to be an improvement over the prevailing reality reported by earlier researchers – Croucamp (2003) noted that neither of these "formalities" tended to exist at all, while Ingle (2009) found that fewer than 10% of MTI employees had written employment contracts.

I did not directly question the interviewees about their employment arrangements (for instance, whether or not they had contracts and benefits) but many raised these spontaneously as a crash causation factor. Some described or alluded to a lack of job security and high vulnerabilit to arbitrary job loss – taxi owners may simply "take away the keys" when drivers ask for time off to attend to family matters, when a dispute occurs over targets, wages or fines, or even when drivers raise concerns about vehicle defects. This is congruent with Ingle (2009) documenting MTI drivers' difficulties with sustaining their employment when ill – one commented to him, "in the taxi

industry you can't afford to get sick. You get sick and there is another driver tomorrow, forever, and you end up hoping he gets sick so you can get your job back" (p.80). I note that the lack of employment contracts also puts the drivers outside of social security nets like the Unemployment Insurance Fund and workers' compensation fund. At best, they can submit a compensation claim to the Road Accident Fund if injured in an accident (or their dependants can lodge a loss of support claim if they are killed). However, the lack of documentary evidence relating to their employment and pay would tend to undermine the quantum which can be claimed in terms of loss of earnings.

Several interviewees directly commented on their employment conditions being non-compliant with legislation, with some referring to the lack of action from the Department of Labour in this regard. The lack of compliance related not only to pay levels (which I have already discussed) but also to the manner in which they are paid. Several interviewees mentioned inappropriate methods – for instance, having cash deposited into their accounts at an ATM by the taxi owner, or having to fetch cash which is left lying in an envelope at the taxi owner's home. Some interviewees also mentioned lack of certainty with regards to their wages – these being paid unpredictably (for instance, on different days of the week) and sometimes not being paid at all, at the whim or convenience of the taxi owner. Furthermore, several drivers mentioned that the lack of payslips affects their ability to get credit, take loans or open bank accounts. I note from the website of the Transport Education and Training Authority (TETA)[108] that the informality of the drivers' employment also creates difficulties with the collection of statutory payments such as TETA skills levies, and as I have discussed previously it can also prevent the drivers from belonging to unions.

Khayesi's findings in Kenya in the early 2000s are strikingly similar to my findings. At that time, *matatu* drivers seldom had formal job contracts, failure to meet the owners' targets tended to lead to job loss and the drivers generally had no employment benefits apart from a lunch break and possibly

[108] www.teta.co.za

a lunch allowance (see for instance, Khayesi, 2001; Khayesi, 2002; Khayesi & Nafuko, 2003). That the *matatu* industry has progressed somewhat seems evident from more recent research by Khayesi and colleagues as well as by the case study provided by McCormick, Mitullah, Chitere, Orero and Ommeh (in Behrens, McCormick & Mfinanga, 2016). Even so, concerns remain about *matatu* drivers' work conditions, with the majority of operators showing low compliance (for instance) with regulations on work hours. My overarching impression is that the current Johannesburg MTI remains more-or-less at the level of the Nairobi *matatu* industry two decades ago.

- **Lack of union representation**

The issue of unionization was not one I touched on in my survey, due to the possibility that questions about this would raise suspicions about the motives behind the research. However, several of the interviewed drivers referred to the difficulties or impossibility of joining a union, in the absence of payslips and formal salary arrangements. One suggested that the "Minister of Unions" (if there is such a position) should deal with this.

Croucamp (2003) notes that true union membership numbers have always been suspect and difficult to establish despite the National Taxi Drivers Organisation (NATDO) claiming that it had 23 000 members and the Transport and General Workers' Union claiming that 25 000 MTI drivers belonged to it. For the purposes of my study, I approached the South African Transport and Allied Workers Union (SATAWU) due to my understanding that this was a key organizer of MTI drivers and had its own taxi chamber, but as noted in chapter 2 the chamber organizer proved elusive and was ultimately not a source of assistance with my study. There are numerous transport-related unions listed in the register of the Department of Labour, but none appears to be strongly involved in representing MTI drivers and most reflect on their websites that membership dues must be paid via salary deductions or debit orders from bank accounts, confirming the information provided during the interviews.

McCaul (1990) notes that in the late 1980s some drivers belonged to driver associations and trade unions and some strikes took place. Croucamp (2003), however, contends that "[u]nions have always been reluctant to take on the taxi bosses and it seems as if violence has a much more effective track record than unions when it comes to changing the minds of taxi strongmen" (p.122). He notes that drivers' grievances were mostly about wage disputes, vehicle roadworthiness and who should pay fines, but the drivers he interviewed for his study expressed the view that "they will never be able to call upon systems of justice and labour regulation as long as the authority of taxi associations and mother-bodies is manifested in corrupt practices and violence" (p.122). This view was congruent with what Croucamp was told by a police official, namely that in 1999 taxi owners in Johannesburg organised hit squads to murder drivers who were involved in trying to set up a union. Croucamp concludes that "[t]he relationship between strongmen and corrupt authorities is just too close", and after the TRP commenced drivers had a "a real fear…that these relationships may become formalised…and subsequently sanctioned by the state" (p.122).

- **Conflictual relationships between taxi owners and drivers, and lack of proper human resource management**

This issue was not canvassed in my survey, but what came through strongly in my interviews was a sense that the drivers are not treated as valuable resources by taxi owners, and that this is strongly related to the glut of unemployed would-be drivers "waiting in the wings" should they be fired or become unable to work.[109] Sugden (2016) notes that MTI drivers continue to experience exploitation and poor work conditions and tend to fear the taxi owners, while Croucamp (2003) postulates three reasons for the poor relations between drivers and owners – firstly, historical abuse of drivers due

[109] Vividly illustrating the relatively low value assigned to the life of a driver within the MTI, Croucamp (2003) cites a 1997 article in the City Press newspaper which noted that hitmen were paid up to R80,000 to assassinate a motherbody executive, R4,000 to assassinate a taxi owner and as little as R2,000 to assassinate a driver.

to them being dependent on patronage from owners, secondly, the fact that owners and associations cannot verify the number of passengers transported (thus allowing the driver to earn extra undeclared income, particularly if he speeds and overloads), and thirdly the fear of redundancy amongst drivers, with changes in the industry such as the TRP. With regards to the last of these, Croucamp notes that at one point it was thought that 40,000 driving jobs would be lost.

Croucamp (2003) labels MTI drivers "the unwanted constituency" and notes that they are "wedged between competing interests without sharing in the dividends of the conflicts and compromises between associations and the state" (p.120); thus, although they are marginalized in the industry, they bear the brunt of its violence. He points out that "neither the democratic state, nor the authoritarian edifice of the taxi industry seems to have been able to accommodate drivers as a constituency" (p.120) and describes the complex symbiosis between drivers and owners as follows:

> *Given the dangerous nature of the work and the low income it generates for taxi drivers, the relationship between taxi owner and taxi driver has always been a precarious balance between economic desperation and coercion. The taxi owner provides the employment, the route and protection from competition, and the driver has no labour rights but an income and the prospect of eaming an amount in addition to his arrangement with the owner.* (p.123)

Echoing this sense of being "poor cousins", several of my interviewees asserted that their work conditions are significantly worse than those of bus drivers and truck drivers. However, research in the formal transport sector reveals that formally employed drivers also report poor work conditions and high job-related stress – in general, driving for a living is known to be stressful. For instance, Kompier (1996) notes that bus driving is a high-risk occupation characterized by high demands, low control and low support; although bus drivers tend to view themselves as the "boss in their own bus", they have restricted autonomy and have to rely on their employers to help

optimize their occupational health and safety (OHS). De Croon et al (2002) note the importance of occupational stress reduction measures among lorry drivers in Holland, while Beaulieu (2005) highlights fatigue as a prominent risk factor associated with professional driving in general. Gianfranchi, Spoto and Tagliabue (2017) report that moped drivers in Italy experience negative emotions while driving and this can contribute to dangerous driving.

The interviewed drivers, as a group, made it clear that they experience high demands (especially in relation to the pressure of the target system as well as to passengers' demands), low support (particularly in relation their financial concerns and work/life balance), low autonomy, significant fatigue and negative emotions whilst driving (for instance, related to conflicts and tensions within the industry, fear of violence, negative social stereotypes about MTI drivers, poor relations with taxi owners and negative encounters with other passengers, other road users and traffic officials). Many directly related these factors to heightened crash risks and several interviewees in this study made mention of maladaptive coping behaviours like substance abuse.

The transcripts from the interviews data echoed the responses to certain survey items, which revealed high levels of stress and numerous day-to-day practical and emotional challenges faced by the drivers, with no recourse such as a human resources manager who could assist with these. Thus, a large majority of the surveyed drivers (96%) indicated concern about MTI crashes, with 84% indicating that they worry about these *a lot* and 12% indicating that they worry about them *a bit*. Correlational analysis showed that more educated and more experienced drivers showed greater concern about crashes. The concerns appeared reality-based, given that more than a third (44%) of the drivers reported having been involved in injurious crashes (with 12% having experienced more than one crash). Other key stressors or concerns related to the drivers' financial constraints, their safety in the face of accidents/ criminals/taxi wars, their fatigue levels and the use of drugs or alcohol in the industry. Somewhat lower (but still prominent) concerns were reported in relation to physical problems (eg: headaches and sore backs and necks) and inadequate breaks. With regards to interpersonal stressors, these

showed up most prominently in relation to the drivers' interactions with other road users, followed closely by their interactions with taxi association officials. Significant stress was also reported in relation to their interactions with passengers, traffic cops and taxi owners, with relatively low stress associated with their interactions with other drivers, rank officials and queue marshalls. With regards to their on-the-road realities, the drivers reported serious concerns about a lack of safe stopping places – together with passengers' demands to stop anywhere, anytime – as well as with bad road conditions (eg: potholes, broken traffic lights, heavy traffic jams) and the need to drive at speed. Relatively low concerns were reported in relation to law enforcement activities like roadblocks, and in relation to poor facilities at taxi ranks.

- **Inadequate training and licensing**

Proper training of professional drivers is a key element of road safety, part of creating a "highly constructed human being" who can safely enter the road traffic system and reducing factors such as ignorance and "joining the collective" which can result in heightened crash risks (as mentioned by Elvebakk, 2005). For the most part, proper training and licensing is required and strictly regulated in relation to formal transport systems (bus and truck drivers), but far lower levels of training tend to take place in the paratransit sector and my interviewees alluded to some MTI drivers lacking both basic driver's licences and professional drivers' permits.

In Kenya the National Transport & Safety Authority offers a thorough driver training curriculum in which Chapter 5 is devoted specifically to drivers of public service vehicles (PSVs) like *matatus* (NTSA, undated). This sets out the minimum requirements to enroll in training as a PSV driver, namely a Std 8 education, an ability to read and write in the official languages, a police clearance certificate, a minimum age of 22 years for up to 14-seater PSVs or 25 years for 15- to 33-seater PSVs, driving experience of at least 4 years (with at least 3 years of specific PSV experience in up to 14-seater vehicles), a certificate of medical fitness obtained within the past 6 months, a police clearance certificate and an absence of any previous dangerous driving

offence over the past 24 months. The minimum requirements for drivers of PSVs exceeding 33 seats are even stricter, including a minimum age of 30 and 4 years of experience driving 15- to 33-seater PSVs. The PSV driver training consists of 19 modules (80 hours of theory and 24 hours of practical training), followed by a 2 ½ hour examination which includes 2 hours of theory testing and ½ an hour of practical testing. Completion of the course and passing of the examination results in the issuing of a Certificate of Competence (COC). In order to be issued with a PSV licence (a sub-category of the Professional Driver's Licence or PDL), a driver must not only possess a COC but must also belong to a professional drivers' body approved by the NTSA.

In chapter 3 I noted that training (or lack thereof) for MTI drivers has been a contentious issue for many years. The Project Spear training centres which were mentioned to McCaul (1990) do not seem to have come to fruition, and Sauti (2006) notes that government-provided driver training has been woefully inadequate. In South Africa, vocational education and training is entrusted partly to sector-specific education and training authorities (SETAs), which are paid skills levies by larger employers within their sector. Smaller employers are exempt from paying such levies due to falling beneath the designated payroll threshold but can still access training via the SETAs. Levies are paid to the South African Revenue Service (SARS), which in turn distributes them to the relevant SETAs using the Standard Industry Classification to determine the nature of the employing body. Designated employers (ie. larger companies and those with turnover exceeding a set threshold) are expected to compile Workplace Skills Plans (WSPs) and Annual Training Reports (ATRs) for submission to their SETA, in line with the Skills Development Act[110]. The relevant body in relation to the MTI is the Transport Education and Training Authority (TETA). On its website[111], this organisation notes that there are four fundamental challenges relating to skills development in the taxi industry, these being taxi operators' low levels of participation in skills

[110] Act 97 of 1998
[111] http://www.teta.org.za

development initiatives[112], the low skills levy base versus the high skills need[113], difficulties with reaching the widespread industry[114] and the fact that many MTI businesses are not registered (or not correctly registered)[115]. TETA does, however, have a Chamber Management Committee in relation to the taxi industry and its website specifies that this includes 3 SANTACO representatives, a representative from the South African Metered Taxi Association (SAMTA), 4 SATAWU representatives, 1 DOT official and a chairperson who is a full member of the TETA board. The committee describes itself as engaging in a continuous advocacy and awareness drive on the provisions of the Skills Development Act and Unemployment Insurance Act as well as other relevant legislation and notes that it also involves other relevant entities like the RAF, Public Protector and Department of Economic Development. It proposes that employee entry into the industry be regulated through prescribed minimum training, such as on customer relations and road safety. However, this requires the availability of provincial and regional training officers along with functional training committees, tasked with the transformation agenda of the industry through skills development and training – presenting problems due to TETA's geographic presence around the country being very limited. Sauti (2006) was informed by a PR/training officer that while a formal TETA-accredited course existed (consisting of 2 weeks of

[112] TETA's website reflects that only 214 taxi businesses registered with SARS fell under TETA, of which only 14 paid skills levies and only 5 participated in skills development through submission of Workplace Skills Plans (WSPs) and Annual Training Reports (ATRs). Of these employers, most are suppliers of metered taxis or chauffeur services, rather than MTI operators.

[113] Most taxi businesses are small and fall beneath the threshold for payment of levies, collectively contributing less than 1% of TETA's annual income. Their total contributions, most of which come from the metered taxi sector, are about R450,000 pa. These levies form the available budget for the estimated 185,000-300,000 economically active people in the taxi sector who are in need of skills development.

[114] TETA has a physical presence only in Gauteng, KwaZulu Natal and the Western Cape, while the industry permeates the economic activities of all 9 provinces, from rural to metropolitan areas.

[115] TETA notes that there is a widespread perception amongst MTI operators that only an operating licence is necessary – most are not registered as businesses with the Companies and Intellectual Property Commission (CIPC) or as employers with the South African Revenue Service. This creates difficulties with collection of skills levies.
Drivers are hired on the basis of a driver's licence and PrDP and have informal verbal contracts with owners, making for difficulties with contribution and collection of skills levies and other statutory deductions such as UIF.

training, with 14 credits awarded), such courses were only offered 2-3 times per year nationally and only a limited number of drivers from each province (eg: 100 from Gauteng) thus underwent training.

I did not ask the surveyed drivers about what types of licences they held or whether they held PrDPs – questions about this may have been perceived as too threatening, and there was too high a chance that social desirability traits would have led to them being inaccurately answered (with no way for me to check the veracity of the information). However, during the interviews some drivers spontaneously mentioned issues relating to licensing, PrDPs and also criminal records (which bar one from obtaining a PrDP). Lack of licences – and prevalence of improperly acquired licences – is a general problem within South Africa's road traffic system, and not confined to the MTI. As I noted in chapter 3, the RTMC's 2017 report reflected a figure of 32,000 irregularly obtained PrDPs (RTMC, 2017); related to this, Khanyile (2018) reports that the RTMC perceives one in three licenses to be fraudulent or improperly issued, due primarily to corruption in the licensing centres. That corruption and fraud are not confined to the traffic authorities and instead extend to the medical practitioners who certify fitness to drive is highlighted by recent media reports of bogus doctors making up to R8,000 per day issuing fraudulent certificates (MedBrief, 2017).

- **Youth and inexperience**

Another issue regarding driver fitness emerged obliquely during my survey, which revealed a large proportion of relatively young and inexperienced drivers. Some 14% fell into the 18-24 age group and another 42% were 25-34. The survey did not ask about their overall length of driving experience, but the majority (70%) had accrued less than a decade of MTI driving experience and 40% had only 1-4 years of experience.

Known to be in the high-risk category, young or novice drivers are dealt with as a specific category in some licensing regimens around the world and the RMTC has mooted (but not yet implemented) a similar provisional licensing

system in South Africa (RTMC, 2010). DOT notes that 80% of South African road deaths involve males aged 19-34, with the most vulnerable driver group being males aged 25-34 (ie. relatively inexperienced drivers) (DOT, 2013). Kimber (2003) notes that driver inexperience is a more significant risk factor than age *per se* – for instance, "it takes an 18 year old about two to two-and-a-half years to gain sufficient experience to be as safe as a thirty year old novice" (p.9). He suggests greater periods of supervised exposure (for example, driving with a parent as a passenger) before full licensing takes place. He explains that prior to the driving test a learner drives "something like 0.1% of their total lifetime mileage – a tiny amount" and few crashes happen during that time – yet, the crash rate "surges up after they pass the test, get a full licence, and can drive unaccompanied by an experienced driver" (p.19). Where this could be particularly relevant in relation to the Johannesburg MTI is that drivers from poor socioeconomic circumstances may not have access to family vehicles and may thus have limited general driving experience at the point that they become MTI drivers. Well over a third of my survey respondents fell into the age group 25-34 and, on grounds of age alone, could be considered less risky than the minority who fell into the age group 18-24. However, it is a concern that well over two fifths of the sample reported only 1-4 years of MTI driving.

As noted previously, in Kenya PSV licensure is stratified by age, experience and vehicle size – all PSV drivers must be at least 22 and have at least 4 years of basic driving experience, while to drive a PSV seating more than 14 people requires one to be at least 25 and to have already acquired at least 3 years of experience driving smaller PSVs. My survey items do not allow for direct comparison with the Kenyan PSV requirements but at least some of the surveyed drivers would not meet these requirements on grounds of age alone, whilst others (those who drive vehicles seating more than 14 people) may not meet them on grounds of a lack of relevant driving inexperience. The most common vehicle size mentioned by my survey participants (being selected by 92% of them) was an 11-16 seater, but 4% did mention driving larger vehicles.

In South Africa, there is very little stratification amongst public transport drivers apart from a minimum age of 21 being stipulated in order to obtain a Professional Driver's Permit (PDrP). One must simply have a valid driver's licence for the vehicle concerned, be certified medically fit to drive and have no criminal record in the past 5 years[116] – there is no longer a need for on-road testing such as used to take place and it is assumed that vehicle owners will check that their drivers are in possession of PDrPs. These permits were mentioned by several of the interviewed drivers (all of whom simply called them by the old term "PDP" rather than the new term "PDrP") and some specifically noted that taxi owners do not necessarily require or check them. Participant 7 (who had obtained the old PDP, requiring in-vehicle testing) also alluded to the PrDP itself not being worth much – he commented, "now you can be a reckless driver with a PDP…it's no longer meaningful".

- **Driving under the influence**

Professional drivers face more stringent requirements in relation to driving under the influence of drugs or alcohol than do ordinary members of the public and some employers (particularly in HICs) screen for this using breathalysers or install alcohol interlocks in company vehicles.

I touched on issues relating to driving under the influence in certain of the survey items. As mentioned previously, most of the surveyed drivers (80%) reflected that they have serious concerns about the use of alcohol and drugs in the industry, with this being ranked fourth on a list of job-related concerns. It was also amongst the top five crash causation factors identified by the participants, being selected by 62% – the higher-ranking factors were 'drivers speeding or making too many trips' (chosen by 66%), 'vehicles being in bad condition' (70%), 'drivers breaking laws' (88%) and 'bad weather' (90%).

During the interviews, several drivers spontaneously raised driving under the influence as a potential crash causation factor and mentioned situations

[116] See https://www.gov.za/services/driving-licence/professional-driving-permit.

where drivers would arguably be unfit to drive due to their use of substances like drugs or alcohol. More than one interviewee asserted that taxi owners sometimes deliberately hire these "unfit" drivers in an attempt to maximise their profits. This highlights the informality of the MTI and a disregard for passenger safety, which I surmise is connected to its money-centric, profit-oriented operating principles as described under Theme 1.

8.3.3 Theme 3: Taxi drivers drive like delinquents

The only survey item which pre-empted this theme was the one relating to the drivers' perceptions of crash causation factors – as noted previously, 88% of the survey participants selected 'drivers breaking laws', making this second only to 'bad weather' (which was selected by 90%).

The interviews explored this in some depth, asking the drivers for their thoughts on members of the public perceiving them as law-breakers. Many of the interviewees readily acknowledged that there is truth in this view, while one alluded to the stereotype having become a self-fulfilling prophecy – ie. that drivers behave as the public expects them to. Several volunteered specific examples of their lawless behavior, like skipping red lights and stop streets, speeding, overloading, driving on the wrong side of the road, using cellphones while driving and driving under the influence. Imaniranzi (2015), in his study of aggressive driving by Cape Town MTI drivers, notes that the drivers readily mentioned traffic violations like incessant hooting, speeding, closely cutting into the traffic, failing to indicate when switching lanes, driving on the road shoulder, skipping red traffic lights and causing obstructions in moving traffic. Kimber (2003) notes that most urban crashes are of four types – run-off crashes, cross-over crashes, side collisions and pedestrian accidents – and the law-breaking examples given by my interviews could certainly be implicated in those sorts of accidents.

One interviewee mentioned that taxi owners sometimes hire drivers without checking if they have a criminal record but on the whole the traffic law violations mentioned did not seem to be perceived as criminal acts in

themselves. The strongest reasons offered for lawless driving related not to active choices made by the drivers but rather to pressure placed on them by the taxi owners (particularly the target system) as well as pressure they expereince from passengers who want to get to their destinations quickly. There was also a sense of law-breaking simply being part of the MTI culture – one interviewee referred to this culture as corrupting drivers, while another noted that breaking the law is "something [the drivers] can easily do, without even thinking twice". This is reminiscent of Khayesi's earlier work in Kenya (see for instance Khayesi, 2001; Khayesi, 2002), which revealed that *matatu* drivers tended to violate road rules – for instance, by speeding to maximise earnings and compensate for the fact that they paid bribes to traffic officers – and many reported having been involved in road crashes.

Croucamp (2003) cites a Department of Transport survey conducted with taxi drivers (year unknown)[117] to explore their perspectives on traffic law enforcement and regulation of the MTI by the state. Some 73% of the drivers perceived traffic officials as easy to bribe and about 61% perceived no relationship between road rules and road safety. One conclusion from the survey was that taxi owners as well as drivers saw themselves as above the law. A similar impression was gained during my interviews, even though several of the participants made direct links between lawless driving and road crashes.

The ethnographic research conducted by Sauti (2006) on the Johannesburg-Randfontein route examines the stereotype that "minibus taxi drivers are all children born of one mother", with her aim being to "obtain a holistic understanding of the labelling of taxi drivers" and to "find out whether the complaints of commuters and society at large [about their] driving habits, behavior and attitudes" are valid (p.xxi); she also wished to explore whether their "ill-behaviour" was pre-existing or "natural" (as if they were literally "born of one mother") or instead learnt within the MTI (for instance, through

[117] The reference given by Croucamp is DOT RR 92/222 – I have searched unsuccessfully for this report.

exposure to “gangsters”, as suggested by Govender, 2006, or through their work conditions and how they were treated by passengers, other road users, taxi owners, traffic officers and fellow drivers). The different roleplayers whose perceptions Sauti tapped (including commuters, queue marshalls, taxi cleaners, rank-based hawkers and vendors, traffic officers and other motorists) proved not to generalize about the drivers and some indicated that negative perceptions of them were unfair and ill-founded. There were also indications that the “spirit of ubuntu” (which she defined as “solidary and unity”) was present within the MTI – one commuter told Sauti, “if you touch one driver, you touch them all” (p.37) – although the drivers she interviewed mainly denied this, some noting that they kept to themselves to avoid jealousy and gossiping. Sauti notes that Gauteng Premier Mbazima Shilowa warned members of the public not to simply view the industry as corrupt and violent but to appreciate the many “good people” within the industry who care about the lives of their passengers and other road users rather than about profits. She also points out the reality that MTI drivers drive under “completely different circumstances to their fellow motorists” and daily face “commuters, motorists and third world traffic cops with their first world laws, who want to change their third world driving habits to first world driving”; thus, they are “expected to drive like private suburban motorists, which is almost impossible under the circumstances in which they work” (Sauti, 2006, p.132). She sums up their situation as follows:

> *Drivers have to constantly drive over the speed limit to satisfy passengers who are demanding and insisting that they would arrive late at work. They are also forced to rush and compete with fellow drivers and take into consideration that they might lose out financially if they don’t and hence end up paying fines and bribes. The driver is forced to ensure that his passengers are carried to their destination in spite of “ridiculous” working hours which he is working.* (Sauti, 2006, p.132)

Sugden (2016) examined the social construction of MTI drivers by using critical discourse analysis to review South African print media articles on the

MTI in 2014. She comments on the media's capacity to create and shift readers' perceptions and notes the presence of three discourses, "The bad citizen", "The victim" and "The good citizen". Reviewing my interview transcripts as a whole, I see elements suggesting that the drivers' discourse contains similar themes. Some acknowledge the wrongfulness of certain driving behaviours (even while mostly displacing the blame for this outside of themselves), some are more fixated on a view of themselves as victims of their circumstances (for instance, due to their economic dependency on their jobs or the need to meet customer expectations) and a small minority focus more strongly on their social role and ethical duties as "good citizens" and conveyors of human passengers. The last discourse includes an acknowledgement of this being difficult, given the culture of the industry as well as the realities of the South African road traffic system.

Ingle (2009) notes that, in light of their poor working conditions, "it is hardly to be wondered at that taxi drivers have a fearsome reputation for being short-tempered and accident prone" (p.76). He also comments that violence is endemic to the MTI – including "straightforward murder" (p.77) – and that conflicts over routes and rank space "can easily escalate into broader conflagrations, of quite bewildering complexity" (p.78). The extreme nature of the violence within the industry is thoroughly documented by Croucamp (2003).

Problems with law-breaking are not confined to the South African MTI, nor are they confined to LMICs. The PRAISE Project in the EU (ETSC, undated) notes that "drivers travelling for work are often under pressure to meet tight deadlines and this means that they are a group that are often likely to speed", and speeding in turn can result in "loss of control of the driving task, and thus potentially of the vehicle" (ETSC, undated, p.22). It also notes that professional drivers may drive under the influence of medicinal and illicit drugs, and this has resulted in the ILO including drivers in its Code of Practice on Management of Alcohol and Drug-Related Issues in the Workplace (ETSC, undated).

The foreign blogger I previously referred to[118] (in a post entitled "In praise of South Africa's Minibus Taxis") commented that opinions about minibus taxis are "to put it charitably, mixed", attributing this to the bloody taxi wars waged by taxi associations ("mafia families") well into the 1990s, the poor condition of the vehicles, and the taxi drivers having "a bit of a reputation for extreme recklessness as they race along their routes" (all p.1). He reflected that minibus taxis seemed, on the one hand, "like an incredibly fascinating facet of South African culture, one that few travellers seemed to explore", but noted that "everyone we talked to pretty much agreed that if we tried to use minibus taxis we would end up dead – the only disagreement was whether we would be robbed and murdered or die in a flaming wreck" (p.2). He also noted a racial slant to the situation, commenting, "Virtually every time we asked a white person [in South Africa] about minibus taxis, they would tell us that trying to use them would certainly lead to misery and death" (p.6).

A less complimentary view appears on the Encounter South Africa website. This informs visitors to the country that, "Like many African cities, cities in South Africa have a chaotic informal public transport systems (sic) in the form of minibus 'taxis'", namely "small-scale bus services, often unmarked, operating with neither timetables nor formal stops". It notes that minibus taxis make up 90% of the taxi sector (metered taxis making up the remaining 10%) and are "almost entirely… 16-seater commuter kombi buses which are sometimes unsafe or not roadworthy". The site advises visitors that "Minibus taxi drivers are known for their disregard for the road rules and their proclivity for dangerously overloading their vehicles with passengers". It also notes that taxi associations show mafia-like behavior and engage in anti-competitive price fixing" (Encounter South Africa, 2013, unpaginated).

Kimber (2003) uses the concept of a "driver failure iceberg" to point out that crashes only result from particularly significant levels of errors or excesses – those which effectively "rise above sea level". Under sea level, and super-imposed on "normal driving activity", is a wide range of less obvious driver

[118] http://www.hedgehogswithoutborders.com

failures which are more minor and do not cause crashes although they may result in near-misses and a need for sudden swerving or braking. Driver failures may relate to impairment due to alcohol, drugs and mobile phones, in addition to fatigue, which Kimber notes is endemic, with about 10% of the driving population thought to have been involved in sleep-related accidents). However, speeding is a failure of the "excess" variety and both increases impact forces in a crash and reduces time available for drivers to correct errors – thus, it is probably the most significant factor to control in order to reduce RTID. The impression gained from my interviews was that the concept of a driver failure iceberg would make sense to the MTI drivers, but also that they perceived a double-standard as operating – as though their "iceberg" of failures is somehow more exposed than that of other drivers (especially "the privates"). The sense of what some said was that their "waterline" sits lower and their human errors are more obvious and less easily forgiven by either the authorities or other road users. Some also alluded to being pre-judged or having generalisations made about them – one recounted how a traffic cop told him that "all [MTI] drivers are shit", while another commented, "everything that happens on the road is the taxi's fault". .

Negative social perceptions about MTI drivers are not confined to Johannesburg. Kretzmann (2018), writing about public transport difficulties in an extremely congested Cape Town (48th most congested city in the world), puts it this way:

> *With a looted Prasa[119] unlikely to rejuvenate a decrepit Metrorail[120] any time soon, we may have to look to the notoriously violent minibus taxi industry to help us out. It's a bit like going to the Mafia for a loan to go gambling, but hey, desperate times.* (unpaginated)

Although the majority of letters to the editor about taxi drivers are overwhelmingly negative, an anonymous writer with the pseudonym "Another

[119] PRASA = Public Rail Agency of South Africa, overseer of most passenger rail services in the country.
[120] Metrorail = the urban train services in the Cape Town metropolitan area

side of the coin" gave a more balanced perspective in a letter to the editor of Auto Dealer, a supplement to the North Eastern Tribune (Anonymous, 2016). This letter was given the title "It's not only taxi drivers" and pointed out that "many people write and talk about taxi drivers" and "It's true that many of them ignore road rules and are generally a menace" – however, the reader was challenged to "look at your own skills and attitude", given that "[m]ost South African drivers are not good drivers". The writer asserted that "[i]t appears that people who point fingers at taxi drivers are hypocrites" and suggested that they look around themselves at "other drivers who also break many rules of the road". The letter suggested that "the only taxis you notice are the badly-driven ones" and "[t]here are taxi drivers who abide by the law and the rules of the road". It also expresses sympathy towards the drivers, mentioning that they would not need to break road rules or endanger lives if they received "decent salaries" – by contrast, "taxi owners are coining it". Furthermore, the writer commented that there were still insufficient safe pulling-off places for them, such that they are "forced to stop like New York City (NYC) cabs wherever and whenever passengers need them".

The issue of delinquency, raised in relation to MTI drivers, seems to be a relevant one in relation to the broader industry as well as in relation to the South African road traffic system more generally. This supports my early contention (mentioned in chapter 1) that the drivers may be a sort of indicator species. Thus, the taxi owners' "delinquency" may be obscured by the fact that the drivers are the visible frontline of the industry. As I noted in the previous chapter, the interview data reflected the shadowy, behind-the-scenes role of taxi owners and almost all of the drivers described the owners in negative terms – including, for instance, terms capturing that they are capitalistic, greedy, selfish or simply downright criminal. The hidden nature of MTI owners and other forms of "elite" (such as taxi association officials) is attested to by Croucamp (2003), who notes that researchers and DOT officials face significant difficulties in relation to determining who the "real leadership" is. Croucamp relates this reclusiveness directly to the endemic violence within the industry, as evidenced by the following anecdote:

> *Even when President Nelson Mandela arranged for a meeting with whoever the real decision-makers may be, not one turned up. They all sent their lieutenants or lower-order strongmen, fearing their presence might expose them to hit squads or compromise their position of strength when negotiating with the state*. (p.118)

The drivers, as the visible face of the industry, do not have the luxury of remaining hidden and face a constant risk of being scapegoated, punished for the "delinquency" of the industry as a whole – as noted previously, Croucamp (2003) has opined that they bear the brunt of MTI violence.

I note that when individuals or groups wish to vent their fury at issues ranging from high fares to poor vehicle quality and unsafe services offered by the MTI, the drivers – unlike the owners – are close at hand and easily identified and targeted. Around the country, regulations may require owners' details to be displayed on the outside of the vehicles, but my personal observations on major Johannesburg arterial roads during peak hours suggest that this is a rare occurrence. The drivers interviewed during my study did not mention any sort of protective measures for the drivers – as one commented, even the association "squad cars" (which are supposed to police the routes and be of assistance in emergencies) are not doing their jobs. This is in stark contrast to the well-protected "delinquents" who make up some of the MTI elites, as reflected (for instance) in the writings of Croucamp (2003), Ingle (2009) and Sekhonyane & Dugard (2004). In sum, there seem to be few vested interests in relation to keeping the drivers' safe. This is compounded by the degree of isolation they experience in the course of their work. In Johannesburg, unlike in some other cities with paratransit services[121], there is no culture of an additional worker being present on the taxis, such as a tout or conductor – instead, Johannesburg MTI drivers seem almost inevitably to work alone. Thus, there is no extra pair of eyes to identify risks, no extra pair of hands to help (for example, after a road crash) and no witness to any adverse events

[121] For instance, in Nairobi the custom is for each *matatu* to have a two-person crew, consisting of a driver and a conductor. There is even provision for training of the conductors, in the national driver training curriculum (see NTSA, 2014).

besides whatever passengers may be in the vehicle at the time. Given the prominent financial pressures described by all the interviewees (which also emerged to some extent in the survey), I surmise that this could be because of the earnings loss which would be associated with devoting a seat to a tout or conductor rather than a fare-paying passenger. This supposition seems supported by observations made by other researchers (see in particular Behrens, McCormick & Mfinanga (2006) as well as some of the writings of Khayesi) – namely, that in paratransit systems which *do* feature touts or conductors, these workers may be expected to leave the vehicle and give up space to paying passengers during peak periods.

In my view, MTI drivers' status as "vulnerable delinquents" – as well as the readiness of other users of the road traffic system to point out their delinquency – relates strongly back to the informality of their employment arrangements (as described under the previous theme "It's not a proper driving job"). Their vulnerability and lack of protective measures also points to a degree of neglect (delinquency) on the part of the owners, who do not seem to use telematics and vehicle tracking devices such as are used in buses and trucks. Not only do the owners appear not to really keep an eye on their vehicles and drivers, the impression gained from the interviewees is that they also take few steps to safeguard the drivers in case of emergencies. The steps used in the formal driving sector may include provision of fire extinguishers and first aid kits but may also consist of written procedures and contact numbers to guide the drivers as to what to do after an adverse event (presuming that they have survived this event and are not incapacitated and unable to follow any procedure). One interviewee mentioned that the drivers are expected to reserve sufficient airtime on their personal cellphones to communicate with the owners, describing this as an extra financial burden on top of the other costs the drivers must cover from their cash at hand.

Before closing off my discussion in relation to this theme, I must also make mention of the wider social "delinquency" which is highly evident on South Africa's roads. Civil society organisations like South Africans against Drunk Drivers (SADD) and the Automobile Association (AA) document this on a

regular basis. For instance, the AA blames the country's "horrific road fatality statics" strongly on reckless drivers, the "certain section of our road using public who simply don't care about others, is only concerned about how quickly they can get to their destination, and who seems (sic) to think the rules of the road don't apply to them"[122]. The AA's view is that using the roads "comes with an obligation to be a safe road user" who recognizes others' rights to also use the roads and sets a good example for the youth. It notes that South Africans have become desensitized to the annual "carnage" statistics and suggests that the problem lies particularly with driver behavior, unroadworthy vehicles, pedestrian behavior and a general lack of education about road safety[123].

8.3.4 Theme 4: The taxi is scrap, a *skorokoro*

The relevant survey items for this theme were those dealing with vehicle sizes, makes, ages, features and defects, as well as the item which tapped the drivers' perceptions of crash causation factors. A large majority (92%) of the respondents reported driving 11-16 seater vehicles and 88% indicated that they drove Toyotas. Croucamp (2003) cites figures from the late 1980s reflecting that Toyota and Nissan then accounted for nearly 90% of all minibus sales, and he notes that Toyota in particular dominated the taxi market over the 20-year period prior to his study. A significant number of the survey participants reported driving relatively elderly vehicles. Around a quarter, respectively, reported driving vehicles which were under 5 years old, 5-8 years old, 8-11 years old, or older than 11 years. In all, almost half (46%) of the drivers reported driving taxis older than the aforementioned 7-year operational lifespan provided by the DOT. With regards to vehicle features all of the drivers reported that they offer driver seatbelts but only 42% reported that they offer passenger seatbelts and airbags were reportedly present in only 28% of the vehicles. As I noted in chapter 6, fewer than half of the taxis reportedly offered power steering and airconditioning and very few offered

[122] https://www.aa.co.za/insights/if-youre-reckless-on-the-road-do-it-alone
[123] https://www.aa.co.za/insights/south-africas-road-safety-crisis-what-is-the-answer

electric windows but more than half had sound systems. The absence of passenger seatbelts in most of the vehicles is congruent with my noting in chapter 3 that seat-belt use in South Africa is markedly low (by international standards) despite our seat-belt laws complying with international best practice.

Rank-ordering of the survey responses to an item dealing with vehicle defects revealed that the most commonly encountered defects (equally ranked) were broken windscreens or wipers, faulty brakes, broken passenger seats, non-functioning lights or indicators and doors failing to open or close properly. Slightly less common were tyre problems, followed by steering wheel problems and broken or uncomfortable driver's seats. Unsurprisingly, in relation to the survey item which tapped the drivers' perceptions of crash causation factors, "taxis being in bad condition" was the third most frequently selected (chosen by 70%), being beaten only by "bad weather" and "drivers breaking laws".

Croucamp (2003) notes that in the early years of the industry it was difficult for black taxi owners to secure finance for vehicles, or to replace these vehicles as needed – thus, defective and older vehicles remained in service. As taxi associations became stronger they had some collective power in terms of negotiating with banks and finance houses, which Croucamp notes had a certain "civilizing effect on the volatility associated with the industry" (p.77) due to bringing together the informal operators into contact with the formal sector – however, taxi operators disliked feeling captive to vehicle manufacturers and financiers. During the period of my study, this issue reared its head when there were MTI protests against very high interest rates (18% to 28.5%) levied by SA Taxi Finance, a major financier (see for instance Steyn, 2017). These rates were justified on the basis of the loans being very high risk and taxi owners, for the most part, not qualifying for bank finance. Steyn quotes Ralph Jones, secretary general of the Gauteng branch of SANTACO, as saying that the purchase price of a new vehicle, R457,000, soared to R1.1 million over a 72-month repayment period at an interest rate of 28.5%, implying repayments of about R15,000 per month. Jones noted that a

vehicle generating R500 per day (after fuel costs) and operating for 20 days per month would only bring in about R10,000 and leave the owner unable to make repayments, frequently resulting in repossessions. One taxi owner told Steyn that his 22-seater vehicles each brought in R20,000 per month, of which he had to pay R19,000 to the finance house.

In chapter 4 I described the Taxi Recapitalisation Programme (TRP), launched in the early 2000s and viewed by many authors as having had very limited success in relation to replacing the aging MTI fleet with safer vehicles. Croucamp (2003) notes that vehicle manufacturers bidding to supply the new vehicles were expected to provide all the legal safety features as well as an electronic driver-controlled door, options for smart card use, a speed governor and appropriate amounts of storage space. Ingle (2009) notes that difficulties were experienced with regards to buy-in from taxi owners and associations, the monetary value of the "scrapping allowance" for old vehicles, the availability and affordability of new taxis and resistance to government's proposed focus on 18- and 35-seater vehicles. He contends that government not only succumbed to pressure from the industry to delay the programme but also failed to pull off the roads those vehicles which it acknowledged were "wrecks" and "death traps" (p.81). Croucamp (2003) notes that one of the only points of consensus in the MTI was that operators declined to pay tax – in his view, the need to register with the South African Revenue Service (SARS) in order to participate in the TRP virtually guaranteed that Treasury was the biggest barrier to participation. With regards to MTI drivers, Croucamp describes them as the "most alienated constituency" and notes that they opposed the TRP due to concerns that (by focusing on larger vehicles) it would result in job losses and "constrain their mobility towards ownership" (p.4).

Besides vehicle defects going unaddressed, there is a more sinister aspect to unsafe vehicles in the MTI which I have mentioned in chapter 7. This can be called the "Killer Quantum" phenomenon, or the use of vehicles which are not fit-for-purpose in relation to transport passengers but are modified to do so

because they are more affordable than proper minibuses. This is not a key focus of my study but would be worthy of bioethical research in itself.

Although profitability is an obvious reason for participation in the MTI, I have previously surmised (and some authors have noted) that the industry is not in fact highly profitable or efficient in its use of resources. Arnoldi (2018), for instance, refers to submissions to the Passenger Transport Inquiry of the Competition Commission which point out that without subsidies, taxi operators with paid-up vehicles sacrifice insurance and maintenance in order to be competitive. This in turn impacts on commuter safety and service quality, increasing the chance that drivers and commuters will be relegated to using "*skorokoro*" vehicles regardless of any protestations they may dare to make. Both Croucamp (2003) and Sauti (2006) note that at the time of their studies many (or most) minibus taxis were over 10 years old. My informal field observations on the roads and highways of Johannesburg give a strong sense that well over half of the current minibus taxi fleet continues to consist of elderly and defective vehicles. I also note a peculiar phenomenon which I nicknamed "the emergence of the *skorokoros*", which was visible during peak periods like the December/January festive period and the March/April Easter period, during periods of high MTI use (for example, when bus drivers were on strike) and even to some extent at month end when the roads and ranks became busier. This phenomenon involved the appearance on the roads of even more battered and elderly vehicles than were usually visible – creating a sense that high demand caused operators to "press into service" vehicles which were dubiously roadworthy, to capitalize on the additional money-making opportunities. I surmise that with this pressing into service of additional vehicles there must also be a pressing into service of a usually invisible "reserve" cohort of drivers – possibly *more* "delinquent" and even less carefully recruited and supported than the regular cohort of drivers.[124]

[124] This issue (the periodic emergence of especially *skorokoro* vehicles) is deserving of a bioethical inquiry in itself – along with related issues like the use of very elderly vehicles for scholar transport. Although the authorities stipulate that scholar transport vehicles should not be older than 12 years, this is a strikingly old age in relation to South African legislation viewing children's best interests as paramount, and is close to double the operational lifespan suggested by the DOT. Road crashes involving scholar transport – sometimes

I will mention one last issue in relation to the minibuses themselves and that is to comment that they can be considered crash-incompatible with ordinary passenger cars, in the sense described by Kimber (2003) and Husak (2004). Kimber explains that when crash partner vehicles differ this affects the nature and consequences of the crash and there may be "strong asymmetries in the likely consequences to the potential 'participants' in a collision" (p.20). Almost inevitably, vehicle-to-vehicle collisions are of different makes and models and thus have different heights, loads and structures – thus, as Kimber notes, there are multiple types of crashes, such as small-vehicle-to-small vehicle (S-S), small-vehicle-to-large-vehicle (S-L), medium-vehicle-to-medium vehicle (M-M), and so on. Husak points out, in relation to SUVs, that their height and weight relative to other traffic, together with their relative rigidity and their vulnerability to roll-overs, makes them crash-incompatible despite them being marketed as safe family vehicles. It strikes me that minibus taxis have much in common with SUVs and, particularly if they are overloaded or have vehicle defects, this could presumably add to crash-incompatibility and cause them to behave unpredictably in crashes. For instance, a cracked windscreen can cause the roof to cave in more easily than it should, worn tyres can affect braking ability and thus impact speeds, defective steering mechanisms can decrease the driver's ability to swerve, broken hooters or indicators make it more difficult for the driver to alert other drivers or signal his intentions, and faulty doors and lack of seatbelts can cause occupants to be ejected easily. Husak's argument that driving of crash-incompatible vehicles could be considered wrongful in and of itself – even if such driving is not frivolous in nature – could well be applicable to the South African MTI due to the high risks it creates for the drivers, passengers and all other road users.

I have previously referred to the PRAISE Project in the EU and to its assertion that WRRS implies that employers have certain moral duties in relation to

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associated with marked overloading – are featured regularly and emotively in the print media, in radio traffic reports and on television. My own experience of attending to a scholar transport vehicle which caught fire and my subsequent inability to locate any responsible person in the Gauteng Department of Education to report this to, together with my observations regarding the absence of any form of child restraints in the vehicles (even ones which carry very small pre-school children) points to a general disregard for road safety.

vehicle purchases. These include considering "how the vehicle will protect its occupants in a crash, its ability to mitigate or prevent crashes, how much it protects unprotected road users, and how compatible it is with other vehicles" (ETSC, undated, p.31). Thus, morally responsible vehicle owners need to pay particular attention to safety-critical features like brakes and tyres, and should ensure that the drivers are aware of the vehicles' load weight restrictions so as to avoid overloading them. Post-crash features like crumple zones, fire-resistant interiors, airbags and side and frontal impact protection are also important.

8.3.5 Theme 5: We are not transporting Coca Colas

No survey items directly foreshadowed this theme, but there were sub-items relating to customer service as well as items relating to driver-passenger interactions, which have some relevance. Passengers were about halfway down the list of interpersonal stressors selected by the drivers, with the drivers' interactions with them being described as less stressful than those with other road users, taxi association officials and traffic cops but *more* stressful than those with taxi owners, other drivers and rank officials/queue marshalls. As previously noted, the most significant on-road concern for the drivers was a lack of safe stopping places, followed by "passengers wanting to stop anywhere, anytime" – thus, the particular combination of trying to render the expected customer service in the context of inadequate design features in the road traffic system, seemed to come to the fore. However, when it came to directly attributing crashes to passengers, only 42% of the drivers selected the item "passengers doing unsafe things" from a list of possible crash causation factors – this was outweighed by the proportion who selected "other road users' behavior around taxis" (selected by 50%) and "pedestrians doing unsafe things" (selected by 52%).

There was dissonance in this regard between the survey (which may have overly constrained the participants' ability to express their full views) and the interviews. The data emerging from the latter pointed to passenger behavior being much more significant than the survey suggested, both in terms of the

stress this causes for the drivers and in relation to their possible motivations for engaging in dangerous behaviors like speeding, disregarding traffic signs and driving in the emergency lane. Multiple interviewees also made mention of negative interactions with passengers at times leaving them in emotional states or having to be assertive or control their reactions – as mentioned under the theme "It's not a proper driving job", driving with negative emotions can itself increase the likelihood of dangerous behavior at the wheel.

A minority of the interviewees focused beyond their own feelings and circumstances and highlighted their social contributions and ethical duties as public transport drivers, with this being captured best by the driver who pointed out "we're not driving Coca Colas". Although some of the interviewees displayed evidence of using virtue ethics, ethics-of-care and/or ubuntu ethics in reasoning about their roles – for instance, by focusing on the need to respect human life and to protect people who are breadwinners and family members – others expressed more of a straightforward customer service focus.

During many of the interviews I gained a sense that even if the drivers themselves care about the human beings they transport, this caring and empathy does not extend to the taxi owners nor is it something they experience themselves when it comes to passengers, taxi owners, taxi association officials and traffic cops, and definitely not from other road users such as "the privates". As I noted under the theme "Taxi drivers drive like delinquents", the taxi owners in particular seem to have a shadowy background role and seldom even come into contact with their customers, let alone show human concern towards them. My impression, in relation to the MTI as a whole, is in line with that of Ingle (2009), who notes:

> *The inescapable impression derived from the literature is that consumers' interests (other than financial) are, notwithstanding protestations to the contrary, the least of the minibus taxi industry's concerns. The industry exudes a strong air of entitlement which that*

> *sector of the populace that patronizes metered taxis would never tolerate. There is no sense of "customer service" whatsoever.* (p.79)

The MEC for Transport in Gauteng has noted that public transport in general does not meet commuters' needs, and the MTI in particular fails to meet their expectations (GDRT, 2017, p.10). Hoffman (2012) expresses the view that, despite their informality "taxis in Johannesburg work well" but she points to a "somewhat baffling" area in which the MTI leaves customers un-served – this is "night time travel", which she notes is thus "reserved for the privileged" (unpaginated). She explains:

> *After sunset, the chances of getting a taxi diminish rapidly. The city empties out of ordinary residents and what was a bustling metropolis during the day begins to feel abandoned and dangerous. By 6pm, the taxi ranks are filled with long lines of commuters as everyone anxiously awaits the next taxi. The average wait becomes at least half an hour, double that during the day. There is a massive unmet demand and bizarrely the time of peak custom is precisely the time when taxis stop operating.* (unpaginated)

In Hoffman's view, "rectifying the lack of evening and night transport in Johannesburg would contribute considerably to the wellbeing of the vast majority of residents as well as enhance the city's economy", making Johannesburg "a city for all residents, not just a wealthy minority". She notes that "the right of residents to work, trade and play in the city regardless of their income or race needs to be recognised" and "the urban economy and social fabric of Johannesburg depends on ordinary citizens' right to the city" (unpaginated). She also suggests that running services at night (even on a limited basis) would increase the profitability of the MTI, pointing as an example to an existing 24-hour line in Mamelodi[125]. To explain the lack of

[125] Hoffman (2012) suggested that a daily profit of $450 million accrued per day to the Johannesburg MTI, even without nighttime services being offered. I note that, at that year's closing exchange rate of about R8.50 to the dollar, this would have equated to a figure of

night services she notes that the controlling of routes by a consortium of associations means that "expanding services would require collective action" – thus, if "only one taxi association were to start operating at night it is unlikely people would feel confident enough to use them and that association would make a loss, particularly if it were also punished by the other associations through violence or exclusion". Hoffman thus concedes that for extended services to work most taxi associations would have to agree and this could be difficult to achieve in an industry which operates as "a fairly violent and secretive cartel"; she recommends that the state step in and broker an agreement "so that all taxis – alongside Johannesburg's citizens – can profit from night services" (unpaginated).

One feature of the MTI which was not raised at all by the interviewed drivers (possibly as a deliberate choice or simply because they have not experienced it directly) is the way in which MTI violence and conflict can affect commuters. Ismail Vadi, MEC for Transport in Gauteng, has noted that commuters do become caught up in the violence which continues to plague the industry (GDRT, 2017) and from time to time there are media reports describing commuters being physically pulled out of taxis and private cars during industrial action in the MTI, or being hurt or killed during conflicts between associations or operators. Even when there are no injuries, people's freedom of movement as well as their consumer rights may be violated – for instance, Dipa (2016) reported that during a taxi strike in Diepsloot commuters were pulled out of those taxis which were operating and blocked from continuing their journeys, without any refunding of their fares. Ingle (2009), unlike some authors, expresses the view that this situation (in which the "law of the jungle" prevails) is not related to lack of regulation or overly high levels of competition but to the constraints under which the industry operates. He suggests that taxi operators be allowed greater freedom to focus on developing differentiated services for the market, so as to better serve the needs of customers and possibly also reduce conflict and competition over popular

about R3.8 billion per day (exchange rate derived from https://www.x-rates.com /historical/).

routes. Besides more “generic” violence, from time to time there are specific instances of gender-based violence at taxi ranks or perpetrated within the industry (including by drivers) – indeed, female public transport users are the most vulnerable passenger group on South African roads (DOT, 2013).
It is a two-way street in that MTI drivers are themselves vulnerable in many ways, as I have mentioned under the theme “Taxi drivers drive like delinquents”. Some of the interviewees pointed to their passengers not only creating stress for them but also at times robbing them – as one participant mentioned, he stopped at night to pick up what he thought were commuters and they turned out to be criminals. While none of the drivers I interviewed mentioned being physically assaulted or harmed, several described feeling pressured, judged or disrespected by their passengers. This situation is not unique to the Johannesburg MTI – for instance, *matatu* drivers in Kenya also report being harassed by their passengers (Khayesi, 2001; Khayesi, 2002).

With regards to how passengers – the “non-Coca Colas” – perceive the services rendered by the MTI, this filtered through only obliquely from the interviews (for instance, in some drivers mentioning that they would like to offer their regular passengers some sort of privileges or loyalty programmes). Dimitrov (2012) notes that in very poor areas people confine their transport use to essential trips due to financial constraints, implying that use of services like the MTI may be akin to a grudge purchase. She also points out that as households rise up the income scale they tend to favour private car use, and growing car use further worsens the availability, quality and frequency of public transport services. Her focus groups with public transport users in Tshwane revealed that they generally viewed minibus taxis as faster than buses and able to offer benefits such as affordability, availability, convenience and accessibility (even offering door-to-door services at times). Her respondents also mentioned that some MTI drivers charged lower prices for scholars in school uniform – for instance, R5 instead of R6, some described taxis as “vibey” and disabled inner-city residents appreciated being able to hire minibus taxis specifically for those who use wheelchairs. However, barriers to MTI use were also mentioned – some respondents indicated that they were overly expensive and unsafe, they were at times overloaded and

some drivers behaved rudely, engaged in speeding, were drunk and lacked driver's licences. The focus group participants also mentioned instances of having to wait until taxis filled up, and of drivers declining to transport luggage and wheelchairs. Furthermore, some expressed the view that buses and trains were safer than taxis, due to lower levels of accidents. There were references to taxis being a ubiquitous and useful back-up option – for instance, when trains broke down or buses were overly full or did not run at convenient times – but a continuously raised issue was the lack of off-peak and weekend transport services.

The perceptions of MTI passengers were also revealed when the Greater Soweto Commuters' Forum (GSCF) made a submission during the Competition Commission's market inquiry into public passenger transport in July 2017[126]. This submission indicates that commuters' concerns relating to the MTI centre on lack of customer service, unroadworthiness of vehicles, reckless driving, operating without operating licences and taxi violence. In addition, it raises the issue of inefficient pricing mechanisms given that different taxi associations charge different fares even when the distance travelled is similar – consultation with commuters as stakeholders is advised. The GSCF strongly recommends that the MTI be subsidized, on grounds that it transports most poor South Africans and other subisidized transport modes (buses and trains) do not efficiently cater to all their transport needs. For instance, it notes that despite being subsidized bus services are expensive, customer service and communication is poor, the vehicles are dirty, unroadworthy and unreliable (constantly breaking down), shifts are not adequately covered, drivers are reckless, the services infringe on commuters' human rights and they do not adhere to the Consumer Protection Act regarding the expiry dates of prepaid coupons. Furthermore, the GSCF perceives bus fare increases as abnormal in relation to the poor services offered and blames these poor services for some commuters losing their jobs and families. The GSCF echoes many previous recommendations in

[126] http://www.compcom.co.za/wp-content/uploads/2018/06/Soweto-Commuter-Organisation.pdf

suggesting that in addition to being subsidized the MTI should be formalized, have its own finance institute, set up a training academy offering courses and refresher courses for drivers, and hold shares in the vehicle manufacturing industry.

It is clear that even if commuters perceive the MTI as dangerous due to violence, accidents and crime, expensive and of poor quality, they continue to use it for lack of practical alternatives (GDRT, 2013, Annexure F, pp.18-19). Nzimande (2018) also points out that they sometimes overlook the risks due to the benefits they receive when drivers speed or engage in traffic violations – these "can be useful to someone who's in a rush" (unpaginated).

Bidasca and Townsend (2016) recommend that taxi drivers be specifically trained to look after passengers' safety – for instance, in relation to how to interact with them to foster seat-belt use and other safety-related behaviours, and how to handle passengers with mobility limitations. They should "use safe pick up and drop off points so passengers are not exposed to fast flowing traffic when entering or exiting a taxi" (p.26) and should have some first aid training in case of emergencies. The same authors assign some safety responsibilities to the passengers, noting (for instance) that they should check vehicles before entering them, use seat-belts appropriately and give feedback to operators regarding drivers' behavior (including through online portals such as are in place in some countries). Furthermore, Bidasca and Townsend note that fares can be structured to foster safe driving and discourage speeding – for instance, by setting them according to both distance and journey duration, with fixed fares being the best option for fixed routes.

The South African MTI, like its counterparts in other parts of the world, has considered how it could provide value-added services to its passengers. Innovations are already happening in paratransit services in other parts of the world – for instance, ENCA[127] reported in May 2013 that *matatus* in Kenya had been equipped with WiFi and noted that innovations like that could give

[127] ENCA is a 24-hour television news broadcasting channel in South Africa.

taxi operators an edge over their rivals (ENCA, 2013). On exploring the concept with taxi drivers and commuters in Johannesburg in June 2014, however, ENCA was told by a driver that such technology would not be right for them and would affect them negatively – in particular, he commented, "Because we will be driving and the taxi drivers will be looking at their computers. That's how accidents happen" (ENCA, 2014). Other innovations which are being explored in relation to the Johannesburg MTI include a taxi app called Khwela, rolled out by a local entrepreneur in March/April 2018 and centred on the Bree Street taxi rank (Nzimande, 2018). This aims to bring the MTI into the digital age by helping commuters identify appropriate taxi services, check fares, communicate with taxi associations (lodging complaints and making suggestions) and the like. It also offers a way for associations to send out alerts and deal with emergencies and plans to offer a "bird's eye view of what is happening daily in our taxi ranks". The founder hopes to encourage people to use the MTI to a greater extent because of its high efficiencies in congested city streets and the fact that "No-one, no matter how skilled, is as agile in traffic as South African minibus taxi drivers" (unpaginated).

In closing off this theme I must note one final observation, which is that MTI drivers effectively transport themselves along with their passengers, and whenever the passengers' lives and safety are jeopardized by risky driving, so too are the drivers' lives and safety placed at risk. With the possible exception of the front seat passenger, drivers are probably at greater risk of dying or being seriously injured than are their passengers – certainly, this is the case in head-on collsions. Thus, the issue is one of harm to human life in general – the way the industry operates currently, it seems to overlook the fact that the drivers, too, are "not Coca Colas".

Based on the operating principles in the MTI violating a number of rights contained in the Bill of Rights contained in the South African constitution – including labour rights and the rights to life and bodily integrity, as well as property rights, I contend that the industry is **contra-constitutional**. As noted earlier in the thesis, I have borrowed this term from the legal sector and use it

to describe the current operating principles in the MTI and why these are so problematic from a human rights perspective. As the constitution is the highest law in the land, the MTI's operating principles which violate the rights of passengers and drivers – and arguably also those of other road users – can justifiably be described as straightforwardly illegal.

8.3.6 Theme 6: We push the economy, we should own the road

No survey items pre-empted this particular theme, which was prominent in the interview data. Several interviewees described how reliant the economy is on the MTI – both in the sense that it plays a major role in getting people to and from their workplaces and in the sense that in itself it is a major source of employment. On the whole, the responses focused on a need for taxis to have special dispensations (such as being allowed to share BRT lanes with the Rea Vaya) and for private drivers to make extra allowances to them on grounds that they are carrying far more passengers than private vehicles do. Multiple "conflict points" exist where MTI drivers and private drivers must share space, with some crashes resulting from this. Some interviewees pointed out that MTI strikes affect the economy and "interrupt" the corporate world, with it also being mentioned that despite their importance in the whole system the MTI drivers themselves are seldom consulted during meetings and other events in the transport sector. One participant described "driving in the yellow line" as a coping mechanism, given the pressure from passengers and the lack of special dispensations on the roads. There was also mention of double standards on the part of "the privates", who are happy when MTI drivers let them in to the stream of traffic, but typically do not return these favours and also do not consider how their own driving behavior can place MTI drivers and multiple passengers at risk. Finally, one participant raised the concept of a community of road users (reminiscent of ubuntu ethics) and reasoned that better communication should take place amongst all categories of drivers.

The drivers' views that they "push the economy" and thus deserve special support is well borne out by the literature. Walters (2013) estimates that 65%

of South African commuters use the MTI, while Schalekamp, Behrens and Wilkinson (2010) describe it as the largest supplier of urban public transport services in the country. It allows poor people to access jobs in previously inaccessible areas (Fobosi, 2013) and has significantly reduced their commuting time (McCaul, 1990; Bank, 1991; Sekhonyane & Dugard, 2004; Fobosi, 2013). The dependency of commuters on the MTI, in areas where no bus or train services are available, is highlighted by comments made to Dipa (2016) during a taxi strike in Diepsloot – a commuter explained, "Most people here rely on just taxis and when they don't operate, we are all stranded" (unpaginated).

A more contentious aspect to this issue is that the MTI sometimes engages in violent means in order to preserve its "captive" customer market. For instance, Maromo (2018) noted that during a taxi strike in Mamelodi motorists who were ferrying stranded people reported being stopped by a taxi association 'squad car' and told that they did not have permission to convey people for reward. As noted previously, Gilili (2018) reported that in the East London area commuters who attempted to hitchhike were aggressively dealt with by taxi association officials and forced to use taxis instead.

Sauti (2006) quotes Dullah Omar (then minister of transport) as stating at the Gauteng Provincial Taxi Conference in July 2000,

> *The taxi industry, despite all bad press has done as much as any aspect of the industrial relations system to contribute to employee productivity.* (p.108)

Blom (2018) reports in relation to the transport market inquiry by the Competition Commission that the current system of bus and train subsidies by the government goes back 30-40 years but the MTI has never been subsidized. He notes that transport analyst Paul Browning argued in a submission to the market inquiry that it is "impossible to subsidise the unregulated and largely informal industry, but that it [is] equally impossible to formalize and regulate the industry without some form of subsidy"

(unpaginated). Blom also quotes the submission of transport and automotive economist Sam Rolland to the effect that subsidies of commuter transport are in use worldwide, especially where transport costs exceed 10% of household income (as in South Africa). Rolland noted that "Although it is very difficult to put a cost to the economy of a dysfunctional transport system, it is clearly enormous". He also indicated that "[p]roxy indicators, such as the recent bus strikes, indicate our dependency on minibus taxis" (all Blom, 2018, unpaginated).

Returning to the argument of Husak (2004), namely that *frivolous* driving in *crash-incompatible vehicles* could automatically be viewed as wrongful and culpably harmful, I contend that MTI driving does not fall into the category of frivolous driving. Neither the passengers nor the drivers are in pursuit of purely recreational or frivolous ends – the drivers take on their jobs due to economic necessity (given the high unemployment rates and lack of alternative income-generating options in South Africa), and the passengers use the industry out of necessity to get to important destinations such as their workplaces (given the absence of satisfactory alternative public transport options). As I noted in chapter 5, Husak adopts the more stringent of two positions in relation to his argument regarding wrongful driving – thus, he argues that the label of wrongfulness should be attached when both conditions are met, but not when one condition is met. I have already argued under the theme "The vehicle is scrap, a *skorokoro*" that Husak's second condition of crash-incompatibility may well apply to the Johannesburg MTI. However, I conclude that his first condition does not apply and that, if his argument is accepted, this means that MTI driving cannot in itself be labelled wrongful or culpably harmful. At odds with this is the view expressed by one of my interviewees, who strongly stated that the MTI should simply cease to exist – a view to which I will return in discussing the final theme, "Government should put its eyes on the industry".

In summary, the MTI holds *de facto* power in relation to many South Africans' heavy reliance on it as their main (or only available) mode of transport, as well as its willingness to resort to violent or aggressive means to maintain its mode

share. On the other hand, it is disempowered by a lack of special dispensations (rendering its services more dangerous and less efficient than they might otherwise be), poor levels of respect, cooperation and consideration shown to it by other motorists, and the lack of involvement in consultations by MTI drivers – those who most intimately understand the conditions in the road traffic system. Whether the lack of subsidies empowers or disempowers the industry is difficult to say. Without subsidies the industry continues to have high levels of autonomy and self-regulation, which probably contributes to its flexibility and customer-responsiveness. However, the lack of subsidies means in effect that it remains an informal "poor cousin" within the public transport market, and is not held to any particular service standards or operating principles by the government. As is being addressed by the transport market inquiry, it is also free to set its own fares (and adjust them at will), which differs from the regulated manner in which fares are set, discounts are offered and refunds given in the formal transport sector.

We are a year or so away from the transport market inquiry wrapping up and making its recommendations. These could have a significant bearing on the nature of the MTI, going forward. However, given its history and the entrenched nature of some of its practices, it seems highly likely that MTI operators and associations will resist or defy any changes which are perceived as not in their best interests (particularly on a financial level). The best interests of the drivers and passengers seem likely to continue to be secondary.

8.3.7 Theme 7: Government needs to put its eyes on the industry

In essence, this theme relates to a sense of government having abdicated with regards to drivers' and passengers' rights and with regards to road safety in the Johannesburg MTI. It also relates to a general sense that the government is failing in relation to reducing road crashes and RTID within the crashogenic South African road traffic system. Before embarking on my discussion of this theme I will note my overarching impression, from the

survey and interview data as well as from the literature and contextual information. This is that the government is reminiscent of a distracted driver at the wheel – one who is nominally in charge of the vehicle but is neither showing vigilance to risk factors, nor exercising control over the forward movement of the vehicle, nor reflecting on and correcting dangerous driving behavior. I have a strong sense that a degree of road safety denialism is at play, congruent with Kimber (2003) noting that there is a general temptation to downplay the size of the RTID problem. He explains that the open nature of the road traffic system, the large number of drivers who are free to enter it without undergoing high levels of selection and training (such as occur in relation to train drivers and airline pilots), and the "huge amount of road travel" which occurs, together mean that the numbers of road crashes are actually "surprisingly low" (p.4) and this makes the problem of RTID seem less significant than it actually is.

My survey did not elicit this theme in an overt manner, but did obtain some descriptive information relating to some aspects of the MTI which the interviewees later recommended that government should "put its eyes on". These can be divided particularly into vehicle-related issues (the domain of the DOT) and labour-related issues (the domain of the Department of Labour or DOL). The interview data dealt richly with this theme and is best encapsulated in the comment of one participant, namely "the government doesn't care about us". A strong sense of marginalization and disempowerment came across in the way the drivers saw themselves (particularly vis-a-vis taxi owners, taxi associations and traffic authorities) and also in the way they saw their passengers. Insofar as the latter issue is concerned, some interviewees alluded to the injustice of "the privates" (with the convenience and ease of individualized transport and roads which are designed with them in mind) seemingly being treated as more important than those who travel via minibus taxi. Although prone to blaming their passengers for some aspects of their unsafe driving, the drivers on the whole showed an allegiance to the passengers and an awareness that poor South Africans lack access to more satisfactory government-supplied transport when it comes to getting to and from important destinations like their workplaces.

Because of the depth of this theme, I will continue my discussion under three sub-headings, focused on the main ways in which the drivers suggested that government should "put its eyes on the industry".

- **Government's role as the system designer and regulator**

The interview transcripts contain a number of items relating to government's overarching role with regards to the road traffic system. These included mentioning of its role as the administrator of vehicle and driver licensing systems and vehicle roadworthiness testing, references to its roles in relation to the physical road infrastructure (including, for instance, the need to attend to potholes and broken traffic lights, design roads appropriately for how they are used and provide special lanes for public transport vehicles where necessary) and comments regarding the need for better integration of different aspects of the system (for instance, regulating the relations between private and public modes of transport). The strong sense gained from most of the interviewees was that they strongly favoured formalization and upliftment of the MTI, implemented by government. However, as I mentioned previously, one participant deviated wholly from this in recommending instead that the MTI disappear altogether in favour of other government-regulated transport modes.

The degree to which the state has "taken its eyes off" – or perhaps "turned a blind eye to" – the MTI broadly has been commented on by authors from different academic viewpoints. Croucamp (2003) and Ingle (2009) provide detailed sociopolitical analyses of the industry, with both noting that taxi "strongmen" – some of whom use violent measures like hit squads to maintain their power – have been allowed to usurp government's regulatory functions. Ingle comments that "while the state is trying to formalize the industry by means of a raft of elaborate and ultimately unenforceable regulations…, it continues to neglect reinforcing basic 'rules' which could serve to rehabilitate the sector, and bring it into line with good business practices" (p.73) (to which I would add "good road safety practices"). Fobosi (2013) notes that the MTI

continues to “straddle the formal and informal economies” (unpaginated), while Mashishi (2011) views the MTI of this century as a legacy of apartheid’s spatial engineering and advises that it be subsidized on the basis of formal performance contracts.

Ingle (2009) and Croucamp (2003) relate the current situation – which Croucamp describes as the state having literally abandoned the MTI – to several factors. One is what Ingle terms state ineptitude and Croucamp calls “a general organizational impotence” (p.5), another is the “constrained legitimacy” of the state (Croucamp, 2003, p.5) and a third is what Ingle describes as a misguided view that public transport can be commoditized. Croucamp views the MTI as having defied “the dominance of the state and [forced it] into compromises on the rules, regulations and values (regimes) of the political process” (pp.2-3). He notes that the MTI is “an important social partner/contender in the state’s democratic project” which involves the development of “the normative architecture of justice and social order” (p.3) – the state and society thus influence each other in the negotiation of common values. He points to the MTI having a potentially destructive and undemocratic influence on this project, given that its entrenched power-monopolies (including violent and illegal mechanisms to sustain these) are actually a legacy of apartheid. Elaborating on this, Croucamp notes that in not-yet-consolidated democracies the “prevalence of social formations that feel structurally prevented from policy formulation or excluded from the distributive range of the state” (p.5) can threaten state-building. In his view, the MTI could act as a “rogue force” which influences the “process of policy formulation [and] the relational and institutional configurations of state-formation in the aftermath of apartheid” (p.7). To offset this, the state must thus enter into compromises in the interest of achieving the greater good. Croucamp comments that at the very least the MTI is “an organisational conundrum to policy formulators in democratic South Africa”, highlighting “the difficulties of policy formulation and state formation under conditions of scarcity” (p.32) – this scarcity being related to limited industrial development, very high unemployment, low incomes and a very large informal sector, all resulting in demands for resources significantly outweighing what either the

state or the market can supply. Croucamp also notes that, having been birthed in opposition to apartheid, the MTI has a strong association with liberationism which "positions it ideally for state patronage" (p.34) and provides it with enough para-military capacity to challenge government's authority and defend its own self-regulatory ability.

These arguments by other authors, coupled with the data gathered from the drivers involved in my study suggest to me that even where the government *is* present in relation to the MTI – where it is an attentive rather than distracted driver – it is compromised and fettered by long-standing power dynamics between it and the industry.

On a moral more than political level, Ingle (2009) notes that the MTI embodies the "dangerous belief that the 'commons' (a public route) can be 'owned' by whoever (not excluding the state) is strong enough to 'capture' it and fight off challengers" – in his view, it is "this 'commodification', of what is in fact an intangible public good, that lies at the heart of the taxi industry's present malaise" (p.73). He comments that the MTI "possesses enormous resilience and appears quite unassailable", having "appropriated for itself many of the most negative aspects of the regulatory hand of the state and become a law unto itself" (p.83). He expresses doubt that government will "ever wrest control back" and notes that instead the industry tends to "hold the state hostage" with threats of strikes (p.83). In his view, since the state is unable to supply adequate alternative transport services for commuters, it has become "beholden to the industry in a way that is far from healthy" and is at the mercy of "the myriad autarkic associations that effectively control the industry and police the routes" (p.84). Far from proposing that the state seek to regulate the MTI, however, Ingle suggests that attempts to formalize the MTI (at state expense) would be akin to achieving 'state capture' of a corrupt pirate industry, which would be both overly expensive and "a recipe for providing yet more niches for organized crime to colonize" (p.85). It would inadvertently create "openings for a new generation of pirates" who then bankrupt "the formalized, erstwhile pirates who can no longer compete with their informal counterparts" (p.84). Ingle argues that in this case the best strategy may

involve cautious *deregulation* and removal of the "intrusive, hegemonic" role government has sought to play, which would decrease the prevalence of corrupt practices. He concludes,

> *Arguably what is needed is not more state regulation but less, and for this level of regulation (which is little more than common sense and good housekeeping) to be properly enforced. This entails the state jealously maintaining its prerogative to act as "sole" regulator, in order to root out the element of 'street justice', and the mobster ethos, which has so tarnished the South African minibus taxi industry's image.* (Ingle, 2009, p.87)

Hoffman (2012) notes that "it seems that the very strategies the taxi industry developed to survive in the apartheid regime, and indeed in the post-apartheid marketplace, are precisely what stand as obstacles to new kinds of collection action; ones that seek to expand common space rather than protect common interests against external threats. If this is the case, it becomes the state's responsibility to broker an agreement between the taxi associations". She suggests that the MTI be "supported and celebrated as an incredibly resilient public resource and economic contributor" (all unpaginaged).

The White Paper produced by the RSTF Task Force notes that companies can exert political influence and help shape policy-making by government – for instance, by providing data including fleet safety metrics and best-practice manuals (RSTF, 2010). In the case of the MTI, there are few indications that road safety is accorded high priority in the negotiations between it and the government – instead, these focus to a much greater extent on issues of financial control. Since the advent of the UNDA, South Africa (as one of the more than 100 signatory countries) has attempted – at least on a policy level – to bring itself into line with the five UNDA pillars. In its Road Safety Summit 2015 the government recognized the need for a particular focus on development of legislation as well as on youth-related road safety problems (DoT, 2017c) and recommitted itself to addressing the very high levels of RTID in South Africa. In its Annual Performance Plan 2015/2016 the DOT

reiterated the country's commitment made at the outset of the UNDA, namely that it would "reduce road carnage by 50% from 13 967 to below 7 000 by 2020", implying "an average annual reduction of 700 road fatalities" (DOT, 2015, p.16). In this document the government commits itself to five key goals (aligned with the UNDA's 5 pillars), namely:

- Road safety management – establishing traffic data management systems to strengthen reporting structures and ensure monitoring and evaluation
- Safe roads and mobility – improving spatial development planning and assessing roads in hazardous locations to address road safety.
- Safe road users – educating people about risks associated with irresponsible road usage and developing conscious road users by changing behaviour and culture.
- Safe speeds – intensifying efforts to deal with speeding and determining appropriate speed limits.
- Safe vehicles – strengthening roadworthiness mechanisms to ensure safety of vehicles and compliance with vehicle safety standards.

My interview data suggests that the government is woefully failing in most of the above areas. The most relevant one for my study is the focus on safe road users and the need to change road-related behavior and culture. Notwithstanding impressive policies, as I pointed out in chapter 3 South Africa's road safety status quo is very problematic – ie. our practices in real-life settings are well beneath road safety best practice, even though some of our legislation and vehicle standards comply with international guidelines. Furthermore, the most visible aspects of the government's road safety interventions remain the policing of individual behavior rather than system interventions, and this suggests that the adoption of the Safe System approach is more hypothetical than real – clearly, government has not properly taken ownership of the philosophy behind such an approach. Kimber (2003) notes:

> *Who should decide exactly where the boundaries of responsibility are to be placed is a difficult question. If we move further in the direction I am advocating* [ie. towards a system approach], *it will mean road authorities and vehicle manufacturers will, de facto, absorb greater responsibility for removing the consequences of routine driver error. In contrast the responsibility for counter-measures to the risk from excess and inexperience failure is ultimately with government, the police, and the courts.* (p.18)

Finally, it is relevant to this theme that many of the drivers I interviewed made reference to instances of bribery and corruption affecting regulatory processes (including driver licensing, vehicle licensing and roadworthiness testing) as well as the way in which road traffic rules are enforced – or not enforced – by traffic officials. This included mention of situations where there are conflicts of interest – for example, when traffic officials are also taxi owners, and abuse their positions to skew activities such as roadblocks. This serves to heighten the profitability of their own businesses and detract from their competitors' profitability, and undermines their credibility and effectiveness when it comes to objectively enforcing road traffic rules.

- **Government's role as overseer of labour relations**

Much of the information which emerged during the interviews centred on the very poor labour relations between drivers and taxi owners in the MTI, and a sense of powerlessness on the drivers' part to effect change. One participant put it simply, commenting "government doesn't care about us". Several interviewees perceived the Department of Labour as a very important roleplayer – even more important than the Department of Transport – in relation to improving their work conditions in a way which will directly improve road safety in the industry. Some also specifically mentioned the need for higher levels of training of drivers, and lower levels of variability in relation to how different taxi operators and associations run their activities. One pointed out the importance of government intervening in the MTI due to its potential to "lift people out of poverty".Under the theme "It's not a proper driving job" and,

to a lesser extent, the theme “taxi drivers drive like delinquents”, I have already outlined many of the specific concerns the drivers raised with regards to their work hours, pay arrangements and general conditions of employment. Surprisingly, none mentioned the sectoral determination specifically or showed awareness of its provisions in relation to working hours and paid leave – for instance, despite having opportunities to do so none mentioned the issue of overtime pay or nightshift allowances and there was no mention of the minimum wages stipulated by the determination (and adjusted periodically for inflation) or comment regarding whether their wages were compliant with these. Furthermore, none of the drivers mentioned the Commission for Conciliation, Mediation and Arbitration (CCMA) which is generally very well known amongst South African employees as an avenue for addressing workplace disputes and grievances regarding unfair labour practices, and there was little (if any) spontaneous mention of unions as a mechanism for representing MTI drivers and resolving their grievances. When opportunities arose to discuss the issue of unionization this was universally dispelled as a possibility – for instance, on grounds that one can only belong to a union if formally registered as an employee and in receipt of payslips and a bank-deposited (rather than cash-based) salary, and also on grounds that union representation would be insufficient to deal with the violent, “strong-arm” tactics within the MTI. As a group, the interviewees came across as subdued rather than militant, mostly naïve or ignorant regarding their rights as workers under the Basic Conditions of Employment Act – let alone under the highly specific taxi sector sectoral determination. This points to a distinct need for education amongst MTI drivers, to enhance their awareness of the deficiencies of their work conditions and how to address these. However, their marked vulnerability to arbitrary job loss, especially in the prevailing climate of high unemployment, and their lack of worker representation and labour solidarity, will constrain their ability to enforce their rights.

Croucamp (2003) notes that until the 1990s no union managed to mobilise or represent MTI drivers, which he attributes to the threat of violence – for instance, he makes mention to his own interview with a police inspector in

1999 which revealed that Johannesburg taxi owners hired hit squads to murder drivers who tried to set up a union. He points out that even the trade union federation COSATU has done little more than comment on the industry's lack of effective labour relations, leaving the drivers as "a constituency without representation… desperately seeking for a source which would restrain the coercive impact of taxi owners and association representatives" (p.124). This is echoed by Ingle (2009), who notes that 'obstinate' drivers[128] may even be murdered for disagreeing with taxi owners, with very limited chances that the perpetrators will be prosecuted.

Writing at a time when the sectoral determination had not yet been introduced, Croucamp (2003) notes that the same factors which prevented the formalization of the MTI "entrench[ed] the status of taxi drivers as similar to labour in the informal sphere of the economy" (p.121):

> *They are not registered at the Department of Labour, have no medical aid, no pension and no disability cover. If they are retrenched or discharged for whatever reason they have very little scope from which to defend their rights, especially since taxi owners can coerce them into submission even after they have left the industry*. (p.121)

With regards to taxi owners' poor compliance with the sectoral determination since its advent in 2005 Ingle (2009) notes that there were ominous warning signs of this from the outset, with owners suggesting that they would comply only if government subsidies were made available to them. He also points out the practical difficulties of the state regulating labour relations in an industry which is "hugely dispersed, autonomous and anarchic", commenting that government cannot even administer more straightforward administrative processes – for instance, it has "shown itself to be unequal to the task of administering and controlling drivers' licences" (p.79). One of the drivers I

[128] This is an interesting use of terms, given that one interviewed driver in my study used a similar term, "*baluhlaza*", to describe taxi owners' stance towards their drivers. As noted earlier in the thesis, my interpreter settled on the English phrase "it's my way or the highway" to describe this demeanour.

interviewed explained that in his view, “Taxi drivers are not difficult to regulate” but there is a problem with regulating “the bosses”. This reinforces my comments regarding the drivers’ poor prospects of having their labour rights respected and adhered to.

Several of my interviewees pointed to the need for intersectoral government intervention into the MTI – for instance, with the DOT and Department of Labour working together to address the drivers’ work conditions in the interests of reducing road crashes. This is congruent with the RSTF noting that there is a need for ministries of labour to cover all situations involving employee-operated vehicles, and not simply those situations involving large commercial or industrial vehicles (RSTF, 2010). Thus, the White Paper of the RSTF recommends that ministries of labour extend their jurisdiction to include workers whose workplace is the roadways and whose roles revolve around operating vehicles on public roads. The drivers interviewed during my study seemed to wholeheartedly support this notion, while at the same time expressing a sense of despair because of an absence of any signs that the Department of Labour is interested in their situation.

- **Government’s role in relation to the human rights of MTI passengers and other road users**

Finally, some interviewees made mention of passenger rights and the need to focus on the safety of all road users, with the government seen as having a clear role in relation to overseeing this; I have already touched on some of these concepts in relation to my earlier discussion of the theme “We are not transporting Coca Colas”. Ingle (2009) notes that government’s inability to properly implement the taxi recapitalization programme in the early 2000s, and its agreement (under pressure from the industry) to delay it, has effectively allowed MTI drivers to “continue using their ‘death traps’ on public roads while carrying passengers” (p.81). Although he argues that *less* rather than more state regulation of the MTI may be appropriate, he perceives the area of road safety as a special case. Thus, he notes that “the only ‘formalization’ that is really required is the proper enforcement of ‘already

existing' standards such as, for example, those that automatically address passenger safety by requiring adherence to the normal rules of the road" (p.86). In this regard, he argues that South Africa's "laws pertaining to vehicle usage are adequate as they stand to ensure passenger safety" (p.87) – thus, the problem is not one of legislation but one of enforcement.
Croucamp (2003) argues that "the primary challenge of new democracies, such as South Africa, [is] the consolidation of the rules, regulations and values of the democratic regime" (p.10) but this is complicated by the fact that different sectors of society "conceptualise democracy from diverse historical viewpoints" and have "varying, often contending, moral justifications for distributive interests, and certainly diametrically opposing views of social order" (p.12). As noted earlier, he points out that the situation is compounded by the economy of scarcity. I note that despite the advent of democracy more than two decades ago, civil society in South Africa remains a site of struggle between the "haves" and the "have-nots". In the road traffic system, this is particularly evident in the tensions between "the privates" (well-to-do vehicle owners) and MTI passengers and drivers (who for the most part come from deeply disadvantaged sectors of society). The impression I have is that government is engaged in a degree of road safety denialism, strongly affecting poor users of public transport and particularly affecting historically disadvantaged black South Africans who remain trapped in the residual spatial realities created by apartheid. The philosophy "Black lives matter" (mooted in the US in response to biased police action against black minorities) is NOT evident on South Africa's roads.

There are, of course, limits to what government can do and it is important to understand its responsibilities in relation to those of the road-using public and the MTI itself. As Khayesi (2002) notes, government "alone cannot tackle the problem of road traffic injuries associated with the matatu… [p]assengers, vehicle owners, policemen, insurance firms, banks, vehicle importers and the travelling passengers have a role to play in improving road safety in the matatu industry" (p.241).

Summing up from the above three sub-sections, the data which emerged from the interviews paints a picture of South Africa's roads as a mirror of broader society. Thus, they are characterized by conflictual interactions between different interest groups and sectors (for instance, MTI users versus "the privates"), sharing the same constrained resources (road space and time) and without a strong sense of leadership or direction from those "in charge" in terms of "doing the right thing"[129]. I am struck by the lack of continuity at a leadership level, within government – there have been eight transport ministers since the advent of democracy in 1994, with three different ministers appointed in the past two years alone. The first three post-apartheid transport ministers served for an average of 60 months, while the last four before the appointment of current incumbent Blade Nzimande in February 2018 served for an average of only 26 months.[130] At least one transport minister seems to have been caught up in former president Jacob Zuma's proclivity for "cabinet reshuffles", designed not to enhance the effectiveness of government ministries but rather to entrench particular power dynamics within the ruling party. Perhaps in part due to this leadership "churn" and the use of political appointees rather than skilled technocrats to ministerial roles, despite our having some world-class road safety laws and our current National Road Safety Strategy reflecting a commitment to a Safe System approach, as I noted in chapter 3 our road safety practice in the real world is poor. I have also pointed to significant problems with the authority tasked with being the lead agency for road safety, namely the RTMC – this highly staffed organization appears to be delivering extremely inadequate services and is failing to create a national vision for road safety. The lack of tie-in between different government documents, in relation to reducing road deaths, is particularly concerning as it results in a lack of a coherent message from

[129] Indeed, it can be argued that those in charge are much better at showing how to "do the wrong thing", if one considers that blue light convoys which allow government officials to be conveyed at above-normal speeds, disregarding the usual traffic rules, are an example of "wrongful conduct".

[130] The role of minister of transport has been held, since the advent of democracy, by Mac Maharaj (1994-1999), Dullah Omar (1999-2004), Jeff Radebe (2004-2009), S'bu Ndebele (2009-2012), Ben Martins (2012-2013), Elizabeth Dipuo Peters (2013-2017), Joe Maswanganyi (2017-2018) and Blade Nzimande (February 2018 to current).

government to the road-using public. The shifting goal posts in terms of how many road deaths would be "acceptable" in 2030 is ethically disturbing, given the number of human lives involved (and the fact that for each road death there are multiple injured survivors, many with life-changing injuries, and typically many bereaved family members who may have lost a primary breadwinner). The South African road traffic system remains skewed in favour of the regime of automobility – the dominance of privately owned cars – despite government's claimed pro-poor stance and its multiple policies reflecting the need to foster increased use of public transport. The crashogenic environment presented by our road traffic system, and the contra-constitutional operating principles of the MTI as by far the most dominant public transport mode, are of great concern yet the government appears unwilling or unable to tackle them effectively.

8.4 Application of Nihlen Falquist's MRAF to the results

Having discussed my quantitative-qualitative empirical data in an integrated fashion, with reference to the literature and contextual information, I will now present my closing argument regarding the ascription of road safety responsibilities (related to the Johannesburg MTI) to identified rolepayers, using the moral responsibility ascription framework (MRAF) postulated by Nihlen Falquist (2005). I explained in chapter 5 that this framework divides road safety responsibility into three categories: blame responsibility, causal responsibility and forward-looking responsibility. I will now set out my moral argument firstly in a narrative manner (dealing in turn with each type of responsibility) and will then provide a graphical summary depicting the types and levels of responsibility I ascribe to each set of MTI roleplayers.

8.4.1 Blame responsibility

In ordinary language, being to blame for something implies having done something wrong (or possibly having failed to do the right thing). Nihlen Falquist (2005) applies this to situations where A being responsible for E includes A causing E – when E is something bad. She notes especially that

blame can be assigned if A acts voluntarily and knowingly. Although Elvebakk (2005) points out that people may not be aware of all their options in a particular situation, may lack knowledge and realisation of what the consequences of their actions will be, may lack the will to behave in the correct manner and may become caught up in collective action. However, in most countries there are deontologically based road safety systems which mean that none of these factors would absolve drivers who break road rules – thus, even within a Safe System approach, they can be blamed for specific incidents and can receive punishments like fines or jail sentences. Ignorance of the law is also not equated to innocence, due to drivers having to undergo training and licensing (thus, becoming the "highly constructed human beings" written about by Elvebakk).

In my view, there are many situations when MTI drivers can reasonably have blame responsibility ascribed to them in relation to road crashes. These would include, for instance, situations when they deliberately drive without a proper driver's licence and/or PrDP, exceed the speed limit (or a speed which would be reasonable for the circumstances), overload their vehicles, drive in the emergency lane or on the wrong side of the road, overtake when it is unsafe to do so, ignore red traffic lights or stop streets, turn from incorrect lanes or change lanes without indicating, follow other vehicles too closely, drive vehicles which they know are unroadworthy, stop in unsafe places, fail to use their headlights after dark, use hand-held mobile devices whilst driving. In the interests of a good life and workable society, these behaviours should be policed in relation to MTI drivers as stringently as they are policed in relation to other professional driver categories, such as bus drivers and truck drivers. Ascribing blame responsibility to them acknowledges their agency.

There may also be instances when blame can be ascribed not to the drivers but to other roleplayers in the MTI or even outside of it. The government as system designer may be blameworthy in respect of particular elements of particular crashes – for instance, when a traffic light goes out of order and is not rectified, when a road has been poorly designed for taxis and other traffic, when a major pothole or other road defect goes unaddressed despite

government being aware of this. However, the government as law enforcer seems to be more blameworthy, due to allowing corruption and fraud to affect testing centres to the degree that non-roadworthy vehicles are certified as roadworthy. It is also blameworthy to the extent that bribery and corruption on the part of traffic officials allow people to get away with dangerous driving.

Other roleplayers who cannot entirely escape blame include taxi operators – if they knowingly provide drivers with defective vehicles or actively refuse to address defects which have been brought to their attention, they should be assigned some blame for specific instances, such as when brakes fail, a tyre bursts or a windscreen shatters and those were predictable events in light of neglectful servicing and repairing of the vehicle. Furthermore, they can be blamed for failing to check that their drivers have valid licences and PrDPs, as without these it is illegal for them to drive public transport vehicles due to the fact that they will be insufficiently trained and medically cleared to do so. MTI service providers – such as vehicle manufacturers, dealers or maintenance centres – may also be blameworthy in particular ways. The most dramatic example of this would be the phenomenon of the “Killer Quantums” (modified panelvans which are not fit-for-purpose and lack features like reinforced floors and appropriately tethered seating) but suppliers of substandard vehicle parts or poor quality servicing could also fit into this category, if foreseeable mechanical failures result in crashes. The next roleplayers who could be in line for a degree of blame are MTI passengers – indeed, the drivers repeatedly mentioned passenger behavior (like requests to speed up or to stop suddenly in unsafe places) as a cause of road crashes. However, the general principle of the driver being in charge of the vehicle and thus to blame for his own conduct suggests that pinning blame on passengers would not hold up in a court of law or in relation to insurance claims. Other road users – from pedestrians to other motorists (including the “privates” who are strongly disliked by some MTI drivers) – can certainly also be to blame for road crashes for which, at first glance, an MTI driver appears to be blameworthy. Here, a fair and non-biased, non-stereotyping accident investigator would be needed to establish the true duty-bearer when it comes to blameworthiness – as noted by more than one interviewee, there are frequently assumptions that

taxi drivers are to blame for *all* the crashes in which they are involved. To the extent that private vehicle drivers fail to respect minibus taxis as public transport vehicles (in the way that buses tend to garner extra respect and have extra dispensations, in many countries around the world), this too may render "the privates" blameworthy in relation to particular crashes.

In summary, I ascribe a major degree of blame responsibility to the MTI drivers themselves, as well as to government as the law enforcer. I ascribe a more minor degree of blame responsibility to *all* other roleplayers.

8.4.2 Causal responsibility

Nihlen Falquist points to the need to not only assign blame but also to look for causally relevant underlying factors, or causal triggers, when it comes to road crashes. Here, much of the data which emerged in my study – and much of the international literature on road safety best practice and the Safe System approach – suggests that the greatest degree of causal responsibility must lie with the designers of the road traffic system. In relation to this, the South African government as system designer and law enforcer can readily be ascribed a significant level of causal responsibility, given what I have argued is the crashogenic nature of our road traffic system. The self-regulating nature of the MTI – which extends to practical details like how ranks operate, what routes are driven, what types of drivers are recruited, what hours the drivers work and under what conditions – makes it appropriate also to ascribe major causal responsibility to the taxi associations and the operators who constitute them. Of particular relevance here is the target system and the way in which this directly contributes to dangerous driving. The same system may also lead to dangerous driving in a secondary way, if it encourages the use of unfit drivers (for instance, those who are under the influence of alcohol or drugs) in order to maximise profits. The field of WRRS makes it clear that work conditions play a major role in shaping the driving behavior of those who drive for a living, and my empirical data points to MTI drivers' work conditions being

deliberately designed with a view to maximizing profits, regardless of the fact that this negatively affects road safety.

Since dangerous driving behavior presents as many risks to MTI drivers themselves as to their passengers, and since my empirical data does not suggest any element of suicidality or self-sacrifice, it appears that they engage in calculated risk-taking because this seems to be what the situation requires of them[131]. The causal factors in their dangerous driving thus seem to lie largely outside of them, rather than within them.

However, I do not absolve the drivers of all causal responsibility – I have no doubt that at times they willfully create negative antecedent conditions which later give rise to wrongful or blameworthy behavior on the roads. This would include, for instance, using alcohol or drugs before starting work (or during a shift) or deliberately overloading their taxis to maximise their earnings.
In relation to MTI service providers, I perceive it as possible – even likely – that they have a strong degree of causal responsibility. Vehicle manufacturers which dominate the taxi market do not seem to be particularly concerned with how their products perform and are used – for instance, Toyota has simply distanced itself from the issue of "Killer Quantums" and is not visibly involved in MTI-related road safety campaigns, despite its dominance in the market. I can also find no evidence that it or any other vehicle manufacturer is grappling with the issues related to a high proportion of minibus taxis beyond the reasonable operating lifespan – for instance, the absence of passenger seat-belts and other safety features in elderly vehicles. There are no retrofitting campaigns and no evidence that Toyota and the other manufacturers are actively speaking out about the safety risks of public

[131] From an observer perspective, I find it surprising to see just how many risks MTI drivers take on the busy roads of Johannesburg *without* a crash resulting. It strikes me that society may have a tacit group agreement in place, namely that other motorists will adapt their driving behaviour to adjust for what has become accepted as "normal" behaviour in the MTI. This is evidenced by other motorists taking evasive action or employing extra caution in the vicinity of a minibus taxi. The fragility of this agreement is easily seen when road users unfamiliar with this "honour code" (for instance, foreign visitors or rural South Africans not used to life in a city like Johannesburg) are shocked or caught off guard by MTI drivers' behaviour.

transport vehicles which are beyond their reasonable operation lifespan.[132] Service providers (maintenance centres and parts suppliers) which offer sub-standard or pirate parts which compromise taxis' safety would also have causal responsibility. Other roleplayers which arguably carry causal responsibility are the various taxi finance houses, which charge high interest rates – ostensibly due to the risky nature of the industry – which result in high vehicle repayments which in turn seem to be an important reason for taxi owners to pressure drivers to maximise profits. Cynically, the finance houses seem to benefit from having a 'captive market' which, due to its informality, has limited prospects of obtaining better-priced capital from the banking sector. It is also possible that they deliberately structure the situation to allow for frequent vehicle repossessions and re-sale, in order to maximise their own profits.

With regards to the passengers, many of the drivers I interviewed seemed keen to ascribe causal responsibility to them and some drivers alluded to how difficult it can be to resist passengers' inappropriate or unsafe exhortations or requests. I do think it fair to assign some causal responsibility to passengers, but not at the same level as that which I assign to some of the roleplayers already mentioned. It may be appropriate for commuter organisations like the GSCF to accept a degree of causal responsibility and embark on passenger education programmes, considering that many MTI passengers may not have undergone training and licensing and may thus lack an understanding of the safety implications of different types of driver behavior.

Finally, in respect of other road users (including, of course, "the privates"), I reason that we have a degree of causal responsibility in that vehicles containing multiple people should perhaps be accorded greater respect than we traditionally give them, in the interest of reducing crashes. In HICs, the respect which is shown to bus drivers by other road users (and often

[132] It is particularly striking that the scholar transport sector is allowed to use vehicles up to 12 years old, and that vehicle manufacturers seem to be silent on this point. Of course, if they were to speak up there may be an assumption that they have a vested interest in the vehicles being retired and replaced with new ones.

mandated by laws) arguably reduces the factors which may cause crashes – for instance, by causing other traffic to slow down significantly in the vicinity of a bus and give priority to passengers who are embarking or disembarking (especially when those passengers are VRUs like schoolchildren or the elderly). Government may never provide MTI drivers with dedicated lanes or in other ways mark them as deserving of special treatment, in line with the desires expressed by some of the participants in my study. However, this is not to say that other road users should not use a moral reasoning process – in line with virtue ethics, ethics-of-care and ubuntu ethics, for instance – and of their own accord give the drivers (and their valuable "cargo") a greater degree of tolerance and consideration in the interests of road safety. Just as there are trust deficits between the MTI and government, and between drivers and taxi owners, there seem to be deep trust deficits between members of the road-using public and MTI drivers, with a great deal of finger-pointing and blaming of the latter for crashes. Greater awareness of the regime of automobility and of how skewed the road traffic system is in favour of "the privates" could assist individual car users to adjust our own behavior in ways which reduce the level of crashes. MTI drivers, after all, may simply be an indicator species in relation to the overall high levels of lawlessness in the South African road traffic system. Lawlessness is certainly not their exclusive preserve.

In summary, I ascribe a major degree of causal responsibility to the government as system designer and law enforcer, as well as to taxi operators and associations and to MTI service providers. I ascribe a more minor degree of causal responsibility to MTI drivers, MTI passengers and other road users.

8.4.3 Forward-looking responsibility

Finally, when it comes to forward-looking responsibility – taking responsibility to improve today's situation for the sake of tomorrow – I perceive government as system designer and government as law enforcer as having the major

share, even though some forward-looking responsibility can be ascribed to all the other roleplayers. Despite authors like Ingle (2009) and Croucamp (2003) pointing out the weakness of the state and the degree of compromise it has accepted in its negotiations with the MTI, I argue that government as system designer has the lion's share of forward-looking responsibility and no other roleplayer can step into the breach if it does not properly enact this responsibility. My contention is based on a number of factors. By virtue of being a signatory to the UNDA, an observer country (at least) within IRTAD and an official adopter of a Safe System approach (in the form of NRSS 2016-2030), the South African government has declared itself committed to reducing road crashes and RTID. Nevertheless, to date its actual achievements in this regard have been very limited. Our dithering lead agency for road safety, the RTMC, offers a user-unfriendly website and poor quality reports and other documents, has a track record of not providing statistics timeously, has at times underspent on its budget and, as I have shown, is failing to communicate a consistent and coherent road safety target to the public. Despite embracing international developments related to road safety and despite taking on particular responsibilities in relation to the city of Johannesburg (which acts as one of only two African data hubs for the World Council on City Data), the government seems to show no embarrassment about the fact that South Africa and Johannesburg stand out for our exceptionally high road fatalities. I have shown in chapter 3 that, regardless of what reference countries we choose to compare ourselves with, we have distinct weaknesses in our road safety legislation and even more so our practices. As in so many other areas, South Africa seems to be policy-rich and implementation-poor in the road safety domain.

The other critical reason for my ascribing the greatest degree of forward-looking responsibility to government – and a reason which is more intimately related to South Africa's sociopolitical and economic landscape than to our international good standing – is our Constitution and Bill of Rights. First and foremost, the right to life and the right to bodily integrity demand urgent measures to reduce RTID, with our present rate of road deaths being treated as no less than a national crisis. Vision Zero may be too many steps away

from the prevailing reality to even begin to seem realizable, but like the parliament of Sweden our government must accept that zero road deaths is the most appropriate ethical goal in relation to what our Constitution requires. From that standbpoint, government should apply at the very least a Towards Zero paradigm in its urgent addressing of our crashogenic road traffic system, with clear goals communicated to the public, regular reporting of RTID statistics and provision of road safety resources ranging from fact sheets to training courses. This requires regularizing of our driver and vehicle licensing systems and improving of the PrDP issuing process (such that PrDPs are only issued to people with proven professional driving capabilities), ironing out fraud and corruption in both cases. It also requires rigorous road rule enforcement which is not tainted by corruption and not subject to bribery, and with the most important traffic violations receiving the greatest attention; the ever-pending demerit points system probably needs to be redesigned or scrapped if it is not compatible with South Africa's systems and resources. The RTMC as lead agency – and the Road Safety Advisory Council – should be subjected to review to determine whether they have effectively fulfilled their mandate or should be reformed or replaced with a more appropriate entity. The future lead agency must justify its existence (and budget) by placing road safety firmly on the agenda of every government entity and every user of the road traffic system, including urgently resurrecting road safety training in schools to create sustainable generational change.

With regards to the MTI itself, its long-term continuation in its current state appears both dubious (due to its self-destructive and unsustainable practices) and extremely ethically undesirable (due to its contra-constitutional operating principles). I thus ascribe a significant level of forward-looking responsibility to the taxi owners and associations as well as MTI service providers (eg: finance houses, repairs and maintenance workshops), to determine what role they can play in a future, safer South African road traffic system.

I ascribe a more minor degree of forward-looking responsibility to MTI drivers and passengers. The timeframe involved is shorter in that their responsibilities are focused mainly on personal survival as well as on

achieving reasonable vehicle lifespans (for instance, the 7 years suggested by the DOT). In the case of the drivers, they are responsible for driving in such a way that they can continue to earn their livelihoods in this manner, for the benefit of themselves, their children and future generations. For passengers, it is about supporting safe driving for the sake of sustainability in this valuable transport mode and for the benefit of themselves and future generations. This responsibility requires passengers to desist from exhorting drivers to take risks, because of short-term desires like the desire to reach their destinations more quickly. It also requires them to educate themselves about road safety and to lobby both the MTI and government with regards to their passenger rights.

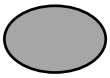
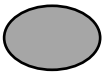
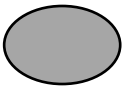
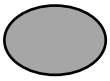
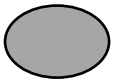
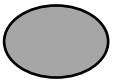
Finally, with regards to other road users it is appropriate to ascribe a certain amount of forward-looking responsibility to them due to the externalities of the road traffic system which can be alleviated, to some extent, if more people switch to using public transport rather than private vehicles. Congestion and noise and air pollution can all be reduced through effective public transport systems, thus all road users (especially "the privates") have a responsibility to behave in considerate and respectful ways towards multi-passenger vehicles, including allowing for (rather than resisting) any special dispensations the road traffic system may offer them. This does, of course, rest on a degree of *mutual* respect and trust between public and private road users, and will require both culture change in the MTI and a challenging of unfair and inappropriate stereotypes relating to MTI drivers.

In summary, I ascribe a major degree of forward-looking responsibility to the government as system designer and law enforcer, as well as to taxi operators and associations and MTI service providers as commercial entities with a profit motive. I ascribe a more minor degree of forward-looking responsibility to MTI drivers, MTI passengers and other road users.

In the table below, I depict the types and degrees of responsibility I have ascribed to the different roleplayers in relation to road safety in the

Johannesburg MTI. A large oval in a particular cell represents a major responsibility within that category of responsibilities, while a small oval represents a minor responsibility.

Table 8.1: Conceptualisation of moral responsibilities ascribed to identified roleplayers in relation to road safety in the Johannesburg MTI (adapting the MRAF of Nihlen Falquist, 2005)

	Blame responsibility	**Causal responsibility**	**Forward-looking responsibility**
Government: system designers			
Government: law enforcers			
Taxi operators and associations			
MTI drivers			
MTI service providers			
MTI passengers			
Other road users			

8.5 Closing remarks

In this chapter I have provided an integrated discussion of the empirical results of my study, including a comment on the relationship between the survey and interview data and references to relevant literature and contextual information. I have reiterated my argument made earlier in the thesis, namely that the South African road traffic system represents a **crashogenic environment** (my term). I have also made a new argument, namely that the operating principles of the Johannesburg MTI violate human rights and labour rights and are thus **contra-constitutional** (a term I have borrowed from the legal sector). In this way I have completed both my descriptive inquiry and my normative inquiry.

I then returned to the MRAF of Nihlen Falquist (2005) and used it to help me set out my closing argument, ascribing particular types and degrees of moral responsibility for road safety to the various roleplayers in the Johannesburg MTI. This argument is strongly informed by the drivers' perspective, in keeping with the driver-centric nature of my study. Finally, I have represented my argument graphically by modifying the MRAF and presenting it in a tabular form.

What remains, and will be addressed in chapter 9, is for me to reflect back on my central research question and the study's aim and objectives, commenting on whether I have answered and met these, before offering a set of practical recommendations which flow logically from my argument. I will also acknowledge my study's limitations and suggest the extent to which its results could be generalized, closing with a number of suggestions for further research.

CHAPTER 9: CONCLUSION AND RECOMMENDATIONS

9.1 Preamble

In this final chapter I summarise the thesis as a whole and draw together the threads from all the previous chapters. I provide a final answer to the central research question, confirm that the study's aim and objectives have been met and offer a set of practical recommendations drawn from my closing argument in the previous chapter. I also discuss the limitations of the study and the degree to which I believe the results can be generalized, before suggesting some topics for further research.

There has been no previous research of a bioethical nature conducted in relation to road safety in the Johannesburg MTI and this thesis represents my attempt to fill this gap and expand the bioethical literature. I began by providing background information via a whistle-stop tour of the vast road safety field, at the end of which I argued that South Africa's road traffic system represents a crashogenic environment. I then offered a condensed history of the complex and conflictual MTI, couched within a broader discussion of paratransit systems, and provided background information on the economic hub of Johannesburg in which my study is set. Next, I reviewed the philosophical literature to better understand key moral issues relating to road safety and I outlined Nihlen Falquist's MRAF, which I had selected as a tool for developing my closing argument. I then laid out the results of my mixed-method empirical research, constituting my descriptive inquiry into the current "lay of the land" in the Johannesburg MTI. Finally, I discussed my results in an integrated fashion, referring to the literature and contextual information to complete my normative inquiry – this led me to argue that the operating principles within the Johannesburg MTI are contra-constitutional. Finally, using the MRAF's categories of *blame responsibility*, *causal responsibility* and *forward-looking responsibility*, I have ascribed different types and levels of moral responsibility for road safety in the Johannesburg MTI to identified roleplayers. In this, I first employed a narrative description and then provided a graphic depiction summarizing my argument.

9.2 Revisiting the research question, aim and objectives

As noted in chapter 1, I set out to answer this central question:

What moral obligations and responsibilities can be ascribed (and to whom) in relation to improving MTI drivers' work conditions and promoting road safety?

My aim was to answer the question through conducting mixed methods empirical research (fitting within the critical realism school of thought and comprising, in philosophical terms, a descriptive inquiry), followed by a normative inquiry and moral reasoning process leading to a closing argument.

I have met the following objectives:

i. To contextualise the Johannesburg MTI by examining the South African and international literature regarding paratransit, public health ethics, road safety and moral road use.

ii. To establish key features of Johannesburg MTI drivers' work conditions (including their occupational health and safety (OHS) concerns) and better understand how these influence their driving behaviour.

iii. To elucidate the drivers' views in relation to crash causation factors as well as their views regarding moral responsibility for road safety in the Johannesburg MTI.

iv. To use all the available information (empirically derived and drawn from the literature and other sources) to develop a reasoned argument, ascribing moral responsibilities to identified roleplayers in relation to reducing crashes and RTID in the Johannesburg MTI.

My study contributes to the discourse on moral road use and moral considerations in road safety, with a specific focus on a paratransit mode which serves a high number of commuters in the economic hub of Johannesburg. My empirical results have expanded and updated the body of

knowledge with regards to MTI drivers' work conditions, has helped elucidate how these conditions influence their driving behavior, and has explored and documented the drivers' perceptions of crash causation factors as well as their suggestions in relation to crash reduction.

9.3 Recommendations

Three major recommendations emanate from this study:

- The establishment of a nongovernmental organization with a specific focus on road safety in the MTI, focused particularly on driver training and advocating for improved work conditions in the industry.

- An intensive intervention by the Department of Labour, to bring the industry into line with the sectoral determination and other labour legislation. This will aim to transform the MTI from the bottom up, as suggested by one of the study participants. Legislation already allows for labour inspectors to request job contracts, payslips, proof of UIF compliance and so on, and it is suggested that preliminary inspections be carried out at all taxi association offices, with further investigation into individual taxi operators as needed.

- A re-think by the Department of Transport regarding its road safety lead agency, the RTMC, and how to make this more effective (or replace it with another entity altogether). This would include ensuring that government clarifies its own stance with regard to reducing road deaths (settling on a firm target and communicating this to the public), provides regular feedback, statistics and reports to enable the public and non-governmental organisations to monitor its achievements, develops and disseminates effective training and materials related to road safety (including re-establishing road safety as a more significant component within the school curriculum) and identifies and implements quick-win road safety strategies such as a specific drive to reduce

RTID in the MTI. This could focus on practical issues such as road redesign to ensure safe stopping places, as well as education of MTI drivers and passengers to promote safer behavior.

9.4 Limitations of the study

9.4.1 Nature of the study samples

My study samples were perforce small and purposive rather than randomly selected and cannot be generalized to the population of short-distance Johannesburg MTI drivers, nor to the population of short-distance South African MTI drivers. However, both the driver survey and the interviews tapped drivers from a range of routes, operators and associations within greater Johannesburg and were thus broader than they might have been, had I focused on only one particular route, rank or association.

Choosing a driver-centric approach inevitably obscured some other vantage points which could be equally worthy of study. Thus, while focusing on the drivers I had only an oblique view of the possible perspectives of other roleplayers, like taxi owners and MTI commuters. The advantage of a clear focus on the drivers was that the study did not attempt to be "all things to all people" and was less overwhelmed by the size and complexity of the MTI than might otherwise have been the case.

9.4.2 Practical challenges in relation to accessing participants

The MTI, as an informal and unregistered industry in which there are no easily accessible databases containing drivers' details, provided a challenging environment in which to access participants for this study. Many additional challenges arose due to the conflictual, turbulent and suspicious nature of the industry, the need to pay careful attention to participant anonymity and confidentiality, and my outsider status. Other practical challenges related to my budgetary constraints (for instance, when it came to hiring a fieldworker) and language complexities (resulting in a need for the research instruments to be available in three languages, and in a need for an interpreter to be present

during the interviews due to my own limited language proficiency). These challenges have been described in chapter 2 (Methods) as well as in the chapters in which I set out my response rates, chapter 6 (Survey results) and chapter 7 (Interview results). The most significant challenge during the interview phase was trying to set up face-to-face pre-scheduled interviews – as I have described, this approach was unsuccessful and ultimately had to be abandoned in favour of unscheduled telephonic interviews.

9.4.3 Researcher naïvete and bias

As I noted in chapter 2, my being an outsider to the MTI – and yet having encountered it daily over many years as a road user in Johannesburg – was a source of both strength and weakness in relation to this study. It took time for me to get to grips with how the industry operates and learn some of the terminology used by the drivers, and my fieldworker/interpreter was helpful in this regard. It also took me time and effort to reflect on how I might have been influenced by widespread social stereotyping of MTI drivers, and to deliberately deconstruct those stereotypes and open myself to whatever empirical data would emerge, with no *a priori* identification of themes. This allowed some surprising issues to be uncovered, which I may otherwise have missed.

9.4.4 Generalisability

(a) To other South African cities

My empirical results probably reflect some generic MTI realities which are common to other South African cities but may also contain idiosyncratic features specific to Johannesburg. From the work of Behrens et al (2016), it is apparent that there are both differences and similarities between the MTI in Johannesburg and that in Cape Town. The most obvious difference, besides the MTI having a higher mode share in Johannesburg, is that in Cape Town the taxis feature a "*gaardjie*" (conductor or tout) who travels in the vehicle along with the

driver – a similar model has been described in relation to Kenya's *matatus* but does not apply in Johannesburg, where the drivers typically work alone. Another difference on which I have commented is the degree to which taxi owners are "visible" to the public they serve – in Johannesburg, relatively few taxis seem to display the details of the owner while my impression is that in Cape Town, for instance, such displays are far more common.

(b) To other transport modes

Paratransit has peculiar features which are not shared by formal public transport modes like buses and trains. For instance, prominent stressors associated with scheduling are reported by drivers of the latter modes, while the key stressors reported by paratransit drivers relate instead to the target system, competition on the roads, their excessive working hours and their informal employment arrangements.

On the other hand, all road-based transport modes in South Africa – formal and informal, public and private, motorized and non-motorized – share the same road traffic system, which I have argued represents a crashogenic environment. To that extent, my results may be generalisable to other transport modes. Certainly, the issue of crashes having a multiplier effect (due to the number of passengers carried) would apply to bus travel just as much as to the MTI. In all cases, moral responsibility for road safety can be seen as shared amongst multiple roleplayers, and Nihlen Fahlquist's categories of blame responsibility, causal responsibility and forward-looking responsibility could certainly be applied to other transport modes.

(c) To neighbouring countries and other LMICs

Having only briefly visited Botswana, Zimbabwe, Lesotho and Swaziland and not had the opportunity to spend time in any other neighbouring country or any LMIC on another continent, I cannot state

with any certainty that my results are generalizable to other countries. However, given that the Johannesburg MTI has many characteristics noted in other paratransit systems in Africa and elsewhere, I suspect that some of my findings may be replicated in other large cities in which minibus taxi services dominate the public transport sector. As I have noted, Khayesi's studies of the *matatu* industry in Nairobi reflect many similarities with our MTI – however, my overarching sense is that the *matatu* industry has evolved while the MTI has, if anything, regressed. The comparative studies of Behrens et al (2016) suggest that the Johannesburg MTI also has much in common with the *daladalas* of Dar es Salaam, Tanzania, and a short visit I made to Harare, Zimbabwe in 2017 allowed me to observe many similarities between the MTI and the minibus taxis in that city. However, one clear difference was apparent to me in Harare in that I observed people hitching free rides by clinging to the outside of slow-moving taxis – a phenomenon I have neither observed nor heard of in Johannesburg.

9.5 Dissemination of the results

I intend to disseminate my research results both within the academic sphere and within the non-academic road safety advocacy sphere. This may include submitting articles to professional journals such as the South African Journal of Bioethics and Law and journals relating to public health, occupational health, occupational therapy and transport sciences. I will also continue to participate in more journalistic presentation of my findings and recommendations, such as the magazine article which has already appeared in Focus on Transport (listed at the beginning of this thesis).

Furthermore, I will offer a summary of my results to relevant entities such as MTI associations and motherbodies, the Gauteng Department of Roads and Transport and the Transportation division within the City of Johannesburg, as well as any other interested individual or organization requesting this.

9.6 Suggestions for further research

Numerous issues worthy of research became apparent to me during the course of this study, some strongly bioethical in nature and others related to public health or occupational health in a more general sense. These include:

- An exploration of the moral collision course between minibus taxi drivers and private vehicle owners on Johannesburg's roads.
- An exploration of commuters' views on moral responsibility for road safety in the Johannesburg minibus taxi industry.
- An exploration of taxi owners' views on moral responsibility for road safety in the Johannesburg minibus taxi industry.
- An inquiry into whether speed governors and alcohol interlocks in minibus taxis would be overly paternalistic road safety measures
- An exploration of ethical issues relating to the non-availability of seat-belts and child restraints in South African minibus taxis.
- Does "ubuntu ethics" offer a way to improve road safety in the South African minibus taxi industry?
- The emergence of the "*skorokoros*" – road safety concerns relating to the resurrection of elderly and defective minibus taxis during peak travel periods.
- Ethical issues relating to vehicle roadworthiness and scholar transport in Johannesburg.
- A benchmarking study: road safety in the SADC region countries

Depending on the outcome of the Competition Commission's market inquiry into public passenger transport, there may be significant changes in the MTI over the next few years. Furthermore, interventions such as those I have recommended in relation to the Department of Labour and Department of Transport could alter practices within the MTI specifically and the road traffic system more broadly. This could present an opportunity for pre-intervention, post-intervention research – for instance, by re-administering my questionnaire, the MTDQ, to measure changes in MTI drivers' perceptions and concerns regarding their work conditions and road safety issues.

9.7 Closing remarks

This final chapter of the thesis has revisited the research question and objectives and pulled together the contextual, empirical and normative threads from the previous chapters. It has set out my major conclusions, namely that the Johannesburg MTI operates within a broadly crashogenic system and its operating principles are contra-constitutional, creating a pressing need to better address road safety in the industry due to the high numbers of passengers it carries. Based on my moral responsibility ascriptions in relation to different MTI role players, I have recommended three main interventions, the first in the nongovernmental sphere and the other two involving, respectively, the Department of Labour and Department of Transport.

In this chapter I have also acknowledged the limitations of my study and provided information which may be useful to future researchers, including a synopsis of the practical challenges associated with accessing MTI drivers, how I dealt with the possibilities of researcher naïvete and bias, my thoughts about how generalizable my results are and how best to disseminate them, and my suggestions for further research in relation to road safety (particularly research focusing on the MTI).

The South African MTI presents a myriad of research opportunities, if funding constraints and practical challenges can be overcome. Given the sheer number of people who use it, it is well worth developing tailored, targeted, quick-win road safety interventions for the industry. This will not only be in line with the National Development Plan (NDP2030) and National Road Safety Strategy 2016-2030 but will also assist South Africa to live up to the spirit and intentions of the UNDA and the SDGs.

In the interest of reducing taxi crashes, injuries and deaths, I hope that this study is but the beginning of the rest of my career.

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APPENDIX A: Photographs relating to the Johannesburg MTI

Photograph 1: Taxis gathered at an informal rank at a shopping centre, during the lull period between the morning peak and afternoon peak traffic periods.



Photograph taken by Lee Randall

Photograph 2: Taxis in inner city Johannesburg, with passengers alighting and boarding in an intersection, in heavy traffic conditions



Photograph taken by Lee Randall

Photograph 3: Taxis coming and going from a small suburban taxi rank in Johannesburg (at left). The taxis at the right are “overflow” from the rank and are parked in the roadway itself, rather than at the edge of the road.



Photograph taken by Lee Randall

Photograph 4: Taxis streaming into a commercial and retail area in northern Johannesburg during the morning peak. A range of vehicle types can be seen.



Photograph taken by Lee Randall

Photograph 5: Taxis heading north (towards the Sandton business and retail area) on the M1 motorway, just after peak hour on a light-traffic day. The arrow marks where a traffic cop has pulled over a taxi (in the middle distance) for checking.



Photograph taken by Lee Randall

Photograph 6: Peak morning traffic (including many taxis) on the M1 motorway on a light-traffic day. On heavy-traffic days, vehicles in this area are often at a standstill.



Photograph taken by Lee Randall

Photograph 7: Taxis performing illegal U-turn manoeuvres in morning traffic.



Photograph taken by Lee Randall

Photograph 8: Taxi dropping off a passenger in an intersection, on a stretch of Louis Botha Avenue (a major arterial road and part of the upcoming 'Corridors of Freedom' Rea Vaya BRT route). There are no designated taxi stopping places for long stretches in this area.



Photograph taken by Lee Randall

Photograph 9: A taxi “making its own lane” (ie. straddling the divide between two lanes) in heavy peak afternoon traffic in Johannesburg.



Photograph taken by Lee Randall

Photograph 10: A taxi full of passengers being driven across a pavement from a side street and into a major intersection, facing into oncoming traffic, during the morning peak.



Photograph taken by Lee Randall

Photographs 11 and 12: Taxis filled with passengers being driven on the wrong side of a major arterial road in heavy morning traffic, despite approaching traffic (not visible in the photographs) coming from the opposite direction.





Photographs taken by Lee Randall

Photograph 13: A taxi driver using the pavement as an additional lane, so as to get ahead of congested afternoon traffic in Johannesburg.



Photograph taken by Lee Randall

Photograph 14: A “skorokoro” (“scrap”) taxi ferrying passengers in Johannesburg (number plate blacked out for reasons of privacy).



Photograph taken by Lee Randall

Photograph 15: Taxis blockading highways in the greater Johannesburg area, protesting about various issues including high interest charged by vehicle finance houses like Toyota. Parts of Gauteng came to a standstill due to the blockades.



Photograph taken by Mariam Marlie

Photographs 16 and 17: Aftermath of an MTI crash on Louis Botha Avenue, close to my offices. This involved two minibuses heading in opposite directions (and falling under the same taxi association) which collided with each other and with a private car. There were no fatalities but reportedly the driver of this taxi was seriously injured – this which would be congruent with these photographs taken 2 hours later.





Photographs taken by Lee Randall

Photographs 18 and 19: Aftermath of another MTI crash on Louis Botha Avenue, in which there were several casualties (including the driver of the private vehicle with which the taxi collided) but no fatalities. The passenger seats in the main part of the taxi came loose from their moorings, as apparent in the second photograph. The rear seats had no seat-belts.





Photographs taken by Lee Randall

APPENDIX B: Ethics certificate 1

M140335

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M140335

NAME: (Principal Investigator)	Ms Lee Randall
DEPARTMENT:	Steve Biko Centre for Bioethics Johannesburg CBD
PROJECT TITLE:	Coffins on wheels: A bioethical study of work conditions, driver behaviour and road safety in the Johannesburg minibus taxi industry"
DATE CONSIDERED:	28/03/2014
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr K Behrens and Prof A Dhai
APPROVED BY:	Professor PE Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL: 06/06/2014

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate Hou University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned resea and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to subm yearly progress report.**

Principal Investigator Signature

10/6/2014
M140335Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX C: Ethics clearance certificate 2

Human Research Ethics Committee (Medical)

Research Office Secretariat: Senate House Room SH 10005, 10th floor. Tel +27 (0)11-717-1252
Medical School Secretariat: PVT Building, Parktown, 2nd Floor. Tel +27 (0)11-717-2700
Private Bag 3, Wits 2050, www.wits.ac.za. Fax +27 (0)11-717-1265
email: Zanele.ndlovu@wits.ac.za Office email: HREC-Medical.ResearchOffice@wits.ac.za

29 March 2016

Lee Randall

Sent by email to: lee@therapyteam.co.za

Dear Lee Randall

Re: **Protocol Ref no: M140335**
Protocol Title: Coffins on wheels: A bioethical study of work conditions, driver behaviour and road safety in the Johannesburg minibus taxi industry"
Principal Investigator: Lee Randall
Protocol Amendments

This letter serves to confirm that the Chairman of the Human Research Ethics Committee (Medical) has approved the following amendments, as detailed in your letters dated 17 February 2016.

The following documents were received:

- Participant Information Sheet
- Semi Structured Interview Schedule

Thank you for keeping us informed and updated,

Yours Sincerely,

.....

Ms Zanele Ndlovu
Administrative Officer
Human Research Ethics Committee (Medical)

UNIVERSITY OF THE WITWATERSRAND
OFFICE OF THE DEPUTY VICE CHANCELLOR RESEARCH
29 MAR 2016
RESEARCH OFFICE HREC (Medical)
JOHANNESBURG

APPENDIX D: Letter regarding availability of psychological services

Emthonjeni

Community Psychology Clinic

Clinic times:
12:00 – 14:00 on
Thursday afternoons

Contact on 011 717 4513

18/11/2013

Attention: Ethics Committee

Confirmation of psychotherapy services

This serves to confirm that, should the need arise, participants in Ms Lee Randall's research study with taxi drivers, can access psychotherapy services free of charge at the Emthonjeni Community Psychology Clinic.

The clinic runs every Thursday afternoon from March to November. Bookings can be made with Nthabiseng on 011 717 4513.

Kind regards

Dr Katherine Bain
Clinical Psychology Supervisor – ECP Clinic
University of the Witwatersrand
011 717 4558
katherine.bain@wits.ac.za

APPENDIX E: Research instruments

1 Participant information sheet A (survey)
2 Consent forms for participation in survey and for placement on list of prospective interviewees
3 Minibus Taxi Driver Questionnaire (MTDQ)
4 Participant information sheet B/verbal consent process (telephonic interviews)

PARTICIPANT INFORMATION SHEET A: MINIBUS TAXI DRIVER STUDY

Hello, my name is Lee Randall and I am registered for the PhD in Medical Bioethics and Health Law at the Steve Biko Centre for Bioethics, University of the Witwatersrand.

Purpose

I am doing research with minibus taxi drivers, to find out their views, experiences and suggestions. I am especially interested in knowing more about their work conditions and about road safety in the minibus taxi industry. The knowledge gained from the study could help with drawing up guidelines and policies to improve drivers' health and safety. It could also help improve road safety in the minibus taxi industry. I would like to invite you to take part in my study. To take part you must be:

- 18 years or older
- A minibus taxi driver who has been driving taxis for at least 1 year
- A short distance driver (driving routes within greater Johannesburg)

Procedures and confidentiality

1. Questionnaire

The first part of the research involves filling in a questionnaire. If you agree to take part, a fieldworker will fill in a questionnaire with you at a time and in a place that is good for you. For instance, you and the fieldworker could sit in your taxi during a quiet time when you are not driving, or could sit at a lunch place at the rank. The survey should take 15-20 minutes. It is anonymous – the fieldworker will not write your name anywhere on the questionnaire or tell anyone else that you have done the survey. When all the surveys have been collected up they will be kept locked up at the Steve Biko Centre. They will not be shown to anyone who is not involved in the study. You can decided to stop participating at any point, and this will not be held against you in any way or reported to anyone else.

If you do the questionnaire, the fieldworker will ask you at the end if you would also like to be interviewed in the next phase of the study. If you say yes, your name and contact details will be put on a private list which will be kept locked up at the Steve Biko Centre and not shown to anyone who is not involved in the study.

2. Interview

The second part of the research involves interviews with taxi drivers to find out more about their views, experiences and suggestions. These interviews will only happen in 2015. If you have given your name, you will be telephoned to see if you want to be interviewed. If you say no, or if you cannot be reached after several tries, your name and contact details will be taken off the list and destroyed. If you say yes, a good time will be arranged with you (eg: in the middle of the day, between your morning and afternoon driving times) so that you can be interviewed at the Steve Biko Centre in Parktown. If you need a Zulu or Sotho interpreter this can be arranged. The interview will last 1 to 1 ½ hours and you will be given some refreshments (tea, coffee, biscuits). You will also be paid an amount for your travel costs to and from the Centre.

If you agree, the interview will be tape-recorded so that it can later be typed up. The interview will be private and your name and personal details will not be mentioned when the study is written about. All interview tapes and notes will be kept locked up at the Steve Biko Centre and will only be available to me and my supervisors. They will be kept for 2 years after any publication or for 6 years if the study does not get published.

Availability of counselling
As the interview will focus partly on road safety, if you have been in or seen road crashes you may be reminded of this. This may make you feel emotionally upset. If you think you need some counseling about this, I have arranged for free counseling at the Emthonjeni Community Psychology Clinic at Wits University. This clinic runs on Thursday afternoons from March to November. They can be contacted on 011 717-4513, or I will arrange an appointment for you if you want me to do so.

Queries regarding the study
If you have questions, you can contact me on 011 440-0325 or 082 339-8476. You can also phone my supervisors at Wits University (Dr Behrens and Professor Dhai) at 011 717-2635. You can also contact the Wits Human Research Ethics Committee by calling 011 717-1234 if you have any concerns about the way the study is being done.
If you want to see the results of the study, please ask for this and a summary will be given to you.

CONSENT FORM FOR PARTICIPATION IN QUESTIONNAIRE SURVEY

I hereby consent to participate in the minibus taxi driver research study by filling in a questionnaire. The purpose and procedures of the project have been explained to me. I understand that my participation is voluntary and that I may refuse to answer any particular items or withdraw from the study at any time, without any negative consequences. I understand that my answers will be anonymous and that my name will be kept confidential. I also understand that all raw data will be kept for 2 years following any publications or for 6 years if no publications result from the study.

Name of participant: _____

Date: _____

Signature: _____

CONSENT FORM FOR BEING PLACED ON A LIST OF POSSIBLE INTERVIEWEES

I hereby consent to my name being put on a list of people who will be contacted during the second half of 2014 or first half of 2015, with regard to participating in an individual interview as part of the minibus taxi driver research study. The purpose and procedures of the project have been explained to me and I understand that if I decline to take part in an interview, or if I cannot be reached despite several attempts, my details will be erased from the list of possible interviewees. I understand that if I do decide to take part in an interview, my participation is voluntary and that I may refuse to answer any particular items or withdraw from the study at any time, without any negative consequences. I understand that if am interviewed my responses will be kept confidential and that all raw data will be kept for 2 years following any publications or for 6 years if no publications result from the study. None of my identifying details (eg: name, contact numbers) will appear in the final research report.

Name of participant: _____

Date: _____

Signature: _____

Minibus taxi driver questionnaire

1. How long have you been a minibus taxi driver?

[ ] 1-4 years
[ ] 5-9 years
[ ] 10-14 years
[ ] 15 years or more

---

2. What time do you usually start work, during the week?

[ ] earlier than 3 am
[ ] between 3 and 4 am
[ ] between 4 and 5 am
[ ] between 5 and 6 am
[ ] between 6 and 7 am
[ ] between 7 and 8 am
[ ] between 8 and 9 am
[ ] later than 9 am

---

3. What time do you usually finish work, during the week?

[ ] earlier than 3 pm
[ ] between 3 and 4 pm
[ ] between 4 and 5 pm
[ ] between 5 and 6 pm
[ ] between 6 and 7 pm
[ ] between 7 and 8 pm
[ ] between 8 and 9 pm
[ ] between 9 and 10 pm
[ ] between 10 and 11 pm
[ ] later than 11 pm

---

4. Do you usually work on weekends?

Saturday	**[ ]**	no		
	[ ]	yes	if yes, the whole day	**[ ]**
			part of the day	**[ ]**
Sunday	**[ ]**	no		
	[ ]	yes	if yes, the whole day	**[ ]**
			part of the day	**[ ]**

---

5. How long does it take to get to the taxi before you start work in the morning?

[ ] no time - the taxi is kept at the same place where I sleep
[ ] less than 10 minutes
[ ] 10-15 minutes
[ ] 16-30 minutes
[ ] longer than 30 minutes

If the taxi isn't kept where you sleep, how do you get to it?

[ ] walk
[ ] cycle
[ ] get a lift or drive myself
[ ] catch a bus/taxi

---

6. Are there times in your work day when you don't drive?

[ ] yes – I take short breaks during the day
[ ] yes – I have a long break between the morning rush and afternoon rush
[ ] no – I keep driving all day with no real breaks

---

7. When you get a break, how easy is it to do these things?

	Very easy	Fairly easy	Difficult	Very difficult
Get something to eat or drink				
Go to the toilet				
Chat to other people				
Get out of the taxi and relax				
Do errands (eg: go to the ATM, do shopping)				

---

8. Thinking about the taxi you drive most often, please answer these questions.

(a) How old is it?

[ ] less than 5 years old
[ ] 5-8 years old
[ ] 8-11 years old
[ ] more than 11 years old

(b) How many seats does it have (including the driver's seat)?

[ ] 10 or fewer
[ ] 11-16
[ ] 17-25
[ ] more than 25

(c) What make is it?

[ ] Toyota
[ ] VW
[ ] Ford
[ ] Mazda
[ ] Kia
[ ] Nissan
[ ] Isuzu
[ ] Mazda
[ ] Mitsubishi
[ ] Mercedes
[ ] other Please specify: _____

(d) Which of these does it have?

[ ] driver seatbelt
[ ] passenger seatbelts
[ ] power steering
[ ] airconditioning
[ ] sound system
[ ] electric windows
[ ] airbags

(e) Which of these do you pay for?

[ ] fuel (petrol or diesel)
[ ] taxi washing/cleaning
[ ] tyres
[ ] servicing and repairs
[ ] touts and queue marshals
[ ] traffic fines
[ ] vehicle licence
[ ] operating permit

---

9. How do you get paid?

[ ] I own the taxi, so I pay myself
[ ] I get a fixed salary or wage
[ ] I get a share of the checkings (income) every day (eg: 10%, 20%)
[ ] I get what is left of the income after paying for costs like fuel
[ ] I get what is left of the income after paying the owner a certain amount
[ ] I get what is left of the income after paying for costs AND paying the owner

---

10. If you own the taxi you drive, please skip this question.
If you drive for someone else, which of these do you get with the job?

[ ] employment contract
[ ] payslips
[ ] UIF cover
[ ] funeral plan
[ ] pension
[ ] accident insurance
[ ] medical aid or hospital plan
[ ] paid leave (eg: sick leave, holiday leave, compassionate leave)

---

11. Do you worry about being involved in taxi accidents?

[ ] no
[ ] yes, a bit
[ ] yes, a lot

---

12. Many drivers have been involved in taxi accidents where someone was injured. Have you ever experienced such an accident?

[ ] no – have never been in such an accident
[ ] yes – have experienced one accident like that
[ ] yes – have experienced more than one accident like that

---

13. I would like to know what problems taxi drivers have with their HEALTH. Please say if you think the things listed below are problems, and if so whether they are minor problems or serious problems.

	Not a problem	**A minor problem**	**A serious problem**
Tiredness because of long work hours			
Not getting enough breaks			
Pain (eg: sore back, sore neck, headaches)			
Not having enough time to wash/bath properly			
Not getting proper meals while working			
Poor safety (accidents, criminals, taxi wars)			

	Not a problem	A minor problem	A serious problem
Using drugs or alcohol			
Worrying about not having enough money			

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14. I would like to know what problems taxi drivers have with RANKS AND ROADS. Please say if you think the things listed below are problems, and if so whether they are minor problems or serious problems.

	Not a problem	A minor problem	A serious problem
Overcrowded ranks			
Not having good lunch areas/rest areas			
Dirty toilets/not enough toilets			
Heavy traffic jams			
Bad roads (eg: potholes, broken traffic lights)			
Not having safe stopping places			
Passengers wanting to stop anywhere, anytime			
Delays caused by roadblocks/traffic cops			
Getting lost/taking wrong turns			
Having to drive too fast			
Having to count money/give change while driving			

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15. I would like to know how much stress taxi drivers have when they interact with OTHER PEOPLE. Please say if you think they experience no stress, some stress or a lot of stress, in relation to each category of people.

	No stress	Some stress	A lot of stress
Other taxi drivers			
Taxi owners			
Taxi association officials			
Rank officials/queue marshalls			
Passengers			
Traffic cops			
Other road users (eg: car drivers, bus drivers)			

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16. How often have you experienced these problems, in the taxi(s) you drive?

	Never	Sometimes	Often
Brakes not working			
Tyre problems (eg: punctures, worn tyres)			
Lights or indicators not working			
Broken windscreen or windscreen wipers			
Doors not closing or opening properly			
Broken or uncomfortable driver's seat			
Broken passengers' seats			
Steering wheel problems			

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17. Which of the things below cause taxi accidents? Choose as many as you want to.

[ ] bad weather
[ ] pedestrians doing unsafe things
[ ] passengers doing unsafe things (eg: wanting to stop just anywhere)
[ ] taxis being in a bad condition
[ ] overloading with passengers
[ ] drivers speeding or making too many trips
[ ] drivers being overtired
[ ] drivers using alcohol or drugs
[ ] drivers being distracted (eg: looking for passengers/giving change while driving)
[ ] drivers breaking laws (eg: jumping red lights, overtaking on a solid line)
[ ] drivers not having the right skills or training
[ ] roads not being properly designed for taxis
[ ] taxi ranks being badly designed or too crowded
[ ] other road users' behaviour around taxis

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18. Are you male or female?

[ ] male
[ ] female

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19. How old are you?

[ ] 18 to 24
[ ] 25 to 34
[ ] 35 to 44
[ ] 45 to 54
[ ] 55 to 64
[ ] 65 or older

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20. What is the highest level of education you have completed and passed?

[ ] never went to school
[ ] Grade 1 or 2 (Sub A or Sub B)
[ ] Grade 3 or 4 (Std 1 or 2)
[ ] Grade 5, 6 or 7 (Std 3, 4 or 5)
[ ] Grade 8, 9 or 10 (Std 6, 7 or 8)
[ ] Grade 11 or 12 (Std 9 or 10)
[ ] college studies
[ ] university studies

THANK YOU VERY MUCH FOR YOUR TIME

PARTICIPANT INFORMATION SHEET B: MINIBUS TAXI DRIVER STUDY

Verbally administered prior to telephonic interviews, and allowing for the use of an interpreter

Hello, my name is Lee Randall and I'm a Wits University student who is doing some research with minibus taxi drivers. I have an interpreter next to me who can speak Zulu, Sotho and English. Which language do you choose?
If you choose English, please just say so if you want something translated into Zulu or Sotho.

My research [Lee's research] started in 2015 with a survey of drivers at different ranks in the Joburg area. Now I am [Lee is] talking to drivers to find out their views, experiences and suggestions when it comes to taxi accidents.

The type of drivers we want to speak to are:

- 18 or older
- Minibus taxi drivers who have at least 1 year of experience
- Short distance taxi drivers in the Joburg area – not long distance drivers, like those who drive from Joburg to Durban and back

If you are that type of driver, we would like to ask you a few questions over the phone. Any information you give could help us make suggestions for improving road safety in Joburg. If you do give information, your name won't be used anywhere in my study and we won't tell anyone that you have spoken to us. If now is not a good time, we can call you again at another time.
In case you want to phone us, our contact number is 011 440-0325. You can also give our number to other drivers you know, who you think would like to talk to us.

If you want the phone number for the study supervisors at Wits University, we can give you that too. [It is 011 717-2635].

Please may we ask you some questions?

APPENDIX F: Initial codes and sub-codes from interview transcripts

CHOICE OF OCCUPATION/JOB SATISFACTION

- Unemployment/lack of options/financial imperatives
- Job-related stress
- Demands from owner
- Abnormal hours
- Lack of work/life balance
- Lack of benefits
- Dislike of job/dissatisfaction with work conditions

FINANCIAL REALITIES

- Wages
- Operating costs
- Underpayment/unfair labour practices
- Capitalist bosses/profit motives of associations
- Variable demands and payment arrangements
- Driver expendability

LAWLESSNESS

- Breaking road rules
- Running away from crimes
- Drivers lacking licences, PDPs[133]
- Lack of operating permits
- Driving under the influence
- Lawlessness of other road users
- Taking advantage
- Offender rehabilitation
- Thuggery of taxi bosses

[133] PDP = Professional Driver's Permit

SOCIAL VILIFICATION

- Negative perceptions
- Discrimination (eg: taxi drivers vs bus drivers)
- Not a proper/normal driving job
- Self-fulfilling prophecy
- Lack of respect from other road users
- Generalization/stereotyping
- Piece-job mentality
- Lack of consideration for drivers
- Transport not seen as valuable

HEALTH AND SAFETY/WORK CONDITIONS

- General concerns/lack of benefits
- Job-related stress and pressure
- Lawless/reckless driving
- Taxi violence/criminal threats
- Long working hours
- Busy periods
- Driver fatigue
- Inadequate breaks
- Employment terms
- “Not a normal driving job”
- No access to unions/unions not helpful to drivers
- Driving under the influence
- Vehicle defects
- Owners/associations don’t care about drivers
- Passenger behaviour
- Deaths and injuries amongst drivers; lack of appreciation of the risks

SKILLS/COMPETENCE/TRAINING

- Knowledge of road rules
- Advanced driver training/certification

- Corporatization
- Multi-tasking
- Assertiveness, people skills, emotional control
- Making allowances
- Customer service
- Variable skills and attentiveness
- Personality attributes
- Multiplier effect
- Driving experience
- General educational level

CAUSES OF ACCIDENTS

- Stress/pressure/bad work conditions
- Traffic/route congestion; competition on the roads
- Lawlessness; improper/reckless driving
- Owner demands/owner behavior
- Vehicle defects/lack of assistive technology
- Multi-tasking/loss of focus/distracted deriving
- Passenger behavior
- Other road users/vehicle classes
- Industry culture/lack of professionalism
- Poor relations between owners and drivers
- Poor law enforcement/regulation; corruption
- Driver fatigue; long hours
- Cash fare system
- Unpredictability
- Substance use
- Focus on money
- Foreign/out-of-town drivers

PERCEIVED SOLUTIONS

- Special lanes/dispensations; critical nature of the industry

- Dealing with “privates”
- Vehicle roadworthiness; assistive technology
- Regulation of work conditions
- Fare payment systems
- Operating permits
- Driver’s licences and PDrPs
- Handling pressure
- Making allowances
- Customer service culture (including loyalty cards)
- Changing the industry’s culture
- No criminal record (in South Africa or outside)
- Empowered passengers
- Law enforcement/government regulation/police visibility
- Reduced profit motive
- Driver training/alertness/vigilance/problem-solving
- Multiple responsibilities
- Limiting of work hours
- Uniformity, consistency
- Subsidization
- Valuing human life
- Interacting with other road users
- Long-term view
- Quota system
- Economic upliftment
- Innovation/quality improvement
- Unionization/strike action
- Formalized routes & schedules
- Meetings

APPENDIX G: A more detailed history of the South African MTI

1 1970s to late 1980s ("pirate industry")

Prior to the 1970s buses and trains were the only transport modes available to poor black South Africans living in racially segregated dormitory townships and outlying areas. These offered only scheduled peak hours services and were insufficient and expensive, making it difficult for people to travel to and from the centres of commerce and industry where only white people were allowed to live (Competition Commission, 2017). The spatial realities of apartheid plus the costs and inadequacies of formal services led entrepreneurial car-owners to offer taxi-like services in large sedan vehicles. The high demand for these led in turn to some operators purchasing minibuses with capacity for up to 15 passengers (Sekhonyane & Dugard, 2004), thus giving birth to the MTI.

In its early form the industry had to "defy apartheid machinations and political tensions" in order to build a niche for itself. For instance, operators had to prove their legal tenancy in urban areas via a Daily Labourer's Permit (as per government's 'influx control' policies) and had to compete for the limited number of 4-passenger taxi operating permits issued each year under the Motor Carrier Transportation Act[134] (Sekhonyane & Dugard, 2004, p.13). During the 1950s to 1970s racially-based transport-related legislation has been passed such as the Native Transport Services Act[135] and the Transport Services for Coloureds and Indians Act[136], which added further complexity to the situation. Croucamp (2003) notes that the Road Transport Act of 1977[137] introduced slightly greater freedom – focusing only on cars (with up to 8 passengers) and buses (with more than 8 passengers), it left a loophole which minibus operators exploited by ensuring that some seats remained empty in their vehicles (thus placing them in the category of cars).

[134] Act 39 of 1930
[135] Act 53 of 1957
[136] Act 27 of 1972
[137] Act 14 of 1977

In the 1970s some 90% of operators' applications for licences were declined, resulting in many operating on an illegal or pirate basis (Sekhonyane & Dugard, 2004). Sauti (2006) points out that the industry served as an access point to a deviant subculture which offered opportunities for criminal behavior like hijacking and theft of car parts. Croucamp (2003) reflects that up until 1979 (ie. in the midst of the official apartheid policy which lasted from 1948 to 1994), the transport sector remained dominated by railway services and government-subsidized bus services. MTI operators were "criminalized and prosecuted, often [forced] into alliances with corrupt bantustan officials, organized crime and the protection rackets provided by gangsters", and their "desperate circumstances" led to strategies like overloading of vehicles to ensure economic survival (p.63). They were also forced into alliances of mutual support, with the first local association being the United Soweto Taxi Owners Association (USTOA) and the first national association being the South African Black Taxi Association (SABTA), set up in 1979 (McCaul, 1990; Croucamp, 2003; ILO, 2003). These structures, with "strongmen" at the helm, allied themselves with the liberationist movement and began pressuring the state to deregulate the industry as the country gradually moved towards a free-market economy (McCaul, 1990; Croucamp, 2003). In response, the Department of Transport set up a National Transport Policy Study (NTPS), resulting in a compromise arrangement which McCaul (1990) and Croucamp (2003) describe as heavily favouring SABTA and existing MTI operators and detrimental to would-be new operators. Local authorities set quotas for the number of taxis operating in their areas, with the approval of bus companies which feared that "waves of too many new entrants" would threaten their own profitability (McCaul, 1990, pvii).

The "Soweto riots" took place in 1976, with schoolchildren protesting against Afrikaans as a medium of education meeting heavy police action which resulted, *inter alia*, in the death of schoolboy Hector Pieterson. Political tensions were heightened and the transport sector became particularly volatile. In response to increasing political pressure as well as demands from the labour market to improve public transport, the Van Breda Commission was set up in 1977 to look into the MTI and ultimately suggested that it be

deregulated to allow for greater competitive freedom for operators (Dugard, 2001). Due to hostility from local road transportation boards (LRTBs) "road carrier permits", however, remained difficult to obtain; most operators continued on an illegal basis, but some businesses failed due to fines and vehicle confiscations (McCaul, 1990).

In 1980 the Welgemoed Commission of Inquiry was set up to probe the high costs and extreme political tensions around transport and proposed that "kombitaxis be pushed off the roads" (McCaul, 1990, p.vii). The government did not act on this, perceiving that it could exacerbate rather than improve the situation – instead, the taxi sector was deregulated, with responsibilities related to it being devolved to lower levels of government and private ownership being encouraged (McCaul, 1990). Mashishi (2011) notes that the newly relaxed regulations effectively legalized overnight some 60 000 unlicensed minibus taxis which had been operating illegally. Bus and train boycotts in the 1980s (protesting against transport costs but also against increasingly onerous political oppression) resulted in further growth amongst small-scale transport operators in the townships, such that the MTI grew to an estimated 126 000 vehicles countrywide (International Market Insight Reports, 1999:2, cited in Mashishi, 2011, p.18). McCaul (1990) notes that by then commuters had come to favour "kombi taxis" which were more flexible than state-provided buses and trains, were available late at night and, on longer journeys, stopped in convenient places; they also reduced commuters' journey time due to less time being spent queuing at bus and train stations.

McCaul (1990) notes that 6 motor vehicle manufacturers supplied the MTI with about 23 minibus models, with about 50% of the vehicles in use being Toyota Hi-Aces, 40% being Nissan E20s and the balance being Isuzu Relay Buses and Volkswagen Kombis/Microbuses. Initially 10-seater taxis dominated 16-seater ones by a ratio of 6 to 1, but this dropped to 2:1 by 1987. While the bus industry introduced 24- to 34-seater midibuses to compete (McCaul, 1990), Mashishi (2011) notes that the emerging MTI captured a higher market share "because of its apparent ability to reduce the '*generalised cost of travel*' of its users" (p.1) – this generalized cost including not just direct

fares and journey times but also indirect factors like safety, security, comfort, convenience and frequency.

4.3.2 Late 1980s to mid-1990s ("free-for-all")

This was a period of deregulation and proliferation within the MTI. Sekhonyane and Dugard (2004) have noted that the legalizing of 16-seater taxis in the late 1980s caused many new operators to enter what was already a crowded sector. This, along with a tendency for corrupt officials to turn "a blind eye to traffic enforcement and vehicle roadworthiness", meant that "from the outset, issues of safety and security were sidelined" and "taxi wars" erupted in relation to routes and rank space (p.15). Sekhonyane and Dugard also note, more sinisterly, that "the sudden deregulation of transport became a means of complementing the state's broader destabilisation strategies in the run-up to negotiations by exacerbating socio-economic and political tensions within black communities" (p.15). McCaul (1990) records that the Competition Board became involved in the late 1980s and concluded that illegal entry into the MTI "could not be controlled" and "trying to keep them out would be futile", supporting the notion of complete deregulation even though SABTA expressed a desire for stricter barriers to illegal entry (McCaul, 1990, p.viii). Eventually, in 1989, government and SABTA agreed to a compromise situation, whereby for 3 years the number of permits issued was restricted and SABTA had veto powers over all applications – this was pending the establishment of local authorities and liaison committees which would then control numbers going forwards, by restricting access to ranks (McCaul, 1990). By 1990, SABTA had some 400 local taxi associations affiliated to it and its dominance allowed it to negotiate special supplier deals and express "ambitious plans – to take over unprofitable white municipal transport services, to start an airline, to assemble minibuses, and to move into other southern African countries" (McCaul, 1990, p.ix).

Sauti (2006), citing Khoza (1992) has listed three forces which contributed to the MTI's significant growth in the 1980s – described by Khoza as an extraordinary socioeconomic phenomenon. In addition to the aforementioned

ability of the industry to bargain with business and industry, the helpful forces came in the form of finance capital options opening up to the black community and government ceasing its crackdowns on black-owned businesses in general and taxi operators in particular. Although white ownership in the MTI was rumoured to be as high as 50%, it was more likely to be around 14%, with Toyota's minibus sales showing an increase in black purchasers from 41% in 1980 to 61% in 1988, and Nissan's sales showing an increase from 36% in 1982 to 66% in 1988 (McCaul, 1990, p.vi).

McCaul notes that in the 1980s the MTI was characterized by volatility which she relates particularly to competition over routes and routes: an "unpleasant feature of the taxi industry has been feuding and conflict between groups of taxi operators… [with most] disputes [being] about which group may or may not use a particular rank or ply a particular route" (p.x). She also notes that in some areas white ownership was "a flashpoint for conflict" (p.x). Croucamp (2003) views the "normative code" associated with the MTI in the 1980s as centering on political liberation as well as economic survival while Dugard (2001) and Sekhonyane and Dugard (2004) note that during the 1990s mafia-type tendencies prevailed, with violent suppression of competition. The latter authors note that the "taxi wars" continued – even increased – after the end of formal apartheid and advent of democracy in 1994, attributing this to the emergence of motherbodies or supra-associations[138]. This is echoed by Croucamp (2003), who writes:

> *With the state conspicuously absent, perhaps more so after 1994, the industry took control of itself, with disastrous consequences for civil, social, and economic contestation. Sporadic violence erupted and hit squads" armed with AK 47s patrolled lucrative routes eliminating unwanted competition. Taxi ranks became sites of bloody guerrilla-*

[138] This goes against the benign assertion made by UN-Habitat (2013), namely that the formation of associations by informal transport operators is a way to reduce "collectively damaging behavior" and increase "ridership and profits" (p.27).

style battles and 'drive-by shootings' and the business of being a 'taxi boss' became a very high risk but high return enterprise. (p.71)

By 1995 the conflict within the MTI became so heated that a National Taxi Task Team (NTTT) was set up jointly by government and the industry to address it. Croucamp (2003) notes that this team consisted of 9 MTI representatives, 9 government sector representatives and 9 industry expert; it held 36 public hearings and received 1,100 submissions. Croucamp (2003) notes that through the NTTT negotiations the MTI presented government with three ultimatums – that subsidies be paid, that the industry be included in policy development and that it remain at least partly self-regulating – in Croucamp's view, that gpvernment ultimately capitulated to these demands reflects its compromised authority in the nascent democracy.

4.3.3 1996 onwards ("dancing with the state")

The NTTT report which was released in 1996 recommended urgent re-regulation of the industry but, as noted by Sekhonyane and Dugard (2004), this was strongly resisted by the motherbodies. Croucamp (2003) notes that many of the report's proposals never came to fruition. This included its recommendation that taxi associations and motherbodies be done away with and replaced with cooperatives.

Also in 1996, the DOT published a White Paper spelling out its "Vision 2020", which focused in part on regulating the MTI. This was followed by a period of intensive law-making in the transport sector, with the enactment of the National Road Traffic Act[139], National Land Transport Interim Arrangements Act[140] and National Land Transport Transition Act[141]. The last of these was an interim measure aimed at unifying national, provincial and municipal laws relating to transport and giving effect to the White Paper. Alongside new national legislation, new laws also began appearing at a provincial level which

[139] Act 93 of 1996
[140] Act 45 of 1998
[141] Act 22 of 2000

were partly aimed at supporting the process of formalizing and regularizing the MTI. Thus, the Gauteng Road Transportation Amendment Act[142] provided for a Provincial Taxi Registrar to be appointed and for MTI associations to be registered and routes regulated. It was replaced by Section 58(3) of the Gauteng Interim Minibus Taxi-type Services Act in 1997[143], the same year that the Gauteng Provincial Road Traffic Act[144] came into being. Further legislation was enacted in 1998 in the form of the Gauteng Interim Road Transport Act[145], which sought to adjust aspects of the Road Transportation[146] to bring them into compliance with the new constitution. Croucamp (2003) has also documented internal changes in the MTI, including the development of a code of conduct to address extreme behavior as well as a grievance procedure to address labour disputes; this saw violence within the industry decline by 41% during the period 1996-1997.

Croucamp notes that in 1998-1999 the violence increased dramatically once more – in Gauteng, violent incidents rose by 81% from 1997 to 1998, and 360 people were injured and 220 killed over that 2-year period. During that time, an unexpectedly high number of taxi associations sought to be registered and Croucamp postulates that this may have been due to taxi owners taking the opportunity to establish new associations (which offer access to routes and ranks as well as protection against rival owners) “in an attempt to escape the coercive patronage of mother-bodies” (p.102). By September 1997 there were 220 associations, 21 274 operators and 34 892 vehicles registered in Gauteng, with many operators and vehicles remaining unregistered. Croucamp argues that the upsurge of violence during the re-regulation period resulted from “disturbed embedded symmetries at the cost of certain interests in the industry” (p.102). He also notes the rise in power of the motherbodies, which used violent means to control the industry – such as the assassination of drivers belonging to the National Taxi Drivers Organisation (NATDO). Joining fees for associations with access to lucrative, high-density routes were

[142] Act 6 of 1997
[143] Act 11 of 1997
[144] Act 10 of 1997
[145] Act 2 of 1998
[146] Act 74 of 1977

R10,000 or more in the late 1990s, and the associations sometimes demanded additional contributions from taxi owners such as protection fees; these were collected by henchmen or even by gangs.

During this period of rapid legislative change and turmoil within the MTI, the Council for Scientific and Industrial Research (CSIR) was commissioned to identify key challenges facing the transport sector. Its report, released in 1998, identified the destructive competition within the MTI as one of 32 key challenges and recommended that the industry (and other private sector transport services) be stabilized. Croucamp (2003) has pointed to the difficulties of a "new democratizing dispensation [which] often inherits an institutional order where the spheres of state and society overlap at numerous junctures" – one consequence of which is that "dominant actors **in** society may exploit their access to the coercive or financial capacities of the state to enhance their influence in society at the expense of their competitors or plainly other members of society". Croucamp goes on to note that political functionaries may also "deliberately provide strongmen or dominant social formations access to decision-making institutions to strengthen their bargaining power with adversaries in the political arena or to pacify recalcitrant constituencies" (all pp.106-107).

Despite the difficult dynamics within the MTI and between it and the state, in 2000 government launched a 4-year taxi recapitalization programme (TRP) which aimed to "recreate the taxi industry from scratch" (Sekhonyane & Dugard, 2004, p.16). This revolved around phasing out 9-to 16-seater minibus taxis in favour of new 18- to 35-seaters, on the basis of government providing "scrapping allowances" to operators to take old and defective vehicles out of commission and assist them to purchase new and better ones. The plan also envisaged a switch to cashless smart card technology for fare payments, making the vehicles accessible for people with disabilities and bringing in an electronic management system to control and regulate the industry as a whole (Sekhonyane & Dugard, 2004; Mashishi, 2011). Croucamp (2003) has noted that government effectively committing to making vast amounts of capital available to the MTI as a way of sorting out the "mess"

it was in – the moral justification for this being "first, that the industry contributes to black economic empowerment and, second, that it essentially provides a service to disadvantaged communities" (p.127). The taxi associations justified the high amounts involved – potentially R72 million in cash and R200 million in guarantees, plus large additional amounts to help set up taxi cooperatives in each province and to fund a dedicated radio frequency for the MTI – on the basis of the past subsidies given to rail and bus services (Croucamp, 2003, p.128). Croucamp notes that the agreements reached – which even extended to writing off operators' bad debts (though this did not actually take place) – reflected the state's "desperation…to accommodate the industry" (p.129).

The TRP and related developments form part of a National Passenger Road Plan (NPRP) which foresaw a safe, efficient and effective industry which was compliant with labour laws and tax requirements (Mashishi, 2011). The TRP was substantially delayed, which Sauti (2006) notes was partly due to Russian-made Gazelle taxis, supposed to be part of the new vehicle issue, being found to be faulty – she was told of a Sunday newspaper article which commented that "the Allies won a world war in less time that it has taken [DOT] to put a safe taxi on the road" (p.101). Interestingly, as noted by Croucamp (2003), Toyota – so long dominant in the industry – did *not* tender to be part of the new vehicle supply process, which Croucamp was told in confidence related to a sense that there were other bidders who would receive preferential treatment by the state.

Ultimately, the TRP met with mixed success. Not only did the operators reject the scrapping allowances offered by government and demand higher allowances as well as an upfront subsidy, they also disagreed as to which body legitimately represented the taxi industry – claims to this effect being made by both the South African National Taxi Association (SANTACO) and the National Taxi Alliance (NTA) (Sekhonyane & Dugard, 2004). Government and the industry also failed to agree on vehicle specifications – for instance, SANTACO mooted a maximum of 29 passengers per vehicle and rejected the notion of all taxis being accessible to people with disabilities (Sekhonyane &

Dugard 2004). Dimitrov (2012), citing Lucas (2010), noted that although MTI vehicles tend to be dangerous and elderly government's attempts to formalize the MTI through scrapping of old vehicles were constrained by a number of factors. These included the cost of preferred Toyota minibuses, the global recession and the National Credit Act (Act 34 of 2005) which set out strict requirements for taxi operators to be deemed credit-worthy. A second phase of the TRP took place from 2005 to 2012, once again facing challenges and not achieving the desired targets.

The DOT reported in 2011 that of its planned target of 8,758 vehicles, some 5 785 [66%] had been scrapped[147]. In its 2015/2016 annual plan, however, it indicated that another 3,189 old taxis were scrapped in 2014/2015, with an additional 1,100 taxis to be scrapped per annum during the 2015/2016, 2016/2017 and 2017/2018 years (DOT, 2015). Its relatively poor results have been attributed partly to financial viability concerns as perceived by taxi operators (see, for instance, Mashishi, 2011; Sekhonyane & Dugard, 2004). As noted by Mashishi (2011), her research with taxi operators in Temba indicated that even though they may have approved of the TRP in principal, many declined to participate in it due to perceiving it as impractical and financially non-viable.

Croucamp (2003) notes that post-1994 the MTI became characterized by dominant mother-bodies, informal regulatory authorities which moved into the space vacated by the apartheid state and showed a "preference for violence as a means of self-control and accumulation" (Croucamp, 2003, p.87). Over-supply of taxis, including pirate operations by established taxi bosses who allowed their vehicles to operate on other routes, further fostered para-military violence. With weakened state interventions in the last years of apartheid, Croucamp notes that "the industry proliferated beyond the realm of any control" (p.89) – furthermore, taxi associations were drawn into protection rackets, drug-running and other forms of organised crime. He points out that post-1994 South Africa involved "a new normative conception of justice and

[147] See http://www.pmg.org.za/report/20110531-briefing-department-transport-its-budget-vote.

social order", but in fact "a great degree of continuity prevailed between the authoritarian state and its democratic successor" (p.91) and the new democracy did not always adhere to the new constitution. Croucamp argues that "the integrated and weblike structure of social control and authority which have continued in the aftermath of apartheid, not only weakened the autonomy of the democratic state, but also effectively attached it (the state) to a fragmented and highly volatile informal political economy, which subsequently forced the state into compromises with renegade and violent societal formations such as the taxi industry" (p.95). He also notes that political parties with allegiances to structures within the MTI can weaken the democratic process and the potential of the state to regulate the industry. In Kwazulu Natal in particular, Croucamp notes, taxi violence is influenced by party politics and investigations are hampered by phenomena such as the disappearance or murder of witnesses. He relates the intermingling of party political issues with societal structures like the MTI to a feature of post-liberationist democracies, in which "political parties often act as the guardians of survival strategies and participate actively in the zero-sum contest for control of assets by preferential constituencies, thus merging conflicts over scarce resources within society with the distributive obligations of the state" (p.116). As Croucamp notes, MTI drivers frequently found themselves caught between commuters, associations, state and political party actors and other transport roleplayers like bus companies – sometimes resulting in drivers being killed or severely injured.

Over the past decade or so, the most significant new development affecting the MTI has been its inclusion in the Integrated Public Transport Networks (IPTNs) which have been proposed for all the major South African cities. The country's selection as the host for the 2010 Soccer World Cup acted as the impetus for these and Johannesburg's Rea Vaya service and Cape Town's MiCiti service were amongst the first IPTNs to get up and running – albeit only partially and with much stalling in the later stages of the projects. A key element of the IPTNs is Bus Rapid Transit (BRT) systems, designed to form the core of a multi-modal system in which the MTI would survive only in relation to "first-mile" and "last-mile" services. The initial proposals were hotly

contested by the MTI – with violent attacks on bus drivers and even commuters in some cases – and a protracted negotiation process has been required between the state and the industry. On the whole, this has led to agreements that taxi operators who will be displaced by the new networks would be absorbed into the system, in the sense of becoming shareholders and access to jobs, and/or would have their businesses bought out by the state. This process has progressed very unevenly around the country, with some allegations of corruption both in the state sector and in the new structures formed by taxi operators to pursue BRT-related opportunities. Significant amounts of money are at stake, over long periods of time, and in some areas (such as Ekurhuleni, with its planned Harambee BRT system having barely got off the ground) it seems likely that the projects will be pared down or possibly even abandoned altogether as the true costs of BRT systems become clear from other cities' experiences.

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