FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

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DISSERTATION

A STUDY ON THE KNOWLEDGE, ATTITUDE, AND PRACTICES OF LONG-DISTANCE DRIVERS ON THE USE OF FLEET MANAGEMENT TECHNOLOGIES TO COMBAT ROAD ACCIDENTS. A CASE OF NICK'S MOTORS COMPANY, NEW ARDBENNIE, HARARE.

BY

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Declaration

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I, Mufaro Muvavarirwa, hereby declare that this work-related project is my original work and has not been submitted before. All the information derived from other sources is well referenced.

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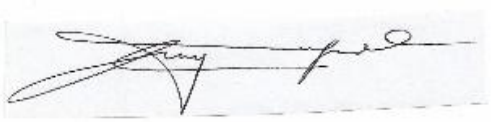
Signature of the chairman…  ….Date……29/06/2025…

DEDICATION

I dedicate this research project to my dear family, friends and the Nick's Motors family for the support they have given me.

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I would like to express my sincere gratitude to my supervisor Mr. Dzvene for the guidance, expertise, patience and the valuable feedback throughout the research process. I would also like to thank the Nick's Motors family for sharing their time, experiences and insights for my research to be a success. Special thanks to my family for the unwavering love, support and understanding throughout this project. Above all, I would like to thank the Lord Almighty for the guidance and for the strength to carry on even when l was not well.

Road traffic accidents (RTAs) continue to pose significant challenges to safety, productivity and economic stability globally, particularly in the transport sector. While many studies have explored the causes of RTAs through Knowledge, Attitude and Practices (KAP) frameworks, limited attention has been given to the role of fleet management (FMTs) in enhancing driver safety and operational efficiency. This study aimed to assess the KAP of long-distance drivers towards FMTs, specifically GPS tracking, dash cams, and driver behaviour monitory Systems, at Nick's Motors in Zimbabwe.

A total of 30 drivers participated in a structured questionnaire survey and results were presented using descriptive statistics. Findings revealed high awareness levels (100%) and a good overall knowledge score regarding FMTs. However only 46.6% of drivers reported a strong understanding of how these technologies function. Attitudes towards FMTs were fair (58.7%), with high concerns around privacy and being monitored. Practice scores were relatively strong (75.6%), indicating frequent use and adherence to FMT protocols, supported by formal training and responsible reporting of system malfunctions. espite the presence and awareness of these technologies, gaps in understanding and mixed attitudes may limit their effectiveness in improving road safety. The study concludes that targeted interventions, including enhanced training and awareness programs, are essential for maximising the impact of FMTs in reducing fatigue–related incidents and improving driver safety. The research contributes to the emerging discourse on integrating technology with driver behaviour to enhance fleet safety outcomes. Road Traffic Accidents, Fleet management technologies, Knowledge, Attitude, Practices, GPS, Telematics, Driver monitoring systems

ACRONYMS AND ABBREVIATIONS

KAP	-	Knowledge, Attitude and Practices
WHO	-	World Health Organisation
RTA	-	Road Traffic Accidents
RTIs	-	Road Traffic Injuries
RTCs	-	Road Traffic Collisions
FMTs	-	Fleet Management Technologies
GPS	-	Global Positioning System
ANTP	-	National Association of Public Transport
IPEA	-	Institute of Applied Economic Research
LMIC	-	Low and Middle Income Countries

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CHAPTER 1

1.1 Introduction

The first chapter of the study focuses on the study's background and streamlines the problem statement, objectives, hypothesis, and justification, limitations, and study area.

1.2 Background of the study

The importance of road safety cannot be overstated, as it has serious consequences that can be life-threatening. Road traffic accidents involving fleets pose significant threats to the environment and driver safety, resulting in injuries, fatalities, and economic losses (Ahmed, 2023). The World Health Organisation estimates that approximately 1.19 million people die yearly as a result of road traffic collisions, with twenty to fifty million sustaining serious injuries and others incurring disability (WHO, 2023). Numerous case studies were undertaken across the globe to assess the significant threats of road accidents.

In China, night-time collisions appear to be more complex than those of daytime (Chen and Fanny, 2019) and involve numerous road safety risks, such as increased rates of fatigue and alcohol consumption and longer reaction times for drivers due to reduced environmental illuminance. A cohort study of sixty drivers was selected at random were divided into an intervention group and a control group, and used an overall evaluation that included oculography, physiological monitoring, and driver behaviour monitoring during mock scenarios pre- and post-intervention. Findings indicated that the KAP-centric intervention improved drivers' visual search skills during night-time driving, allowing them to tackle possible risks with less physical strain and handle their vehicles proficiently.

One-third of highway mishaps in Brazil involve trucks, making traffic crashes a global problem. To determine the precise causes of truck collisions on Brazilian highways, a study was conducted (Soliano et al, 2024). According to a study conducted by the National Association of Public Transport (ANTP) and the Institute of Applied Economic Research (IPEA), traffic accidents in Brazil cost the country R$ 50 billion annually, with substantial expenses linked to lost productivity and medical care (De Carvalho, 2020). The study delved into the causes of crashes, considering variables such as traffic conditions, geographical location, weather conditions, and vehicle characteristics.

Interestingly, Soliano et al. (2020) found that lethal collisions occur more frequently in favourable weather, perhaps due to heightened risk-taking behaviour. According to the findings, states and the federal government must work together immediately to improve road conditions. The yearly variations in fatal occurrences that have been noticed highlight how dynamic road safety issues are, requiring proactive and adaptable solutions. The study shed light on the difficulties in road safety by examining the most hazardous roadways, the impact of road type on collision frequency, the impact of outside variables like weather, and the primary causes of collisions (Soliano et al, 2020). In contrast to Nick's Motors case study, this research will concentrate on drivers and their comprehension of fleet management systems.

In Trinidad, a knowledge, attitudes, and practices (KAP) study was conducted among drivers to discover which components contributed to road traffic collisions (Gopaul et al., 2016). Road traffic accidents (RTA) account for nearly 1.24 million deaths annually, or 3400 per day, with most fatalities in low-income countries (WHO, 2013) and (Gopaul et al., 2016). The factors contributing to RTCs include a lack of effective policies, non-adherence to road safety regulations, and inexperienced drivers. Most participants demonstrated a moderate level of awareness of road traffic regulations. An outstanding proportion of respondents accurately indicated the key contributory factors for road traffic accidents, which encompass drivers' noncompliance, lack of knowledge about traffic laws, and blazing speeds.

Positive attitudes towards seat belt use were observed, with 61.8% of respondents agreeing on its importance. However, support for passenger seat belt use was lower at 53%. Most drivers considered mobile phone use while driving as unsafe, with 94.3% of the respondents sharing this view. Additionally, a significant number of respondents expressed concern about drinking and driving. While this research did justice in investigating the reasons for road traffic collisions, it left out a research gap regarding the use of fleet management technologies. Further studies could investigate the role of fleet management technologies in reducing RTCs and improving road safety (Gopaul et al, 2016).

Drivers in emerging economies, such as Pakistan, frequently disobey traffic norms and regulations due to a lack of understanding and bad attitudes towards them. A study was conducted, involving a systematic survey of 260 drivers in Karachi, Pakistan (Abbas et al., 2024). The majority of respondents (74.6%) knew that motorcycle riders must wear helmets, followed road signs (74.2%), and use seat belts (64.6%). Over half of respondents (54.6%) were unaware of the speed limit in residential areas, and nearly half (45.4%) said that drug use

while driving was not risky and opposed penalties for traffic violations. In addition, 45.8% of drivers said licenses were superfluous. In Karachi, Pakistan, drivers may lack understanding of traffic rules (e.g., speed limits), have bad attitudes towards safe driving practices (e.g., drug driving), and place low importance on their licenses (Abbas et al, 2024). The study only focused on the road norms but left a research gap on fleet management technology.

In 2018, a Knowledge, attitude and practice study of road traffic collisions among vehicle drivers in Majmaa city, Saudi Arabia, was conducted due to an increase in RTAs (Alhassan et al., 2018). Road traffic accidents have been a major cause of disability in both developing and developed countries. Blazing speed was the most prevalent reason recorded in present and previous investigations, and as claimed by this research, the most injured parts included the head, neck, upper and lower limbs. The study had 157 participants set as the target population, and the most probable age group ranged from 21 to 30 years old as people were set into different groups.

Among the 157 participants, 69.4% owned a vehicle and 30.6% did not; 90.5% acquired a driver's license and 9.5% did not have a driver's license. The data also showed that 56.1% of the drivers had good knowledge about driving and the road signs, whereas 38.9% had moderate knowledge, and only 5.1% had poor knowledge. Furthermore, 87.9% of the individuals had a poor attitude toward driving safely, while 12.1% had a moderate attitude. Concerning practice, the researcher found that 52.9% of the respondents had poor practices and 44.6% had moderate practice, while only 2.5% had a good practice (Alhassan et al, 2018).

In Nigeria, a KAP survey was done on long distance drivers regarding HIV/AIDS. The research sampled 451 truckers and the aim of the study was to discover the common, unsafe behaviour, attitude, and knowledge of HIV among long-distance truck drivers. A questionnaire for data collection was designed and out of 451 truckers, only 164 were tested for the virus due to shortages of test kits and consent. The infected individuals were between the age of 21-30 and the occurrence of antibodies among the drivers amounted to 2.4% (4/164). About 68.1% of the drivers agreed to be at high risk of contracting HIV and 55.3% admitted to having more than one sexual partner. The results calls for concern as it showed that the population of truckers is a potential high risk in Nigeria although their HIV prevalence (2.4%) was lower than the overall national prevalence (4.6%) (Atiola et al, 2010).

Commercial long-distance driving is becoming increasingly popular, accounting for a substantial portion of the population's socioeconomic life (Okafor et al, 2018). Sadly, most

drivers do not know why it is important to undergo fitness assessments. The study was conducted to analyse commercial long-distance drivers' knowledge and practice of fitness to drive in Benin City, Edo State. Data was collected from 315 participants and their cars.

About the 315 participants, 177 (56.2%) knew the term "medical examination for drivers". About half (54.3%) of business drivers lacked knowledge about their driving health. Moreover, 79.7% had inadequate driving fitness. Participants who did not visit the doctor for nursing were less likely (B = -0.845) to have strong knowledge of fitness to drive than those who were treated by a doctor. Most drivers had little knowledge and practice of fitness to drive (Okafor et al, 2018)

Between 1990 and 2010, injuries caused by road accidents in Kenya were the second leading cause of physical dysfunction. The research was carried out to evaluate the incidence of speeding, as well as knowledge, attitudes, and practices, in the Thika and Naivasha areas of Kenya. To evaluate the occurrence of speeding, six routes in two regions were selected using a multi-stage sampling procedure and were observed at several instances throughout the week. Drivers participated in roadside KAP interviews at public parking areas, service stations, and rest stops. From July 2010 to November 2012, eight speed observations and four KAP interviews rounds were conducted.

The speeding observational surveys indicated a high percentage of vehicles exceeding the expected limits in the two regions, with an average of 46.8% in Thika and 40.2% in Naivasha. Generally, 58.8% of trucks in Thika and 57.2% in Naivasha exceeded the speed limit by 10 km/h or more. In Thika (70.3%) and Naivasha (68.7%), respondents believed that speeding contributes to road traffic crashes; however, awareness of speed restrictions was poor (Bachani et al, 2013).

Another study was conducted in Nigeria and the purpose was to evaluate the practices of using a phone while driving, attitudes against using a phone while driving, and understanding of the risks associated with using a phone while driving. A questionnaire that participants self-administered yielded 377 completed replies and the outcome measures were self-reported crash injury, and self-reported crash involvement. According to the findings, about 75% of the participants in the survey stated that they had previously been injured in a crash. When compared to drivers who were well-informed about the dangers of cell phones while driving, those who were not had far higher probabilities of reporting collisions. Similarly, there was an

outstanding increase in the likelihood of self-reported crash outcomes for both a negative attitude toward and a bad behavior of using a phone while driving. The conclusion emphasizes the need for more awareness and action to change the practices, attitudes, and knowledge surrounding cell phone use among Namibian drivers (Adeyemi, 2021).

Another was conducted to examine HIV and AIDS awareness, prevention, and attitudes among trained long-distance truck drivers at a dangerous commodities transport company in Gaborone, Botswana. This study evaluates condom use, consistency, and sexual partner concurrency among a specific demographic and socioeconomic group. This study indicated low obstacles to condom usage, high levels of reported condom use, but reduced condom consistency with wives and regular partners, as well as the practice of multiple sexual partners within this population. Over half of bulk vehicle operators felt vulnerable to sexual temptation and danger of HIV due to their occupation (Ngcongco, 2014). Most studies focus on drivers and their KAP on HIV and Aids but neglect the evolving technologies of Fleet management technologies.

One of the main causes of death and morbidity is injury (Midani et al., 2020). First aid is the quick care given to someone who has been unexpectedly hurt or ill until help from a professional arrives or the individual has recovered (Van der Velde et al., 2009). First aid might be a determining factor in RTA that makes the difference between life and death. In Zimbabwe, a case study was undertaken to examine drivers' attitudes and knowledge regarding first aid. Early provision of appropriate first aid could save many lives (Midani et al., 2020). An online survey was used to perform a cross-sectional study. Participants had a driver's licence and the required age was a maximum of eighteen. Participants with certifications from approved organisations and paramedics were not allowed to participate. The questionnaires were completed by 343 individuals in total (Mohamediya et al., 2023).

The majority of participants (94.2%) said they were familiar with the term "First Aid." but only 52.43% of participants said that the victim should be taken to the hospital without the ambulance, while only 49.73% of participants knew the ambulance number. Regarding attitude, 34.86% of respondents said they would not be willing to administer first aid in an RTA situation. Most participants expressed a willingness to take part in first aid courses in order to enhance their attitude and knowledge. Although the majority of participants understand the fundamentals of first aid, their ignorance and concern about potential legal repercussions

prevent them from offering first aid in RTA situations. In light of these findings, we advise new drivers to take first aid courses to obtain certification (Mohamadiyeh et al., 2023).

In the year 2014 in Zimbabwe, a study was conducted and it used a descriptive survey approach to measure drivers' awareness of seatbelts, seatbelt law, and attitudes towards the seatbelt regulation (Mabuto, 2014). The study sampled of 180 drivers through scheduled interviews to collect data. The study's findings revealed 53.30% correct responses on seatbelt awareness, 36.94% on seatbelt law, and 47.96% of drivers exhibited negative attitudes towards seatbelt laws. The data revealed that there were some information gaps and that nearly half of the drivers held negative sentiments (Mabuto, 2014).

Biofuels are commonly used in low- and middle-income countries to preserve foreign money, reduce climate change, employment creation, and promote rural revitalization. However, vehicle operators have little knowledge of blended biofuels. A study was carried out to examine motorists' awareness and attitudes towards mandatory ethanol blending in Zimbabwe, following implementation. A sample of 200 respondents was used and all of them completed the questionnaire. Motorists struggle with limited knowledge of ethanol blends and how to modify their engines for high ethanol blends (Mabumbo and Mafongoya, 2019).

Approximately 63.1% of the respondents did not know about the specialized aspects of ethanol-blended fuel, particularly regarding engine efficiency. Secondly, some motorists reported issues such as unstable idling (36%), shortage of power (19.5%), and difficulty starting the engine (16.5%). Despite criticisms, 54% of respondents have a good attitude towards ethanol-blended fuel, and 60.3% would suggest it to other drivers (Mabumbo and Mafongoya, 2019). The study showed that carrying out a lot of awareness campaigns regarding the use of bioethanol in the transport industry can go a long way to remove misconceptions that drivers have on ethanol blends but it left a research gap on fleet management technologies.

Most of these past KAP surveys focused on the causes of road accidents, but few have explored the role of fleet management technologies in preventing crashes. This research will focus on fleet management technologies, including telematics, driver monitoring systems, and vehicle tracking devices, and their potential to reduce road accidents. By investigating the current state of fleet technologies and their significance on road safety, this research aims to contribute to the development of effective strategies for reducing road accidents and promoting safe transportation practices.

1.3 Problem statement

Despite adopting fleet management technologies (FMTs), international drivers in the transport industry continue to experience high rates of fatigue, accidents, and inefficiencies, resulting in significant costs, safety risks and environmental impacts. Worldwide, road crashes are a major cause of fatalities, and, despite improvements in road safety, projections have shown that fatalities from traffic crashes will increase significantly by 2030. According to the Traffic Safety Council of Zimbabwe, a total road crushes of 25 968 resulted in 1037 total fatalities and 5181 injuries from January to June 2024.

At Nick's Motors, 30 to 40 incidents are recorded per year, with a maximum of 2 accidents, and estimated costs of R100, 000 to repair the damages, according to company records. One of the customers banned all PUMA drivers due to the increase in the number of incidents. Driver fatigue is one of the most common dangers to road safety and poses a number of risks to drivers as well as passengers on the road. Driver fatigue means that drivers have less time to react to oncoming hazards because their alertness and concentration are impaired (May, 2011).

Fatigue can have an impact on the decision-making process, which can have major consequences on driver safety. The existing studies focus primarily on operational efficiency, fuel consumption and vehicle maintenance, overlooking the critical aspect of driver safety. Despite the growing importance of fleet management technologies in promoting occupational road safety, there is a scarcity of research examining the knowledge, attitudes, and practices of these technologies among fleet operators and drivers. This research aims to bridge this knowledge gap by investigating the KAP of fleet management technologies for enhancing driver safety.

1.4 General objective

To assess the KAP of drivers towards fleet management technologies, such as telematics, GPS tracking, dash cams, and driver behaviour monitoring systems on driver fatigue, safety and efficiency among long-distance drivers.

1.5 Specific objectives

1. To determine the level of knowledge of drivers on the use of FMTs.

2. To examine the attitude of drivers towards the adoption and use of FMTs and identify areas of improvement.

3. To explore the current practices of drivers in using FMTs and improve driver safety.

4. To provide evidence-based strategies for improving the knowledge and practices of long-distance drivers regarding fleet management technologies to enhance road safety.

1.6 Hypothesis

Understanding the KAP of drivers on FMTs such as GPS tracking, driver behaviour monitoring, and real-time alert systems will significantly reduce the incidence of accidents and improve safety outcomes among long-distance drivers in the transport industry.

H0

There is no significant association between the knowledge, attitudes, and practices of long-distance drivers regarding the use of fleet management technologies.

H1

There is a significant association between the knowledge, attitudes, and practices of long-distance drivers regarding the use of fleet management technologies.

1.7 Justification

Long-distance driving increases the risk of accidents, injuries, and fatalities. Improving driver safety is essential to reduce these risks and ensure the well-being of drivers. FMTs, such as telematics, GPS tracking, and driver behaviour monitoring systems, have become increasingly prevalent. Assessing the KAP of drivers regarding fleet management technologies and their impact on driver safety is crucial to optimising their effectiveness. It helps identify areas of improvement leading to safer driving experiences. Addressing drivers' concerns and attitudes towards these technologies contributes to a better work environment and increased job satisfaction. Fleet management technologies help drivers optimise routes, reduce fuel consumption and improve vehicle maintenance, making their jobs easier. Nick's Motors and all fleet managers and operators can benefit from this research because improving driver safety can lead to reduced costs associated with accidents, insurance premiums and worker compensation claims.

Implementing Fleet Management technology can help monitor driver behaviour, identify risky practices and provide targeted training. This can only be effective if we know what the drivers think about the technology. Enhanced safety measures can lead to a safer working environment

and reduce stress related to road safety if only the drivers understand how they work and are willing to cooperate. Getting access to feedback on drivers and their perceptions on fleet management technologies can help drivers improve their skills and adopt safer driving habits.

Safer roads contribute to overall public safety. Existing research focuses primarily on operational efficiency, HIV and AIDs in long-distance drivers, and road traffic crashes, leaving a knowledge gap regarding the KAP of drivers on fleet management technologies. This research will bring out insights which promote transportation safety and technology. It also provide companies with valuable insights into drivers' knowledge, attitudes and practices, enabling them to make informed decisions about fleet management technologies.

1.8 Study Area Description

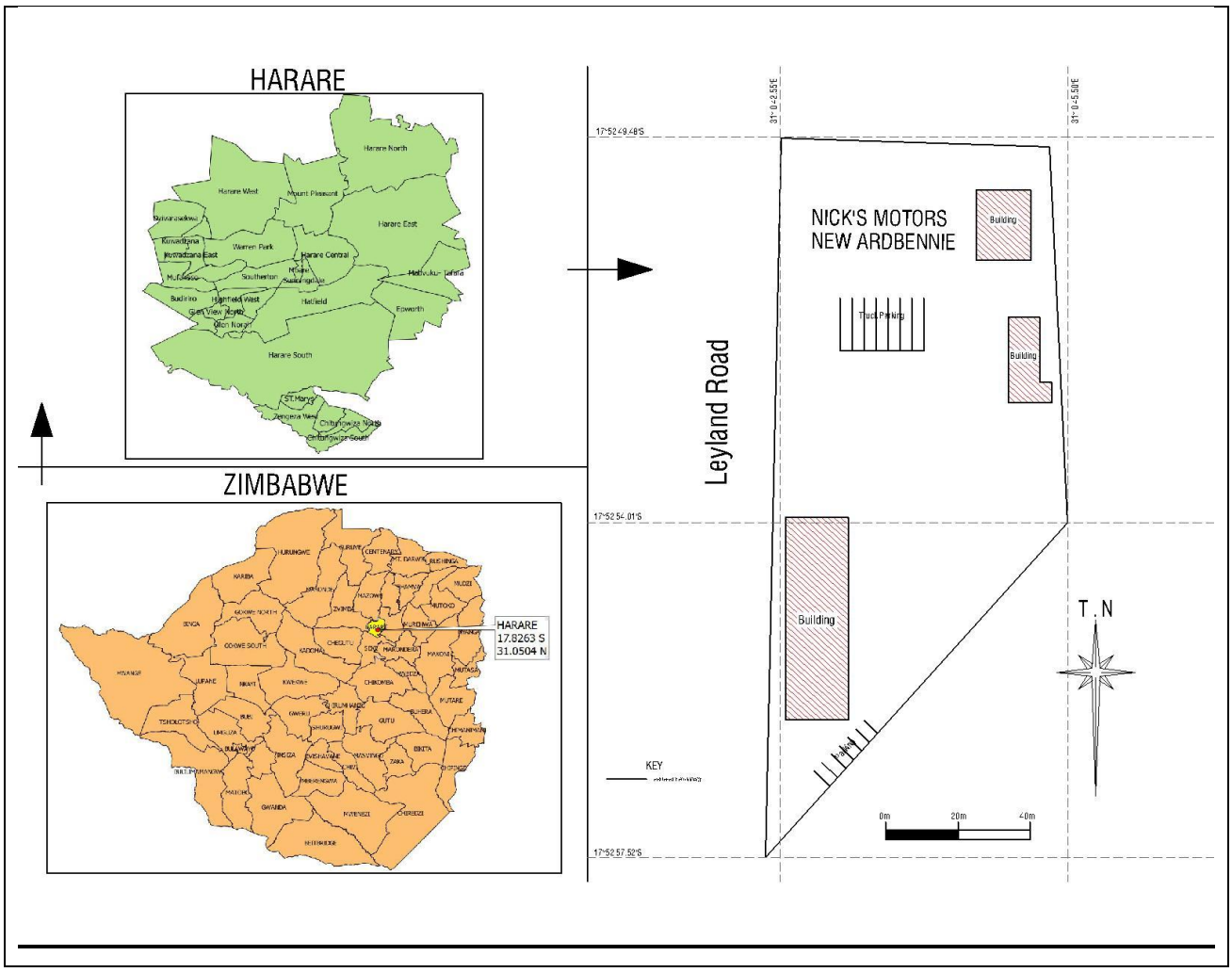

Fig 1.8.1: Map showing Nick's Motors

The research will be conducted on Nick's Motors, which is located at 668 Leyland Road, New Ardbennie, approximately 7.9km from Harare CBD. The company is geographically located at UTM Zone 36 coordinates 17.8263 S and 31.0504 N. The area covers an extensive landmass characterised by a subtropical highland climate, with annual rainfall ranging between 825mm and 855mm. The climate supports open woodland with the Msasa tree being particularly common. The area has limited vegetation cover due to urbanization and industrialization. The area is dominated by concrete, pavements and buildings which leads to reduced biodiversity. The company sits on the Highveld, a plateau of raised land.

The primary water source of Nick's motors is Lake Chivero which lies about 35km Southwest of Harare along the main road to Bulawayo. The Lake provides essential water for both industrial operations and local communities such as Houghton Park. The river experiences

seasonal variations in flow, with higher volumes during the rainy season (November to March) and lower flows in the dry season (April to October).

The area's physical features are primarily defined by its industrial heritage with a mix of historical buildings and commercial structures. Residential areas coexist with industrial zones so most people survive by working in industries since there is no land for crop cultivation. There is high population density due to industrial zones, with well-developed transportation networks with access to essential services such as clinics, main roads and schools. The area has higher densities due to more affordable or accessible housing options. The area's proximity to the CBD provides easy access to the metropolitan facilities while maintaining lower living costs.

1.9 Limitations

The study is focusing on a specific geographical region, which is Nicks Motors, and this limits the generalizability of the study to other industries, regions or drivers. The sample size of drivers is limited, which could impact the reliability and accuracy of the findings. The rapid evolution of fleet management technologies may render the study's findings obsolete. The study may not account for the impact of the organisational culture on the adoption and use of fleet management technologies. The quality of the research may be affected by factors such as incomplete or inaccurate records. Some drivers might resist cooperating, citing concerns about privacy and job security.

1.9.1 Conclusion

Chapter 1 highlighted the importance of road safety and the benefits of fleet management technologies in reducing road accidents and improving driver safety. The problem statement has identified the knowledge gap regarding the KAP of drivers towards fleet management technologies. The study's objectives, hypothesis and justification have been specified, emphasizing the need to assess the KAP of drivers and provide evidence-based strategies for improving road safety. The study acknowledged the limitations of the research and specified the geographical region. Overall this chapter has set the stage for the research study, which aims to develop effective strategies for promoting safe transportation practices.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review gives an overview of the topic, discussing various technologies and their applications. It examines the knowledge, attitudes, and practices of long-distance drivers regarding fleet management technologies and their potential role in reducing road accidents. The chapter also reviews existing literature by other authors and highlights the research gap.

2.2 Overview

Road traffic accidents are a significant issue worldwide. Long-distance drivers are especially vulnerable due to fatigue, long driving hours, and unsafe road conditions (Okafor et al, 2017). In response, fleet management technologies (FMTs) have been promoted to improve road safety. Their use is growing in the transportation industry, aiming to increase safety, efficiency, and productivity (Oladimeji et al, 2023). Understanding drivers' knowledge, attitudes, and practices (KAP) regarding these technologies is essential for successful implementation and adoption. Awareness of fleet management systems varies among drivers; most know that GPS tracking helps monitor vehicle location and movement. Some are familiar with telematics devices, which provide insights into driving habits, vehicle performance, and safety.

The KAP framework is useful for evaluating drivers' understanding of FMT capabilities, their support for its use, and how their driving habits match safety goals. Insights from these assessments can identify training gaps, resistance to adopting technology, or misconceptions that might compromise safety. Moreover, understanding driver perspectives can guide policy development, enhance training programs, and tailor technologies to meet user needs. Ultimately, this research aims to connect technological progress with human behavior, creating a safer road environment through informed and cooperative use of fleet management systems.

2.3 Fleet Management Technology Usage in the Transport Industry

Fleet management involves overseeing and optimizing a company’s fleet of vehicles, including planning routes, managing drivers, and monitoring vehicle performance (Santos, 2021). It also entails coordinating vehicle maintenance to maximize efficiency and minimize costs in transportation and delivery. Fleet management technologies are a set of digital tools and systems for monitoring, optimizing, and managing a company’s fleet, tracking vehicle location, fuel consumption, driver behavior, and maintenance needs (Santos, 2021).

A few decades ago, the idea of real-time vehicle monitoring seemed unrealistic. This changed with the introduction of GPS trackers. The U.S. automobile industry developed GPS in 1974,

with an experimental satellite launched by Rockwell International in 1978 (Martin, 1986). A GPS tracking system uses the Global Positioning System to monitor vehicle locations. GPS tracking devices let fleet managers see vehicle locations and movements in real-time, allowing them to respond quickly and optimise dispatching (Morais et al, 2023).

GPS data can help analyse routes, spot bottlenecks, and improve efficiency, cutting down travel time and fuel use. Using GPS tracking can prevent vehicle theft, enhance driver safety by monitoring risky behaviours, and assist in recovering stolen vehicles. Real-time visibility of vehicle locations and delivery status enables better communication with customers and ensures timely deliveries (Morais et al).

In the late 1970s, the concept of telematics emerged. Alain Minc and Simon Nora of France defined telematics as using telecommunications to transfer information. Fleet management began moving from basic maintenance to strategic coordination, balancing speed, scale, and route planning more effectively than before. This period laid the groundwork for modern fleets and led to today's advanced fleet management practices. Telematics systems are now a key part of modern fleet management, providing many benefits by using real-time data and analytics to optimise operations.

Telematics can set up virtual boundaries around specific areas and alert fleet managers if a vehicle leaves designated zones, enhancing security and preventing unauthorised use. Many telematics systems offer features like automatic crash notification and vehicle location assistance, which are crucial in emergencies. They can also track driving habits like speeding, hard acceleration, and braking, providing data for driver training to improve safety. Imagine a smart computer in your vehicle that can report details such as speed, idling, fuel use, and low tire pressure (Jensen & Miller, 2021).

Route optimisation software identifies the most efficient route or order of stops for vehicles in the transportation industry. It uses sophisticated algorithms, real-time traffic data, vehicle capacity, delivery time windows, and other factors to shorten travel time, cut fuel use, and lower operational costs while boosting efficiency.

In the transportation sector, route optimisation is vital for enhancing logistical performance. Fleet management companies typically use it for freight transport, courier services, and field service operations. The software usually integrates with GPS systems, telematics, and fleet

management platforms, allowing transportation managers to plan, monitor, and adjust routes dynamically.

In the modern transport industry, where reliability, safety, and efficiency are critical, Maintenance Management Systems (MMS) have become essential tools. These software-based solutions aim to streamline and optimize the maintenance of physical assets like vehicles, equipment, and infrastructure. Implementing MMS in the transportation field has transformed how maintenance activities are planned, executed, and tracked, leading to improved service delivery and cost-effectiveness.

A Maintenance Management System offers a centralized platform for overseeing maintenance activities. It allows organizations to schedule preventative maintenance, monitor asset performance and history, manage spare parts inventories, document maintenance actions, and ensure safety and regulatory compliance. These functions are vital in transportation, where a single component failure can cause costly downtime, safety risks, and regulatory violations.

One common use of MMS in transportation is scheduling preventative maintenance. Trucks experience wear and tear due to frequent use. MMS enables maintenance teams to arrange routine checks and services based on factors like mileage, engine hours, or time intervals. This proactive strategy identifies possible faults before they turn into serious problems, reducing unexpected breakdowns and extending asset life.

Driver Behaviour Monitoring (DBM) has emerged as an important fleet management solution in the evolving transportation market. This strategy focuses on enhancing driver safety, improving operational efficiency, and optimising fleet performance. By using telematics and data analytics, DBM provides fleet managers the tools to monitor, evaluate, and enhance driver behaviour in real-time.

DBM involves collecting real-time data related to driver performance (Li et al, 2025). Managers can use this information to compare driver performance against benchmarks and identify areas needing attention. Key performance indicators (KPIs) like hard braking, rapid acceleration, and excessive idling are crucial for assessing the safety and efficiency of driving practices. DBM systems help fleets maintain regulatory compliance by providing documented evidence of driver behaviour and training efforts, thus reducing legal risks

Additionally, implementing DBM promotes accountability among drivers. Knowing their actions are being monitored encourages drivers to adopt best practices, leading to safer driving

habits. This proactive strategy benefits individual drivers and enhances the fleet's overall reputation. DBM involves careful planning and technological integration. These systems can seamlessly connect with existing fleet management software, GPS tracking, and vehicle maintenance systems to create a comprehensive monitoring setup. However, effective deployment requires training for both drivers and fleet management. Ensuring all parties understand the system and its benefits is crucial for realising its full potential.

2.4 Level of Awareness of Fleet Management Technologies

Knowledge refers to the understanding and awareness drivers have of fleet management technologies (Lave, 2021). Research on drivers' knowledge of these technologies is limited. However, studies show that drivers' awareness of technology features and benefits can greatly affect adoption and usage rates (Smith et al, 2020). For example, a study on GPS tracking systems found that drivers who understood the technology's purpose and advantages were more likely to use it effectively (Johnson et al, 2019). Factors that influence drivers' knowledge include training programs and experience with technology (Williams et al, 2018). A study on telematics systems found that drivers who received thorough training were more aware of the technology's capabilities and limitations (Davis et al, 2020).

According to a study by Victor in 2025, a large logistics company with a fleet of 500 vehicles adopted an audio-based predictive maintenance system to monitor truck health. This system successfully predicted 35 cases of engine failure that traditional methods missed. It reduced downtime and improved fleet utilization, which was often neglected by traditional methods, causing inefficiencies by either over-maintaining functioning vehicles or under-maintaining those nearing failure. This system helped drivers understand how to use these technologies.

A study by Zhang et al. in 2021 in China looked at drivers' awareness of fuel-saving features. Results showed that drivers had a limited understanding of fuel-saving systems, which are examples of telematics. They even underestimated the importance of these fleet management technologies.

A separate study conducted in Northern Thailand found that recognizing current behavior is the first step towards effective organizational change, such as in the applications of GPS-based fleet management systems (Kwansirin et al, 2017).

Research indicates that many long-distance drivers, especially in developing areas, have limited knowledge about FMTs. Adebayo et al. (2019) found that while fleet managers often know a lot about these technologies, drivers may lack awareness of their functions and benefits.

Richardson (2016) showed that most truck drivers do not have a clear understanding of highly automated driving systems. This knowledge gap can hinder the adoption and effective use of FMTs, potentially undermining their intended safety benefits.

2.5 Attitudes Towards Fleet Management Technologies

Attitudes are complex mental states that include drivers' thoughts, feelings, and opinions about fleet management technologies, such as their perceived usefulness, ease of use, and invasiveness (Olson & Stone, 2005). Drivers' attitudes toward FMTs significantly affect their acceptance and usage. Negative views, such as seeing these technologies as tools for surveillance, can lead to resistance and non-compliance. Zhou and Kumar (2020) noted that drivers who view monitoring systems as invasive are less likely to engage with them positively. In contrast, when drivers see that FMTs are meant to enhance safety and efficiency, they are more likely to adopt and use them effectively (Ajzen, 1991).

A study in Northern Thailand by Kwansirin et al. in 2017 showed that when a company suggested GPS tracking to monitor driver behaviour, drivers who felt their privacy was violated were less likely to use the technology (Taylor et al, 2019).

Involving drivers in choosing and implementing FMTs generates a sense of ownership and trust, leading to better acceptance. Clear communication about the benefits and purposes of these technologies is key to forming positive attitudes (SmartFleetUSA, 2024). A 2016 study showed that truck drivers have a positive attitude toward receiving feedback about their driving performance related to highly automated driving, especially if designed and implemented properly. Drivers expressed a positive attitude towards fleet management technologies due to their desire for positive feedback and concerns for safety and liability issues related to these technologies.

Another study that was done by Huang et al in 2005 showed that drivers want to receive more feedback about their driving behaviour, which shows positive attitudes towards fleet management technologies. They also prefer positive feedback to negative feedback, which shows room for improvement. Drivers have varying attitudes towards feedback, modality, frequency and timing, highlighting the need for adaptable feedback systems.

2.6 Practices of drivers towards fleet management technologies

In this context, practices refer to how drivers interact with, use or respond to fleet management technologies. The actual practices of drivers how, they interact with FMTs affect the real-world impact of these systems. In practice, training and consistent feedback loops have been shown

to improve compliance and performance (Kogler & Maier, 2021). For example, Telematics was utilised in research in Virginia in 2022 to give input on a variety of driving behaviours, such as speeding, harsh braking, severe acceleration, wearing seat belts, rough cornering, and idle time, but the success of such monitoring depends on driver cooperation and willingness to adjust behaviors accordingly (Smith et al., 2022).

Yunir (2020) conducted a case study of the Borneo Economic Corridor, which used a GPS tracker and a smart GPS server 3.3, Google Earth. The findings proposed that optimisation layouts can save 36.7% - 48.61% of the current journey time, allowing the movement to be enhanced by four to five times. FedEx adopted FleetGuard, which focuses on tyre pressure monitoring devices and GPS sensors. This revolutionary technology includes real-time pressure monitoring, predictive maintenance, and driver behaviour analysis. This assisted the drivers in lowering operational expenses and improving reliability (Meenambika et al, 2023).

2.7 Theoretical Framework

The Technology Acceptance Model (TAM), developed by Fred Davis in 1989, came as an adaptation of the Theory of Reasoned Action (TRA) to explain user behaviour in the context of technology adoption. TAM is widely regarded as one of the most prominent models for understanding and predicting the adoption and use of technology systems in a variety of fields, including transportation and logistics.

In this study, TAM serves as a theoretical lens through which long-distance drivers perceive, accept, and use Fleet Management Technologies (FMTs) such as GPS tracking, telematics systems, dash cams, and driver behaviour monitoring tools. The model identifies critical cognitive and attitudinal characteristics that drive behavioural intention to use technology, which in turn predicts actual usage. The theory starts with the external variables, which represents the system design features. Perceived Usefulness (PU) is the extent to which a driver believes that using FMTs will improve their driving performance, reduce fatigue, prevent accidents, and enhance overall safety and efficiency (Davis, 1989)

Perceived Ease of Use (PEOU) is the extent to which a driver believes that using FMTs will be free of effort or complexity. If drivers perceive FMTs to be easy to learn and operate, they are more likely to adopt them. Attitude Toward Use (ATU) consists of the positive or negative feelings of drivers towards using FMTs. This attitude is influenced by their perceptions of usefulness and ease of use. Behavioural Intention to Use (BI) is the intention or willingness of

a driver to use FMTs soon. A strong behavioural intention often leads to actual use. Actual System Use (AU) is the real-life utilisation of fleet technologies by drivers in their day-to-day work. This represents the practical outcome of the above constructs (Davis, 1989).

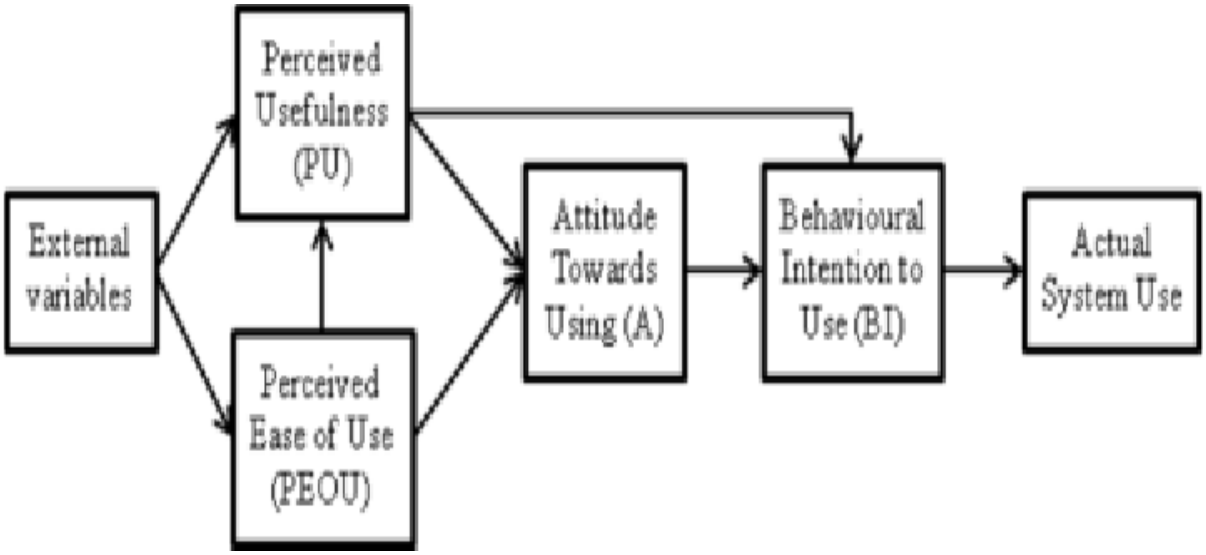

Figure 2.7.1: Technology Acceptance Model

TAM allows this study to investigate how knowledge of FMTs affects perceived usefulness and ease of use. It helps analyse drivers' attitudes, especially in response to data collection and monitoring and determine whether intention translates into actual practice, and what barriers exist. The Model is supported by Ali et al. (2020), who found that truck drivers in Pakistan were more likely to use telematics systems when they understood their safety benefits and found them easy to operate. Chikanya & Mlambo (2022) noted that in Zimbabwe, resistance to vehicle tracking systems was largely due to low awareness and negative attitudes linked to privacy concerns. Makumbe (2019) observed that continuous training and positive reinforcement improved driver compliance with monitoring systems in South African freight companies.

2.8 Advantages and Disadvantages of Fleet Management Technologies

Fleet management systems have altered the transportation industry by providing capabilities that significantly increase efficiency, safety, and regulatory compliance. However, like every technological advance, these systems offer advantages and disadvantages that must be carefully addressed. Understanding these factors is crucial for transportation companies wanting to enhance operations and solve potential problems (Bolanos et al, 2022).

The potential to enhance operational efficiency is among the most important benefits of FMTs. GPS monitoring systems offer real-time route optimisation, enabling fleet managers to identify the most effective routes for drivers. This not only conserves fuel but also reduces travel time, leading to faster deliveries and more effective resource utilisation. Furthermore, automatic scheduling tools streamline the dispatch process, boosting overall productivity (Verma et al, 2024).

Safety is a crucial benefit of fleet management technologies (Mohammed and Jokonya, 2021). Tools that monitor driver behaviour can detect risky practices, allowing for focused training to minimise accident rates. Real-time alerts for mechanical concerns or hazardous driving conditions help to ensure safer operations by preventing accidents and breakdowns (Alsayaydeh, 2023). These devices aim to protect both drivers and the general public by instilling a safety culture.

Regulatory compliance is an essential component of fleet management, and technologies like Electronic Logging Devices (ELDs) play an important role in this regard. ELDs ensure compliance with Hours of Service requirements, reducing the risk of violations and penalties. Furthermore, automated documentation and reporting simplify compliance with safety and environmental regulations, allowing fleet managers to focus on core operations (Forsyth, and Haddud, 2024).

Cost savings are another key benefit. Improved route design and driving behaviour can result in significant fuel savings. Predictive maintenance features can also assist discover potential mechanical flaws before they worsen, resulting in decreased repair costs (Achouch et al, 2022). These financial benefits help transport businesses increase their profitability.

Using fleet management solutions also results in improved customer service. Real-time tracking enables customers to obtain precise delivery updates, increasing happiness and trust (Alsayaydeh, 2023). Improved communication between drivers and dispatchers improves the overall customer experience by giving timely information and support.

Despite their various advantages, fleet management solutions can have some drawbacks. One of the most obvious problems is the significant upfront cost necessary for deployment (Claps et al, 2015). The price of purchasing and integrating new technology can be prohibitively

expensive for some businesses. Furthermore, continuing maintenance expenditures associated with software and hardware updates can put an additional burden on budgets.

The complexity of these systems also creates obstacles. Integrating new technology into existing infrastructure can be time-consuming and require significant training for both drivers and fleet managers (Farahpoor et al, 2023). Ensuring that all users are adept in using the systems is critical for maximising their efficacy.

Privacy concerns represent another significant drawback. Continuous monitoring can generate concerns about surveillance, leading drivers to worry about their job security and privacy. Furthermore, data breaches pose hazards to sensitive information, demanding strong cyber security measures.

Another factor to consider is technological dependence. Technical breakdowns or system faults can interrupt operations, causing delays and inefficiencies. Furthermore, overreliance on automated devices may impair drivers' situational awareness and decision-making abilities, jeopardising safety.

The misuse of data generated by fleet management technologies is also an issue. Misinterpretation or wrong application of this data can result in incorrect conclusions and actions. Furthermore, the pressure to perform based on monitoring might cause unnecessary stress for drivers, compromising their well-being and safety (Rahman et al, 2022).

Finally, resistance to change can impede effective implementation of fleet management alternatives. Employees may be hesitant to accept new tools out of fear or discomfort with change, reducing the overall effectiveness of the systems.

2.9 Research Gap in Assessing the Knowledge, Attitude, and Practices (KAP) of Drivers Regarding Fleet Management Technologies

The assessment of drivers' Knowledge, Attitude, and Practices (KAP) concerning fleet management technologies is a relatively underexplored area compared to the extensive research on the technologies themselves (Umar et al, 2024). Identifying the research gap in this domain can help inform future studies and improve fleet management. While several studies analyse the usefulness of technology in enhancing safety and efficiency, research is scarce on how drivers perceive these tools, their awareness of the technologies, and their willingness to utilise them (Biassoni, and Gnerre , 2024).

Research often overlooks the specific knowledge gaps that drivers may have regarding fleet management technologies. While some studies assess general technology acceptance, few delve into the nuances of what drivers know about the functionalities, benefits, and limitations of these tools (Rahimi and Oh, 2024). Understanding these knowledge gaps is crucial for effective training and implementation.

While there is literature on the acceptance of technology in the transportation sector, there is little research on drivers' opinions towards fleet management technologies. Fear of surveillance, aversion to change, and perceived intrusion into privacy can all have a substantial impact on adoption rates (Mohamed and Jokonya, 2021). A better knowledge of these attitudes is required for developing interventions and training programs.

Current research frequently fails to examine how different practices among drivers determine the use of fleet management technology (Molemi, 2021). Variability in driving habits, adherence to legislation, and use of technology can result in inconsistent outcomes. Investigating these practices can provide valuable insights into how to improve the effectiveness of fleet management solutions (Molemi, 2021).

Most studies, capture drivers' KAP at a specific moment. There is a need for longitudinal studies that examine changes in KAP over time, particularly as new technologies are introduced and drivers acquire training and experience with these instruments (Gopaul et al, 2016).

2.9.1 Conclusion

This literature review highlights the importance of understanding drivers' KAP towards fleet management technologies. While existing research provides some insights into drivers' knowledge, attitudes, and practices, there are significant gaps and limitations that need to be addressed. Future research should focus on providing a thorough understanding of drivers' KAP towards fleet management technologies, including the impact of training and education programs, organizational policies, and feedback mechanisms. By synthesizing existing research and identifying areas for future study, this literature review sets the stage for further investigation into the complex issues surrounding drivers' KAP towards fleet management technologies.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter employs a quantitative approach, utilising a descriptive research design to assess the KAP of drivers regarding the use of fleet management technologies for enhancing driver safety. A structured questionnaire will be administered to a sample of drivers at Nick's Motors to collect data, which will be subsequently analysed. The study aims to provide insights into the current KAP of drivers, identifying gaps and areas for improvement in the adoption and use of fleet management technologies.

3.2 Research design

The research employed the case study research method. According to the Qualitative Research and the Modern Library (2011), a case study is a detailed examination of one individual, group, or event. In this case, we are having an in-depth study of drivers and their KAP on fleet management technologies. In a case study, every element of the subject's life and background is examined to identify patterns and the reason for conduct. The goal of a case study is to understand as much as possible about the drivers so that the information may be applied to a larger group. Unfortunately, case studies are very subjective, and it might be difficult to generalise the results to a broader population. Case studies have the advantage of allowing researchers to record information on the 'how,' 'what,' and 'why' of something that is done. It allows researchers to get information on why one method may be preferred over another. It also allows researchers to formulate theories that may be tested in experimental studies.

3.3 Sampling procedure

The research was carried out on all PUMA drivers, which are 40 in total, so no sampling technique was required. The drivers have various age groups and different experiences, so conducting the research on all of them will result in more effective results without bias.

3.4 Research tools

The researcher used primary sources of data. Primary data is information that researchers have directly gleaned from primary sources through questionnaires, surveys, or interviews (Kumar et al, 2025). The primary sources of primary data were the drivers, and the data collection method used was questionnaires. A questionnaire is a set of questions designed to elicit information from respondents about their attitudes, experiences, or opinions. They can be used to gather quantitative or qualitative data (Dahal et al, 2024). The researcher developed a KAP survey that included questions tailored to assess knowledge, attitudes and practices regarding

fleet management technologies and ensured that the questions were clear and unbiased. The questionnaire consisted of 22 questions, and they were normally distributed.

The questionnaire consisted of four sections:

(i) Demographic background.
(ii) Knowledge about fleet management technologies
(iii) Attitudes towards fleet management technologies
(iv) Practices towards fleet management technologies

The questionnaires were then taken by the researcher for analysis.

3.5 Statistical Analysis

The researcher used Microsoft Excel 2013 and SPSS version 20 to analyse the data. Only 30 drivers responded, and others said they were facing network challenges. The research questionnaire had 5 questions to ascertain the participants' knowledge, 5 questions to assess their attitudes and 6 questions to ascertain their practices regarding fleet management technologies. Each correct response received a score of 1, while incorrect and don't know responses received a score of 0. Each character's average score was determined, and responses were classified as "Good" if the score was above 70% "Fair" if the score was from 51-69% or "Poor" if it was less than 50%. The overall KAP scores were calculated by combining the scores. The total KAP score was used to rank the level of knowledge, attitude, and practice of the participants toward food safety and hygiene. Tables were used to display the data after analysis.

3.6 Research ethics

Research ethics can be defined as doing what is morally and legally right during research. They are standards for conduct that differentiate between right and wrong, and acceptable and unacceptable behaviour (Parveen et al., 2017). Appropriate ethical issues considered in research when dealing with human subjects were considered (P Bhandari, 2024). They included privacy, confidentiality and anonymity.

The research subjects participated willingly without being forced. The researcher assured the participants that declining to participate would have no negative effects or penalties. The researcher gave the participants all the information they required on the study. Because

everyone has the right to privacy, the researcher safeguarded their personal information. The researcher protected anonymity wherever it was possible, even when it was not possible to collect data anonymously.

3.7 Conclusion

This chapter mapped out the research methodology used to assess driver's KAP regarding fleet management technologies. A descriptive case study approach was adopted, with data collected from all 40 drivers using a structured questionnaire. Responses from 30 participants were analysed using Microsoft Excel and SPSS, with scores categorised to evaluate KAP levels. To maintain the integrity of the research process, the researcher took note of the ethical considerations such as informed consent, confidentiality and beneficence. The chosen methodology ensures reliable and comprehensive insights into drivers' engagement with fleet management technologies

CHAPTER 4: RESULTS

4. Introduction

Chapter 4 presented, analysed, and discussed findings. The researcher used tables to present data.

4.1 Section A: Demography

Table 1: Summary of demographic characteristics

Demographic variable	Category	n=30	%=100
Sex	**Male**	**28**	**93.3**
	Female	**2**	**6.7**
Age	**26-34**	**13**	**43.3**
	35-40	**10**	**33.3**
	41-49	**7**	**23.3**
	50+	**-**	**-**
Highest Educational	**Primary**	**1**	**3.3**
Level	**Secondary**	**11**	**36.7**
	Tertiary	**17**	**56.7**
	Other	**1**	**3.3**
Years of Driving	**<1**	**1**	**3.3**
Experience	**1-5**	**10**	**33.3**
	6-10	**15**	**50**
	>10	**4**	**13.3**
How long have you been	**<1**	**4**	**13**
Employed at	**1-3**	**12**	**40**
Nick's Motors?	**4-6**	**14**	**46.7**
	>6	**-**	**-**

The study had 93.3% male and 6.7% female participants since males dominate the driving industry. The 26-34 age group accounted for 43.3% of the participants, which had the largest number of participants. The remaining age groups (35-40 and 41-49) each accounted for 33.3% and 23.3%, respectively. Only 3.3% of the respondents had either primary or other as their highest level of education. The tertiary educational level had 56.7%, and the secondary level had 36.6%. Half of the drivers (50%) have 6- 10 years of driving experience. Among the remaining respondents, 33.3% have a driving experience of 1-5 years, and 13.3% have an

experience of more than 10 years. Only 3.3% have a driving experience of less than a year. Only 13% have been employed at Nicks Motors for less than a year. The respondents who have been working at Nick's Motors for 1-3 years are 40%. The rest (46.7%) have been at Nick's Motors for 4-6 years

4.2 Section B: Knowledge of Fleet Management Technologies.

Table 2: Knowledge on fleet management technologies

Knowledge Variable	Participant response	n	%	Preferred response	score
Q1. Are you aware of any Fleet Management Technologies?	**YES**	30	100	**YES**	1
Q2. A dash cam continuously records video footage of the road ahead.	**YES**	30	100	**YES**	1
Q3. Which of the following technologies are installed in your truck?	**ALL**	21	70	**ALL**	0.7
Q4. How did you first learn about these technologies?	**Company training**	23	76.7	**Company training**	0.767
Q5. On a scale of 1-5, how well do you understand these technologies?	**Well and very well**	14	46.6	**Well and very well**	0.466
TOTAL KNOWLEDGE SCORE					**3.933**

According to Table 2, the total score on knowledge is 3.933 out of 5, meaning the percentage knowledge score is 78.7%, which is quite good.

All the respondents were aware of fleet management technologies, and they all knew what a dash cam is used for. Almost three-quarters (70%) correctly scored all the fleet management technologies in the truck. The remaining 30% are not aware of the technologies that are present in their trucks. Most of them left out three or more techniques. Most of the participants (76.7%) first learnt about these technologies from the company training, and 20% learnt from a supervisor or colleague. Only 3.3% taught themselves about fleet management technologies.

Almost half (46.6%) understand these technologies, but 53.3% do not understand them. 53.3% are aware of the fleet management technologies but do not understand them.

4.3 Section C: Attitude towards Fleet Management Technologies

Table 3: Attitudes towards fleet management technologies

Attitude Variable	Participant response	n	%	Preferred response	score
Q6. Do you believe these technologies mitigate the risk of road accidents?	**Strongly agree and agree**	23	76.7	**Strongly agree and agree**	0.767
Q7. How do you feel about being monitored while driving (e.g., through GPS or dash cams)?	**Comfortable**	8	26.7	**Comfortable**	0.267
Q8. Do you think these technologies improve driver discipline?	**YES**	26	86.7	**YES**	0.867
Q9. Do you think dash cams invade driver privacy	**NO**	9	30	**NO**	0.3
Q10. Would you support increased use of such technologies in your company?	**YES**	22	73.3	**YES**	0.733
TOTAL ATTITUDE SCORE					**2.934**

From table 4, the attitude score is 2.934 out of 5, meaning the percentage attitude score is 58.7%, which is quite fair.

76.7% of the respondents believe that these technologies can mitigate the risk of road accidents. Only 26.7% feel comfortable being monitored by dash cameras or GPS tracking systems. The remaining 73.3% are not comfortable with being monitored while driving. 86.7% agreed that the fleet technologies improve driver discipline.

70% of the respondents think that the use of dashboard cameras invades driver privacy, while only 30% think of it as not invading personal space. Most of the participants (73.3%) support the increased use of fleet management technologies.

4.4. Section D: Practices Regarding the Use of Fleet Management Technologies

Table 4: Practices towards fleet management technologies

Practice Variable	Participant response	n	%	Preferred response	score
Q.11 How often do you use the fleet technologies in your vehicle?	**Always**	15	50	**Always**	0.5
Q12. Have you received formal training on how to use these technologies?	**YES**	27	90	**YES**	0.9
Q13. If yes, how effective was the training?	**YES**	15	50	**YES**	0.5
Q14. When a device malfunctions (e.g., GPS or fuel tracker), how do you respond?	**REPORT IT**	24	80	**REPORT IT**	0.8
Q15. Have you ever knowingly disabled or bypassed any of these technologies?	**NO**	25	83.3	**NO**	O.833
Q16. Have you ever been penalised for not complying with fleet management regulations?	**NO**	21	70	**NO**	0.7
TOTAL PRACTICES SCORE					**3.733**

According to Table 4, the total score for practices is 3.733 out of 6, meaning the percentage practice score is 62.2%, which is quite good.

Half (50%) of the respondents always use fleet management technologies in their vehicles. Others (26.7%) use it often, and the remaining 23.3% use it sometimes. 90% of the respondents have received formal training on the use of the techniques, and 50% agreed that the training was effective. A majority of 80% said that they report any malfunctions immediately after they occur. 83.3% refused to have bypassed or disabled any of the technologies.

In addition, 70% of the respondents have never been penalised for not complying with fleet management technologies, and only 30% have been penalised before.

4.5 Conclusion

This chapter showed the results from research questionnaires distributed, which were analysed by Microsoft Excel 2013 and SPSS version 20.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 Introduction

The chapter reviews the findings obtained in Chapter 4 based on the related literature.

5. 2 Knowledge of Fleet management technologies

The overall knowledge score was 78.7%, and it reflects high awareness but with mixed depth of understanding. All the drivers were aware of the FMTs, likely due to their mandatory exposure or visible installations. Nick's Motors equips its trucks with FMT, and drivers will be exposed to them daily. Kachilala & Dumba (2022) reported near-universal awareness of FMTs in Zimbabwe's funeral and logistics sectors, due to organisational policies and operational necessity. This supports Adler et al. (2019), who found that while commercial drivers are generally aware of GPS and Dash cams, their knowledge of integrated telematics systems, like fuel monitoring or predictive maintenance tools, is often superficial.

All drivers fully understood that dash cams record road footage. This shows familiarity with one of the most visible and understandable tools. This aligns with findings of Chiparo et al. (2021**),** who also found high awareness of dashboard cameras in Zimbabwean state enterprises, especially when installed visibly in vehicles.

Most of the drivers were aware of the types of technologies installed in their trucks (70%), but did not have an understanding of why they are used. This dovetailed with the findings of Parnell et al (2018), who stated that in order to understand a certain technology, one must be fully aware of why the technology is present and how it's used. Some of the drivers could not point out some of the technologies installed in the truck because some of them are not visible, hence they are overlooked. This points out an incomplete knowledge of full FMTs.

The fact that 76.7% learned about the technologies from company training echoes findings from Gresham et al (2021), who emphasised the role of internal training programs in enhancing technological adaptation in transport companies. The findings of this study contradict with the results of another research carried out in United States, where respondents learned about the technologies on their own (Eby et al, 2018). The remaining drivers who did not learn from company training might have learnt through their peers, online videos or personal experience.

The self-rated understanding question had the weakest knowledge, indicating that less than half of the drivers feel confident in how the systems work or how to interpret the data collected. The driver may be aware of the systems but not taught how to interpret the alerts or how the systems work. Venkatesh & Davis (2000) explain that "perceived ease of use" affects whether users feel capable with a system. Only 46.6% reported a strong understanding, suggesting that training quality and methods may need improvement, a concern echoed by Ghosh and Bustamante (2020), who argue that the theoretical training alone is insufficient for operational mastery.

According to a study carried out in Karachi, Pakistan, analysts suggested that knowledge affects drivers' practices, so ensuring that drivers fully understand why these technologies are used would lead to better practices (Abbas et al., 2024).

5.3 Attitudes towards Fleet Management Technologies

Attitudes were mixed, with a total attitude score of 58, largely due to privacy concerns. Most drivers recognize the safety benefits of fleet management technologies (76.7%). This shows awareness of the potential technology to enhance safety. This is supported by Kachilala & Dumba (2022) found positive driver perceptions of safety benefits in Zimbabwean fleets, strengthening acceptance.

Most of the drivers (86.7%) said FMTs improve discipline because they track various drivers' behaviours such as speeding, harsh braking, and idling, which can then be used to identify areas for improvement and provide targeted coaching. This echoes the findings in Zimbabwe, where the researcher reported that ICTs and telematics improve fleet compliance and driver accountability (Chiparo et al. (2021**)** This supports the findings from a study carried out in USA where 70% of the respondents believed that these technologies also made them safer drivers (Elby et al, 2018).

Only 26.7% felt comfortable being monitored, and 70% viewed dash cams as invasive because the feeling of being watched can increase stress and discomfort, especially if the cameras are inside the vehicle. Another reason is a lack of transparency; if companies fail to explain the purpose and usage of dash cams or fail to address driver concerns, it can lead to mistrust and resistance. Others fear that the footage might be wrongly used.

This echoes the findings from Malaysia, where the researcher proposed that ethical implications are a significant aspect to gain the trust of users towards autonomous technology use. As a result, ethical implications should be included in training to promote user trust, which leads to user acceptance (Adnan et al, 2018)

This supports earlier research by Fagnant and Kockelman (2015), who noted that even when technology offers clear safety benefits, driver acceptance is undermined if surveillance is perceived as intrusive. Similarly, Hoff and Bashir (2014) found that perceived loss of autonomy can reduce technology acceptance, especially among experienced workers.

On the other hand, the support for increased use (73.3%) is encouraging and mirrors findings by Zhou and Xin (2019), who noted growing support for fleet technologies when drivers see direct benefits like reduced penalties, enhanced safety, or performance-based rewards.

5.4 Practices Related to Fleet Management Technologies

The practice score was high (62.2%), with half of the drivers stating that they always use fleet management technologies, while others said they use them irregularly. This indicates that half of the drivers either do not know or do not understand how these technologies work because once a technology is installed in the truck, it will always be active. Drivers may not always be responsible for checking or activating these technologies; for example, a GPS is always on by default, which causes varied self-reporting. This is supported by Kachilala & Dumba (2022), who noted that even when telematics systems were installed in Zimbabwean fleets, utilisation was inconsistent due to limited driver awareness or motivation.

The other reason why there is inconsistent use of the technologies is that some drivers may not perceive the direct benefit and which reduces motivation. This aligns with Fonseca and Ferreira (2025), who found that routine use of driver-monitoring systems improved safety, but only when drivers saw the benefit or were actively monitored.

A very high proportion (90%) of respondents received formal training, which shows high organisational investment. This is mainly because companies like Nick's Motors often include FMT training as part of their induction or compliance measures due to their structured fleet operations. This echoes the findings of Chiparo et al (2021), who emphasised the role of training in improving the effective use of vehicle management systems in Zimbabwean parastatals.

Only half of the respondents thought that the training was effective. This might be because the training was too theoretical with limited hands-on exposure to tools like a GPS tracker, a dash camera or the telematics software. This is supported by Makumbe (2019), who found that training lacking real-world demonstrations failed to improve driver behaviour in southern African fleets. The findings also align with Venkatesh & Davis (2000), who noted that *perceived ease of use* increases when users get hands-on experience, not just lectures.

Some drivers may have been trained long ago before new technologies were updated, without refresher courses skills become obsolete. Chiparo et al. (2022) observed that fleet workers in Zimbabwe often lacked updated training, leading to partial or outdated system use. If the training material was in technical English and did not account for varying literacy levels, some drivers might not have fully grasped the concept. Kachilala & Dumba (2022) highlighted the need for simplified and localised training approaches to improve understanding and uptake in Zimbabwe's transport sector.

About 83.3% stated they had never disabled or bypassed the systems. This indicates a culture of compliance and responsible behaviour, which aligns with Hubbard et al (2014), who concluded that strong internal policies combined with frequent training foster consistent technology use.

Another reason why there are no penalties is that there might be weak enforcement. Waiyaki & Brits (2015) showed that where monitoring is robust but penalties are inconsistently applied, drivers may be lax. The 30% who reported penalties might suggest that some enforcement may exist. Others may be compliant or not caught, which shows a gap between enforcement and monitoring.

5.5 Conclusion

The findings suggest a clear association between drivers' knowledge, attitudes, and practices (KAP) regarding fleet management technologies. While knowledge was high (78.66%), both attitude (58.68%) and practice (62.2%) lagged. This disparity implies that knowledge does not automatically translate into positive behaviour unless supported by favourable attitudes. For instance, although 100% of drivers were aware of dash cams and GPS, only 26.7% felt comfortable being monitored. These results align with the Technology Acceptance Model (Venkatesh & Davis, 2000), which emphasises the mediating role of attitude between perceived

usefulness and actual behaviour. The interplay between KAP components thus supports the hypothesis that a significant association exists among them.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study explored the knowledge, attitudes and practices (KAP) of long-distance drivers at Nick's Motors regarding the use of FMTs such as GPS tracking, dash cams and driver behaviour monitoring systems. The findings revealed high awareness levels and satisfactory compliance with FMT use, yet also highlighted moderate knowledge and ambivalent attitudes, especially concerning driver privacy. While most drivers agree on the safety benefits of FMTs, a lack of full understanding and discomfort with surveillance features may hinder broader adoption. The respondents showed interest in the topic and were keen on wanting a better understanding of these technologies. The study concluded that targeted interventions, including enhanced training and awareness programs, are essential for maximising the impact of FMTs in reducing fatigue–related incidents and improving driver safety.

6.2 Recommendations

- Companies should provide regular refresher courses that move beyond basic introductions and focus on practical usage.
- Training should include scenario-based simulations that demonstrate real-life usage of FMTs.
- Materials should be adapted to suit various literacy rates, including visual aids.
- Companies should engage drivers in open dialogues and feedback sessions on the purpose, scope and limits of the monitoring technologies.
- Consider the use of less-intrusive alternatives such as wearable devices so that drivers will feel that their privacy is not being invaded.
- Introduce incentive systems where drivers with the best compliance rates receive recognition or rewards.
- To ensure FMTs are not only available but effectively integrated, management commitment is essential in enforcing proper use without making drivers feel surveilled.
- There is limited empirical data on FMT implementation in the Sub-Saharan African context; therefore, further studies should investigate long-term impacts of FMTs on crash reduction, fuel savings and driver wellbeing.
- Pilot programs could test the efficacy of new technologies, for example, biometric wearables or fatigue detectors, in real driving environments.

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APPENDICES

Appendix 1: Approval letter

DEPARTMENT OF ENVIRONMENTAL SCIENCE

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BINDURA UNIVERSITY OF SCIENCE EDUCATION

17 March 2025

Dear Sir/Madam

REQUEST FOR PERMISSION TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT

PROJECT TITLE: A STUDY OF THE KNOWLEDGE, ATTITUDE AND PRACTICES OF DRIVERS REGARDING FLEET MANAGEMENT TECHNOLOGIES TO COMBAT ROAD ACCIDENTS. A CASE STUDY OF NICK'S MOTORS.

ACADEMIC SUPERVISORS: MR DZVENE

This letter serves to inform you that **Mufaro Felistus Muvavarirwa, Registration Number (B211703B)** is a fourth year student at Bindura University of Science Education, in the Department of Environmental Science. During her fourth year of study, she is supposed to do a research project in her area of specialisation.

Please assist in any possible way. Data collected will be used for academic purposes only and will not be published without your prior consent.

Thank you for your assistance.

Yours faithfully.
Mr T. Nyamugure
DEPARTMENT OF ENVIRONMENTAL SCIENCE

CHAIRPERSON
Department Of Environmental Science
Faculty Of Agriculture And Environmental Science
Bindura University Of Science Education
P. BAG 1020, BINDURA
ZIMBABWE
OFFICIAL

Appendix 2: Research Questionnaire

My name is Mufaro Felistus Muvavarirwa, a Bindura University of Science and Education fourth-year student studying an Honours Degree in Safety, Health and Environmental Management. I am conducting **A STUDY ON THE KNOWLEDGE, ATTITUDE, AND PRACTICES OF LONG-DISTANCE DRIVERS ON THE USE OF FLEET MANAGEMENT TECHNOLOGIES TO COMBAT ROAD ACCIDENTS. THE CASE OF NICK'S MOTORS COMPANY IN NEW ARDBENNIE, HARARE,** as my research project. Your input will guide the research and identify any areas which require improvement to enhance driver safety. Participation is completely voluntary, and you are free to withdraw at any time without any consequences. I kindly ask that you respond to all questions truthfully. Thank you for your time and contribution.

INSTRUCTION TO RESPONDENTS

Make sure to tick all the boxes without writing your name on any part of the paper

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Gender: Male ☐ Female ☐
2. Age (years): 18-25 ☐ 26-34 ☐ 35-40 ☐ 41-49 ☐ 50+ ☐
3. Level of education: Primary ☐ Secondary ☐ Tertiary ☐ Other ☐
4. Years of driving experience: less than a year ☐

   1 – 5 years ☐

   6 – 10 years ☐

   More than 10 years ☐
5. How long have you been employed at Nick's Motors? Less than a year ☐

   1 – 5 years ☐

   6 – 10 years ☐

   More than 10 years ☐

	SECTION B: KNOWLEDGE OF FLEET MANAGEMENT TECHNOLOGIES	
Number	**Knowledge**	**Answers**
1.	Are you aware of any fleet management technologies used in your vehicle?	Yes ☐ No ☐
2.	A dash cam continuously records video footage of the road ahead and sometimes the interior of the vehicle.	True ☐ False ☐
3.	Which of the following technologies are installed in your truck? (Tick all that apply): -GPS tracking system - Dash camera - Speed governor - Fuel monitoring system - Electronic logging device - Driver fatigue monitoring system	☐ ☐ ☐ ☐ ☐ ☐
4.	How did you first learn about these technologies? - Company training - Supervisor/colleague - Personal research - Other:	☐ ☐ ☐ ☐
5.	. On a scale of 1 to 5, how well do you understand how these technologies work? 1 – Not at all 2 – Slightly	☐ ☐

	3 – Moderately 4 – Well 5 – Very well	☐ ☐ ☐
	SECTION C ATTITUDES TOWARDS FLEET MANAGEMNT TECHNOLOGIES	
6.	Do you believe that these technologies reduce the risk of road accidents? - Strongly agree - Agree - Neutral - Disagree - Strongly disagree	☐ ☐ ☐ ☐ ☐
7.	How do you feel about being monitored while driving (e.g., through GPS or dash cams)? -Very comfortable -Somewhat comfortable - Neutral - Uncomfortable - Very uncomfortable	☐ ☐ ☐ ☐ ☐
8.	Do you think these technologies improve driver discipline and performance?	Yes ☐ No ☐ Don't know ☐
9.	Do you think dash cams invade driver privacy?	Yes ☐ No ☐
10.	Would you support increased use of these technologies in your company?	Yes ☐ No ☐ Don't know ☐

	SECTION D: PRACTICES TOWARDS FLEET MANAGEMENT TECHNOLOGIES	
11.	How often do you use the fleet technologies in your vehicle? - Always - Often - Sometimes - Rarely - Never	☐ ☐ ☐ ☐ ☐
12.	Have you received formal training on how to use these technologies?	Yes ☐ No ☐
13.	If yes, how effective was the training? -Very effective - Somewhat effective - Not effective	☐ ☐ ☐
14.	When a device malfunctions (e.g., GPS or fuel tracker), how do you respond? - Report it immediately - Try to fix it yourself - Ignore it - Not sure what to do	☐ ☐ ☐ ☐
15.	Have you ever knowingly disabled or bypassed any of these technologies?	Yes ☐ No ☐

16.	Have you ever been penalised for not complying with fleet management regulations?	Yes ☐ No ☐