

https://dspace.org/

The high road traffic accidents rate on the Moloto Road

Maluleka, Given Mpho

2017

http://hdl.handle.net/10539/23686

Maluleka, Given Mpho (2017) The high road traffic accidents rate on the Moloto Road, University of the Witwatersrand, Johannesburg, <http://hdl.handle.net/10539/23686>

Downloaded from a DSpace repository. https://dspace.org/

The High Road Traffic Accidents Rate on the Moloto Road

By

Given Mpho Maluleka

Research report submitted to Wits School of Governance in 25% fulfilment of the requirements for the degree of Master of Management in Public and Development

Supervisor: Mr Murray Cairns

2016

DECLARATION

I, the undersigned, hereby declare that this research is my own original work and has never been submitted elsewhere to fulfil the requirements of any other degree. I hereby submit this research report for the degree of Masters of Management in Public and Development at the Wits School of Governance, Johannesburg.

_____ _____

Given Mpho Maluleka Date

DEDICATION

This work is dedicated to the following people:
My Wife, Maryann; My Mother, Ivy; My children Dipuo, Karabo, Tinyiko and Nkateko; and my Grandmother, N'waMbaqa (Katrina).

I am thinking and dreaming aloud. Do you hear it?

ACKNOWLEDGEMENTS

I give thanks and praise to God for having proven to me that with Him all things are possible. Therefore blessed be the Lord who daily provides us with benefits (Psalm 68:19).

- To my supervisor, Mr Murray Cairn, your suggestions and willingness to assist made me turn the corner, and your patience with my work far exceeds my words of appreciation.
- I extend my gratitude to Mr Amos J Mokoena my work could not have come to this stage if it was not of your assistance. Thank you very much.

- I wish to thank the following institutions for their cooperation: Mpumalanga Public Works Roads and Transport; Mpumalanga Community Safety Security and Liaison (MCSSL); Kwa-Mhlanga United Local and Long Distance Taxi Association (KULLDTA); Kwaggafontein Taxi Association (KTA); Taxi Council (TC), Mpumalanga Commuter Organisation (MCO); Thembisile Hani Local Municipality (THLM); South African Police Services(SAPS), the Traditional Leader and Public Utility Transport Company (PUTCO).
- To Ms. Mabore Mampa, Mr. Ngoni Ngwarai and Mr. Tso Mtsweni, it was through your unwavering support and motivation that I emerged with this paper. We stood together as a family.

- During the course of my studies, there were times when my work commitments, social activities, my hospitalisation and at some point, financial constraints interrupted my study programme, which made me believe that I might not complete this research project. It was during these trying times and many others that my Bishop Madzela Masumbuka, the congregation and friends' prayers and words of inspiration echoed in my ears all the time and that made me gain confidence in my abilities and the strength to pursue my goals. There is no words that can be equated with the depth of my appreciation and love.

- Lastly, I would like to thank all the people who were keen to chat with me about my research. Your contributions are appreciated.

ABSTRACT

The research investigated the high rate of road traffic accidents and the high mortality rate on the Moloto road in the western region popularly known as the Nkangala region of Mpumalanga province. The purpose of the research was to explore suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road. The research also aimed at discussing the relationship between the road traffic accidents and the road congestion.

The research attempted to find the interventions suggested by stakeholders on how to reduce road traffic accidents on the Moloto road. The unprecedented number of road accidents on the Moloto road is a serious concern for both government and road users. In 2012 alone, 890 traffic accidents were recorded on the Moloto road. This research found that the majority of these accidents were caused by human behaviour such as reckless driving, over speeding, drinking and driving.

The relative invisibility of traffic officials on the Moloto Road partly explains why road users engage in such behaviours. Increased visibility of traffic officials may encourage change in road user behaviour and help reduce the number of road traffic accidents on the Moloto Road. Congestion as one of the major causes of road traffic accidents can be solved by widening the Moloto road. Congestion can also be dealt with through the development of the Moloto rail corridor which is seen as a tool to remove vehicles on the Moloto road. It is also realised that both the government and the road users can play an important role in the reduction of road traffic accidents on the Moloto road. The government must develop infrastructure and the road users must obey the rules of the road.

The sampling method for this qualitative case study was purposive sampling. The selection of respondents was done within stakeholders of the Moloto Road. Collection of data was done on the individuals representing their organisations. Data was analysed according to the accepted procedures for qualitative data processing.

ABBREVIATIONS

CTO……Chief Traffic Officer

DA……...Democratic Alliance.

DOT…….Department of Transport

KULLDTA……..Kwa-Ndebele United Local and Long Distance Association

KTA…….Kwaggafontein Taxi Association

K537……...Britain's most killer road

MCO……Mpumalanga Commuter Organisation

MDCSSL…….Mpumalanga Department Community Safety, Security and Liaison

MDPWRT……...Mpumalanga Department of Public Works Roads and Transport

MEC……...Member of Executive Committee

MM……..Municipal Manager

NNH..…….Nairobi Nakuru Highway

NTSRK……National Transport Safety Regulations of Kenya

PUTCO……...Public Utility Transport Company

PRASA……Passenger Rail Agency of South Africa

RSF…….Road Safety Foundation

RSFERAP……..Road Safety Foundation and EuroRAP

RSK…….Road Safety Kenya

RAF…….Road Accidents Fund.

SANRAL……South African National Road Agency Limited

SAPS……..South African Police Services

RTC……Regional Taxi Council

RTMC……..Road Traffic Management Corporation

TL……...Traditional Leader

WHO……..World Health Organisation.

TABLE OF CONTENT

CHAPTER 1……...……...1

INTRODUCTION AND BACKROUND……..……..…1

1. Introduction ……....1
2. Background……..…5
3. Problem statement……..…8
4. Research purpose ……..…9
5. Research question ……..…..9
6. The structure of the research……9
7. Conclusion……..…..10

CHAPTER 2…..11

THE LITERATURE REVIEW……..11

1. Introduction……...…11
   1.1. Nairobi Nakuru Highway……....11
   1.2. A537…….…….12
2. Road traffic accidents……..…….12
   2.1. Road transport……..….12
   2.2. Accidents ……...13
      2.2.1. Road traffic accidents factors on the Moloto road……..……14
      2.2.2. Types of accidents……..…14
      2.2.3. Categories of road traffic accidents on the Moloto road…….....15
      2.2.4. Traffic ……...….16
      2.2.5. Congestion ……...….16
      2.2.6. Road condition……..17
      2.2.7. Intersection ……..……...…17
      2.2.8. Stray animals causing road traffic accidents ……..……....18
   2.3. Human factor ……..…18
      2.3.1. Speed ……..……..…19
      2.3.2. Drinking and driving……..……19
      2.3.3. Reckless driving…….……....21

2.3.4. Fatigue ……21
2.3.5. Destructive driving ……22
3. The effects of road traffic accidents……23
4. Risk factors on the Moloto road……24
5. Conclusion ……27

CHAPTER 3……28

RESEARCH METHODOLOGY……28

1. Introduction ……28
2. Rationale of the study……28
3. Research design ……29
4. Types of research……29
   4.1. Qualitative research ……29
   4.2. The case study ……31
   4.3. Survey research ……31
   4.4. Descriptive research……32
   4.5. Explorative research……33
5. Population ……33
6. Sampling ……33
   6.1. Purposive sampling……34
7. Interviews ……35
   7.1. Data analysis……35
   7.2. Data validation……37
      7.2.1. Validity ……38
      7.2.2. Construct validity……38
      7.2.3. Reliability ……39
8. Research processes ……39
9. The significant of the research ……39
10. Elimination of bias ……40
11. Ethical consideration ……40
12. conclusion ……41

CHAPTER 4 ……..…..42

PRESENTATION OF RESEARCH FINDINGS AND ANALYSIS……..…42

1. Introduction ……...……...42
   1.1. Categorisation of respondents ……..……...…42
2. Data analysis ……..……..….43
   2.1. Demographics of respondents ……..……..….43
   2.2. Age group of respondents ……..…..44
   2.3. Organisations ……...…..…44
   2.4. Gender of respondents ……..…..45
   2.5. What are the main reason behind the road traffic accidents on the Moloto road? 45
   2.6. What makes Moloto road different from other roads In Mpumalanga? 46
   2.7. Can road traffic accidents be reduced on the Moloto road? ….....49
   2.8. How can road traffic accidents be reduced on the Moloto road? …….50
   2.9. Whose responsibility it is to reduce road traffic accidents? ……..52
   2.10. How would you reduce road traffic accidents?……..…53
   2.11. If you can be given a chance to manage the Moloto road what can you do or improve?……..54
3. Conclusion ……..……..…..…….55

CHAPTER 5……..56

DISCUSSION OF THE RESEARCH FINDING…….……56

1. Introduction ……..….56
2. Findings of the study……..…56
3. Human factor……..…56
   3.1. Speeding …….……..…57
   3.2. Drinking and driving ……57
   3.3. Reckless driving ……...…58
   3.4. Fatique ……..……..58
4. Congestion ……..…...58
5. Government and road users both responsible ……..…59

6. Infrastructure ……..…60
6.1. Moloto road ……..…60
6.2. Moloto rail corridor ……..60
7. Public safety awareness ……..…60
8. Visibility of traffic officers ……..……..61
9. Conclusion ……..…..61

CHAPTER 6……62

RECCOMENDATIONS AND CONCLUSION ……..…62

1. Introduction ……..…..62
2. Conclusion ……...…..63
3. Recommendations…….….66
3.1. Deployment of more traffic officers …….……...66
3.2. Widening of Moloto road ……...66
3.3. Construction of Moloto rail corridor……..67
4. Conclusion ……..…67
5. References ……....68

TABLES AND FIGURES

Tables

Table 1: South African Road Network…….....3

Table 2: Moloto road profile……..5

Table 3: Categories of road traffic accidents on the Moloto road…….15

Table 4: Risk factors on the Moloto road…….....24

Table 5: Demographics of respondents ……...43

Figures

Figure 1. What are the main reasons behind the road traffic accidents on the Moloto road? ……45

Figure 2. What makes Moloto road different from other roads in Mpumalang? …….47

Figure 3. How can road traffic accidents be reduced on the Moloto road? ……...49

Figure 4. Whose responsibility is it to reduce road traffic accidents? …….52



A bus collision on the Moloto road, which resulted in the deaths of 30 people on the 12th November 2013 (News 24, 2013, 11, 12).

CHAPTER 1

INTRODUCTION AND BACKGROUND

1. Introduction

Moloto road (corridor) is situated in the Nkangala Region of the Mpumalanga Province. This name is derived from the Moloto village situated on the Gauteng-Mpumalanga Provincial boundary. The R573 national road is popularly known as Moloto road.

The Moloto road connects the employment destinations within the Tshwane Metropolitan areas with rural communities situated in the Thembisile Hani and the Dr JS Moroka Municipalities of the Nkangala District of Mpumalanga province as well as the Moutse (Dennilton) areas of the Sekhukhune District of Limpopo Province (Department of Transport, 2015).
According to the Mpumalanga Community Safety Security and Liaison MDCSSL (2013) on peak seasons there are more than one thousand vehicles driving on the Moloto road during peak hours and around six hundred during off peak hours. In the off peak seasons there are more than six hundred vehicles during peak hours and three hundred during off peak hours.

The Moloto road starts in Zambezi drive in Tshwane and goes through Mpumalanga and ends up in a small town called Marblehall in Limpopo Province (DOT, 2015). The Moloto road has the highest number of road traffic accidents in Mpumalanga Province. In 2012 890 road traffic accidents were reported on the Moloto road (MDCSSL, 2013).

The Moloto road is always congested because there are more than 570 buses travelling to and from Gauteng on a daily basis (PUTCO, 2013). The Moloto road traffic accidents are unique because they are serious fatalities which happens often and the road is famous for its high mortality rate and turning others into disabled people, it inflicts pain into the families of the affected, leaving children as orphans and affecting the economy of the country (DOT, 2011).

The Department of Transport has a responsibility to plan, design, construct and maintain the road network, to protect the public investment in the road infrastructure, to make sure that the transport system is functional, to promote safety of traffic on the road network and to provide a reliable, effective, efficient and integrated transport system (DOT, 2006). South Africa has a well-developed and modern transport infrastructure. Transport is regarded as a heartbeat of economy and the government has plans to spend billions of rands to improve roads, railways and ports (DOT, 2006).

National roads are the sole responsibility of the National government which is the department of transport and it does not have the in-house implementation arm. Act No 7 of 1998 established the South African National Roads Agency (SANRAL) as a statutory company responsible for the planning, design, operation, construction, control, management, maintenance and rehabilitation of national roads in South Africa. There are 6713 km of national roads networks in South Africa. It is the responsibility of the Department of transport to develop transport policies, building of roads and the maintenance on all national roads through SANRAL (DOT, 2006). Moloto road has been declared by the Minister as the national road which means it will now be upgraded, serviced and maintained by the department of transport through SANRAL.

The DOT (2006) says that the provincial roads in provinces operate on a traditional public service delivery model of road authorities and the road authority carries out the road delivery functions such as policy formulations, performance management, contracting and service delivery. The road authorities outsource most of their delivery functions to the private sector, but routine and special maintenance are conducted in-house. Limpopo province is doing the combination of the traditional road authority structure for its maintenance arm and a road agency structure for the remainder of its functions and there are about 357 000km of provincial roads (DOT, 2006).

The municipal road networks totals around 168 000km, according to the SA Institute of Civil Engineering. Public Transport Strategy plans to integrate rail, taxi and bus services in co-operation with private operators (DOT, 2007). 19% of the national roads are toll roads and most of which are maintained by SANRAL while the rest have been concessioned to private companies to develop, operate and maintain (DOT, 2006). Moloto road will not be tolled and concessioned according to SANRAL.

Profile of Road Networks in South Africa

Road Authority	Length (km)	Network Split
National roads	6713	1%
Provincial roads	357 000	47%
Unproclaimed Rural roads	221 000	29%
Metro, Municipal and other roads	168 000	23%
Total	752 713	100%

Table 1: South African road networks (DOT,2006)

South Africa has got 21 000km of rail network. In South Africa rail network is managed by the Department of public Enterprises through Transnet. South Africa has got 21 000km of rail network, 1500km are heavy lines and 8200km are electrified (DOT, 2006). The Department of Transport is managing commuter rail through PRASA and it has got a fleet of over 20 years which need to be overhauled and buy 7 200 new trains. The rail infrastructure will be upgraded to accommodate the new coaches. Commuter rail is only found in urban areas where there are different types of transport like taxis and busses. Commuters have a choice to choose from in terms of effectiveness, accessibility and price. Moloto rail corridor will be the first rail passenger transport to be built in semi-rural areas and it will compete with busses to Tshwane and with taxis for local transportation.

The government approved the Integrated Public Transport Strategy which will be a solution to all Public Transport challenges. The government is responsible develop standards, norms, regulations and legislation to direct the development of public transport for rural and urban passengers and above all it must promote and implement a safe, reliable, effective, efficient, coordinated and environmentally friendly public transport system (DOT, 2007). Most people uses taxis in South Africa to travel to work, about 25% of the population use taxis, and about 9% uses the bus, whilst 6% travel by train (DOT, 2007). Trains are a common mean of transport amongst the poorer communities in locations and urban areas because of the high subsidy that it is receiving from the government.

The more the subsidy it receives the more it becomes affordable. The challenge with it is that it is not accessible and it is only available in selected areas. Areas like the former Kwandebele qualifies to have a train because the majority of people works in Tshwane which is in Gauteng and uses buses, taxis and private cars to get to work, which in turn create congestion on the road and this lead to high rate of road traffic accidents on the Moloto road.

Subsidised public transport is important for the functionality of the economy and improvement of the transport system in South Africa. The likes of trains and busses are subsidised by the provincial governments through grants from the national government. The department of transport uses the operational subsidy which is to pick up the difference between what the user afford and what the operator wanted in order to operate. Busses are subsidised by the government that is the reason why they are cheaper than taxis. PUTCO buses operates on the Moloto road to transport people from the former homeland of Kwandebele to their working destinations in Gauteng with full subsidy.

The taxi industry is the most expensive land transport because it is not subsidised by the government, commuters have to pay full fees. The government realised that the taxi industry is not formalised and taxis are not safe, effective reliable or affordable. The Taxi Recapitalisation Programme was introduced by government as an intervention to bring about effective, reliable, safe, affordable and accessible taxi operations by introducing new taxi vehicles designed to transport commutes. The Department of transport budgeted R7.7 billion for the taxi recapitalisation programme in 2006 as part of the seven year programme, it was not only about scrapping of old taxis and buying of new taxis but about how operators can be assisted in a form of subsidisation (DOT, 2007). The taxi recapitalisation has not produced intended results and the status quo remains. Taxis remain hazardous, not safe and expensive. The Integrated Public Transport Strategy says that the government want to subsidise the integrated public transport but not a certain type of public transport.

The integration of public transport must be encouraging people to use public transport and leave their private vehicles at home. This will reduce vehicles on the road, congestion will be minimised and road traffic accidents will be reduced.

The introduction of e-tolls is another way of controlling unnecessary vehicle movement by switching from private vehicles to public transport but for the fact that there is no integrated public transport people will continue using the unaffordable e-tolls than the inconveniencing public transport. Poor communities do not have a choice but to utilise buses as they are affordable, those who afford use expensive taxis and private vehicles and that lead to congestion and the high rate of road traffic accidents. In 2012 the Moloto road had 890 accidents of which 44 were fatal, 220 people were seriously injured and the 211 were slightly injured (MDCSSL, 2013). On the 11th of November 2013 a bus, a bakkie and two trucks collided on the Moloto road and killed 30 people and seriously injured others. This indicates that the Moloto road needs an intervention.

Profile of Moloto road

Length	93km
Type of the road	Type two (the main road which has got smaller roads attached to it)
Off peak season Traffic: Peak hours Off peak hours	More than 600 per hour Less than 300 per hour
Peak Season Traffic: Peak hours Off peak hours	More than 1000 vehicles More than 600 vehicles
Road maintenance	SANRAL
Ownership	National road

Table 2. Moloto road profile (DOT, 2014)

2. Background

Between 1973 and 1979 the Moloto road was gravel. After the government realised that there were many road traffic accidents, the road was tarred to try and reduce the number of road traffic accidents. Between 1990 and 2000 the road was broadened in order to minimise the number of road traffic accidents and preferably bring the road traffic accidents to zero. However despite the broadening of the road more road traffic accidents continued to be experienced.

The road traffic accidents increased the number of mortalities and many were left seriously injured and disabled. 50% of the total road traffic accidents involved light motor vehicles, 15% involve minibus taxis, 15% involve busses and 20% were stationary objects, motorbikes, animals and pedestrians. The Department of Public Works Roads and Transport in Mpumalanga initiated a feasibility study on the Moloto rail corridor which was conducted between 2006-2007. The intention was to improve the public transport accessible to commuters travelling to Pretoria daily and the research established that the project was indeed feasible. According to the feasibility study, the Moloto rail corridor will be able to attract more commuters which will reduce the number of vehicles on the Moloto road which in turn will reduce the number of road traffic accidents.

The former Minister of Transport in the Republic of South Africa Mr Sibusiso Ndebele in March 2007 announced in parliament that the only way to solve the Moloto road traffic accidents is to introduce the Moloto Rail Corridor. The National Department of Transport appointed a service provider to do the feasibility study on the Moloto Rail Corridor which was finally approved by parliament. According to the report the Moloto Rail corridor was supposed to have a budget of R9, 3 billion.

The Mpumalanga Provincial government was also aware of the approval. The Democratic Alliance (DA) asked the Member of the Executive Committee of the Mpumalanga Department of Public Works Roads and Transport (MDPWRT) Ms Dikeledi Mahlangu about the progress report and she responded that rail corridors are not the competency of the province but a national government competency, this means it is only the national government that can build the rail infrastructure.

The DA in the national parliament also wanted the progress report because the Department was given permission by parliament to proceed with the project. In April 2010 the transport minister Mr Sibusiso Ndebele when responding to the parliamentary written question he said that the project had been put on hold because of fiscal constraints and economic recession. The minister emphasised that the project will be reassessed in the 2010/11 to 2012/13 strategic plan of the department which did not happen. As a result of the changing of ministers in the South Africa Department of Transport the Moloto rail corridor project was not treated as a priority anymore.

Two ministers were appointed after Minister Sibusiso Ndebele. Nobody remembered the project except for the affected people on the ground until the major road traffic accident that involved a bus and a truck. The accident happened on the Moloto road next to Kwaggafontein on the 12th of November 2013 where 30 people died and more than 35 seriously injured. The Minister of Transport Ms Dipuo Peters in her speech in Kwaggafontein on the 28th April 2015 said that the initial estimates based on the findings of the feasibility study conducted in 2014 of the Moloto rail corridor indicated that the rapid rail service will be allocated R20 billion. R10 billion will be allocated on rolling stock and another R4, 5 billion on improving associated road infrastructure. She further said that the project will be taken over by Passenger Rail Agency of South Africa (PRASA) and seek funds from the National Treasury. That means that as soon as the funds are available from the national Treasury the project will kick start.

There is an office in Kwa-Mhlanga which is dealing with the management of the Moloto road and the office is called the Kwa-Mhlanga service centre. The alcohol evidence centre was also launched by the MEC of the Mpumalanga Department of public works roads and transport Dr Clifford Mkansi in February 2011 and the centre has made an important contribution towards increasing the successful prosecution rate of offenders of driving under the influence of alcohol from only 11 in 2010 to 49 in 2011 (Mpumalanga Department of Public Works Roads and transport, MDPWRT 2012).

The Moloto road has been administered by three provinces which are Gauteng, Mpumalanga and Limpopo making it difficult to manage. In order to improve efficiency in the management of the Moloto road, administration of the road was put under one authority. The government gazette of the 29th of July 2015 announced the detachment of Moloto road from the three provinces and incorporate it into one authority which is the South African National Road Agency Limited (SANRAL) the agency of the Department of Transport. The Minister of the Department of Transport Ms Dipuo Peters announced the incorporation of the Moloto road into SANRAL and gave them the go-ahead to make the road safer. SANRAL is now responsible for the upgrading of the 93km Moloto road (R573). Mr Madoda Mthembu the project manager of SANRAL said “As the road traverses three different provinces – managed by three different road authorities – there were difficulties in maintaining it.

We are of one mind with the Minister of Transport that this road needs to be made safer for its users urgently, and that this requires a single road authority to ensure sustainable maintenance". The minister of Transport Ms Dipuo Peters said that government has allocated R1.3 billion to improve the Moloto road. The project involves the upgrading and widening of the road to accommodate existing and future traffic, to improve access roads, to do routine road maintenance such as pothole repairs, to clean storm water culverts and to update road signs and road markings.

According to Mr Madoda Mthembu, the road maintenance started the same day the Moloto road was transferred to SANRAL and he further said that the rehabilitation phase will start after the contractors have been appointed, the design and environmental impact assessments have been done. It is estimated to start during the 2017/2018 financial year. The project will be completed in 36 months and it will form part of SANRAL's non toll road.

3. Problem statement

There are lots of road traffic accidents on the Moloto road and there are lot of approaches which were applied to solve the problem but did not work. The researcher approached the stakeholders to reflect on what they thought would be the most appropriate intervention to reduce the road traffic accidents on the Moloto road.

The rate of road traffic accidents on the Moloto road is very high and many people die as a result. The MDCSSL (2013) annual report says that 890 road traffic accidents happened in 2012 on the Moloto road, 44 of the road traffic accidents were fatal, 220 were seriously injured and the 211 were slight injuries. According to Putco (2013) they have 570 schedules which are operated with 570 busses from Mpumalanga to Gauteng in the morning and back in the afternoon. There are also taxis which transport people to and from Gauteng, trucks, delivery and private vehicles which are effectively using the road.

According to the MDCSSL (2013) 90% of the road traffic accidents are as a result of human error. This means that drivers are liable for road traffic accidents rather than the un-roadworthy vehicles and the condition of the road. Reckless driving and high speed are mostly as a result of drivers who drive under the influence of alcohol.

There is a correlation between the road traffic accidents and alcohol (WHO, 2011). Prior to this research, no research had been conducted on Moloto road on gathering information on whether stakeholders believe that there could be a solution to the road traffic accidents and potentially what it would be.

The causes of the road traffic accidents are known and this research is intended to get the views of local stakeholders on road traffic accidents and their recommendations to the solution.

4. Research purpose

The purpose of the research is to explore suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road.

5. Research question

What interventions would likely reduce the road traffic accidents on the Moloto road?

6. The structure of the research

The study is divided into 6 chapters as follows:

- Chapter 1 gives an introduction and background of the research problem, the aim of the study; the objectives of the study; the problem statement; the research questions; and the significance of the study.
- Chapter 2 explores various studies by other researchers internationally and nationally with regard to assessment (literature review).
- Chapter 3 focuses on research design and methodology wherein the population, sampling and instruments are explored.
- Chapter 4 is about the presentation of research findings.
- Chapter 5 discusses the research findings.
- Chapter 6 is about conclusions and recommendations of the study.

7. Conclusion

This chapter dealt with all the aspects that are linked to the research problem, and it further explored how the objectives of the research achieved, and indicates the interconnectedness of the parts to the research problem statement. In the next chapter which is the literature review the researcher explores researches carried out by other researchers internationally and nationally with regard to the topic in question.

CHAPTER 2

THE LITERATURE REVIEW

1. Introduction

Literature review is a process that involves reading, researching, understanding and establishing assumptions on published works and literature on a specific theme (Brink 1996). LoBiondo-Wood and Haber (2006) says that a literature review determines the known and the unknown about a concept, theme or problem.

The literature reviewed has shown that since the construction of Moloto road no research has been done on the topic. The purpose of this literature review is to investigate other roads in the world in particular the Great Britain (A537) and Kenya (NNH) that has got the similar characteristics with Moloto road. The researcher only give some examples on the above mentioned roads.

1.1. Nairobi Nakuru Highway

Nairobi-Nakuru Highway (also called A104) is a highway with a length of 159km which is in Kenya. It is 66km longer than Moloto road. NNH links Nakuru the capital of Nakuru County and former capital of the Rift Valley Province and Nairobi the capital and largest city of Kenya (Kenya National Highway Authority, 2014). NTSRK (2012) says that the Highway is extremely dangerous and notorious for drunk-driving combined with speeding, poor overtaking and pedestrians on the road which resulted in 320 mortalities on the Highway in one year alone (2012). WHO (2011) says that the highway is listed among the most dangerous roads in the world, and has been named as one of the world's most unsafe roads that is prone to road traffic accidents.

The NTSRK (2012) says that the main risks on the NNH are lack of barriers, poor conditions of vehicles, poor driving techniques and weather as major causes of road traffic accidents on the busy highway and it further says that the road is mainly dangerous because of human error and a lack of traffic law enforcement. The road is almost having the same characteristics with the Moloto road.

1.2. A537

The Road Safety Foundation (2011) says the A537 is the most lethal, beautiful but very dangerous road which winds through the Peak District between Macclesfield in Cheshire and Buxton in Derbyshire. It is known as the 'Cat & Fiddle road' by local people. Road Safety Foundation and Euro RAP (2012) further says that the A537 is well known by tourists, heavy goods vehicles and high powered leisure motorcyclists. The road has severe curves, steep falls from the roadway and is trimmed by dry-stone walls or rock face for the greater part of the road. The British road safety experts says it will be proper and fitting to name the road the 'widow-maker' because of its mounting death toll.

AA president Edmund King said: "The worst performing A537's fatal and serious collisions rose by 127 percent in three years from 15 in the period 2003-2005 to 34 in 2006-2008 with most road traffic accidents happening on weekends during the summer in dry and day light condition". The daily mail says that the majority of victims were motorcyclists who are staying outside the local area which are male and with an average age of 35.

2. Road traffic accidents

The research explores the suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road. There are reasons why there are road traffic accidents on the Moloto road and the different types and categories of road traffic accidents. It discusses the road transport system with the intersections, road conditions, congestion and traffic. In addition, it also deals with the human factor which is also a major reason why road traffic accidents occur on the Moloto road. The human factor includes drinking and driving, reckless driving, driver destruction and speeding.

The researcher also examines the high accident roads in Britain and Kenya, and how they managed to solve road traffic challenges and how the Moloto road can be improved from the experiences of the two roads. There is the A537 road in Mancclesfield which was rated as one of the most dangerous roads in the Great Britain (RSFERAP, 2012).

Kenya had the highest accident rate in the world with 3000 fatalities between 2009 and 2011 with NNH as the main contributor more than any other road in Kenya (WHO, 2009a). The researcher uses the A537 and the NNH as examples in dealing with the Moloto road traffic accidents.

2.1. Road transport

According to the (WHO, 2009a) transportation is divided into four modes of transport which are Air, Maritime, Rail and Road transportation. Moloto road is categorised as a road transport. The researcher discusses the accidents and the different types of accidents, the traffic and congestion on the Moloto road as the reasons behind road traffic accidents.

2.2. Accidents

The Oxford English dictionary (2013) defines an accident as “an unexpected and undesirable a mishap unforeseen without apparent cause”. Qin and Reyes (2011) define a road traffic accident as “that occurrence in a series of events, which usually produces injury, mortality or property damage”.

WHO (2009a) defines an accident as “an unpremeditated event resulting in a recognisable injury”. The RSFERAP (2012) says that 450 of the1700 accidents in Britain happened on the A537.

The National Transport and Safety Regulations of Kenya (NTSRK, 2012) says that between 2009 and 2011 the NNH had more than 3000 accidents. MDCSSL (2013) reported that in 2012 there were 890 accidents on the Moloto road. The hierarchy of accidents on the Moloto road are as follows, the human factor contributes 90% of all the road traffic accidents and the road conditions contribute 10% of the total accidents.

2.2.1. Road traffic accident factors on the Moloto road

According to the MDCSSL (2013) there are factors which causes road traffic accidents on the Moloto road which are as follows: High speed, Drink and driving, Reckless driving, Fatigue, Driver destruction, Pedestrians , Stray animals, Congestion, Road condition, Environment and Intersection.

2.2.2. Types of accidents

According to the MDCSSL (2013) there are three types of accidents which occur on the Moloto road. These are: fatal accident, serious accident and slight accident.

- According to the MDCSSL (2013) a fatal accident is an accident which killed people on the scene. Unlike the WHO (2009a) define fatal accident “as people died on the scene and within 30days with injuries from a road traffic accident. The A537 in Britain had 53 fatalities in 2011 (RSFERAP 2012). There were more than 1000 fatalities in the NNH between 2009 and 2011 (NTSRK, 2012). According to the MDCSSL (2013) Moloto road had more than 44 fatal accidents only in 2012.
- Serious accidents are those where people are seriously injured and can die on the way to hospital or later on or be disabled. RSFERAP (2012) says that there were 130 serious injuries on the A537 of Britain. The NNH had at least more than 1300 serious injuries (NTSRK, 2012). Moloto road had 220 serious injuries in 2012 according to the (MDCSSL, 2013)
- The slight injuries are the minor injuries that can be easily healed and the lives of the injured are not in danger. Moloto road had at least 211 slight injuries in 2012.

The number of lives lost due to road traffic incidents are increasing very fast and can be compared to tuberculosis and HIV/Aids (WHO, 2009a). The Moloto road is termed the most killer road because of lives lost on the road.

2.2.3. Categories of road accidents on the Moloto road during 2012

Category of accidents	Number	%
Head/ rear end	219	24.6
Side swipe: same direction	101	11.3
Accident with pedestrians	92	10.3
Vehicle overturned	85	9.5
Animal accident	83	9.3
Accidents with fixed objects	70	7.8
Turn right in face of oncoming traffic	61	6.8
Head on collision	56	6.3
Sideswipe opposite direction	48	5.4
Turn left / right from wrong lane	44	4.9
Others	31	3.5
TOTAL	890	100

Table 3. Categories of road traffic accidents on the Moloto road (MDCSSL, 2013**)**

Table 3 shows that the majority of road traffic accidents (24.6%) on the Moloto road occur on the front and rear end of the vehicle which poses a danger to the occupants of the vehicle, the second will be the 11.3% of the sideswiping of vehicles going the same direction and it only damage the vehicle on the side. Accidents with pedestrians are the third at 10.3%. Pedestrian-related accidents happen due to the houses and businesses built less than 20 meters away from the Moloto road. It becomes a challenge if drivers bump stationery objects. 9.5% of vehicles which overturned were not due to disturbances involving other road users, indicating the role of human factors. The sideswipe opposite direction had only 5.4% of vehicles involved in road traffic accidents on the Moloto road in 2012.

Turning right in the face of the oncoming traffic has also been a popular one at 6.8% which is also a human error which brings most of the road transport accidents to be of human error. Head on collision is also one of the dangerous accidents which become fatal in most cases and it is mostly done by human error. Sideswipe which is done by opposite vehicles is at 5.4% which means it is a challenge and it is not good and favourable for the road users on the Moloto road.

Turning left from the far right and turning to the right from the far left is also the reason behind the 4.9% accidents on the Moloto road, it is a human factor. The 3.5% categorised as “others” represents accidents between vehicles and motorcycles, road traffic signs etc. It happens that in one road traffic accident there is more than one category involved and it will be called by the initial one because it must be classified into one (RTMC, 2012).

2.2.4. Traffic

The A537 is a very busy road with many vehicles travelling during the peak hours and less vehicles travelling during the off peak (RSFERAP, 2012). The NTSRK (2012) said that there were more vehicles on the NNH than motor bikes and pedestrians. On the Moloto road there are more vehicles during the peak hours and the peak seasons like Easter holidays and festive seasons.

The Moloto road traffic consists of trucks, delivery vehicles, taxis, buses, motorbikes and private vehicles (MDCSSL, 2014). The traffic moves between residential areas in the former homeland of Kwa-Ndebele or Nkangala District and the work places in Gauteng including movement from Tshwane in Gauteng and the Limpopo Province.

2.2.5. Congestion

DOT (2014) defines traffic congestion as a “condition on road networks that occurs as use increases, and is characterised by slower speeds, longer trip times and increased queuing”. Rodrigue, Comtois, Slack, (2006) says that the structures of transport are fully conforming and they have got a high level of growth in economic activities which forms spatial structures that are sustained by transport system.

Rodrigue et al, (2006) believes that the most important challenge on the road is traffic congestion which is as a result of demand exceeding the supply of road network. The NNH and the A537 are also encountering big volumes of vehicles and motorbike more especially on the intersections.

The MDCSSL (2013) reports that 10% of the 890 accidents which happened in 2012 on the Moloto road are caused by congestion, it further says that as a result of this congestion drivers tend to be impatient and choose to overtake on the left or face the oncoming traffic. Smith (1970) believes that the challenges which are happening on the traffic flow contribute or causes the traffic congestion and he further say that the traffic flow is the easy movement of individual drivers and vehicles between two points.

There is a strong relationship between speed and volume because there is a desire to estimate speed for maximum flow (Salter, 1974). The economic growth in the world leads to the increase in motor vehicle ownership and urbanisation (WHO, 2009a), and this is also the major contributor to congestion on the Moloto road.

2.2.6. Road condition

The road conditions are also a major reason of road traffic accidents if the road condition is not favourable (WHO, 2004a). According to the NTSRK (2012) and the RSFERAP (2012) the A537 and the NNH roads had the bad road layout which made vehicles skid in bad weather conditions as oppose to Moloto road which was constructed almost 10 years ago (MDPWRT, 2012).

2.2.7. Intersections

According to the WHO (2009a) the intersections are the main cause of congestions, which contribute a lot towards drivers losing their patience. According to the DOT (2011) road traffic accidents occur at the intersections because it is the location where two or more roads cross each other. The critical reasons that account for the major part of intersection related crashes are the illegal manoeuvring and the false assumption related crashes (RTMC, 2012). The RSF (2011) says that the A537 was regarded as the most dangerous road in the Great Britain and some of the road carnages derived from the intersections.

The NTSRK (2012) is concerned with the congestion which is emanating from vehicles, motorbikes and pedestrians on intersections of the NNH. The afore mentioned three roads are the type two roads which mean that they have got roads joining them and have intersections.

Moloto road has got intersections which do not have traffic control devices and this is a major contributor towards congestion and road traffic accidents (MDCSSL, 2013). Some road users on the Moloto road lose patience because of the congestion on the intersection and begin to break the law which end up in road traffic accidents.

2.2.8. Stray animals causing road traffic accidents

Some of the road traffic accidents are as a result of animals on the Moloto road because it is not fenced (MDCSSL, 2013). Livestock such as cows become unavoidable when approaching from the tall weeds or nearby forest. There are also some wild animals on the NNH which have been some of the reasons for road traffic accidents (NTSRK, 2012).

In Great Britain on the A537 there is no challenge on the road pertaining to stray animals as it is not stated anywhere as a challenge.

Goats, sheep and dogs are smaller and they might not have an impact on major road traffic accidents unlike a cow which is bigger in size and hence can lead to very serious fatalities on the Moloto road (MDPWRT, 2012). Animals have also been noted as the reasons behind the road traffic accidents on the Moloto road and the NNH of Kenya.

2.3. Human factors

The human factor road traffic accidents are the types of accidents which are caused by human or human error (WHO, 2004a). These include the speeding of vehicles, drunk driving, fatigue, driver distraction and reckless driving. The human factor contributes 90% of all the road traffic accidents on the Moloto road (MDPWRT, 2012).

2.3.1. Speed

Speeding is known as a major contributing factor in the majority of road traffic crashes (Al-Kaisy and Durbin, 2009). WHO (2009a) believes that there is a correlation between speed and road traffic accidents and further says that high speed seriously compromises road safety. Liu, Chen, Subramanian and Utter (2005) argue that about one third of the road traffic crashes has been caused by the vehicle speeding. A further 50% of speeding related fatal crashes occur when negotiating a curve and 20% of non-speeding related fatal crashes happens under the same roadway geometry.

The MDCSSL (2013) found that 50% of the 890 road traffic crashes on the Moloto road has been caused by speeding vehicles and it further shows that the majority of 44 fatal accidents in 2012 are caused by speeding. Davis, Davuluri, Pei (2006) assumed that the increasing number of serious or fatal road crashes were a result of increasing speed, based on crash data from Australia. It is believed that majority of single vehicle run off the road crashes happens in rural areas, where there are restrictions.

Mohammadi (2013) stated that in Britain and Mancclesfield city in particular most accidents were caused by speeding and was later resolved by reducing the speed limits on the roads as follows, speed limit on local roads would be 30 km/h, main streets in the city 50km/h and out of city speed restricted to 80km/h. They also resolved that the traffic officials must be highly visible at all the times, Mohammadi (2013). This scenario can also be applied on the Moloto road.

2.3.2. Drinking and driving

WHO (2009a) says that there is much evidence that shows that alcohol consumption by road users is a primary reason for road traffic accidents because the tests are normally done after the accidents. A person who exceeded the limit of alcohol consumption is affected by alcohol and may be physically unable to drive a motor vehicle.

One who is less affected but still under the influence of alcohol possesses a danger as a driver (Rose and Carlson, 2005). In its annual report on road traffic accidents on the Moloto road, the MDCSSL (2013) reported that drink and driving account for more than 50% of the 890 accidents happened on the Moloto road in 2012.

The A537 road is not different to Moloto road because driving under the influence of alcohol accounts for the bigger percentage than the other reasons behind the road traffic accidents (RSFERAP, 2012).

In the NNH alcohol consumption is causing a major blow because there are vehicle drivers who drive under the influence of alcohol, there are Motorbikers who are also taking alcohol before driving and pedestrians who just drink and walk, alcohol causes more than 80% of accidents between motor vehicles, motorbikes and pedestrians (NTSRK, 2012).

Escobedo, Chorba, Waxweiler (1995) realised that the risk has increased on drivers under the age of 40 when they drive at night and on less crowded roads and the MDCSSL (2013) confirmed this by saying that most of the drivers involved in the Moloto road traffic accidents are between the age of 20 and 40 and tested positive for alcohol consumption.

Escobedo et al. (1995) recommends that there must be very strict laws which will be aimed at decreasing alcohol drinking drivers and pedestrians, which can be the most effective intervention because they put themselves and others at risk.

Priority must be given to drunk drivers because alcohol is associated to almost more than half of the accidents that are happening in the three roads.

Ponce, Munoz, Andreuccetti, De Carvalho, Leyton, (2011) is adding by further saying that even psychoactive substance are also a reason for accidents. That is why the alcohol evidence centre in Kwa-Mhlanga was launched by MEC Dr Clifford Mkansi in February 2011 which is playing a major role in increasing the successful prosecution rate of offenders who drive under the influence of alcohol on the Moloto road (MDPWRT, 2012).

2.3.3. Reckless driving

Reckless driving is defined as “when an offender curiously disregard the risk of harm of which the offender is aware, WHO (2009a) further says that recklessness is the same as negligence which the courts classify as a criminal offence.

Reckless driving in the A537 and the NNH are rife and uncontrollable and the WHO (2004a) further says that there is a correlation between driving under the influence of alcohol and reckless driving.

MDCSSL (2013) says that more than 20% of the 890 road traffic accidents occur because of reckless driving. Like in the NNH and the A537 most of the reckless driving on the Moloto road is also influenced by driving and walking under the influence of alcohol (MDCSSL, 2013).

2.3.4. Fatigue

Horne and Reyner (2000) believes that fatigue contribute more than 15% of the road traffic accidents in the Great Britain in general and in particular the A537. One cannot differentiate between sleepiness, tiredness, drowsiness and fatigue as they can be used interchangeably (Anne and Walling, 2000). The RTMC (2012) says that fatigue makes us unaware of what is happening on the road and stands in the way of our ability to respond quickly and safely to the dangerous situation ahead. People driving on the Moloto road mostly come from as far as Polokwane and further and chances are that they are tired and sleepy because they have had a long journey. It is difficult to identify a road traffic accident which happened as a result of fatigue and it is not normally reported as the reason behind the road traffic accident (RTMC, 2012).

According to Horne et al (2000) there are only two causes of fatigue which are: the lack of quality/ quantity sleep and driving at times of the day when one is normally sleepy. The DOT (2014) believes that in the types of road traffic accidents that are happening as a result of fatigue the driver is normally alone and depart the driving lane and collides with stationary objects or oncoming vehicles.

There are symptoms or warning signs of driver fatigue like daydreaming, drifting in the lane, poor judgement, slower reaction time, head nodding, constant yawning and rubbing your eyes (DOT, 2011).

Anne et al (2000) believes that fatigue is not the only reason for sleepiness but general health, alcohol, drugs medicines and illness can also be the reason behind the tiredness of a driver and they further say that sleep related road traffic accidents becomes more dangerous because of the high speed and the driver who cannot take some avoiding actions.

2.3.5. Destructive driving

RTMC (2012) define Destructive driving as an act of driving while engaged in other activities, they further said that there was technology gadgets built into vehicles or brought into vehicles, such as cell phones, DVD players and more are distractors for many drivers. Distractions are among the major reasons for most of the road traffic accidents and road users are not adhering to the laws of this country (RTMC, 2012).

Destructive driving is as dangerous as drink and driving and it weakens driver's reaction more than alcohol (RTMC, 2012).

Ponce et al (2011) says that text messaging, talking on cell phone, watching a movie, writing a grocery list, nursing a baby and putting in contact lenses are destructive in nature and one can end up in a road traffic accident. The RTMC (2012) discourages the usage of cell phone when driving and went to an extent of passing a law that prohibits the usage of cell phone when driving. RSF (2011) indicate that in Britain cell phone usage when driving is a major challenge and contribute towards the high rate of road traffic fatalities. The RSF (2011) confirms that the major share of road traffic accidents in Kenya and in particular the NNH are as a result of cell phones. On the Moloto road the usage of cell phones is also major challenge and account for the bigger number of road traffic accidents (MDCSSL 2012). The non-visibility of traffic officials encourages the usage of cell phones when driving.

3. The effects of road traffic accidents

According to the WHO (2011) the major effect of road traffic accidents is the loss of lives because it affects the family, relatives, the community and the government.

- Road traffic accidents leave children without parents and that affects the children mentally, socially and financially.
- Some becoming temporary or permanently disabled which also affects the family, relatives and government (WHO 2011).
- The road traffic accidents affect the economy of the country because the damaged vehicles must be repaired. MDCSSL (2012) says the damaged government properties must also be repaired by the Mpumalanga government.
- Above all, the government through RAF must pay the deceased family, the injured and the disabled (MDPWRT, 2012), and
- The road traffic accidents are inflicting pains into the people and leaves children as orphans which is likely to affect their social and economic being for the rest of their lives (MDSCCL, 2012).The Moloto road traffic accidents have been the major reason for pain and suffering in most people's lives as it has created more orphans and left people with disabilities (MDSCCL, 2013).

4. Risk factors on the Moloto road

Category of accidents	Risk factor %			Statistically significant relationships
	Human	Environment	Vehicle	
Head / rear end	80	5	15	Negligence, close following, speeding, sleepiness, road works, faulty brakes, smooth tyres
Sideswipe: same direction	80	5	15	Negligence, dangerous overtaking, sight distance, faulty indicators, cars
Pedestrian	90	10	0	Driving on shoulder, pedestrian visibility, speed, alcohol, fatigue, road signs, steering, brakes, and cars.
Fixed object	90	10	0	Negligence, losing control, speed, alcohol, fatigue, road sign, steering, brakes, cars.
Overturned	80	5	15	Lost control, speed, alcohol, fatigue, sight distance, burst tyre, trucks.
Sideswipe: opposite direction	95	5	0	Dangerous overtaking, speed, males, sight distance.
Vehicle left road	80	5	15	Lost control, inattention, speed, fatigue, road curves, pedestrians, burst tyre, cars.

At angle: both straight	90 90	5 5	5 5	Negligence, failed to stop, intersection and control, faulty brakes, access spacing, brakes, cars
Hit animal	30	65	5	Speed, fencing, lighting.
Turn right in face of Oncoming traffic	95	5	0	Negligence, turning in front of traffic, no use of indicators, cars.
Head on	95	5	0	Dangerous overtaking, inconsiderate driving, speed, sight distance, road markings.
Turn from wrong lane	100	0	0	In attention, no use of indicators, road marking.
Reversing	100	0	0	Inattention, illegal movement, faulty brakes.
At angle one or both turning	100	0	0	Inattention, road signs

Table 4. Risk factors on the Moloto road (MDCSSL, 2013)

Table 4 shows the risk factors on the Moloto road and it indicate the reasons behind those factors. The human factor contribute 80% of the head/ rear end, vehicles only contribute 15% and 5% for the environment, negligent, close following and speed are closely related to head/ rear end.

The sideswipe: same direction account for 80% on human factor, 5% on environment and 15% on the vehicles which is also committed by human and it is related to dangerous overtaking and negligence. The majority (90%) of pedestrians are killed or injured by human error and very few (10%) are as a result of the environment.

Driving on the shoulder lane, pedestrians crossing the road, over speeding and brakes failures are closely related to cause accidents with pedestrians. Human factor is also a major contributor (90%) of accidents with fixed objects and they are influenced by negligence driving, over speeding, driving under the influence of alcohol and fatigue.

Losing control of the vehicle, high speed, alcohol and fatigue are human factors which contribute 80% of road traffic accident, environment contribute only 5% and the vehicles the remaining 15%.

The sideswipe: opposition direction is 95% of a human error and only 5% of environment, dangerous overtaking, man and speed are highly correlated to the sideswipe on the opposition direction.

Vehicle leaving road is also created by human factor (80%) which is related to fatigue, over speeding, losing control of the vehicle and driving under the influence of alcohol.

The environment is the lowest (5%) and vehicles condition can make 15% of road traffic accidents.

At angle one or both turning is purely negligence and 90% human fault, the environment and the vehicle can only contribute 5% each.

Stray animals are a challenge on the Moloto road as they are mostly likely to be hit at night. The environment factor takes the centre stage with 90% and only 10% of human error.

Making U-turns is also one of the factors of road traffic accidents and it is basically negligence and it is a result of human factor.

The majority (95%) of head on collisions are caused by negligence which is as a result of human error and only 5% can be due to environment which contributes far less to road traffic accidents on the Moloto road.

Turning from wrong lane is a human made error (100%) and it is as a result of inattention.

Reversing is human made and solely human (100%) and it is as a result of inattention.

At angle: one or both turning is purely human made (95%) of inattention and 5% of environment.

5. Conclusion

In conclusion the examples made on the A537, the NNH and the Moloto road were relevant because all the three roads had the same characteristics. The three roads are called killer roads in their respective countries.

- The A537 in the Great Britain had more road traffic accidents than any other road in Britain. The government of Britain implemented some strategies to curb the high accident rate by reducing the speed limit by 20 everywhere, employing more traffic officials on the A537, prosecuting all the offenders harshly and had safety awareness campaigns. The road traffic accidents were reduced.
- The NNH like Moloto road had the high accidents rate and the government of Kenya had to come up with solutions against the high rate of road traffic accidents. They intervened by deploying more traffic officers, building of courts along the NNH, the immediate prosecution of law breakers and the planting of permanent speed cameras on the NNH.
- The South African government can learn from the two governments of Kenya and the Great Britain in order to deal with the high accident rate on the Moloto road.

CHAPTER 3

RESEARCH METHODOLOGY

1. Introduction

In the research methodology section, the researcher discusses the research paradigm which determines if the research is quantitative or qualitative. The research design outlines the strategy of a case study. A data gathering research technique is explained. The research reliability and validity is also discussed in this chapter. It also indicates the structure and the limitation of the research.

2. Rationale of the study

It is crucial to explore suggestions from the stakeholders on which interventions would likely reduce the road traffic accidents on the Moloto road. The Moloto road has taken many people's lives, therefore the research is relevant. The research attempts to resolve the challenges faced by motorists and road users on the Moloto road.

Hollow and Wheeler (2002) define qualitative research as a method of social survey that emphasises on the way people understand and make sense of their knowledge and the world in which they live in.

The researcher uses qualitative research to deduce and explore the behaviour, perspectives, experiences and feelings of the Moloto road stakeholders by emphasising the comprehension of these elements. Trochim (2006) and Burns et al (2003) believes that researchers who use this technique assume an individual centred holistic and humanistic viewpoint to understand human experiences without focusing on the detailed concepts.

3. Research design

Mouton and Marais (1988) stated that a research design is a strategy on how the researcher chooses to perform the formulated research problem. The objective of the research design according to Mouton and Marais (1990) is to plan, structure and execute the project concerned in such a way that the validity of the outcome is exploited.

According to Seidman (1998) a research design is a comprehensive plan of how a research will be undertaken. It provides the foundation according to which the data are to be collected and examine the research question. Kvale (1996) believes that the collection and analysis technique that best suits the problem and is anticipated to offer the most reliable and valid data should be employed. The researcher should select the research approach after considering the aim of the research, the nature of the research question and the resources (Seidman, 1998).

The choice of a detailed research design was the first step in the identification of what was to be examined. In this situation the researcher has chosen to do the case study as it was appropriate for the researcher to explore suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road.

According to De Vos, (1998) the researcher should begin with investigating the applicable literature, filing his information of the subject, and learning what others say about it, when he intends compiling a research design.

4. Types of research

The following are different types of research:

4.1. Qualitative research

Leedy (1997) defines qualitative research as “an inquiry procedure of understanding a social human problem and it is based on building a complex holistic picture which is formed by words, it is conducted in a natural setting and reporting detailed views of informant”.

Downs (2004a) describes qualitative research as a systematic subjective research design used to describe life experiences and situations to give the meaning. Burns et al. (2003) further state that the researchers using this approach accepts a person centred, comprehensive and humanistic perspective to understand human abilities without concentrating on the specific perceptions. Trochim (2006) suggests that qualitative research is used to discover the performance, perceptions, skills and feelings of people by emphasising the understanding of these elements.

Hollow and Wheeler (2002) states that qualitative research is a system of "social enquiry that emphasis on the way people understand and make sense of their knowledge and the world in which they live".

Qualitative research is defined by Yin (2009) as a form of systematic and empirical enquiry into meaning. By systematic enquiry Shank means planned, ordered and public enquiry. Burns et al. (2003) describes qualitative research as a "systematic subjective research design used to describe life experiences and situations to give the meaning". Downs (2004a) further states that the researcher who uses this approach adopts a person centred and humanistic perception in understanding human involvement without concentrating on specific theories. Yin (2009) is sharing the same view in stating that "qualitative approaches have a focus of natural settings, an interest in meanings, perspectives and understandings, an emphasis on process, a concern with inductive analysis and grounded theory".

Qualitative research was used in this research to explore the challenges facing the government, communities and the road users of the Moloto road. A qualitative approach helped the researcher to interact with the Moloto road stakeholders and interested parties, it was also informed mainly by the researcher's ideas and confirmed by what the stakeholders of the Moloto road and their organisations under research felt and observed, and as supported by literature review. The advantage of using qualitative approach is that it provides a meaning through which the researcher established the challenges which are faced by the government and road users of the Moloto road. In addition, the methodology enabled the researcher to find out about the challenges on the Moloto road and performs as it allows the researcher to penetrate in depth situations, settings, relationships or people to reveal uncertainties.

The researcher has adopted a case study design because it allows him to collect extensive data on the individuals and programmes on which the research is focused (Cohen, Manion& Morrison, 2002). The researcher has spent an extended period of time on the Moloto road and interacted with the respondents.

The main methods that the researcher used in the research are observation, interviews and document analysis. In this research the researcher interviewed the participants in their workplaces, observed the Moloto road and analysed the documents from other similar roads in other countries like the Great Britain and Kenya.

4.2. The case study

Bryman (2012) says that the exponent of the case study design often favours qualitative method because the observation is on respondents and the interviews are unstructured. The fact that the researcher chose to conduct a qualitative research it was then appropriate to do the case study. Seidman (1998) believes that a case study is about the investigation of people and organisation.

This research examined the views of stakeholders on what they think would likely reduce road traffic accidents on the Moloto road using a case study and it also used the qualitative research method to explore suggestions from stakeholders on how to reduce the road traffic accidents on the Moloto road. Yin (2009) says that the criterion of a case study is to be reliable, replicable and validated. The Moloto road traffic accidents were investigated from the Moloto village which is the beginning of Mpumalanga province until Groblersdal which is the beginning of Limpopo Province. The research has only focused on the Moloto road.

4.3. Survey research

Trochim (2006) believes that survey research is one of the most important areas of measurement in practical social research. The comprehensive area of a research includes any measurement processes that involve the asking of questions to stakeholders of the Moloto road about the reasons behind the road traffic accidents, and a survey can be everything, from a short paper-and-pencil response form to an intensive one-on-one in-depth interview.

4.4. Descriptive research

Descriptive research is intended to give a clear picture of a situation as it logically happens (Burns et al, 2003). It may be used to validate current practices, to make verdict and the improvement of theories.

The descriptive research method deals with the questions based in the present state of affairs (Kvale, 1996). According to Trochim (2006) a descriptive approach sets out to look for precise and suitable descriptions of the activities, objects, procedures and persons involved in the study. Saslow (1992) supports this view by saying that a descriptive approach gives a detailed description of the phenomenon. Kvale (1996) agrees by stating that in a descriptive approach the subjects described is as precise as possible and he further say that, that is what they experience, feel and how they perform. In view of this the researcher chose the descriptive method as the one to address the primary research question.

This research seeks to provide a description of how respondents provided their information on how to reduce road traffic accidents on the Moloto road without any spark of compulsion.

4.5. Explorative research

An explorative approach helps the research to lead to the insight and comprehension of the phenomenon (De Vos, Strydom, Fouche and Delpoort, 2005). An exploratory research enables the researcher to share the understanding and observations of respondents and to explore how they view the road traffic accidents on the Moloto road. This suggests that the researcher has to be willing to learn new ideas and be open to suggestions, the researcher has to make sure that there are no pre-conceived ideas to influence the research (Saslow, 1992). This research is explorative in nature because it attempts to get suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road. In this research the researcher was able to hear from respondents on what is their view on the mortality rate on the Moloto road.

5. Population

According to De Vos, (1998) a population is the total set from which the individuals or units of the research are selected. It is the totality of people, proceedings or organizational units which the research problem is concerned. In this research all community members are road users of the Moloto road that is why it is imperative for the researcher to identify the target population.

Babbie and Mouton (2006) defines target population as the number of people or stakeholders who are directly involved in the research. In this research, the questions were written down shared and discussed with the ten participating stakeholders. The stakeholders are organised parties who are using the Moloto road on a daily basis. They all have interests on the Moloto road and they are all concerned about the high road traffic accidents rate.

6. Sampling

De Vos (1998) defines sampling as “taking any portion of population or universe considered for actual inclusion in the study” and according to Bailey (1982) a sample refers to a percentage of the whole population and it is an approximation of the whole rather than a whole itself.

The sample is the representative of the populace from which it was drawn. In this research sampling procedure was utilised as the researcher utilised the representatives of organisations which represent the entire population in the region but have interests and affected by the high road traffic accidents on the Moloto road.

The primary objective of sampling procedure is to get a representative sample (Babbie et al, 2006). Sampling on the Moloto road has given the researcher an opportunity to get as much information as possible from the qualitative research’s point of view. Purposive sampling was prioritised and mostly preferred to all other methods of sampling as it provides the researcher with an opportunity to come up with a lot of information especially in a qualitative research (Schreuder, Gregoire and Wood, 1993).

The researcher used the purposive sampling method because only ten Moloto road stakeholders were interviewed about the interventions that can be used to reduce road traffic accidents on the Moloto road.

6.1. Purposive sampling

The researcher chose specific organisations with interests on the Moloto road as respondents in the research. The research has been organised into themes, each of these themes were answered by all the respondents. Leedy (1997) states that purposeful sampling is done in order to increase the value of information sourced from small samples.

In other words, the researcher had a small number of respondents to work with as they were only ten and that is why the researcher identified the organisations which have interests on the Moloto road, they all have the expertise or knowledge of the Moloto road.
The use of judgement on who should be included in the research is advised (De Vos, et al 2005). The judgement allows the researcher to choose respondents who are knowledgeable of the Moloto road and the transportation in general.

7. Interviews

Vockell and Asher (1995) see the reduction of ambiguity as another advantage of any interview since the researcher can ask the respondent to make clarifications on some issues that may appear to be unclear. The physical presence of the researcher enables the respondents to be within the scope of the research which means they cannot discuss anything beyond the road traffic accidents on the Moloto road.

The researcher was satisfied that the work was properly done irrespective of time allocated. The work was done in time because there were very few respondents. Most of the talking was done by respondents for they were supposed to give their insight and their experience on the Moloto road.

8. Data gathering

Gathering data is the most important factor in this case study because all the Moloto road stakeholders have suggestions on how to solve the Moloto road traffic accident challenges. The researcher used the primary data collection because he was supposed to deduce information from the Moloto road stakeholders and they are able to answer as many questions as possible as long as they are helping in enriching the research. There were follow up questions to clarify the discussion and bringing more understanding.

The researcher interviewed all the following organisations and role players of the Moloto road.

- The primary respondents are: SAPS (Station Commissioner), Mpumalanga Community Safety, Security and Liaison (Chief Traffic officer), Mpumalanga Departments of Public Works Roads and Transport (the Regional Manager), Thembisile Hani Local Municipality (Municipal Manager).
- The secondary respondents are: Kwa-Mhlanga Taxi Association (chairperson), Kwaggafontein Local and Long Distance taxi association (chairperson), Taxi Council (chairperson), and PUTCO (traffic manager).
- The tertiary respondents are: Traditional Leader and Mpumalanga Commuter Organisation (chairperson).

8.1. Data analysis

According to Welman, Kruger and Mitchell (2005) data processing or data analysis is a cyclical process which is basically dealing with the interpretation and it fit into every stage of qualitative research. It is a systematic process where data is selected, categorised, compared, synthesised and interpreted so as to draw cautious conclusions based on the data collected. Data analysis is concerned with making sense and interpreting the data collected so that it is saved and available for future use (Seidman, 1998). The data analysis assists the researcher to determine themes and perceptions entrenched during the interview (Saslow, 1992).

Data collection and data analysis works hand in hand in qualitative research and should be done concurrently for the researcher to concentrate and shape the research. According to Brink and Wood (1998) the analysis in qualitative research cannot be separated from data collection. The method of consolidating data will differ depending on the research strategy and collection technique used. After organising data the researcher can go to the next stage which is the data analysis. The interpretation can only be done after the data has been organised and described (Leedy and Ormrod, 2005).

The researcher used descriptive methods to analyse the data. Schutt (2006) says that the descriptive analysis is concerned with the description or summarisation of the data attained from a collection of individuals. The demographics selected were considered according to their knowledge of the Moloto road and how they are affected by the road traffic accidents. Data was collected from the respondents through a structured questionnaire which was aimed at deducing more suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road.

As the researcher prepares for the data analysis the audio-tapes were listened to and each interview was recorded verbatim. The researcher established themes after reading the verbatim records and played the audio tape. The researcher wrote down responses from respondents. In the data analysis the researcher applied the following: comparing, contrasting, categorising, aggregating and ordering were applied in the analysis of the data (Schutt, 2006).

- Categorising: The researcher divided the observed data into small units.
- Contrasting: The researcher identified the similar and dissimilarities of the units.
- Aggregating: The researcher determined groups of matters which were related to each other.
- Ordering: The researcher developed patterns and themes through opposite thinking.
- Comparing: The researcher will compare the data received.

According to Schutt (2006) the data analysis involves the following five stages:

• Ordering the data.
• Generating categories, themes and topics.
• Testing the emerging hypotheses against the data.
• Searching for alternative explanations of the data.
• Writing a report.

The huge size of collected data was reduced into manageable units and all the stages of the data analyses had its data reduction. It involved interpretation as the researcher was trying to bring meaning and insight into the words of the respondents. According to Walsh (2001) the qualitative data must display the following conditions:

• It must be short to avoid unnecessary ambiguity.
• It must be realistic so that the researcher makes the least assumptions and still clarify the data.
• It must avoid contradictions so that it can be reliable.

• It must relate to what we know about the theme so that it becomes reliable.
• It must be powerful so that it explains the data without losing accuracy.
• It must be recommending new concepts and prospects.

Lastly, the researcher draws a conclusion on the findings and it will be followed by a discussion emanating from findings on the high road traffic accidents on the Moloto road. The recommendations in the research are made to improve the situation or to minimise road traffic accidents on the Moloto road.

8.2. Data validation and reliability

Walsh (2001) believes that reliability and validity are used in order to measure rigour, quality and the potential of the research and certain practices and principles need to be used in order to achieve the intended goal. This assisted the researcher to produce a quality research which identifies interventions which could likely reduce the road traffic accidents on the Moloto road.

8.2.1. Validity

Bryman (2012) says “validation has been particularly popular among qualitative researchers, because they frequently want to ensure that there is a good correspondence between the findings and the perspectives and experiences of their research participants”. That is why the respondents of the Moloto road research were given an opportunity to comment on the findings of the research. The researcher also recorded the interview so that there can be proof in case challenges do arise. Brink and Walsh (2001) says that validity is the ability of an instrument to measure what it is supposed to measure and nothing else.

The researcher ensured that the instrument’s validity was beyond reasonable doubt and had major reasons to develop it. The simple language was used in developing questions so that respondents must be able to understand.

The questions were very clear and precise. The interview questions covered the domain intended to be covered and that was content validity according to (Cohen, at, al. 2002). There are different types of validity but the researcher chose to do the construct validity because it is relevant to the high road traffic accidents rate on the Moloto road.

8.2.2. Construct validity

The validity of the instrument is assessed by the content validity and it makes sure that the questions and the statements are related to the intended aim and purpose of the research (Cronbach and Meehl, 2000).

Buckingham and Saunders (2004) indicate that construct validity is related to content and, to some extent, principle. The device has construct validity if the instrument is clearly based on one or more academic framework or concept so that, combined, the items in that instrument, only refer to that concept. Construct validity was used by the researcher because it had the potential of producing the intended aims and objectives of the Moloto road research. Construct validity assisted in answering all the research questions of the high road traffic accidents on the Moloto road research.

8.2.3. Reliability

According to Postlethwaite (2009) reliability refers to the amount of which a measuring system gives reliable outcomes. A reliable test when administered independently will provide the same or consistent set of scores for group of individuals (Postlethwaite, 2009).

9. Research processes

The researcher interviewed the participants on a one to one basis. The questionnaires were distributed few days before the interview so that the organisations could discuss the questions if they feel like giving the collective view. The researcher had a recorder and a questionnaire to fill as the participants respond to the questions. Each participant was interviewed for plus minus 40 minutes because they were giving long answers in a way of showing their good understanding of the Moloto road. Questions were structured in a way that they were not personal that is why the participants did not have a problem of giving answers.

Participants did not have attitude towards the researcher because of the fact that interviews were done in their offices or work places. After the respondents were interviewed the researcher started to analyse the data received.

10. The significance of the research

The significance of the research is to explore suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road and to give some recommendations. The Moloto road has got high mortality rate which inflicts pain to the beneficiaries and non-beneficiaries of the deceased. Some people are disabled and it also affects the South African economy by repairing the government damaged infrastructure and the RAF paying of the affected people on the road traffic accidents on the Moloto road. The researcher is interested in this research because its findings and recommendations could assist in the reduction of road traffic accidents and it will also assist the government in drafting of policies on the reduction of road traffic accidents on the Moloto road.

11. Elimination of bias

The study eliminated biasness by the following:

- The interview questions were developed in such a way that they addresses the research objectives.
- The interview questions were developed in way that they did not discriminate against the respondents in any way.
- There was no influence from the researcher when the respondents were giving their site of the story.

12. Ethical consideration

The following was observed:

- It was voluntary for the Moloto road stakeholders to participate in the research.
- The independence of the respondents was respected.
- There was no influence posed by the researcher to the respondents.
- The names of the respondents were not disclosed and their organisations will not be accountable for any misrepresentation of facts and recommendations from the research.

The respondents and their views were treated equally and given the respect that they deserve. The respondents was not forced to an individual but requested the organisation to delegate one to represent their views. The organisation had the right to refuse or to reserve their comments through their delegate.

All the organisations had the choice to partake or not to partake. The researcher interviewed chairpersons of MCO, KULLDTA, KTA and the RTC as the legitimate representative of the organisations. Other organisations contributed through their accounting officers which legitimises the whole process of interviews.

The questionnaire was given to the organisation or stakeholders in advance so that they can discuss it and delegate one to reflect their views. The researcher believes that the respondents were not forced by their organisations to participate in the research.

The researcher wants to emphasise that the respondents were deployed by their organisations without the influence of the researcher. The research is intended to gather information on whether stakeholders believe that there could be a solution to the high road traffic accidents and make some recommendations which might assist in reducing or eradicating road traffic accidents on the Moloto road.

13. Conclusion

The chapter described the research design and methodology of the research. Data was collected by means of a structured questionnaire, and the next chapter focuses on the presentation and data analysis through the use of tables, percentages and pie charts. Furthermore, the presentation and analysis are followed by explanations of what the data represents.

CHAPTER 4

PRESENTATION OF RESEARCH FINDINGS AND ANALYSIS

1. Introduction

In Chapter three the research design and methodology, approaches for data collection and analysis, data validation and ethical considerations were discussed. Findings and data analysis will be discussed in this chapter. This chapter has got a fairly comprehensive discussion and quotations from stakeholders on interventions or suggestions which can likely reduce the road traffic accidents on the Moloto road. The data obtained from stakeholders have been analysed, presented and interpreted. The chapter connect the existing literature on the theme under discussion and the findings of the research.

1.1. Categorisation of Respondents

- Respondent 1 : Kwandebele United Local and Long Distance Taxi Association
- Respondent 2 : Kwaggafontein Taxi Association
- Respondent 3 : Regional Taxi Council
- Respondent 4 : Public Utility Transport Company
- Respondent 5 : Mpumalanga Commuter Organisation
- Respondent 6 : Traditional Leader
- Respondent 7 : Mpumalanga Department of Public Works Roads and Transport
- Respondent 8 : South African Police Services
- Respondent 9 : Thembisile Hani Local Mumicipality
- Respondent 10 : Mpumalanga Department of Community Safety, Security and Liaison.

2. Data analysis

2.1. Demographics of respondents

Variable	Frequency	%
Age of participants		
Below 20 years	0	0
21-30	2	20
31-40	4	40
41-50	4	40
51 years and above	0	0
Total	**10**	**100**
Education level of respondents		
Below Grade 12	3	30
Grade 12	2	20
Certificate	0	0
Diploma	2	20
Undergraduate Degree	2	20
Postgraduate Degree	1	10
Total	**10**	**100**
Employer/Organisation		
Mpumalanga Commuter Organisation	1	10
Kwaggafontein Taxi Association	1	10
KwaMhlanga Taxi Association	1	10
Municipal Manager-Thembisile Municipality	1	10
Traditional Leader	1	10
Mpumalanga Department of Public Works Roads and Transport	1	10
Chief Traffic Officer	1	10
PUTCO	1	10
SAPS Station Commander	1	10
Regional Taxi Council	1	10
Total	**10**	**100**
Gender of respondents		
Male	7	70
Female	3	30
Total	**10**	**100**

Table 5. Demographics of respondents (2014).

2.2. Age group of respondents

The youngest respondents were between the age of 21 and 30 years of age which constituted 20% of the respondents. The 40% is between the age group of 31 and 40 and the other 40% is shared by the age group between 40 and 50.

2.3. Organisations

There was an equal distribution of stakeholder participation which constituted 10% each.

The Department of Community Safety, Security and Liaison which are active role players on the Moloto road were represented by the Chief Traffic Officer. The Kwaggafontein Taxi Association, a local transporter of commuters on the Moloto road, was represented by its chairperson. The KULLDTA which also transports commuters on Moloto road on a daily basis was represented by the chairperson.

The Mpumalanga Commuter Organisation represents daily commuters who use public transport. Their task is to protect commuters' interests in cases such as abuse by public transport operators. The MCO has got structures which are democratically elected by commuters of all types of public transport which are categorised into Ward, Municipal, Regional and Provincial structures. The commuters were represented by the regional chairperson.

The DPWRT is responsible for repairs and developments on the roads which ferry both goods and commuters, they were represented by the regional head of the department. Most accidents happen on the Moloto road which falls under the jurisdiction of Thembisile Hani Local Municipality and the Municipal Manager was interviewed. The Regional Taxi Council holds an executive position at a regional level and its interest is to see the safety transportation of commuters on the road. The RTC was represented by the chairperson. The station commissioner represented the SAPS which is responsible for traffic control to curb road accidents that are a menace to the community as it directly affects them in the event of them occurring. The traditional leader as the traditional head of the community who is also interested in the wellbeing of his subjects.

2.4. Gender of respondents

The majority of respondents (70%) were men and the 30% were women. The researcher wanted to interview equal number of respondents in both men and women but this is an indication that the transport industry is dominated by men that is why the number is not balancing. The transport sector and its structures are dominated by males (MDPWRT, 2012).

2.5. What are the main reasons behind the road traffic accidents on the Moloto road?

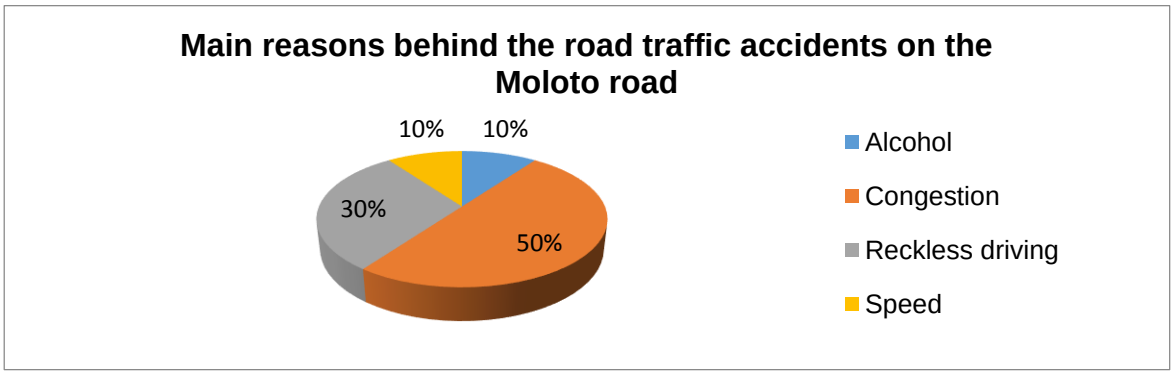


Figure 1. Main reasons behind the road traffic accidents on the Moloto road?

Figure 6 indicates that 50% of respondents said congestion is the cause, 30% says it is reckless driving, 10% said it is drivers driving under the influence of alcohol and another 10% said it is over speeding.

> Congestion is the main reason behind the road traffic accidents. Congestion normally happen in the peak hours of the morning and afternoon and that is where accidents are happening and the reason is the government does not want to extend the road to accommodate many vehicles. They also don't want to provide road infrastructure that is why this road traffic accidents (Respondents 3, November 2014).

Transport operators will always want to shift the blame to government as if the government does not deliver the services as expected. They imply that failure of the government to deliver will result in road carnages. In essence they are saying reckless driving is caused by government.

> Reckless driving was the main reason behind the road traffic accidents. There is a strong relationship between reckless driving and driving under the influence of alcohol. Reckless driving is purely a road traffic accident cause which is caused by human behaviour (Rrespondents10, November 2014).

The government officials will want to show their good understanding of road rules and respond according to the findings and road traffic accident reports. In a way they will also shift a blame to the road users in defence of the government.

10% felt that the main reason behind the road traffic accidents on the Moloto road was driving under the influence of alcohol. Drunk driving is dangerous because it causes road traffic accidents.
A drunk driver can drive recklessly, can exceed the speed limit, can overtake on the barrier line and can disobey all traffic rules on the road which is hazardous to road users.

The remaining 10% believed that speed was the main reason behind the road traffic accidents on the Moloto road. Speed is highly related to drink and driving as well as reckless driving. In most cases one cannot separate the three causes of road traffic accidents because they are all caused by human factor. Being in a hurry makes people exceed the speed limit and end up overtaking recklessly onto on-coming traffic.

2.6. What makes Moloto road different from other roads in Mpumalanga Province?

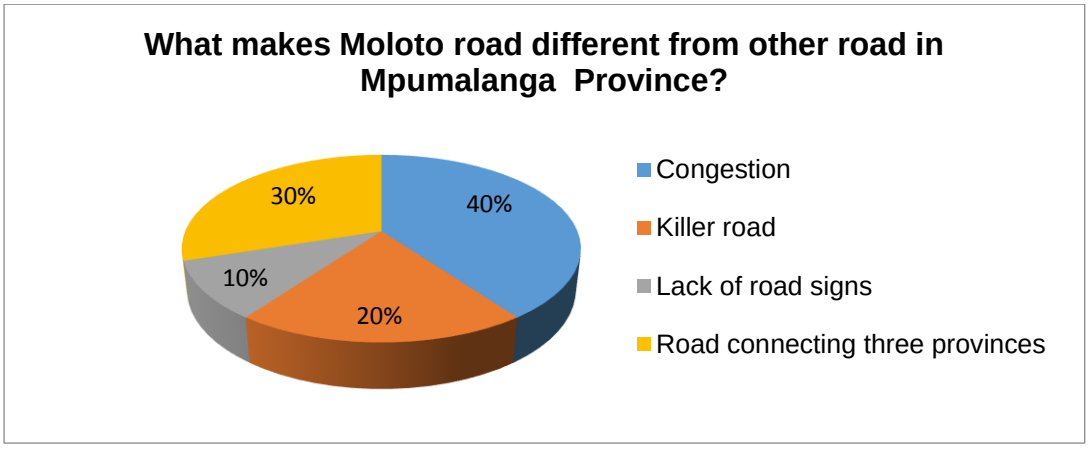


Figure 2. What makes Moloto road different from other roads in the Mpumalanga Province?

Figure 7 shows that 40% of respondents agreed that congestion made the Moloto road different from the other roads in Mpumalanga province. 30% said that the reason is because Moloto road connects the tree provinces which are Gauteng, Mpumalanga and Limpopo Provinces. 20% says that it is different because it is the most killer road in the Mpumalanga Province which is supported by the (MDCSSL, 2013).

> With my experience and according to the report that I saw Moloto road is the most killer road because it has many vehicles travelling on it, it connects the three provinces and there are lot of four way stops (Respondent 8, 2014).

People are staying far from their work place and use public transport like taxis and buses to go to and from work. Delivery vehicles and private cars also contribute to the congestion in this road. The fixed cost of buying and owning a car including the price, motor insurance, car tax, and depreciation encourage drivers to use their cars as often as possible. The delays and unreliability caused severely affect the productivity of businesses, as well as their ability to innovate and access new markets and resources. Drivers are spending more time doing nothing but sitting in a bumper to bumper traffic that becomes an economic problem. The connection to the three provinces creates large volumes of traffic leading to the road traffic accidents.

> The lack of road traffic signs is the main reason the Moloto road is different from other roads in the Mpumalanga Province. Indeed without road traffic signs this will create more road traffic accidents (respondent 2, 2014).

There is R1.3 million allocated to SANRAL to rehabilitate the Moloto road. It is three year programme to make sure that Moloto road becomes one of the competitive road in the Province and Nationally. SANRAL will make upgrades on the road including widening it, closing of potholes and making sure that there are visible road signs on the Moloto road.

2.7. Can road traffic accidents be reduced on the Moloto road?

70% of the respondents believes that road traffic accidents can be reduced on the Moloto road. The 30% do not believe that road traffic accidents can be reduced.

> The road traffic accidents cannot be reduced on the Moloto road because of the driver's attitude, this is making it a lot difficult for the government to implement measures that will reduce the road carnages. Without the road users and the government working together the road traffic accidents will increase yearly. Moloto road has been killing people for years now but nobody is taking an initiative to reduce those road traffic accidents which means the status quo will remain (Respondent 5, November 2014)

The Commuters feel that the government is not doing enough to reduce the road traffic accidents. They then feel that as long as the government is not taking a step forward everything will remain as is. They also blame the transport operators for not taking responsibility for being contributors of road transport accidents. They feel that until the government and the transport operators take responsibility road carnages will not be reduced.

> Government is not doing enough to try to minimise mortalities on the Moloto road and if the government can put some efforts on reducing the road crashes that will be possible and achievable (Respondent 1, November 2014)

> It is not the government's fault but the drivers or road user's faults. It is road users who do not adhere to the road traffic laws. The government can implement all their safety plans but there must be a buy in of road users which will finally help in reducing road traffic accidents (Respondent 8, November 2014).

Both respondents believe that road traffic accidents can be reduced but the challenge is that they blame each other as the main cause of road traffic accidents. Operators feel that it is not their fault but the government is in fault. The government want the road users to be more involved in reducing road traffic accidents by adhering to road traffic laws and stop being emotional on the road. Respondents feel that the road traffic accidents can be reduced and that will save lives of people.

If interventions can be put in place road traffic accidents can be reduced. It only needs commitment from all stakeholders.

2.8. How can road traffic accidents be reduced on the Moloto road?

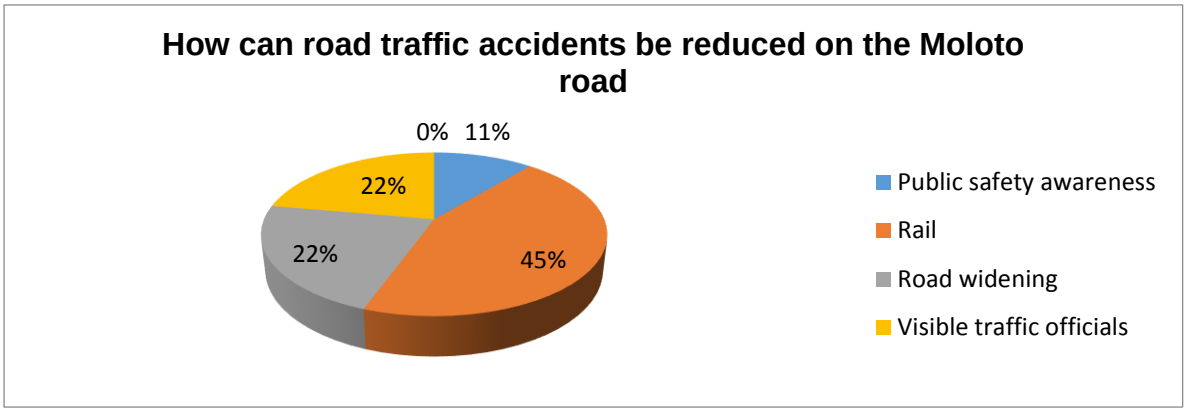


Figure 3. How can road traffic accidents be reduced on the Moloto road?

Figure 9 indicate that 45% of respondents said that Moloto rail corridor can be a solution to the high road traffic accident rate on the Moloto road. The 22% believed that if the Moloto road can be widened the road traffic accidents will be reduced. The other 22% says that the visibility of the traffic officers can reduce road traffic accidents on the Moloto road The 11% of the respondents believe that public safety awareness can reduce road traffic accidents on the Moloto road.

> Moloto rail corridor will reduce vehicles on the road because people will prefer trains than buses and taxis and that will reduce road traffic on the Moloto road. Congestion would be eliminated as there would be fewer vehicles on the Moloto road and fewer road traffic accidents. The train will be much cheaper than both the bus and the taxi and commuters will want to save their money (Respondent 5, November 2014).

Respondent 5 views this as a commuter because they see railway as a cheaper and reliable mode of public transport than the road transport. Rail is alleged to be the safest form of transport. There are fewer chances of accidents and breakdown on railways as compared to other modes of transport. People might prefer using trains because it will be safe, affordable, reliable, effective and efficient than the buses and taxis. That will mean that buses and taxis will be reduced on the road and that will do away with congestion and road traffic accidents on the Moloto road.

Moreover the commuters cannot be exposed to the sun, rain, snow etc. unlike in the case of taxis and buses. With those reasons they feel that railway will be more effective than road transport. Although it is not guaranteed that after the construction of the Moloto rail corridor people will move from taxis, buses and private vehicles in favour of the Moloto rail. People might continue using their preferred type of transportation to work. The Moloto Rail corridor might not remove busses on the Moloto road but minimise their operation because busses will be feeders to the train and ferry commuters from train station back home whilst some commuters will prefer a bus and taxi over a train.

> It does not take a genius to figure out the reasons behind traffic congestion. There is a very big demand of transportation because people are buying private vehicles in large numbers. People who are using public transport has increased and that forces us to buy more vehicles to ferry our commuters effectively and roads becomes smaller and smaller. The government must widen the road to avoid this road traffic accidents (Respondent 1, November 2014).

The biggest advantage of road widening is that the road will be able to handle more traffic. Disadvantages include the slowdown and rerouting of traffic while the work is underway, as well as the cost and the added pollution from the increase in traffic which can also cause road traffic accidents. The widening of Moloto road can mean an increase in over speeding which will also cause road traffic accidents. It is a perception that widening the Moloto Road will accommodate more vehicles and reduce road traffic accidents.

Rail transport is tied to a particular track that is the reason why it cannot provide a door to door service. The cost of intermediate loading and unloading are very high, more deterioration and wastage of time. The great disadvantage of rail transport is the time cost on terminal operations. Respondents believe that busses and taxis will also be on the road in large numbers to do the door to door deliveries. Congestion will only be reduced from Tshwane to Moloto village and from Moloto Village into Thembisile Hani and Dr JS Moroka municipalities there will be no change because congestion and road traffic accidents will continue to be there.

Deployment of more traffic officers will improve law enforcement through visible policing, and lead to compliance among the road users on the Moloto road. The lack of visibility of traffic officers contributed to the high rate of road traffic accidents (Respondent 10, 2014)

According to the MDCSSL (2013) there is a shortage of traffic officers in the Mpumalanga Province and in particular on the Moloto road that is why road users can do as they wish. They believe that deployment of more traffic officers should be aided by speed cameras and the frequent monitoring by traffic officers who will be conducting vehicle stops and checking for offenders.

Most of the road traffic accidents are caused by human behaviour which can be corrected through awareness campaigns. Road users must understand why safety on the road is so important. It is believed that public safety awareness will make road users to be more cautious than those who lacked the knowledge. The public safety awareness must be taught at schools so that schools produce pupils who are aware of the safety of the public.

2.9. Whose responsibility it is to reduce road traffic accidents?

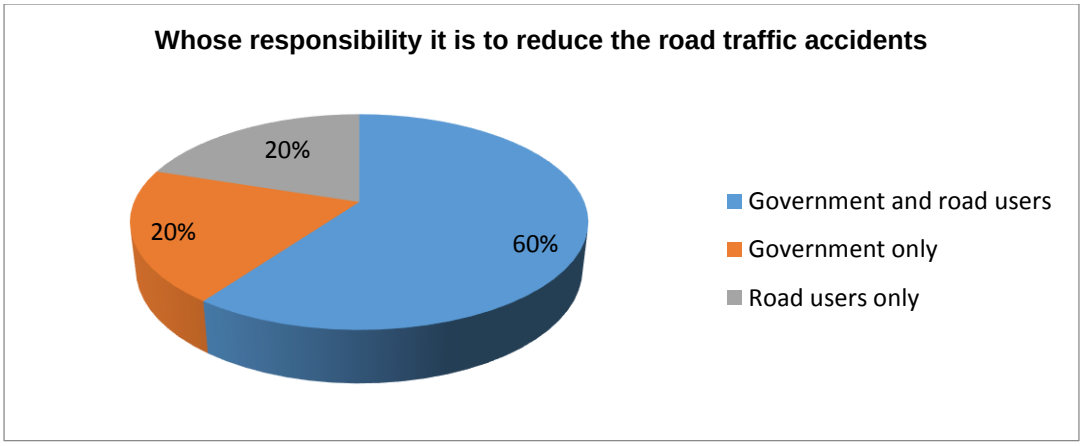


Figure 4. Whose responsibility is it to reduce road traffic accidents?

Figure 11 indicates that 60% of respondents agreed that government and road users have the responsibility to reduce the road traffic accidents. The 20% believe that only the government is responsible to reduce road traffic accidents on the Moloto road. The other 20% believed that only road users can reduce the road traffic accidents on the Moloto road.

> The government and the road users are capable of reducing road traffic accidents on the Moloto road. If the government plays its role of regulating, monitoring and taking care of the road infrastructure, road users will respond positively and avoid causing road traffic accidents by adhering to the rules of the road. I am insisting that the government has a role to play in regulating and enforcing the laws governing the road and the transportation in general (Respondents 3, 2014)

> The government's role is to have a sound road infrastructure in place to enable road users to travel safely. Roads must be maintained by the government at all times because good road network system reduces fatalities. The road traffic accidents on the Moloto road are caused by government negligence because there are no road signs and if they are there they are not visible (Respondent 2, 2014).

> Road users must respect the laws governing the transportation in general and on the Moloto road in particular. Road users do not adhere to the rules of the road, which is why so many road traffic accidents, If road users can cooperate with government and obey the rules there will be no road traffic accidents (Respondent 10, November 2014).

The road traffic accidents are causing more damages and claiming lives of people. Respondents feel that there are many things that government and road users should do to reduce the road traffic accidents on the Moloto road.

Respondents feels that there are not enough and visible road signs on the Moloto road which makes it extremely difficult to drive along this road. The road users as the initiators of road traffic accidents must be part of the problem solving because they are part of the problem. Road users have a major role to play in reducing road traffic accidents. Without the involvement of road users, the government alone will not solve the high road traffic accidents on the Moloto road.

The lack of visible traffic officials on the stretch of road makes road users take advantage by deliberately breaking the rules of the road. If the government plays its role and road users also play their part, automatically road traffic accidents will be reduced. The government as a regulator of the laws must also monitor or enforce the law.

2.10. How would you reduce road traffic accidents?

60% respondents believed that if congestion can be reduced from the Moloto road the road traffic accidents will be minimal. The 40% of the respondents said that if road users could adhere to road traffic rules the road traffic accidents would be reduced.

> Congestion plays a role in causing road traffic accidents because people are not patient. Congested roads need users to be patient, alert and obey road rules because the non-obeying of rules can be catastrophic (Respondent 7, November 2014)

The high number of vehicles which are making traffic jams on the Moloto road and crossroads are making people get nervous and feel like they are being delayed to get to their destinations on time. As a result they will ride speedier than they were going to and in the process they will unknowingly cause serious road traffic accidents. The reduction of vehicles or the widening of the Moloto road can also reduce the road traffic accidents. This reduction can be made both by governments and individuals.

> Road users do not adhere to road traffic laws hence so many accidents occurring and if road users can begin to acknowledge and respect the rules of the road, road traffic accidents will be significantly reduced. Road users flout speed and in most cases go over the stipulated speed limit in a particular zone which unnecessarily causes fatalities. Road users do not obey stop signs which consequently leads to road traffic accidents (Respondent 8, November 2014).

Some people believe that harsh punishments for driving offences can play a role in reducing road traffic accidents and some do not agree with the notion. A campaign is needed to make people aware of distracted driving like eating, reading a map, talking on a cell phone and arguing with passengers. They must be taught on how to lower blood alcohol limits and make more people aware that even a little alcohol can weakens their driving abilities. Road users should adhere to road traffic laws and respect the road traffic signs and call upon the government to make traffic signs visible everywhere. Traffic officers must change their attitude towards motorists and that will help motorists regard them as friends and fellow citizens, that will also help motorists to begin to adhere to traffic laws and be open to being educated on the rules of the road.

2.11. If you can be given a chance to manage the Moloto road what can you do or improve?

50% of the respondents believed that if the government deployed more traffic officials, there would be fewer road traffic accidents. The other 50% said that if the government reduces the speed limit by 20 kilometres per hour on the Moloto road it could reduce road traffic accidents.

> Motorist or road users on the Moloto road are always in hurry that is why they are always driving very fast and exceeding the speed limit of that zone. To me speed is a major contributor of the Moloto road traffic accidents (Respondent 8, November 2014).

The higher the speed at the point where the road traffic accident will happen, the less time there is for the driver to react, higher speeds play a very significant role in causing crashes. Speed mean more force unleashed on the victims and thus speed directly influences the likelihood of death or serious injury. This is particularly so when vulnerable road users such as pedestrians, cyclists and motorcyclists are involved in a collision with another vehicle. The government must also look into the possibilities of reducing the speed limit and this will surely assist in reducing the road traffic accidents, speeding is one of the main causes of road traffic carnages on the Moloto road.

> Traffic officers are not visible on the Moloto road that is why road users are too free to do whatever they want to do which is in most cases against the law and hazardous to other road users (Respondent 6, November 2014).

The National Road Traffic Act (No 93 of 1996) mandates traffic officers to “regulate and control” traffic on public roads to ensure the safe and efficient movement of the traffic. This cannot happen if there is no effective allocation of traffic officers to the Moloto road. Looking at the causes of the road traffic accidents, the government must ensure that there are sufficient traffic officers allocated to the Moloto road. The government must develop norms and standards for the number of traffic officers to be allocated to road sections considering vehicle volumes on that particular road. The traffic officer’s visibility will assist in the obeying of the road rules and the more the rules are obeyed the more the road traffic accidents are reduced.

3. Conclusion

The results show that the majority respondents believed that road traffic accidents could be reduced. Only a few believed that road traffic accidents would not be reduced on the Moloto road. The prevalent view is that the human factor is the reason behind most of the road traffic accidents on the Moloto road. In the next chapter the researcher analyses the results.

CHAPTER 5

DISCUSSION OF THE RESEARCH FINDING

1. Introduction

This chapter deals with the findings of the research and is appropriately linked to the findings of others as discussed in the literature review. The discussion in this chapter follows a sequence of questions which were asked during the interview.

2. Findings of the study

There were five questions that the research investigated. The questions were:

1. What are the reasons behind the road traffic accidents on the Moloto road?
2. What makes Moloto road different from other roads in the province?
3. Can road traffic accidents be reduced on the Moloto road?
4. Can Moloto rail corridor reduce road traffic accidents on the Moloto road and
5. Whose responsibility is it to reduce the road traffic accidents and how?

3. Human Factor

All road traffic accidents caused by humans is called human error. The respondents support the findings by the MDCSSL (2012) that 90% of accidents are caused by human error. The respondents agree that speed, reckless driving, driving under the influence of alcohol, driver destraction and fatigue are the major causes of road carnages on the Moloto road. They all believe that human error can be controlled and be corrected. The MDPWRT (2012) notes that the major contributors to the appalling road traffic accidents statistics are poor behaviour and traffic violations which cause over 90% of accidents. In response to this, respondents suggested that the visibility of traffic officers can reduce the road traffic accidents caused by human error.

3.1. Speeding

The NNH in Kenya has the large number of road traffic accidents which are a result of speeding vehicles and the A537 in the Great Britain had the same problem (WHO, 2011). According to reports speed is also a major contributor of road traffic accidents on the Moloto road, which is supported by the respondents in this research. They believe that the shortage of traffic officers and speed cameras on the Moloto road allows road users to drive the way they want particularly with regard to disobeying the speed limits

The respondents feel that the challenge can be solved by government and the road users working together. Speed is also categorised as reckless driving because the driver is at fault. WHO (2009a) says that speed is a major contributor of road traffic accidents in the world and the MDPWRT (2012) support it by saying that the majority of Moloto road traffic accidents are merely caused by over speeding.

3.2. Drinking and Driving

There is much evidence that shows that alcohol consumption by road users is a primary reason for road traffic accidents because the tests are normally done after the accidents and a person who exceeded the limit of alcohol consumption is affected by alcohol and may be physically unable to drive a motor vehicle (WHO, 2009a).

Of the road traffic accidents which happened on the Moloto road in 2012, drink and driving command a bigger portion which is similar to the international experience (DOT, 2011). The respondents say that Moloto road is not closely monitored and there is a sense that road users will not get caught.

The alcohol evidence centre in Kwa-Mhlanga plays a major role in increasing the successful prosecution rate of offenders who drive under the influence of alcohol on the Moloto road (MDPWRT, 2012), but more effective monitoring of road users has to be implemented in order to start the prosecution process.

3.3. Reckless driving

Reckless driving in the A537 and the NNH is very high and uncontrollable and the WHO (2004a) further says that there is a correlation between driving under the influence of alcohol and reckless driving. In this research 30% of respondents felt that reckless driving contributes a lot on the road traffic accidents that are happening on the Moloto road. They feel that if reckless driving were reduced the road would be safe and accident free. The three roads that are discussed all have a high number of road traffic accidents caused by reckless driving. Drinking and driving, speed and fatigue are all causes of reckless driving. The respondents believe that the deployment of more traffic officers on the Moloto road will minimise reckless driving.

3.4. Fatigue

Respondents say that people driving on the Moloto road come from as far as Polokwane and further and chances are that they are tired and sleepy because they have had a long journey and others are coming from Johannesburg going to Polokwane without resting on the way. They say that fatigue makes them unaware of what is happening on the road and stands in the way of their ability to respond quickly and safely to the dangerous situation ahead. It is difficult to identify a road traffic accident caused by fatigue. That is why when detecting the cause of an accident you cannot say it was caused by fatigue but you can have another reason which will hide fatigue. The respondents suggest that effective monitoring of the Moloto road by visible policing can be a solution to the challenge.

4. Congestion

The WHO (2011) says that the NNH and the A537 are also encountering big volumes of vehicles and motorbike, especially on the intersections and in peak hours. The roads have got the same characteristics as Moloto road when coming to road traffic accidents. The data shows that congestion normally happens in the peak hours of the morning and afternoon with a few accidents happening off peak hours, which indicates that congestion is a contributor to the road traffic accidents on the Moloto road because there are very few road traffic accidents off peak hours.

As a result of congestion drivers tend to be impatient and decide to drive on the left or face the oncoming traffic which is reckless driving and dangerous for road users. The only way to reduce private vehicles on the Moloto road is to develop a safe, affordable, accessible, effective and efficient integrated public transport which can provide citizens with alternative transport options. This will need the buy in of decision makers, political support and willingness from the citizen.

Government and road users both responsible.

The data shows that the respondents feel that both government and road users share responsibility to reduce road traffic accidents. Government regulates and monitors the road for transgressors, respondents believe that the government is doing nothing to minimise carnages on the Moloto road, they feel that if the government can put more effort on reducing the road traffic accidents that will be possible and achievable. Some said that it is not the government's fault but that of the drivers or road users faults. They blame it on the road users because the road users do not adhere to the road traffic laws. They believed that even if the government could implement all their plans as long as the road users are still not focussed there would still be road traffic accidents.

Respondents believe that the lack of visibility of traffic offices contributed to the number of road traffic accidents. The addition of traffic officers should be aided by speed cameras and the frequent monitoring by traffic officers conducting vehicle stops and checking for offenders. The government wants to integrate the various transport modes and have a safe regulated public transport services (DOT, 2015). It is an indication that the government would want to assist in reducing road traffic accidents on the Moloto road.

The respondents said that road traffic accidents would not be reduced because they believe that both the government and the road users are not doing much to improve the situation despite the losses incurred. They said that the government did not care about the mortalities on the Moloto road because if they cared they were going to put some effort towards improving the situation. Their view is that the government is reluctant because road users will not take heed of their responsibility to reduce road traffic offences on the Moloto road.

5. Infrastructure

5.1. Moloto road

Infrastructure is solely a government responsibility. 22% of respondents believed that the Moloto road is too narrow and that is the reason why there are so many fatalities. The poor surface condition together with irresponsible driver behavior has resulted in a high rate of crashes and fatalities on the Moloto road. Respondents believe that the road should be widened to accommodate more vehicles and avoid congestion. The Minister of Transport and SANRAL has already allocated R1.3 billion to rehabilitate and upgrade the Moloto road, which will assist in trying to reduce road traffic accidents. In addition to widening the road, more attractive forms of public transport would reduce the number of vehicles travelling on the Moloto road. DOT (2007) says that quality public transport and infrastructure will lead to people opting for public transport over private vehicles and that on its own will mean the reduction of vehicles on the road.

5.2. Moloto rail corridor

Respondents felt that the Moloto rail corridor could be a solution to the high road traffic accidents on the Moloto road because it would improve the public transport system in the region. It will convince people to leave their private vehicles in favour of rail and public transport in general. Some people will move from taxis and busses and some will sacrifice their vehicles for Moloto rail. The Moloto rail initiative is targeted to reduce traffic congestion and to curb continuous road carnages on the Moloto road. The Minister of Transport Ms Dipuo Peters in her speech in Kwaggafontein on the 28th April 2015 said that the feasibility study conducted on the Moloto rail corridor in 2014 estimated that the rolling stock will be R10 million, rapid rail will need R20 billion and the improvement associated to road infrastructure will be R4.5 billion.

6. Public safety awareness

The respondents said if people were taught about public safety, road traffic accidents would be reduced. Respondents claimed that most of the road users did not know and understand why safety on the road is so important. They believed that public safety awareness could reduce the number of accidents on the road.

Public awareness and education are at the heart of the road safety strategy, while the authorities continue to reinforce the law enforcement capabilities throughout the year. Awareness will make road users more cautious. Respondents suggested that the public safety awareness must be taught at schools so that schools produce pupils who are aware of the safety of the public. Arrive Alive as an awareness campaign is one of the government programmes which is aimed at reducing road traffic accidents.

7. Visibility of traffic officers

The visibility of traffic officers is one of the big concerns raised by respondents. The questions which are normally asked by road users are, where are our traffic officers? What is the purpose of traffic regulation enforcement? The main objective of traffic regulation enforcement is road safety and it is achieved by preventing road users from committing offences which are related to road crashes and injuries. Traffic officers must primarily be seen as preventing drivers from committing traffic offences with a perception of the risk of being caught. The visibility of traffic officers can bring about the long lasting changes in driver behaviour and also changes the driver attitude. In this case the purpose is not to apprehend the offending driver and bring him/her to book but to reduce driver attitude and reduce crash risks or reduce road traffic accidents. MDCSSL (2014) declared that there is a shortage of traffic officers in Mpumalanga which Moloto road is part of. The government can fight the road traffic accidents by employing more traffic officers in particular for Moloto road.

8. Conclusion

The data shows that congestion on the road is the key factor contributing to road traffic accidents. Stakeholder solutions are primarily the rail network, followed by road widening. The sense that there are insufficient traffic officers policing the road, coupled with insufficient road traffic signs suggest that government has a role to play, but the responsibility to drive safely is the road users, not the government. In order to resolve the situation, alternative transport options need to be provided as well as upgrading of the Moloto road, coupled with oversight of the road users behaviour in the form of an active presence of traffic officials.

CHAPTER 6

RECCOMENDATIONS AND CONCLUSION

1. Introduction

This chapter focuses on summarising, giving the conclusions and recommendations of the research. The purpose of this research was to explore suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road.
In order to do this, the following questions were asked:

- What are the reasons behind the road traffic accidents on the Moloto road?

  The majority of respondents said that congestion is the major cause of road traffic accidents on the Moloto road.
- What makes Moloto road different from other roads in the Mpumalanga province?

  The majority of respondents said that congestion makes Moloto road different from other roads in Mpumalanga province.
- Can road traffic accidents be reduced on the Moloto road?

  70% of respondents said yes the Moloto road traffic accidents can be reduced whilst the few said no.
- How can road traffic accidents be reduced on the Moloto road?

  Respondents felt that the Moloto rail corridor can be a solution to the high road traffic accidents on the Moloto road.
- Whose responsibility is it to reduce the road traffic accidents and how?

  The respondents said that government is responsible to reduce road traffic accidents by constructing the Moloto rail corridor, deploying more traffic officers and the widening of the Moloto road.

The purpose of the research was fulfilled because the respondents were allowed to explore suggestions on how to reduce road traffic accidents on the Moloto road. They suggested the widening of the Moloto road, the visibility of traffic officers and the development of the Moloto rail corridor.

2. Conclusion

Moloto road is one of the dangerous roads in South Africa with a high accident rate, with a high death and disability rate. The following is the summery of the research:

Chapter 1

This chapter introduced and explained the topic which is the high road traffic accidents on the Moloto road, it defines the Moloto road and its road traffic accidents. The researcher explained the purpose or the research and the question to be answered by the research itself. It also define the types of roads that are there in South Africa, the chapter explains the National, provincial and municipal roads and draw a line on the responsibilities and functions of each tier of government.

It discusses the rail in general and Moloto rail corridor in particular as a remedy to the congestion and road traffic accidents on the Moloto road. It gives the history of the road and its administration. The chapter also gives the structure of the research and the problem statement.

The researcher is set to explore suggestions from stakeholders on how to reduce the high road traffic accidents on the Moloto road.

Chapter 2

The researcher looked at some readings about the roads with similar characteristics with the Moloto road which are the NNH of Kenya and the A537 of the Great Britain. Both roads have got the high road traffic accidents like the Moloto roads and their authorities were busy trying to minimise the road traffic accidents. It is identified that the majority of road traffic accidents were caused by human error. These includes speeding of vehicles, drunk driving, fatigue, driver destruction and reckless driving. The human error constitutes 90% of all road traffic accidents on the roads and on the Moloto road in particular. There are other causes of road traffic accidents which are congestion, road condition, intersections, stray animals which constitute the remaining 10% of all road traffic accidents.

There are effects caused by the road traffic accidents on the Moloto road like the loss of life, turning people into disable, traumatising the family, inflicting pain into the affected families, leaves children without parents and it affect the economy of the country. The categories of road traffic accidents, the risk factors, types of accidents, the effects of road traffic accidents, the road traffic accidents factors and risk factors on the Moloto road are also mentioned and discussed in this chapter.

The literature showed that the three mentioned roads have got the high number of road traffic accidents and the authorities of the Moloto road can learn from the authorities of the NNH and A537 roads on how they managed to reduce their road traffic accidents. It showed that the roads had the common types of road traffic accidents and they can be reduced.

Chapter 3

This is the research methodology section which determines if the research is qualitative or quantitative. To explore the suggestions from the stakeholders on how to reduce road traffic accidents on the Moloto road, the researcher had to use a suitable research design which will produce a good quality research.

The qualitative research was used in order to explore suggestions on the road traffic challenges of the Moloto road and the case study design because the observation was on respondents. The population on the Moloto road are the stakeholders who have got interests and use Moloto road on a daily basis.

The data was gathered from the following organisation: SAPS, MDPWRT, MDSSCL, THLM, KTA, PUTCO, TL, KULLDTA, RTC and MCO. The systematic data analysis process was done by selecting, categorising, comparing, synthesizing and interpreting data collected. The researcher recorded the interviews and filled in the questionnaire as the respondents respond to the questions. In eliminating biasness the researcher constructed the questionnaire in such a way that it addresses the research objective and allowed the stakeholders to explore suggestions on how to reduce road traffic accidents on the Moloto road as the significance of the research.

Chapter 4

Moloto road stakeholders were identified and requested to nominate one representative to be interviewed. There are five questions asked which are: what are the main reasons behind the road traffic accidents on the Moloto road? What makes Moloto road different from other roads in Mpumalanga Province? Can road traffic accidents be reduced on the Moloto road? How can road traffic accidents be reduced on the Moloto road? Whose responsibility it is to reduce road traffic accidents on the Moloto road? Clarity seeking questions in case there was misunderstanding and additional two questions were asked which are How would you reduce road traffic accidents? And If you can be given a chance to manage the Moloto road what can you do or improve?

The data said that road traffic accidents on the Moloto road can be reduced because they are of human making or human error. Drinking and driving, Congestion, non-visibility of traffic officials, over speeding, reckless driving and fatigue were identified as the causes of road traffic accidents on the Moloto road.

The construction of the Moloto rail corridor, widening of Moloto road and the deployment of more traffic officials were seen as the solution to the road traffic carnages on the Moloto road.

Chapter 5

The chapter discusses the findings from the data analysis and link them to other chapters like the literature review. The chapter is informed by the research question asked in chapter one, it also deal with the questions and responses from the respondents. The chapter identifies human factors as the major causes of road fatalities. Human factors include reckless driving, speeding, driving under the influence of alcohol and fatigue. The human errors are errors that can be corrected or solved provided the person is prepared to do the corrections. Congestion is identified as a major cause of the road traffic accident because some human errors emanate from it and it causes every road user to panic.

The analysis says that, Moloto rail corridor is a solution to the congestion and the high road traffic accidents on the Moloto road. The widening of Moloto road and the installation of road traffic signs is also seen as a remedy to the high mortality rate on

the Moloto road. The public safety awareness is one of the identified solutions to the high road traffic accidents which can be coupled with the visibility of traffic officials on the Moloto road, it is believed that the visibility of traffic officials can manage the driver conduct.

3. Recommendations

The following recommendations are based on the findings and the conclusions of the research:

3.1. Deployment of more traffic officers

- The non-visibility of traffic officers is mentioned as one of the reason behind the road traffic accidents and respondents believes that the deployment of traffic officers in large numbers can reduce road traffic accidents on the Moloto road.
- There must be surveillance cameras and mobile traffic officers.
- There must be visibility of traffic officers and random testing of driving under the influence of alcohol on the Moloto road.

3.2. Widening of Moloto road

- There is congestion on the Moloto road which is alleged to be one of the major causes of the road traffic accidents and the respondents suggested the widening of the Moloto road which will reduce congestion and the road traffic accidents.
- There must be proper lighting and road traffic signage on the Moloto road, the government should also care to paint the road so that it can be clear at knight and there must be road reflections on the yellow line.

3.3. Construction of Moloto rail corridor

- Congestion is caused by buses, taxis, delivery vehicles and private vehicles driving on the Moloto road and according to the respondents the government should consider the construction of the Moloto rail corridor which will reduce vehicles on the road.
- Congestion will be reduced because people will favour public transport over private vehicles. People will move to Moloto rail as it will be affordable, accessible, effective and efficient.

4. Conclusion

The respondents believes that the government can resolve or reduce the road traffic accidents by deploying more traffic officers on the Moloto road, widening of the Moloto road and the construction of the Moloto rail corridor. It is indeed possible to reduce road traffic accidents on the Moloto road.

5. REFERENCES

Al-Kaisy, A. and Durbin, C. (2009) Platooning on Two-Lane Two-Way Highways: An Empirical Investigation. *Journal of Advanced Transportation*. 43, no 1, pp. 71-88.

Babbie, E. and Mouton, J. (2006) *The Practice of Social Research*. Cape Town: Oxford University Press.

Anne, D. and Walling, M, D. (2000) Sleep Apnoea and the Effects of Sleep disruption.

Bailey, K, D. (1982) *Methods of Social Research*. New York: Free Press.

Brink, H. (1996) *Fundamentals of Research Methodology for Health care Professionals*. Cape Town: Juta.

Brink, P, J. and Wood M, J. (1998) *Advanced Design in Nursing Research*. 2nd edition. Thousand Oaks: Sage publication.

Bryman, A. (2012) *Social Research Method*, 4th edition, United States, Oxford University Press, Inc.: New York.

Buckingham, A. and Saunders, P. (2004) *The Survey Methods Workbook*: *From Design to Analysis*. Cambridge: Wiley Blackwell.

Burns, S, N. and Grove, S, K. (2003) *Understanding Nursing Research*, 3rd Edition, Philadelphia: Saunders.

Cohen, L. Manion, L. and Morrison, K. (2002) *Research Methods in Education*. London: Routledge Falmer.

Cronbach, J. and Meehl, P.E. (2000). *Construct Validity in Psychological Tests*, Psychological Bulletin, 52 p. 282.

Davis, G. Davuluri, S. and Pei, J. (2006) Speed as a Risk Factor in Serious Run-off-Road Crashes: Bayesian Case-Control Analysis with Case Speed Uncertainty *Journal of Transportation and Statistics*.

Department of Transport (2006) *Road Infrastructure Strategic Framework For South Africa: The Department Of Transport South Africa*.

Department of Transport (2007) *Public Transport Strategic Framework: The Department Of Transport South Africa*.

Department of Transport (2011) *Decade of Action for Road Safety: Arrive Alive: The Department Of Transport South Africa.*

Department of Transport (2014) *Integrated Public Transport Network: The Department of Transport South Africa.*

Department of Transport (2015) *National Land Transport Strategic Framework: The Department of Transport South Africa.*

De Vos, A, S. (1998) *Research at Grass Roots :a primer for the caring professions.* Pretoria: J.L. van Schaik.

De Vos, A, S. Strydom, H. Fouche, C, B. and Delport, C, S, L. (2005) *Research at Grassroots, for the Social Sciences and Human Service Profession*, 3rd Edition. Pretoria: Van Schaik Publishers.

Downs, A. (2004a) Keynote Address Delivered at UCT Annual Student Research.

Conference in 2004. “Why Traffic Congestion is Here to Stay...and Will Get Worse”: Cape Town.

Escobedo, L. Chorba, T. and Waxweiler, R. (1995) Patterns of Alcohol Use and the Risk of Drinking and Driving Among US High School Students, *American Journal of Public Health*.85,7:976-8.

Horne, J and Reyner, L. (2000) *Sleep Related Vehicle Accidents*, Sleep Research Laboratory, and Loughborough University.

Kvale, S. (1996) *Interviews: An introduction to qualitative research interview. London:* Sage Publications.

Leedy, P, D. (1997) *Practical Research (Planning and Design Sixth Edition)*.New Jersey: Prentice Hall.

Leedy, P. and Ormrod, J. (2005) *Practical Research Planning and Design*. Allyn& Bacon.

Liu, C. Chen, C. Subramanian, R. and Utter, D. (2005) "*Analysis of Speeding-Related LoBiondo-Wood, G. and Haber, J. (2006) Nursing Research: Methods and Critical Appraisal and Evidence-based Practice*. 6thedition. St Louis: Mosby.

Mouton, J and Marais, H, C. (1988) *HSRCStudies in Research Methodology: Basic Concepts in the Methodology of the Social Sciences*. Pretoria: Human Sciences Research Council.

Mouton, J and Marais, H, C. (1990) *Basic Concepts in the Methodology of Social Sciences.* Pretoria: Human Sciences Research Council.

Mohammadi, G. (2013) Road Traffic Crash Injuries and Fatalities in the City of Kerman, Iran, *International Journal of Injury Control and Safety Promotion*,20:2,184-191,DOI: 10,1080/17457300.2012.686039.

Mpumalanga Department of Community Safety Security and Liaison (MCSSL), (2012) *Moloto Road Annual Accident Report of 2011*: MDCSSL publication.

Mpumalanga Department of Community Safety Security and Liaison (MCSSL), (2013) *Moloto Road Annual Accident Report of 2012*: MDCSSL publication.

Mpumalanga Department of Public Works Roads and Transport (DPWRT) (2011) New Strategy to Fight Drinking and Driving Issue 5: MDPWRT publication.

Mpumalanga Department of Public Works Roads and Transport (MDPWRT), (2012) Departmental Annual Report: MDPWRT publication.

National Transport Safety Regulations of Kenya (NTSRK), (2012) Kenya Grappling with Killer Roads Despite Tough Laws. http://www.ntsr.gov.co

Oxford English Dictionary (2013) The Definitive Record of the English Language. Oaldt8.oxfordlearnersdictionaries.com/ 22/09/13.

Ponce, J. de C. Munoz, D, R. Andreuccetti, G. De Carvalho, D, G. and Leyton, V. (2011) Alcohol-related Traffic Accidents With Fatal Outcomes in the City of Sao Paulo*, Accident Analysis and Prevention* 43(3): 782–787.

Postlethwaite, T, N. (2009) *Educational Research: Some Basic Concepts andTerminology.* Institute of Comparative Education: University of Hamburg.

Public Utility Transport Company (2013) *Annual Report*: Putco

Qin, X and Reyes, P, E. (2011) Conditional Quantile Analysis for Crash Count Data, *Journal of Transportation Engineering.*

Road Safety Foundation. (2011) *Road Traffic Accidents, Britain's most dangerous road:* RSF.

Road Safety Foundation and EuroRAP. (2012) *Britain's Killer Highway Revealed in Chilling New Accident Road Map:*RSF

Road Traffic Management Corporation (RTMC) (2012) *South African Road Safety Audit Manual, Second Edition*: RTMC.

Rodrigue, J, P, C. Comtois, B. and Slack, P. (2006) *The Geography of Transport Systems*: London.

Rose, E and Carlson, P. (2005) *Spacing Chevron on Horizontal Curves*" Transportation Research Record.

Salter, R, J. (1974) *Highway Traffic Analysis and Design.* London: Macmillan.

Saslow, C.A. (1992) *Basic research methods*. New York: Random House.

Schreuder, H, T. Gregoire, T, G. and Wood, G.B. (1993) *Sampling Methods for Multisource Forest Inventory.* Canada: John Wiley & Sons, Inc.

Schutt, R, S. (2006) *Investigating the Social World: The Process. 5thEdition. California*: Sage Publication.

Seidman, I. (1998) *Interview as qualitative research: A guide for researchers in education and the social sciences*. New York: Teachers College Press.

Smith, R, H, T. (1970) *Concepts and Methods in Commodity Flow Analysis. Economic Geography.*

South African National Road agency (SANRAL), (2011) *Annual report.*

Trochim, M, K. (2006). *Research methods*. (Online). Available from: http://www.socialresearchmethods.net/kb/survey.php. (Accessed 11 December 2013). United Nations Children's Fund website, http://www.unicef.org/iran/media_4783.htmlAccessed 27/09/13.

Vockell, E,L. and Asher, J,W. (1995) *Educational Research (Second Edition).* New Jersey: Prentice Hall.

Walsh, M. (2001) *Research made real: A guide for students*. London: Nelson Thornes

Welman, J,C. Kruger, S,J. and Mitchell, B. (2005) *Research Methodology. 3rd Edition.* Auckland: Oxford University Press.

World Health Organisation (WHO), (2004a) *World Report on Road Traffic Injury Prevention-Main massages.*

World Health Organisation (WHO), (2009a) *Global Plan for the Decade of Action for Road Safety 2011-2020.*

World Health Organisation (WHO), (2011*) Ten Leading Causes of Dearth by Board Income Group*. http://www.who.ont/mediacentre/factsheets/fs310/en/index.html

Yin, R, K. (2009) *Case Study Research: Design and Method, 4th edition*, Los Angeles: Sage.