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ASSESSING THE CONTRIBUTION OF SPEED GOVERNOR IN REDUCTION OF ROAD TRAFFIC ACCIDENTS IN KAMONYI DISTRICT

Dissertation submitted to the University of Rwanda in partial fulfilment of the requirements for the award of Masters of Arts Degree in Peace Studies and Conflict Transformation

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AUTHORISATION TO SUBMIT THE CORRECTED DISSERTATION

I, undersigned, Dr. Gisaro Cya BITITI, member of the panel of examiners of the dissertation done by

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Hereby testify that, he successfully entered the suggested corrections by the panel of examiners and stands with authorization to submit required copies to the administration of CCM for administrative purpose.

Done at Kigali

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DECLARATION

I, Elie KUBWIMANA, declare that the work which is being presented in thesis entitled "**Assessing the Contribution of Speed Governor in Reduction of Road Traffic Accidents in Kamonyi District** "in partial fulfilment of the requirements for the award of Masters of Arts Degree in Peace Studies and Conflict Transformation and submitted to the University of Rwanda, is my own original work. It has not been presented anywhere else by me for the award of any other degree of this or any other University/Institute.

Candidate Signature

……..

Date: ……./……../..2022

DEDICATION

This research work is dedicated to my family for their encouragement and an endless support through prayers during my studies. It has not been easy for them to stay alone with my one-year absence especially children. In addition, this work goes to almighty God for his protection throughout the journey. Lastly but not least, I highly appreciate for different supports and encouragements from my supervisor, friends, classmates and family members from the beginning to the end of my studies.

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Finally, but certainly not least, I'd like to express my gratitude to my classmates and other individuals who helped in various ways to make this project a successful.

Elie KUBWIMANA

ACRONYMS AND ABBREVIATIONS

ADT: Average Daily Traffic

API: Application Programming Interface

CIP: Chief Inspector of Police

CCM: Centre for Conflict Management

DPU: District Police Unity

ECM: Electronically Commutated Motors

ECMT: European Conference of Ministers of Transport

GPS: Global Positioning System

ISA: Intelligent Speed Assistance

ITF: International Transport forum

MININFRA: Ministry of Infrastructure

NCRBD: National Crime Records Bureau Data

OECD: Organization for Economic Co-operation and Development

RN1 road: Rwanda National road 1

RNP: Rwanda National Police

RTDA: Rwanda Transport Development Agency

RTIs: Road Traffic Injuries

RURA: Rwanda Utility Regulatory Authority

SG: Speed Governor

UR: University of Rwanda

VRU: Vulnerable Road Users

WHO: World Health Organization

ABSTRACT

In Rwanda, road traffic accidents have been observed as a big concern with injury and death being one of the major issues as well as other countries. To overcome this, in September 2016, the regulatory body launched speed governor device in trucks, buses and other heavy vehicles to control road deaths resulting from speeding. This study entitled assessing the contribution of speed governor in reduction of road traffic accidents in Kamonyi district aims at evaluating the impact of speed governor in reduction of road traffic accidents at Kamonyi District RN1 road. To achieve this objective, the study used both primary and monthly records of road accidents occurred in RN1 road from 2010 to 2021. Primary data were collected using questionnaires filled by drivers of mentioned cars with speed governor installed using RN1 and four companies supplying speed governors. To complement information from questionnaires, officers from District Police Unity (DPU), staff from RURA who are concerned with day to day use of speed governors in Rwanda, some people who were the victims of vehicles over speeding were interviewed and the total sample size including those who filled questionnaires was 202. Collected data were analyzed using SPSS and both quantitative and qualitative techniques were used. The research findings from this study showed that, speed governor has significantly reduced the number of road traffic accidents in RN1 road Kamonyi District. However, there are numerous challenges like internet connection, network coverage, some drivers who deliberately disconnect this device for personal gain, and there is lack of policy regulating the use of speed governor in Rwanda. In addition, findings indicate some other factors that reduce road accidents like regular vehicle inspection, adherence to road signs, traffic enforcement cameras, and regular vehicle control, to mention but few.

Key terms: Speed Governor, Road Traffic Accidents and Kamonyi District, Rwanda.

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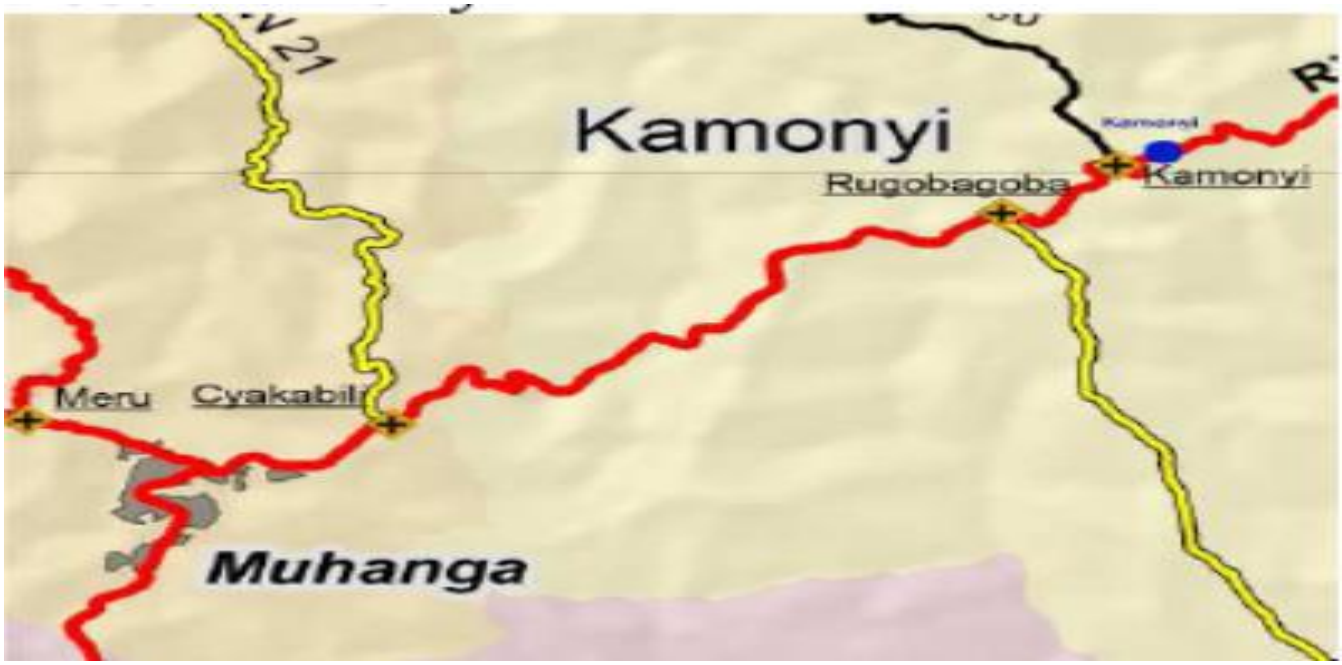
This section of the road has the highest traffic volume, it serves as the main entrance of the Capital City of Kigali from three RNs (RN4, RN1, RN7) and it is linking Kigali City and the new developing sub-urban of Ruyenzi Cell.

Source: RTDA Consultancy Services for Traffic Count Survey on National Paved Roads report, 2013.

Figure 2: RN 1 Kamonyi – Muhanga District

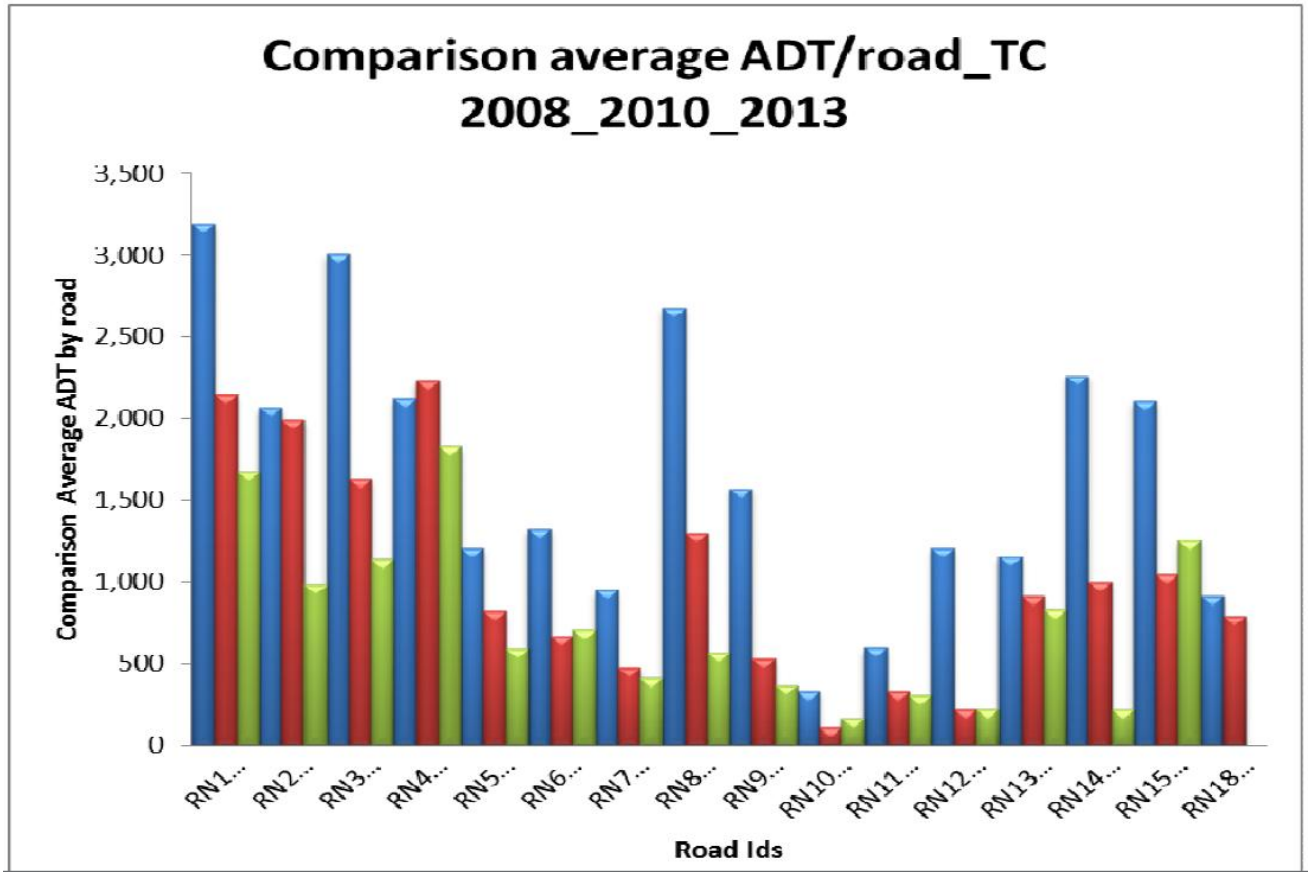
This section serves as the continuity of RN1 and RN7, this section is characterized with use of Heavy vehicles providing construction material like sand, bricks, etc to the City of Kigali.



Source: RTDA Consultancy Services for Traffic Count Survey on National Paved Roads report, 2013.

Figure 3: Comparison Average Daily Traffic (ADT) /road –TC 2008-2010-2013

This chart show that road RN1has the highest share in road traffic movements compare with other roads in Rwanda.



Source: RTDA Consultancy Services for Traffic Count Survey on National Paved Roads report, 2013.

CHAPTER ONE: GENERAL INTRODUCTION

1.0 Introduction

This chapter provides the general introduction of the study which comprises the background of the study, statement of the problem, research questions, and significance of the study, scope and limitation of the study including organization of the study.

1.1 Background of the study

Road traffic movement is becoming demanding across the world, these movements comprises with walkers, bicycle riders or motorcycles and not forgetting vehicles. The road users usual differ from their attitudes towards the road usage with different categories of motor vehicles under driven of different capacities and purposes. Due to the world competitions in various businesses, most of the time the road traffic users are in hurry for various reasons, schooling, and office works, trading, transporting goods and services or carrying construction materials, and so on.

Road accidents have become a major public safety concern in recent years, necessitating a multifaceted response (Racioppi et al, 2004). With high road traffic flow and congestion, the trend in road accident fatalities is becoming a threat in various countries, particularly in the developing world (Racioppi et al., 2018). The number of fatalities and disabling road accidents increases gradually, posing a serious safety problems to all parties involved in their prevention (Gopalakrishnan, 2012).

The implementation of rules and regulations, as well as the integration of speed reduction devices in most accident groups of cars, are all mechanisms for preventing road accidents (Racioppi et al., 2018). "From 1990 to 2013, the number of road deaths globally has consistently increased, with the bulk of deaths happening in countries with Low- and Middle-Income and Africa having the highest road traffic fatality rate. According to World Bank projections, worldwide road accidents deaths will increase by more than 35% between 2010 and 2020 as a result of continued economic expansion and growing motorization (Dilmore, 2005).

Worldwide, annual deaths due to road traffic deaths has grown to 1.35 million, according to the WHO's 2018 report on road safety, which was released in December 2018. Road traffic accidents are the leading cause of death for people aged 5 to 29 years old. Walkers, cyclists, and motorcyclists endure a disproportionate share of the burden, particularly in developing countries. The cost of mobility, according to the report, is too high, especially given proven solutions exist. To achieve any future global goal and save lives, immediate effort is essential to put these measures in place (WHO, 2018). Road traffic injuries (RTIs) are the eighth-leading cause of death worldwide, with a disproportionately high number of fatalities occurring in low- and middle-income countries (Albalate, 2019). Some developing countries, such as Rwanda, have a greater rate of these deaths, which is likely to climb as economic expansion accelerates (Niyonsenga, 2012). Vulnerable road users (VRUs), such as cyclists, walkers, and motorcyclists, bear an excessively large percentage of the harm burden (Rollason, 2017).

In Africa, road traffic accidents claim the lives of the most economically active people aged 15 to 59 years. In the 19-59 age group, the number of men involved in traffic accidents is three times compared to that of women in the same age group. One out of every ten deaths of men in 15 to 59 age group result from road accidents in North African nations. Libya and Tunisia account for 10%, Egypt 8%, Sudan and Morocco 7%. Road accidents are responsible for 25% of all injury-related deaths in Africa. According to this research, road traffic fatalities, road traffic accidents contribute 5% of deaths among males in 15-59 age group but this rate climbs to 6.5 percent for boys whose age ranging from 15to 29 in Sub Saharan Africa. Males aged 15–59 die in considerably greater numbers from traffic accidents than from malaria, diabetes, respiratory, or digestive disorders. However, for females, practically any other causes of death have greater weight than traffic accidents (Ncube, 2013).

In Egypt, Tunisia, and Morocco, road traffic accidents account for more than half of all injury-related deaths, with Egypt accounting for 64%, Tunisia for 58%, and Morocco for 51%. Approximately two time as many males aged 15-59 die due to injury-related reasons such as road accidents, violence, as well as other causes than from tuberculosis, respiratory diseases and cancer but the death rate from HIV/AIDS was only marginally higher (Ncube, 2013).

In Rwanda, road traffic accidents are seen as a big concern with injury and death being one of the major issues. Road traffic accidents rank fourth among Rwanda's top 50 causes of death with mortality rate

of 32.1 per 100 000 people. Road traffic accidents in Kamonyi district RN1 road have also been rampant due to its road traffic movements and geographical nature. It is among the thirty districts that make a republic of Rwanda and it is geographical located in southern province. This RN1 road is considered to be among the most frequent use with a lot of vehicles connecting to other districts in western province and considered as a hub to the Rwanda neighboring countries, for example republic of Burundi and DRC Congo. This RN1 road connects to other roads going to different places in Rwanda which leads to a huge traffic movements of trucks, buses and other heavy vehicles from southern province seeking services in City of Kigali for numerous purposes like universities, schools, social amenities, industries and construction materials including different markets located in southern province (Nshutiyukuri et al, 2020).

As result, all of these development activities involve too much road traffic movements during the day and night with drivers of different driving behaviors whereby some are under pressure of their bosses, influence of alcohol, lack of control technic others not driver mastery while others are under pressure of their family issues and not forgetting road conditions under which they are using including unforeseen vehicle mechanical problems. These road constraints are most likely to be the root causes of over speeding that results into fatal road accidents. The government of Rwanda adopted several strategies like any other country across the World in order to deter or reduce the number of fatalities and injuries that results from accidents. The major improvements of the road infrastructure were made like sign posts, speed limits, mandatory seatbelts, drink-driving laws was established, bans on the use of cell phones while driving and legal requirement for motorcyclists to wear helmets, just to mention but few.

The Ministry of Infrastructure (Mininfra) and Rwanda National Police (RNP) after realizing that mainly fatal road traffic accidents were mostly contributed by trucks, buses and other heavy vehicles due to over speeding, the Government of Rwanda through that Ministry enacted a presidential order relating to speed governor device usage in public transport and commercial trucks in February 2015. In September 2016, the regulatory body launched the installation and use of speed governors officially in public and commercial vehicles in an attempt to control road deaths resulting from speeding. In 2017 just after one year of introducing this technology, report shows that severe road accidents were tremendously reducing by 21% as affirmed by the new times report (Nshimyumukiza, 2017).

CIP Emmanuel Kabanda, a spokesperson for the Traffic Police, also stated that after the introduction of speed limiters, police have begun on a public awareness campaign aimed at persuading worried drivers of the importance of speed limiters. That came following a spike in traffic accidents in 2014, which resulted in 70 deaths and another 100 hospitalizations, primarily due to speeding. RNP also opted to install speed governors after learning that similar road accidents had occurred elsewhere in the world and that they were having a good effect. Between August 2016 and January 2017, police recorded 541 occurrences in which 25 people have died and 74 were seriously injured. This was before the deployment of speed governors. According to authorities, 424 incidents occurred between February and July 2017, killing 14 people and injuring 54 others. The police concluded that using speed governors was a reliable solution based on these figures. This positive feedback during that time was the statistical results from 3,054 public transport vehicles (59.3%) installed speed governors and 5,430 trucks (80.2(Nshimyumukiza, 2017).

Even though it was reported that speed governor installation resulted in road traffic accidents reduction, there is no evidence that this reduction was direct consequence of speed governor installation in public and commercial trucks because in 2018 speed enforcement both mobile and fixed cameras were also introduced including other deterrence mechanisms across the country. This study intends to establish the contribution of speed governor in reducing road traffic accidents in RN1 road, Kamonyi District.

It is the aforesaid background that has prompted the researcher to deeply investigate the contribution of the use of speed governor in combination with other mechanisms to reduction road traffic accidents in Rwanda, in particular Rwanda National Road 1 in Kamonyi district.

1.2 Statement of the problem

The usage of speed governor in trucks, buses and other heavy vehicles was introduced in order to deter, reduce or mitigate road traffic accidents resulting from over speeding. However, there is a tendency of some drivers complaining about the time spending from departure to the destination in their normal routine activities. Henceforth, some drivers decide to manipulate these technologies for personal gain in order to maximize their profits. We can also not ignore that some drivers whose speed choice is persuaded by the speed of other drivers. This is suspected to be practiced regardless of dynamism of traffic control devices to increase road traffic conditions and improve safety.

In Rwanda, so far nine local companies were given license by Rwanda Utility Regulatory Authority (RURA) to provide speed governor services. Once this device is installed in vehicle, it is the duty and

responsibility of this company to provide 4G internet services to enhance built-in Global Positioning System (GPS) and ensure close remote monitoring of its status. Even though, traffic and road safety department also does monitoring but some cases of speed governors being off are still rampant either caused by internet bundles completed or deliberate removal done by some drivers of which leads to the road accidents.

According to the above concerns, the contributions and consequences that are likely to be brought about by the use of speed governors will relatively produce low effects as a result of reducing speed limits. The use of speed governors in roads traffic management requires further investigation and analysis. Since the inauguration of speed governor in Rwanda in 2016 intended to reduce road traffic accident in Rwanda, there has been no other studies on the speed governor and reduction of road accidents in Rwanda and this shows a gap on the assessment of speed governor and reduction of road traffic accidents due to lack of studies done on this topic and also because all 7 days of the week I used to travel from Kamonyi to Kigali, I have seen many Road traffic accidents in this district. It is therefore the study under review mainly focus on assessment of speed governor and reduction of road traffic accidents in Rwanda the case of RN1 road Kamonyi district. The results of this study will give a more accurate estimations of the safety, mobility and environmental impact associated to speed limit changes in RN1 road of Kamonyi District. The outcomes of this study will help Rwandan law enforcement officials in drafting appropriate laws and regulations to govern the use of speed governors.

1.3 Research objectives

The general objective of this study was to assess the impact of speed governor in reduction of road traffic accidents in RN1 road, Kamonyi District.

1.4 Specific Objectives

1. To assess the impact of speed governor in reduction of road traffic accidents at Kamonyi District RN1 road
2. To identify challenges faced by drivers, companies that supply speed governor in Rwanda and also traffic & road safety department police officers.
3. To identify other factors that contribute to reduction of road traffic accidents in Rwanda, Kamonyi District.

1.5 Research questions

1. What are the impact of speed governor in reduction of road traffic accidents in RN1 road, Kamonyi District?
2. What are the other factors that contribute to reduction in road traffic accidents in Kamonyi District?

1.6 Significance of the study

The results of this study will contribute to the benefits of society considering that speed governor plays a considerable role in road traffic. The most of the drivers of trucks, buses and other heavy vehicles that are compelled to use speed governor do complain for mobility for example travel times, delays and traffic jams. The study will provide enlightenment on the significance gained from lowering speed such as reduction of motor vehicle clashes, reduction of loss of lives and money that can be saved through the use of the above technology.

This study also intends to come up with illustration of statistical contribution of the use of speed governor in vehicles that mainly use RN1 road of Kamonyi District. From this statistic the traffic and road safety department will be able to have a baseline on road accidents for better informed decisions. The study under review suspects a new trend of road accidents whereby there is a shifting from trucks, buses and other heavy vehicles to the small cars due to over speeding. This is the right time for the study to evaluate its validity and come up with recommendations. In Rwanda, there has never been similar study like intended one to indicate the root causes of severe accidents that result from speed governor manipulations. This study will assess the validity of this speculation and also come up with suggestions. Even though, this study provides the significance to the system end users and traffic police department. This study will be beneficial to the body of knowledge because it will open up the room for other similar or slightly different to this study as a baseline.

1.7 Scope and limitation of the study

This study intends to evaluate the contributions of speed governors in road traffic accidents reduction. The focus will be on RN1 road Kamonyi District general area meaning not a specific location or hotspots. Even though road accidents involve different vehicles that are currently not concerned on the use of speed governors but also the new trend of road accident can be observed. It is in this regard that

private or personal vehicles also will be part of the population to provide their insight as far as road accidents and speed limit are concerned. The study will not cover the cyclist and motorcyclists since their accidents do not involve many people at ago. The expected constraints are during data collection whereby some drivers may hesitate to disclose some key information on how they manipulate speed governors and under whose assistance; their time of interaction also might be very limited since are always busy. This study is mostly appropriate in the field of security and development.

1.8 Organization of the work

This study is organized as follows:

Chapter one discuss the general introduction and outlines the study's background, problem statement, research questions, research objectives, significance of the study and the scope and limitation of the study. Chapter two focus to the existing theoretical literature reviews, theories and conceptual framework used to guide the findings.

Chapter three presents the research methodology used and indicates the methodological approaches applied during this study. It outlines the research design, approach, study population and sample size used, data collection techniques, procedures and data analysis including ethical concerns. Chapter four provides the data presentation and analysis. In this chapter, more analysis of the findings based to the research questions are conducted. Hence, chapter five dwells on the discussions of the findings, conclusion as well as recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter intends to present written overview of major writings and other sources of information on contribution of speed governor in reduction of road traffic accidents. Different theories and theoretical frameworks are applied in guiding evaluation in order to support the study under review.

2.1. Definition of key concepts

This section contains the definition of the major concepts of the study under review hence permit the readers to fully understand the study background. The concepts to be defined include but not limited to speed governor, over speeding, mobility, traffic, speed management and reduction of road traffic accident.

2.2. Speed Governor

A speed governor, also called a speed limiter, is an Intelligent Speed Assistance (ISA) device that avoids a vehicle from exceeding speed that has set. This is not the same as cruise control because the vehicle does not maintain a predetermined speed. The driver may continue to use the accelerator, but after the vehicle reaches the desired speed, the speed governor prevents it from going any faster (Buyacar Team, 2021).

In Rwanda speed governor is currently applied to the specific motor vehicles with specific purpose, drivers of these motor vehicles have different needs and behaviors and also the supplier of this solution are different with numerous ambitions. The speed governor primary objective in road traffic accident is to reduce the fatal accidents or minimize the injuries once accident occurs in order to achieve the following:

- Road safeties whereby walkers and passengers onboard feel reassured to arrive to their destinations safely.
- Properties and infrastructure safety which promotes development and country good reputation
- Speed governor can be used to safeguard the engine and the vehicle as the life span of engine reduces always when driving at maximum. It can also be utilized to save fuel because the electronically commutated motors (ECM) manage the fuel injection and prevent the car from driving any faster once the preset speed is reached, even if the driver fully steps on the accelerator.

It is therefore advisable to use speed governors in road traffic accidents reduction but it requires too much attentions on how these devices are used under which conditions and other whose supervisions for better outcomes.

Speed governor also can be referred as a device that limits the rotational speed of an internal combustion engine or protects the engine from damage caused by excessive rotational speed. It is typically installed in specific motor vehicles to prevent or mitigate fatal road accidents that result in significant loss of lives and properties.

2.3. Over speeding

An engine is allowed to turn above its design limit and this is known as over speeding. This could have serious consequences for the engine, since it could cause it to fail or shorten its lifespan. Drivers and passengers are in grave danger when they speed. Walkers and other road users are also put in grave danger as a result of this.

When the speed increases, the chance of a crash and the severity of the crash's effects also increases. It was also noted that 1% increase in mean speed, increases the chance of a fatal crash and severe crash by 4% and 3% respectively. Also, when a car hits with speed from 50 to 65 km/h, the chance of mortality will be 4.5 times compared to walker hit by a car with speed walker hit by car fronts face increases the chance of mortality by 4.5 times. It was noted that mortality rate for car passengers in car-to-car side accidents is 85 % for car at 65 km/h (Eureka Africa, 2021).

2.4. Mobility

Mobility refers to ability to move from one place to another using one or more modes of transportation to meet daily demands. The difference between the design speed and the stated speed limit is known as speed variance. According to the literature on road safety, speed and fatal accidents are highly correlated, as well as the severity of the crash's consequence. According to a research by Elvik and colleagues (2004), walkers hit by a car had a higher risk of serious injury or death, even at very modest speeds. The study also confirmed that one way of preventing road accidents fatalities is reduction of speed. This is considered to be more successful compared to other safety measures like reduction of the number of drivers using alcohol while driving or traveling at night (Elvik et al, 2004).

2.5. Traffic

Vehicle movement is referred to as traffic. This viewpoint believes that travel refers to vehicle travel and that a trip refers to a vehicle trip. It assumes that increasing vehicle mileage and speed is the most effective strategy to improve transportation system quality(Litman, 2011).

2.6. Speed management

Speed management is a proactive strategy that requires drivers to travel at speeds that provide mobility and ensures the safety of their lives. The goal of the road safe agency is to develop a road transportation system that assume and accommodates human mistakes while reducing the danger of death or severe injury. This does not imply that faster speeds are always bad. Reduced travel time save money and grant you more mobility. It is the job and responsibility of road traffic policymakers to balance the advantages with the increased costs of death and injury that may follow, as well as to provide practical recommendations regarding limit speeds to achieve road safety benefits (ITF, 2006).

2.7. Speed Affect Road Traffic Collisions and Injury

The majority of experts in road safety think that improper speed selection by drivers, usually understood as the usage of excessive vehicle speeds, or speeding, is a major contributor to road fatalities worldwide. For many reasons, higher speeds rise the chance of a collision. A driver is more likely to lose vehicle control, fail foresee incoming risks in a timely manner, and lead other road users to underestimate the car's speed. Obviously, traveling at a higher speed increases the distance to be traveled in a certain time, and hence the distance traveled when a driver or rider reacts to a potentially dangerous circumstance on the road ahead increases. Furthermore, the vehicle will stop at long distance if a driver brakes while driving at a higher speed (ITF, 2006).

2.8. Effects of Speed on Crashes and Crash Severity

A considerable dangerous elements in traffic, according to Wegman and Aarts, (2006) is speed, as driving at high speeds result in faster crashes which can cause more severe injuries. When driving at high speed it will be difficult to assimilate and act on information, as well as an increasing braking distance. Due to this, the possibilities of colliding are increased, resulting in a higher crash rate and a greater likelihood of a more harmful outcome.

The report also revealed that increasing speed by 1 km/h is results in 3% risk of a crash with an injury. It was noted that in severe crashes, fatal risk is significantly larger; in such circumstances, a one

kilometer increase in speed increases the chance of serious fatal injury by 5%. When the vehicle is traveling faster than 30 km/h, the human threshold for injury from an automobile will be exceeded. According to the research findings, a walker if is collided with a vehicle with at least speed of 50 km/h, the chance of being killed is at 80%. The same report showed that wear seat belts and drive a well-designed automobile can give security up to 70 km/h in frontal crashes and 50 km/h in most side effects for car occupants (Peden et al, 2004).

2.9. Safety and Mobility

According to the study by Tingvall and Haworth, (1999) on safety and mobility with Vision Zero approach, the loss of human life and health is intolerable, and the road transportation system should be structured to prevent such events. This indicates that, with the exception of health-related environmental issues, safety is a more significant aspect of the road transportation system. As a result, mobility must follow safety and cannot be acquired in a way that harms safety.

According to Vision Zero strategic concepts, the level of violence that the human body can resist without killed or severely injured is the most essential regulatory factor for safe road traffic, and vehicle speed should be established by technical requirements for roads and vehicles. (Tingvall & Haworth, 1999) , (Whitelegg & Haq, 2006).

2.10. Contributing Factors to Over Speeding

Individual drivers over speed has a variety of reasons. Some argue that traveling at greater speeds provides an instant benefit in the form of a reduced journey time in theory, if not in actuality. This benefit is strengthened all the time a driver is driving at speed that exceeds the limit set without facing any consequence. It can be said that higher speed increases the rate of serious and fatal road crashes, and that individual travel conditions can affect a driver's speed selection. As an example, the driver tends to drive faster if the car does not belong to him. When persons are in a hurry, they may choose risky speeds. When drivers and motorcyclists speed for fun, they often claim that they had no idea on the speed limit, necessitating the installation of suitable signage, despite the fact that ignorance is never a defense. According to certain studies, people seek to optimize their level of risk behavior, such as driving faster on safer roads if they believe there would be less enforcement actions while others found that driving at high speed gives them a sense of pleasure or achievement (Dorn, 2019).

2.11. Reduction of Road Traffic Accident

Reduction of road traffic accidents can be referred to the situation whereby occurrences of road traffic accidents within a given period of time have been tremendously decreased as compared with the predetermined period. While various government agencies responsible for road safety have attempted to reduce RTAs through different mechanisms such as the implementation of speed bump zones, steel bar doors, speed limits using marked signs on the road, traffic cameras, improved vehicle technology, and airbags, a more clear vision is required, one that looks to avoid the crash completely (Alonso et al, 2015). According to Australian researcher Taylor, road traffic injuries are anticipated to be the third most common reason for persons being admitted to hospitals by 2020. According to the National Crime Records Bureau, 141,526 people died 477,731 people injured from road accidents in India in 2014. Trucks, buses, and other heavy vehicles were responsible for 27% of road deaths in India in 2013. Speeding has been identified as one of the top three causes of fatalities and crashes on the road around the world. As a result, speed management is a critical strategy for increasing road safety (Archer et al, 2008).

Results from the study conducted by Organization for Economic Co-operation and Development (OECD) based in Paris, the link between vehicle speed and the severity of accident outcomes has been well documented. Speeding comes first among road safety problems in many nations worldwide, according to a large research done by the OECD and the European Conference of Ministers of Transport (ECMT) in 2006, which found that reducing average speeds by 5% may result in a 20% reduction in fatalities (ITF, 2006).

Researchers such as Kloeden & McLean, (2001), Elvik et al, (2009), and Nilsson, (2004) went even further, claiming that reductions in speed can prevent accidents and significantly reduce the severity of those that do happen, especially for vulnerable road users like walkers and cyclists who are common in urban areas.

According to the ISA report (2012), speed is considered as the most critical elements in road traffic accidents since it raises the likelihood of an accident and the severity of the consequence. For example, if a person is hit by a motor vehicle at 30 km/h, the walker is more likely to survive than if the walker is hit at 50 km/h. As a result, faster speeds are associated with a higher accident risk, resulting in a larger likelihood of fatal and serious accidents.

Furthermore, according to Afukaar (2003), speed is among contributing factors in vehicle crashes, still speed reduction can be an adequate way of to prevent traffic crashes in countries with low income.

Lowering limits speed, on the other hand, is ineffectual unless it is supported by resources to make sure that the limitations are followed. Other techniques to reduce speed, like speed bumps and rumble strips, roadways that separate high with low speed users, technology solutions like speed governors, and improved public awareness of the problem, should be considered, according to this research.

It is in this regard that by assumption the usages of speed governors once are well coordinated and closely monitored reduce the road traffic accidents. This means that accidents reduction will always depend on the drivers' behaviors, suppliers of the technology and the close monitoring team from traffic and road safety department. This means that speed governor in reduction of road traffic accidents will always depend on credibility of the people using this technology.

The primary purpose of a speed restriction is to improve road safety, which can be accomplished by either restricting or coordinating functions. The limiting function provides a maximum speed on roads, reducing the likelihood of a collision and the severity of accidents. The coordinating function lowers speed variations on roads, resulting in more consistent traffic flow (Ivan, 2004) and (Chang, 2005).

2.12. Theoretical Framework

Adaptation theory states that humans always try to adjust their behavior to their surroundings. Roadways that are free of any real threats encourage drivers to drive faster and riskier than they would if they had to modify their behavior to other vehicles, walkers, and cyclists. As a result, efforts to make driving safer by removing impediments from the road are thought to be compensated by riskier driving (Molt & Beyrle, 1982).

Deterrence theory also suggests that crime is likely to occur when the expected gain from illegitimate activity is higher than the costs. In reference to the above theories on the concepts of speed governor in reduction of road traffic accidents. It shows that this study will be carried out within speed limit impact deterrence and theory of adaptation which predict that reduction of road accidents will depend upon driver behavior, effective use of speed governor including committed end users. This is especially applicable in the field of road safety, as policymakers and enforcement agencies try to increase public's perception of the assurance, severity, and speed with which those who engage in illegal driving behaviors face punishment. (Davey & Freeman, 2011).

2.13. Conceptual Framework

This study indicates the complexity of road traffic accidents and different impacts that result from its occurrences. Though, most of the time these accidents are influenced by over speeding some other causes are delivered from the nature of the road including mechanical defaults and behaviors of some drivers. The speed at which a vehicle travels has a direct impact on the likelihood of a collision, the severity of injuries sustained, and the likelihood of fatality. Speeding, consumption of alcohol, calmative drugs, weariness, being a young person, having youth people driving in the same vehicle, and travelling in the dark can all contribute to deadly road accidents.

The below figure illustrates the link between independent and dependent variables whereby the use of speed governor and enforcement speed cameras decreases the amount of road accidents that involve the loss of people and properties. The focus of this theoretical and conceptual framework is put on concepts that constitute the two variables from independent variables and three variables from dependent variables.

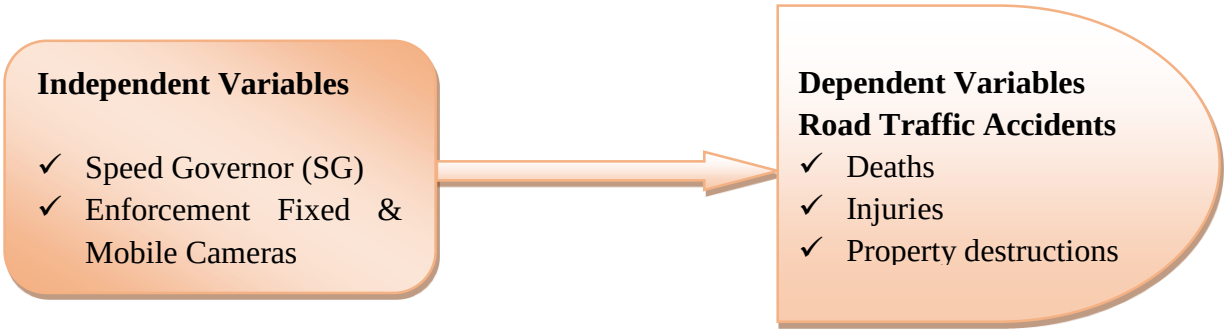


Figure 4: Conceptual Framework

***Source*:** Researcher, 2022

Higher speeds may be tolerated if the road infrastructure and vehicle contact is well-designed and crash-protective, such as with crash beanbags on the sharp edges of roadside barriers. However, with no protective barriers between automobiles and roadside items, most road systems enable far higher speeds. It is unreasonable to believe that all crashes can be avoided based on unpredictable nature of human behavior in a complicated transportation environment. But, if greater consideration was given to the tolerance of human body for harm while constructing the transportation system, there might be significant interests when crashes happens, resulting in fewer major injuries or deaths. Unfortunately, in Kamonyi District RN1 road, most traffic systems, are either not installed to some places and even those installed are not sufficient where as others are not designed on the basis of human tolerance but this can also be achieved by separating cars and walkers by providing enough footways.

2.14. Summary

This chapter discussed the key concepts use by this study and what other researchers said about road traffic accidents and speed governor use. Key concepts discussed include speed governor, over speeding, mobility, traffic, speed management and reduction of road traffic accident. Each of these concepts were explained where different sources for better understanding views of different researches on these concepts and the use of speed governors. Based on results from these sources, all researchers agreed that reduction of speed may result to reduction of road accidents. This chapter also showed that Speed governors and road cameras were considered as independent variables while road accidents were used as dependent variable.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0. Introduction

This section covers the study's overall design, the study setting, the study population, the study design, the study sample and sampling strategy, data collection methods and tools, data analysis, study difficulties and constraints, and ethical considerations.

3.1. Research Design

A descriptive, cross-sectional, non-experimental design was adopted. According to Kate (2006), a cross-sectional study is inexpensive, simple, and quick to perform and estimate the prevalence of the desired outcome because the sample is usually drawn from the entire community. The independent variable cannot be changed in a non-experimental design, and there is no experimental group (Polit & Beck, 2004). The goal of a descriptive study is to observe and describe characteristics of a situation as they occur naturally, and it can also be used to explain the current state of a variable or phenomenon. The study also used quantitative approach. According to Polit and Beck, (2004) is a systematic process for obtaining quantifiable information about words that are transformed into numerical form by statistical calculation. Statistical processes are used to examine the outcomes, and quantitative research findings can be applied to those who aren't participants in the study.

3.2. Study Population

The study population is the subset of the target population available for study (Polit, 2004). This study involved both primary and secondary data whereby primary data through questionnaires were collected from all drivers who meet the criteria set like having driving license category C, D, D1 or E and his or her vehicle must be installed with speed governor and in additions use RN1, Kigali-Butare - Akanyaru (157 Km) through RN1 road Kamonyi District. Apart from drivers, Traffic Police Officers from District Police Unity (DPU) were also part of the respondents, 4 Companies who had managed to supply at least 2000 speed governors and above with license from RURA were also part of the study population, and also staff from RURA who are concerned with day to day use of speed governors in Rwanda. Since, the road traffic accidents involve people injuries, death and property destructions, the study also included some people who were the victims of vehicles over speeding and also in car accident due to over speeding.

3.3. Sampling Techniques and Sample Size Determination

Sample size in quantitative research which refers to the number of subjects or items to be used in a study, it is usually represented by n. The sample size for this study was calculated using Cochran's formula after estimating the number of cars that pass by RN1 road Kamonyi District with speed governors installed hence, it was considered as the study the population. Traffic counts, according to the report from RTDA in 2013, indicates that 20,396.0 were the motor vehicles registered in Rwanda from which 15.825% when round of equal 16% meaning motor vehicle equivalent to 3,227 use road 1 Kamonyi District.

With formula, when you take (3,227 / 20,396) x 100 = 15.821 % when you round of it is 16% of total vehicles that use Kamonyi Distrct. In addition, according to report from Traffic & Road Safety Department and RURA indicates that in Rwanda, 15,212 are motor vehicles installed with speed governors. This report was also confirmed by reports obtained from 9 companies that supply speed governors in Rwanda from which 15.825% which is equal to 16% when round of use RN1 road Kamonyi District. With formula, (15,212 x 15.825) /100 equals 2,407 vehicles which is considered as study population.

The sample size using Cochran's formula is given by

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where n_o is Cochran's sample size recommendation, N is the population size, and n is the new, adjusted simple size.

The formula for n_o is also given by

$$n_0 = \frac{z^2 pq}{e^2}$$

Where

n is the desired sample where population > 1000

z is standard normal deviate (1.96) corresponding to 95% confidence limit.

q= degree of precision usually set at 0.05 and $q = 1 - p$

p is the estimated proportion of an attribute that is present in the population set to 0.05

e is the acceptable margin of error for proportion being estimated set to 0.005

Replacing these values in the formula for n_0 we get

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384$$

From this,

$$n = \frac{384}{1 + \frac{(2407-1)}{2407}} = \frac{384}{\frac{2407+2406}{2407}} = \frac{384 * 2407}{4813} = 192$$

Table 1: Sample Size Derivation

SN	Unit	Category	No of Respondents
1	Public Transport Motorvehicles	Drivers	96
2	Commercial Transport Motorvehicles	Drivers	96
3	Company that supply Speed Governor	Company Boss	4
4	Traffic & Road Safety Department	Staff/Police Officers	3
5	Rwanda Utility Regulatory Authority	Staff	1
6	Witness of Road Traffic Accident due to Vehicle Over speeding	Victims	2
Total			**202**

Source: Researcher, 2022.

Table 1 above illustrates the distribution of respondents to whom primary and secondary data were collected from. As it is shown, the majority of respondents were drivers of public transport vehicles and commercial transport vehicles with a total number of 192 drivers. The sample size for drivers was obtained based on numbers of vehicles with speed governor installed using RN1 road and the total number of vehicles with speed governor installed in the country. As speed governors were installed in public transport vehicles and commercial transport vehicles, the sample size was distributed in a way

that each group of vehicles is represented equally and questionnaires were given to them. Additionally, it was realized that owners of speed governor company may have information on the use of speed governors, challenges that they face in providing these devices as well as providing suggestions on how this service can be improved, four individuals each representing company that supplied at least 2000 speed governors were included in the sample for complementing information from drivers. Apart from company owners, focus group discussions with 3 staff from Traffic & Road Safety Department monitoring speed governor but also who are in charge of road traffic accidents was organized. As RURA plays also a key role in regulating the use of speed governors, one staff from RURA was included in the sample targeting to get his insights on use of speed governor and emerging challenges. Other group of respondents included in the sample was made of 2 witnesses of road traffic accident from Kamonyi District as they may have additional information about road accidents and the use of speed governors.

3.4. Data Collection process

Data collection for this study used online data collection tool called Kobo tool box where tablet was used for collecting data for a period of 5 working days. After getting permission from research ethical committee to conduct data collection, researcher went to the site and meet with authorities and explain to them the purpose of research and request them to meet with participants.

The selection of respondent of this study used a non-probability sampling technique called convenience technique. According to (Lund Research, 2012) this technique on the judgment of the researcher and is based on working with participants who meet a certain criterion but who are easily accessible to the researcher and willing to participate in the study

To make sure that our sample were representative the number of respondents needed from each group were given questionnaires purposively where a small conversation was conducted with respondent to be sure that the selected driver meet criteria which was to have speed governor installed and having driving license category C, D, D1 or E. Questions for this study were answered only by those people meeting these criteriors and agreed to be involved in the research after a brief introduction to the study and why their answers are very important to this study. To ensure confidentiality, no participants' names and address was on the questionnaire and participants had right to withdraw from the study anytime.

3.5. Validity and Reliability

In order to test validity of the instruments questionnaire was translated from English into Kinyarwanda language, 2 persons who are fluent in both languages translated the questionnaires and double check was done together with the researcher.

3.6. Data Analysis and Interpretation

The data that were collected through questionnaires was analyzed and interpreted through SPSS Version 24 and presented in the form of tables and figures while secondary data for road accidents was analyzed using SPSS version 24 also but presented in the form of tables for statistical tests performed to achieve the study's objectives.

For data obtained from respondents through questionnaire, specifically those asking respondents views on road accidents, descriptive statistics tables were used for analysis. For secondary data analysis, paired sample t-test was used. The null hypothesis for this test was that the mean number of road accident before the use of speed governor is the same as the mean number of accident after speed governor while the alternative hypothesis was that mean number of road accident were different before and after speed governor. As the test required normally distributed data, Wilk normality test with null hypothesis that data are normally distributed was used to ensure accuracy of paired sample t-test results. To make conclusion of rejecting null hypotheses for all these test, printed p-value was compared with 0.05 level of significance where a p-value less than this value implies rejection of null hypothesis in favor of alternative hypothesis.

3.7. Study Limitation

Lack of current research related to this topic, it is difficult to define accident hotspots of Kamonyi district RN1 road and motor vehicles from a given company are not operating from permanent direction hence affect empirical data in interpreting the challenges frequently faced, including motilities because they keep rotating. Other limitations for a researcher were time and financial constraints to look for different sources of information available and increase sample size that represent entire population.

3.8. Summary

This chapter discussed the methodology used by this study to achieve study's objectives. The study was conducted in Kamonyi District specifically RN1road to assess the impact of speed governor use on road traffic accidents. Regarding study design, the study adopted descriptive, cross-sectional, non-experimental design as the best design to be used. The study used both primary and secondary data type. Primary data collected was collected from drivers of public transport cars and cargo commercial transport cars with speed governors installed. Secondary data were records on monthly road accidents occurred in RN1road in Kamonyi district from the year 2010 January to 2021 December. It used 2,407 cars that are assumed to use RN1road with speed governors installed as population. The sample size was calculated and found to be 192 cars which was distributed equally for public transport and cargo commercial transport cars and this implies that 96 drivers of cargo and 96 drivers of public transport cars were included in the study. Data collected were analysed using SPSS software and results were presented in the form of tables where paired sample t-test was used to evaluate the impact of using speed governor on road traffic accidents.

CHAPTER FOUR: DATA ANALYSIS

4.0. Introduction

This chapter presents results obtained after analyzing the data for this study. As the study analyzed both quantitative and qualitative data, results were presented in the form of statistical tests tables as well as frequency tables.

This section provides results obtained by performing paired sample t-test.

Table 2: Descriptive statistics of road accidents

Period	Count	Min	Max	Mean	Standard Deviation
Before_Speed_Governor (2010-2016)	6	162.00	186.00	174.83	9.02
After_Speed_Governor (2016-2021)	6	119.00	141.00	131.67	7.94

Source: Secondary Data, 2022

Table 2 illustrates summary statistics of yearly road accidents in Kamonyi District whereby from 2010 to 2015 (before using speed governors) and from 2016 to 2021 (after using speed governors). Results from the table show that on average the number of road accidents decreased after the introduction of speed governors. Additionally, based on values of standard deviations of road accidents in the two time periods, it can be seen that variability in number of accidents is higher before speed governor compared to the period after speed governor. The higher variability before speed governor implies may be due to due to the lack of effective policies for regulating road accidents.

Although descriptive statistics from Table 2 reveal that the number of road accidents before using speed governors is higher than the mean road accidents after the use of speed governors, a statistical test is needed to make sure that the difference is statistically significant. As the test may be either parametric or non-parametric, a test for normality is need to know which one should be used. These findings, can also not conclude that the significance impact was a result from the use of speed governor only, because in 2018 traffic police also introduced speed enforcement cameras including other mechanisms across the country and Kamonyi District inclusive of which the researcher believe to have had a positive contribution in reduction of road traffic accidents.

Table 3: Test of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Before_Speed_Governor	.178	6	.200*	.964	6	.849
After_Speed_Governor	.133	6	.200*	.971	6	.899

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: Secondary Data, 2022

This test was conducted to check whether the data used are normally distributed or not. The null hypothesis for this test was that the data are normally distributed. Conclusion for this test on whether the null hypothesis would be rejected was taken based on values under Sig. column (p-values). Based on results from this table, p-values of Shapiro-Wilk for before speed governor and after speed governor are all greater than significance level of 0.05. This implies a 95% confidence that our data can fit the proposed test as the null hypothesis that data are normally distributed is accepted and the key requirement for paired sample t-test.

Table 4: Paired sample t-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before_Speed_Governor - After_Speed_Governor	43.16667	6.08002	2.48216	36.78607	49.54726	17.391	5	.000

Source: Secondary Data, 2022

Test of normality of the data presented in Table 3 confirmed that parametric test (paired sample t-test) in this case can be used to know whether the effect of speed governor is statistically significant. The null hypothesis of paired sample t-test was that there is no significant difference in mean road accidents before and after using speed governors while alternative hypothesis is that there is a significant difference in mean road accidents before and after using speed governors. Based on results presented in Table 4, the p-value is highly less than the significance level of 0.05 which also give 95% confidence

of rejecting null hypothesis that speed governors have no impact on road accidents. Based on these results, a conclusion that a significance difference in mean number of road accidents before and after using speed governor exist can be made. This conclusion is in line with the expected results from the use of speed governors in reducing road accidents.

In addition to the analysis of road traffic accident data from Kamonyi District, the study analyzed responses from questionnaires to confirm and complement information obtained from quantitative analysis of road accident data.

The following is a table showing demographic information of respondents. Based on the table, all

Table 5: Demographic information of respondents

		Frequency	Percent
Sex	Male	190	100
	Female	0	0
Age	16-24	1	0.5
	25-30	16	8.4
	30-35	30	15.8
	35-40	46	24.2
	40-Above	97	51.1
Years of experience	1-3	2	1.1
	3-5	11	5.8
	5-10	60	31.7
	10-Above	116	61.4

Source: Primary Data, 2022

Table 5, presents demographic information of respondents. The table reveals that all respondents were male, and that most of them were 30 years old and above. Additionally, the table reveals that a higher number of respondents are experienced with 10 years of experience and others with 5 years of experience. This ensures ensures that information obtained is accurate as it was obtained from experienced people who has both experiences use of road with and without speed governors. Hence, can easily know the major contributing factor of road traffic accidents in Kamonyi District.

Table 6: Types of sim cards used in speed governors and types of internet

		Frequency	Percent
What type of SIM CARD do you install in speed governor?	MTN	179	94.2
	AIRTEL	11	5.8
	TIGO	0	0
What type of internet do you use?	2G	0	0
	3G	190	100
	4G	0	0

Source: Primary Data, 2022

Table 6 provides information on the type of sim card and type of internet used in speed governors for interviewed drivers. According to the results, MTN sim card is most used compared to airtel and Tigo. Also it can be seen that 3 G is the only internet that is being used in speed governors. From this information, it can be said that if MTN fails to provide internet accurately, speed governor usage would face problems. In addition to the above, the research findings show that some drivers load the internet bundle at their discretion whereas most drivers are done by the speed governor companies. For the drivers loading at their own, it is a big challenge because they do not have a platform to monitor when to load or not therefore find themselves most of the time their speed governor not able to be localized through GPS thus find themselves punished.

Table 7: Answers on shortage of internet bundles

		Frequency	Percent
Have you experienced a shortage of internet bundle in your speed governor?	Yes, very often (Every week)	17	9
	Yes, sometimes (Once a month)	124	65.5
	Never	9	4.8
	I don't know	39	20.6

Source: Primary Data, 2022

This table provide information on whether respondents faced with shortage of internet. Results presented reveal that a higher proportion of drivers sometimes experienced a shortage of internet. While others did not know whether they experienced this problem. This may result from the fact that some of the drivers do not know how speed governors work and this may be a serious issue on achieving the goal of speed governor. From this, it will be good if drivers are given general briefings on how speed

governor works, benefits and expected punishment to those who jeopardize with the use of these devices. This is because the proportion of those who don't know when and how to test if internet bundle is finished can never be ignored otherwise no ignorance to the law.

Table 8: Other factors that can reduce road accidents

		Frequency	Percent
Do you think daily vehicle inspection by driver prevent road accident?	Strongly Agreed	178	94.2
	Agreed	10	5.3
	Neutral	1	0.5
	Disagreed	0	0.0
	Strongly Disagreed	0	0.0
Do you agree that adherence to road sign posts reduce road accident?	Strongly Agreed	160	84.2
	Agreed	27	14.2
	Neutral	3	1.6
	Disagreed	0	0.0
	Strongly Disagreed	0	0.0
Do you agree that traffic enforcement cameras reduce traffic road accidents?	Strongly Agreed	176	92.6
	Agreed	10	5.3
	Neutral	4	2.1
	Disagreed	0	0.0
	Strongly Disagreed	0	0.0
Do you agree that regular vehicle control inspection reduce road accident?	Strongly Agreed	168	88.4
	Agreed	19	10.0
	Neutral	3	1.6
	Disagreed	0	0.0

	Strongly Disagreed	0	0.0

Source: Primary Data, 2022

Table presents responses on questions on respondent's views on other possible factors that can contribute to reduction of road traffic accidents. Based on research findings, it shows that from the drivers a big percentage is aware that apart from the use of speed governor, there are some other factors that contribute to reduction of road traffic accidents like vehicle inspection, adherence to road signs and regular vehicle control. In addition to the above, almost everyone knows that traffic police deployed traffic enforcement cameras across in order to reduce the speed choice hence, contribute to reduction of road accidents. Based on this results, it can be said that even if speed governor can help in reducing road accident but these elements also should be put into consideration in order to get accurate results. It is therefore, the duties and responsibilities to both government and private sector ensure the underlying policies put in place to deter and reduce road accidents are well observed because when accidents are reduced, security in a country can take place including socio economic activities can be guaranteed to everyone. For instance, when an accident occurs lives of people perish, insurance companies spend a lot of money and hospital are overwhelming in supporting those injuries and end up paralyzing other medical services. We cannot also ignore properties destructions due to road accidents and loss of manpower of people who have to follow accident cases in justice, just to mention but few.

Table 9: Respondents views on speed and accidents

		Frequency	Percent
Do you think the use of minimum speed prevent road accidents?	Strongly Agreed	154	81.1
	Agreed	28	14.7
	Neutral	8	4.2
	Disagreed	0	0.0
	Strongly Disagreed	0	0.0
Do you think speed governor reduce road accident?	Strongly Agreed	173	91.1
	Agreed	14	7.4

	Neutral	3	1.6
	Disagreed	0	0.0
	Strongly Disagreed	0	0.0

Source: Primary Data, 2022

Results from quantitative analysis revealed that the effect of speed governor in reduction of road traffic accidents is significant. This can be shown by the big percentage of the respondents who are truly aware that minimum speed can help in reducing road accidents. This can only be achieved if all drivers adhere and effectively use speed governors including other policies that the traffic and road safety department has put in place to combat over speeding in order to reduce accidents in Kamonyi District and elsewhere in the country. However, the research findings indicate that some drivers are becoming the victims of speed governors because whenever speed governor is not monitored in real time from the Police Traffic or RURA or when driver is caught up with speed governor not working even if the root cause is hardware or network coverage issues, the automatic assumption is that the device was deliberately disconnected. Hence, compelled to pay a fine of 200,000Frw and yet under normal circumstances speed violation or over speeding above 60km/h or beyond 80km/h fine is 25,000Frw or 50,000Frw respectively. It is therefore, paramount that Traffic and Road Safety Department together with RURA harmonize this punishment and establish a national policy on the use of speed governor in Rwanda.

After analyzing responses from drivers, answers from representatives of companies providing these speed governors were also analyzed. First, table presenting basic descriptive information of the company including names of companies participated in this study, type of speed governor they provide as well their experience was presented.

Table 10: Speed governor provider company information

Name of Company	Type of speed governor it provides	Experience
Pascar tech	Speed governor with recorder	5 years and above
Kensrin ltd	Rescoe speed governor	5 years and above
Benocars	Offline	5 years and above

Sator	SPG001	5 years and above

Source: Primary Data, 2022

Table 10, presents information about companies participated in the study. It is seen that four companies answered questions. It is also seen that each company provides its specific type of speed governor with all having the experience of five years and above. This ensures that information obtained from them was accurate as they have experience. The information obtained from the findings also indicated that there is a big problem and misunderstandings within the supplier companies whereby some companies provide a very strong devices and expensive whereas other companies deliver weak devices with cheap price. Hence, some companies started stealing from other companies especially those who offer weak product stealing from those with strong and expensive speed governors. This issue was mainly conducted from garage and orchestrated by some technicians from speed governor Supplier Company. The researcher was informed that this issue was escalated to RURA and traffic police and amicably sorted out with blame on wrong practices. However, there is a need to harmonize the technical specifications of speed governor to be applied as a policy in Rwanda.

Table 11: Respondent views on Speed governor and internet bundles

		Frequency	Percent
Have you experienced a shortage of internet bundle in your speed governors?	Yes, very often (Every week)	0	0.0
	Yes, sometimes (Once a month)	3	75.0
	Never	1	25.0
Do you agree with people stating that lack of internet bundles to activate GPS the driver's/ car owner pays consequences?	Strongly Agreed	1	25.0
	Agreed	2	50.0
	Neutral	1	25.0
	Disagreed	0	0.0
	Strongly Disagreed	0	0.0

Source: Primary Data, 2022

Table 11 above shows answers from respondents on whether they experienced shortage of internet bundles and whether they agree with people who say that drivers pay consequences in case of internet shortage. Based on results, three out of four companies faced internet shortage problems. In addition to this, results show that lack of internet affect drivers. Based on this results, it can be said that regular checking of internet would be good and that it would be good if there is a way of identifying the cause of a speed governor not working so that drivers will not be affected by this. Since, the shortage of internet affect car owner or driver and yet have no platform to monitor how much internet bundles remain. The researcher was informed that the best option to tackle this issue is to have a contract with supplier of the speed governor takes care of internet as a single package. At least the company can work with telecom companies and harmonize this constraint.

Table 12: Respondents Views on misuse of speed governors

		Frequency	Percent
Do you agree with people stating that some drivers deliberately disconnect speed governor?	Strongly Agreed	1	25.0
	Agreed	2	50.0
	Neutral	0	0.0
	Disagreed	1	25.0
	Strongly Disagreed	0	0.0
Do you agree with people stating that some drivers deliberately disconnect speed governor through the help of technicians from supplying company?	Strongly Agreed	0	0.0
	Agreed	2	50.0
	Neutral	1	25.0
	Disagreed	0	0.0
	Strongly Disagreed	1	25.0

Source: Primary Data, 2022

This table shows respondents views on whether drivers can disconnect speed governors purposively in order to maximize time on their own and by the help of company's technicians. Results from the table, show that it may be that drivers deliberately disconnect speed governors and that some of company's technicians help drivers to disconnect speed governors. This malpractice must be discouraged otherwise the policy of use speed governor in reduction of road traffic accidents may not be achieved. Though, not all drivers were ready to provide their opinions on this malpractice but those who interacted with a researcher requested that police and RURA must be strict on those who abuse the use of this technology because when accident occurs affect almost everyone.

4.1 Challenges in Installing Speed Governors

When asked about challenges that companies face in installing speed governors, insufficient stock, absence of policy regulating speed governor, Telecom operators not covering entire country and misunderstanding with traffic police on field were among challenges that companies face. After mentioning these challenges, respondents were asked to provide advice on effective use of speed governors. They suggested that team work, regular sensitization to car owners and drivers on the importance of using speed governors, playing role as required to everyone concerned as well as having regulation of speed governor would help. In addition to this, based on question asking support they need from RNP/RURA, it was noted that good communication, regulation of fines, effective way of monitoring speed governors as well as effective collaboration are needed for better use of speed governors. Some companies were supporting idea of developing a singles monitoring platform that comprise all companies then share an application programming interface (API) such that a company can still monitor its platform. This platform can convenience companies supplying speed governor as well as traffic police and RURA to monitor the situation from single platform not 9 standalone interfaces.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0. Introduction

This chapter highlights the study's findings and finishes with recommendations for future improvements in terms of the speed governor's role in reducing road traffic accidents. The section includes a crucial discussion, conclusion, and practical recommendations which may attract future researchers on this subject.

5.1. Summary of findings

The general objective of this study was to assess the effect of speed governor on the reduction of road traffic accidents in Rwanda, the case of RN1 road in Kamonyi district. The study used two types of data, quantitative and qualitative data. The quantitative analysis started by describing data of road accidents in Kamonyi District RN1 road from 2010 to 2016 and from 2016 to 2021 separately which were considered as periods before and after the use of speed governors respectively. Descriptive statistics showed that the yearly number of accidents before speed governors was higher compared to the number after the use of speed governors where the maximum number before and after speed governors was 186 and 141 respectively. Also, results showed that the yearly average number of accidents before and after speed governor was 174.83 and 131.67 respectively. The reduction in the number of road accidents in the period after speed governors may result from different government policies aimed at reducing road accidents including speed governor usage.

Results from paired sample test aimed at testing whether the effect of speed governors in reducing road accidents is statistically significant showed that the mean of differences in road accidents before and after speed governor is 43.17 which is positive and significant based on a p-value which was 0.000. This is an indication that there is a significant difference in mean road accidents before and after speed governor use. That is, after speed governor use, the number of road traffic accidents reduced significantly.

The results obtained from the analysis of questionnaires for both drivers and companies confirmed results obtained from the quantitative analysis that speed governor contributes to the reduction of road accidents. Results showed that 95.8 % agreed that minimum speed can help in reducing road accidents while 98.5% agreed that speed governor can reduce road accidents.

In addition to this, questionnaire analysis showed that other factors like vehicle inspection, adherence to road signs, traffic enforcement cameras, and regular vehicle control can contribute to the reduction of road accidents. Also, the analysis of questionnaires revealed that there are some challenges in using speed governors like internet connection which does not work in some regions and the possibility of some drivers who deliberately disconnect speed governors helped with speed governor provider companies.

The results obtained in this study are in line with results obtained from other researchers who tried to do research in this field. The study by Elvik et al., (2004) showed that speed and road safety are statistically related. He added that the decrease in speed results in a reduction in accidents and the severity of injuries.

The relationship between speed and road accidents also was noted by Buyacar Team, (2021) where it was said that as driving speeds on a road increase, the crash rate increases as well. According to PAHO, (2018) speeding is widely acknowledged as the most serious of the traffic violations, and speed control policies and initiatives play a critical part in an attempts to enhance road safety indicators. Furthermore, Hydén, (2020) stated that even little reductions in travel speed result in large reductions in traffic injuries and deaths.

5.2. Conclusion

Based to the research findings analyzed through both qualitative and quantitative methods indicates that speed governor plays a pertinent contribution in road traffic accidents reductions. When road accidents are minimized citizen will be safe and gain confidence on their security when traveling by cars. The use of speed governor as a policy contribute also a lot on socio economic development of a country since the money spent by insurance companies in accidents can be channeled in other developmental sectors. Apart from this, when accident occur people perish and properties are also destroyed, it is the reasons why every stakeholder into this policy must ensure the intended objectives are met. However, this IT solution cannot work alone but rather requires other joint solutions like speed enforcement cameras, regular car inspections and adherence of drivers to the sign posts dispatched across the roads. In addition, continuous sensitization awareness campaign to the road users is a key paramount because some road accidents are driven by the road users' behaviors especially drink and drive, driving under influence of others, alcohol or pressure of the car bosses. This plays a key role in deterrence of accidents because research indicates that even if the vehicle is in good

conditions but driver's behavior and attitudes towards road use will remain negatively contribute to the road traffic accidents.

Deterrence and mitigation of road traffic accidents requires joint efforts with different actors like those that are concerned to road maintenance, upgrade of road sign post, office responsible to issue driving license including provision of examination test to those that needs to use roads, and amendment of law that govern the road traffic usage. Private companies' role can also not be ignored because they provide IT solutions that support and influence driving behaviors to some drivers like speed governors and traffic enforcement cameras that contribute a lot in reduction of traffic road accidents. These IT solutions are mainly supported and enabled by the telecom companies, this helps real time monitoring driver's driving behavior hence reduce accidents.

5.3. Recommendations

Traffic road accidents prevention and reduction is a complex phenomenon which requires joint efforts from different actors both government and private sectors. However, as far as road accident is concerned Rwanda National Police, Ministry of infrastructure, Rwanda Utility Regulatory Agency and private sector plays a significant role but each entity can have a specific task to coordinate.

It is therefore the researcher recommend the department of Traffic and Road Safety (T&RS) to harmonize the use of speed governors, develop a road traffic accident database and jointly cooperation with RURA

It is also recommended to RURA develop a policy that govern the use of speed governor in Rwanda including the punishment to those that compromise on the use of this technology.

RURA also should harmonize, distinguish and segregate the roles and responsibilities of each entity as far as network connectivity is concerned.

The ministry of infrastructure together with RTDA are recommended to ensure roads are revisited and upgraded to accommodate both motor vehicles and pedestrians. In addition, where possible RN1 road or Rwanda National road 1 to be doubled by increasing lanes from one to at least two.

Traffic and Road Safety Department also is recommended to conduct further studies on the new trend of accidents whereby there is a shift from vehicles with speed governors to small or private cars.

REFERENCES

Afukaar, F. . (2003). Speed control in developing countries: issues, challenges and opportunities in reducing road traffic injuries. *Injury Control and Safety Promotion*, *10*(1–2), 77–81.

Albalate, & F. (2019). Congestion, road safety, and the effectiveness of public policies in urban areas.

Alonso, A., Monzón, A., Indicators, R. C.-E., & 2015, undefined. (n.d.). Comparative analysis of passenger transport sustainability in European cities. *Elsevier*. Retrieved April 11, 2022,

Archer, J., Fotheringham, N., Symmons, M., & Corben, B. (2008). *The impact of lowered speed limits in urban/metropolitan areas*.

Bluman, A. G. (2009). *Approach, Elementary statistics: A step by step* (8th ed.). McGraw Hill.

Buyacar Team. (2021). *What is a speed limiter? | BuyaCar*.

Chang, L.-L. (2005). Analysis of freeway accident frequencies: negative binomial regression versus artificial neural network. *Safety Science*, *43*(8), 541–557.

Davey, J., & Freeman, J. E. (2011). Improving road safety through deterrence-based initiatives: A review of research. *Sultan Qaboos University Medical Journal*, *11*(1), 29.

Dilmore, J. H. (2005). *Implementation strategies for real-time traffic safety improvements on urban freeways*.

Dorn, L. (2019). *Why do people speed?* https://www.ageas.co.uk/solved/road-safety/why-do-people-speed/. accessed on 15th April 2022.

Elvik, R., Vaa, T., Hoye, A. &Sorensen, M. (2009). The Contribution of Research to Road Safety Policy-Making. *The Handbook of Road Safety Measures*, 117–141.

Elvik, R, Christensen, P., & Amundsen, A. (2004). *Speed and road accidents: an evaluation of the Power Model*.

Elvik, Rune, Christensen, P., & Amundsen, A. (2004). Speed and road accidents: An evaluation of the Power Model. *TOI Report 740*, *740*(December), 134.

Eureka Africa. (2021). *Eureka Africa, Author at Eureka Africa Blog*.

https://www.eurekaafricablog.com/author/admin/. Accessed on 17th May 2022.

Glen, S. (2020). *T Test (Student's T-Test): Definition and Examples - Statistics How To*. https://www.statisticshowto.com/probability-and-statistics/t-test/. Accessed on 10th May 2022.

Gopalakrishnan, S. (2012). A public health perspective of road traffic accidents. *Journal of Family Medicine and Primary Care*, *1*(2), 144.

Hydén, C. (2020). Speed in a high-speed society. *International Journal of Injury Control and Safety Promotion*, *27*(1), 44–50.

Isa, I. S. A. (2012). *SWOV Fact sheet The relation between speed and crashes*. *April*, 5.

ITF. (2006). *Speed Management*.

Ivan, J. N. (2004). New approach for including traffic volumes in crash rate analysis and forecasting. *Transportation Research Record*, *1897*, 134–141.

Kamonyi District. (2018). *" A bright land of horticulture and quarries ."*

Kate, L. A. (2006). Study design III: Cross-sectional studies. Evidence-based dentistry. *Nature.Com*, *7*(1), 24–25.

Kloeden, C., & McLean, A. (2001). Travelling speed and the risk of crash involvement volume 2-case and reconstruction details. *Raru.Adelaide.Edu.Au*.

Litman, T. (2011). Measuring Transportation Traffic, Mobility and Accessibility. *ITE Journal (Institute of Transportation Engineers)*, *73*(10), 28–32.

MOLT, W., & Beyrle, H. (1982). AN ADAPTIVE THEORY OF ROAD SAFETY. *Institute for Road Safety Research SWOV*.

Ncube, M. (2013). *Mortality in Africa: The Share of Road Traffic Fatalities*.

Nilsson, G. (2004). *Traffic safety dimensions and the power model to describe the effect of speed on safety*.

Niyonsenga, D. (2012). *Assessing public transport supply for Kigali, Rwanda*. http://essay.utwente.nl/84857/1/niyonsenga.pdf. Accessed on 12th April 2022.

Nshimyumukiza, J. (2017). *Speed governors have reduced traffic accidents, says Police | The New*

Times | Rwanda. Nshimyumukiza Janvier. https://www.newtimes.co.rw/section/read/219177. Accessed on 7th May 2022.

Nshutiyukuri, C., Bhengu, B. R., & Gishoma, D. (2020). An assessment of Nurses' knowledge, attitude and practice of emergency care related to road traffic accident victims at three selected hospitals in Rwanda. *African Journal of Emergency Medicine*, *10*(3), 127–131.

PAHO. (2018). Speed and road crashes. In *Regional office for the World Health Organization Americas*.

Peden, M., Scurfield, R., Sleet, D., Mathers, C., & Jarawan, E. (2004). *World report on road traffic injury prevention*.

Polit, D., & Beck, C. (2004). *Nursing research: Principles and methods*. https://books.google.com/books?hl=en&lr=&id=5g6VttYWnjUC&oi=fnd&pg=PA3&dq=Nursing+Research,+Principles+and+Methods+&ots=_0kUtIpkxF&sig=QlTiP-yifX-0EN3rh5UK1olsUfg. Accessed on 2nd May 2022.

Racioppi, F., Eriksson, L., Tingvall, C., & Villaveces, A. (2004). Preventing road traffic injury: a public health perspective for europe. *World Health Organization*, 9–79.

Rollason, W. (2017). Youth, presence and agency: the case of Kigali's motari. *Journal of Youth Studies*, *20*(10), 1277–1294.

RTDA, (2013). *Consultancy services for traffic count survey on national paved roads in 2013*, 22-24.

Tingvall, C., & Haworth, N. (1999). Vision Zero-An ethical approach to safety and mobility. In *In 6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000*.

Warner, H. W. (2006). *Factors influencing drivers' speeding behaviour*.

Wegman, F., & Aarts, L. (2006). *Advancing sustainable safety: National Road Safety Outlook for 2005-2020.*

Whitelegg, J., & Haq, G. (2006). *Vision Zero: Adopting a target of zero for road traffic fatalities and serious injuries*.

WHO. (2018). *Global status report on road safety 2018: summary*. https://apps.who.int/iris/bitstream/handle/10665/277370/WHO-NMH-NVI-18.20-eng.pdf.

ANNEX "A"

RWANDA NATIONAL POLICE

Musanze, 16 Dec 21

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TO WHOM IT MAY CONCERN

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Any assistance rendered to him in this regard is highly valued by the College.

R MUJIJI
CP
COMMANDANT

ANNEX "B"

GUIDE TO INTERVIEW QUESTIONNAIRE FOR DRIVERS

Discussion Topic:

NAME OF DRIVER

Q1: Sex

A. Male
B. Female

Q2: Age

A. 16-24
B. 25-30
C. 30-35
D. 35-40
E. 40- Above

Q3: Year of experience

A. 1-3
B. 3-5
C. 5-10
D. 10-Above

Q4: Status

A. Single
B. Married
C. Divorce
D. Widow

Q5: Level of Education

A. Primary
B. Secondary
C. University

Q6: Type of vehicle

A. Minibus (15 passengers)
B. Bus (30 passengers)
C. Bus (60 passengers)
D. Lorry (3-5 tons)
E. Lorry (5-20 tons)
F. Trailer vehicle

Q7: Does your vehicle have speed governor?

1 yes 0 no

Q8: when did you install speed governor in your vehicle?

A. 2016
B. 2017
C. 2018
D. 2019
E. 2020
F. 2021
G. 2022

Q9: Which type of speed governor do you have (Mechanical and Electronic)

A. Mechanical Centrifugal
B. Power Assisted
C. Hydraulic Governor
D. Pneumatic Governor
E. Electromechanical Governor
F. Electronic Governor

Q10: What type of SIM CARD do you install in speed governor

A. MTN
B. Airtel
C. Tigo

Q11: What type of internet do you use

A. 2G
B. 3G
C. 4G

Q12: Who is responsible to load internet bundle

A. Company
B. Car owner

Q13: How often do you load internet bundles to your speed governor

A. Every week
B. Every month
C. Every quota of year
D. Once a year

Q14: Have you experienced a shortage of internet bundle in your speed governor

A. Yes, very often (Every week)
B. Yes, sometimes (Once a month)
C. Never

Q15: What do you do when runs out of internet bundles

A. Inform company
B. Inform car owner
C. Load new internet bundles
D. None of the above

Q16: Which mechanism do you apply in ensuring internet bundle does not finished

A. Through regular monitoring

B. Calls to the company
C. By assumption
D. None

Q17: have you had a road accident with this vehicle

E. Yes
F. No

Q18: if yes what was the root cause

A. Over speeding
B. Mechanical default
C. Fatigue
D. Violation of rules
E. Drunken Driving.
F. Distractions to Driver.
G. Avoiding Safety Gears like Seat belts
H. Non-adherence to lane driving and overtaking in a wrong manner
I. Inherent Hazards or Nature of Job

Q19: Do you think daily vehicle inspection by driver prevent road accident

E. Strongly Agreed
F. Agreed
G. Neutral
H. Disagree
I. Strongly disagreed

Q20: Do you think the use of minimum speed prevent road accidents

A. Strongly Agreed
B. Agreed
C. Neutral
D. Disagree
E. Strongly disagreed

Q21: Do you agree that adherence to road sign posts reduce road accident

A. Strongly Agreed
B. Agreed
C. Neutral
D. Disagree
E. Strongly disagreed

Q22: Do you agree that traffic enforcement cameras reduce traffic road accidents?

A. Strongly Agreed
B. Agreed
C. Neutral
D. Disagree
E. Strongly disagreed

Q23: Do you agree that regular vehicle control inspection reduce road accident

A. Strongly Agreed
B. Agreed
C. Neutral
D. Disagree
E. Strongly disagreed

Q24: Do you think speed governor reduce road accident

A. Strongly Agreed
B. Agreed
C. Neutral
D. Disagree
E. Strongly disagreed

Q25: Do you agree with people stating that drivers deliberately disconnect speed governor

A. Strongly Agreed
B. Agreed

C. Neutral
D. Disagree
E. Strongly disagreed

Q26: What could be the reasons why drivers deliberately disconnect speed governor

A. To minimize travel time
B. Avoid engine damage
C. Avoid traffic jam
D. Passengers pressure on driver
E. Vehicle Bosses pressure
F. Shutdown engine. Hence, accident
G. No point mort 61km/h shutdown

Q27: What challenges do you encounter in use of speed governor

A. Unwanted traffic fines
B. Absence of policy regulating speed governor
C. Delay technical support on speed governor
D. Misunderstanding with traffic police on field
E. Speed governor self-disconnection

Q28: What is your advice on use of speed governor

GUIDE TO INTERVIEW QUESTIONNAIRE FOR COMPANY

Company Name

Company Respondent

Status

A. Male
B. Female

Q1: What is your experience in supplying speed governor

E. 1-3

F. 3-5

G. 5-Above

Q2: Which type of speed governor do you supply and why

G. Mechanical Centrifugal

H. Power Assisted

I. Hydraulic Governor

J. Pneumatic Governor

K. Electromechanical Governor

L. Electronic Governor

Q3: Which type of vehicles do you install your speed governor

G. Minibus (15 passengers)

H. Bus (30 passengers)

I. Bus (60 passengers)

J. Lorry (3-5 tons)

K. Lorry (5-20 tons)

L. Trailer vehicle

Q4: How many speed governors have you installed for the last two years

H. < 100

I. 100-500

J. 500-1000

K. 1000- Above

Q5: What type of SIM CARD do you install in speed governor

D. MTN

E. Airtel

F. Tigo

Q6: What type of internet do you use

D. 2G

E. 3G

F. 4G

Q7: Have you experience network coverage

A. Yes
B. No

Q8: If yes what do you do

A. Report to RNP/RURA
B. Info Telecom Companies
C. Keep quite
D. Info Vehicle owner

Q9: Who is responsible to load internet bundle

C. Company
D. Car owner

Q10: How often do you load internet bundles to your speed governor

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Q19: What challenges do you encounter in installing speed governor

A. Insufficient stock

B. Absence of policy regulating speed governor

C. Telecom operators not covering entire country

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Q20: What is your advice on effectiveness of use of speed governor

Q21: What support do you need from RNP/RURA

ANNEX "A"

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Elie Kubwimana

ORIGINALITY REPORT

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