THESIS ID: CEET/HEM/2012-13/4033

SPATIAL VARIATION OF VEHICULAR ROAD ACCIDENT IN KIGALI CITY

A THESIS

Submitted by

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Under the guidance of

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Submitted in partial fulfilment of the requirements for the award of

MASTER OF SCIENCE DEGREE IN

HIGHWAY ENGINEERING AND MANAGEMENT



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November, 2014

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This is to certify that the Thesis Work entitled **"SPATIAL VARIATION OF VEHICULAR ROAD ACCIDENT IN KIGALI CITY"** is a record of the original bonifide work done by **Theoneste BUREGEYA (Reg. No: PG20134033)** in partial fulfilment of the requirement for the award of Master of Science Degree in Highway Engineering and Management of College of Science and Technology during the academic year 2012-2014.

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I hereby declare that the thesis entitled **"SPATIAL VARIATION OF VEHICULAR ROAD ACCIDENT IN KIGALI CITY"** submitted for the Degree of Master of Science is my original work and the thesis has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship of similar other titles. It has not been submitted to any other University or Institution for the award of any Degree or Diploma.

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DEDICATION

To Almighty God

To my mother

To all my families and friends

To all fascinated Architects and Civil Engineers

ACKNOWLEDGMENTS

My sincere gratitude goes to my research project supervisor Associate Professor Jennaro ODOKI for his technical and wise advice, suggestions and corrections that made this research fruitful. My thanks go to my lovely girlfriend, all friends and colleagues who helped me in one way or another. I am very grateful to all members of my family for their supports and advices. My special thanks are addressed to the Government of Rwanda for its appreciable policy of promoting education at all levels. Again my sincere acknowledgements go to the entire administration of University of Rwanda and the whole academic staff. Finally, I express my gratitude to each one who directly and indirectly contributed to make my studies successful.

God bless you all!

ABSTRACT

The road accident fatalities attract the attention in all countries of the planet. In 2013 the deaths from traffic accident were estimated to about 1.2 million people per year. The analysis of accident data is of importance for policy makers in help to reduce fatalities associated with those accidents. In additional road accident data are needed by statisticians to understand the trends, scale and nature of accidents, by safety engineers to investigate site and no site factors where safety interventions may be effective. This study was for assessing the spatial variation of road accident data in Kigali City and identifying the main causes of road accidents.

The mobility of the population, development and expansion of Kigali City need to meet with a sustainable, safe and healthy environment. Kigali City was reported as the zones at high risk of accidents in Rwanda. In order to achieve reduction in road traffic accidents and in applying interventions measures, the analysis of the variability in recorded data related to road accident is important.

The research aimed to establish the spatial variation of road accident data across the Kigali City with view of the causes and making recommendations for safety measures. It focused on establish the trend and characteristics of road traffic crashes, analyse the spatial distribution of road accident data in Kigali City and determine the main cause and types of vehicles involved in accidents.

The analysis of variation of road accident needs a collection of data in different years and locations. Data used in this study were road traffic accident data collected from Rwanda National Police from 2012 to June 2014 in Kigali City (they started to record accident with details). They are presented for each year and for every month. The collected data were then collated, analysed and presented in form of maps to show the spatial distribution of Road Traffic Accidents cases by Districts. The accidents frequency and accident rate per km per year were used to ranks Districts with high risk of accidents.

Gasabo District was found to have high number of accidents than other Districts of the Kigali City. The consideration of the length of road network has effect on the ranking of Districts in experiencing accidents. They were observed using the accident rate per km per year. There was a considerable decrease of the number of road traffic accidents from November to December in all Districts. This may be due to the enforcement of regulations during the period of Christmas and New Year days.

The negligence was the main cause of accidents, followed by bad maneuver. Pickup, lorry, minibus-bus, four wheel vehicle, cars, motorcycle, moped bicycle, pedestrian, wheel borrows are the types of vehicles or road users involved in accidents in Kigali City. The cars were found to be the types of vehicles mostly involved in road accidents and pedestrians were the most vulnerable road users in road crashes.

It was established that Rwanda does not have a good data record. Their data do not precise the location of accident and all injuries involved in the same accident. Therefore it is recommended that proper systematic means should be established for recording road accident data. Accident rate considering the daily traffic in each District may be investigated to increase the precision in the ranking of Districts according to their exposure.

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LIST OF ABBREVIATIONS AND ACRONYMS

WHO: World Health Organization

UNECA: United Nations Economic Commission for Africa

RTDA: Rwanda Transport Development Agency

MININFRA: Ministry of infrastructure

EAC: East African Community

NISR: National Institute of Statistics of Rwanda

UNECE: United Nations Economic Commission for Europe

NNGE: Nyarugenge

KRO: Kicukiro

GBO: Gasabo

KIST: Kigali Institute of Science and Technology

BAC: Blood Alcohol Concentration

BICO: Bureau for Industrial Cooperation

M: Male

F: Female

DRC: Democratic Republic of Congo

HGV: Heavy Good Vehicle

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CHAPTER 1: INTRODUCTION

The road accident fatalities attract the attention in all countries of the planet. According to World Health Organisation (2013) [1] the deaths from traffic accident were estimated to about 1.2 million people per year where 90% were in developing countries [2]. With much motorization, road traffic crashes and injuries continue to rise. In 1990 the road traffic injuries were at the ninth place at the list of most causes of human mortality and is projected to be the third in 2020 [3]. By age groups road accident for young people occupy globally the second, the first and the third place with age in the range 5-14 years, 15-29 years and 30-40 years respectively as cause of death. Males people are vulnerable than females.
Moreover, pedestrians account for between 45 per cent and 75 per cent of all road traffic deaths in developing countries [4]. Pedestrians and passengers of public transportation are the most affected in African countries [4]. Over 75 per cent of road traffic casualties in Africa are in the economic productive age bracket between 16 and 25 years [4]. The causes of traffic crashes and fatalities varied. The WHO (2013) [1] identified five main causes of accident (speed, alcohol, road characteristics, driving environment, use of helmets and seatbelt) that are grouped mainly into human factors; vehicles and highway infrastructures. Amongst the three factors, the vehicle factor relates to the road-worthiness of vehicles. Vehicle failure resulting from vehicle defects, lack of maintenance and using low quality spare parts also contribute to road crashes and fatalities [4]. The road surface with distresses or with poor geometric features has also significant contribution to road accident.

Accident data are of importance for policy makers to reduce fatalities associated with those accidents. Accident data can be used at three levels [5]. They are used at the national level by the central government to decide on the safety policy. They can be used by the regional authorities to make decision at regional level for example conducting campaigns on drink-driving and child safety education. At the local level where data can be used by local engineers to determine where the main problems are on the network they are responsible for.

Data tend to have slightly differing needs and reasons for collecting them. They are needed by statisticians to understand the trends, scale and nature of accidents, by safety engineers to investigate site and no site factors where safety interventions may be effective and assessing progress in term of improving safety. Insurance companies use data to set appropriate premiums, or general public needing access to their police accident report for insurance

purposes. The common aim is to acquire relevant knowledge from data to help prevent accidents of similar nature from occurring in the future [5].

Studies concentrate on the trends of road accidents with no emphases on their spatial variation [4]. The spatial variation should be emphasized on to assess where intervention are effective as mentioned above. This study is for assessing the spatial variation of road accident data in Kigali City, identifying the main causes of accident and making recommendations.

1.1. PROBLEM STATEMENT

The World Health organisation [1] reported that road traffic injuries are a major health challenge that require concerted efforts for effective and sustainable prevention. The road traffic systems are the most complex and most dangerous in all of the systems that people have to deal with every day. The road traffic accidents are defined as any accident involving at least one road vehicle or a vehicle in collision with a pedestrian occurring on the public road in which at least one road vehicle resulting in at least one injured or killed person [6]. The vehicle need not be moving and accidents involving stationary vehicles and pedestrians or users are included. According to WHO (2013) [1], an accident is fatal if involved person is killed within 30 days of its occurrence.

The Road traffic accident is a global problem through which more than 80% of the deaths on the road occur in low – income and middle countries [1]. In additional pedestrians, cyclists and riders of motorized two-wheelers and their passengers account for around 50% of global road traffic deaths [1]. Reliable and accurate data are needed to raise awareness about the magnitude of road traffic injuries, and to convince policymakers of the need for action. They are also needed to correctly identify problems, risk factors and priority areas, and to formulate strategy, set targets and monitor performance. Data-led diagnosis and management of the leading road traffic injury problems enables appropriate action and resource allocation. Without this, there will be no significant, sustainable reductions in exposure to crash risk or in the severity of crashes. Traffic accident data are collected every day in most countries, but for better use they are to be processed and analysed. Road traffic accident data may vary geographically, by age, by gender or the type of road users (car occupants, pedestrian, motor vehicles, or cyclists).

The rapid development of the Kigali City presents challenges to the transport systems where the expansion of the city needs to meet the mobility of the population with a sustainable, safe and healthy environment. The annual growth rate of population in Kigali city is estimated to 4% [7]. To meet this expansion, the City is increasing the capacity of its road networks, but often at the expanse of the safety of the vulnerable road users. Effective interventions including designing safer infrastructure and incorporating road safety into land use and transport planning; improving the safety features of vehicles; and improving post crash care for victims of road crashes. In additional, Kigali City was reported as the zones at high risk of accidents in Rwanda [8]. To achieve to reduce road traffic accidents and in applying interventions measures, the analysis of the variability in recorded data related to road accident is important as mentioned previously.

1.2. RESEARCH OBJECTIVE

1.2.1. General objective

The main objective of this study is to establish the spatial variation of road accident data across the Kigali City with view of the causes and make recommendations for safety measures.

1.2.2. Specific objectives

The objectives of the research were to:

1. Establish the trend and characteristics of road traffic crashes.
2. Analyse the spatial distribution of road accident in Kigali City
3. Establish the causes of road traffic accident in Kigali City
4. Establish the main types of vehicles involved in road traffic in Kigali City

1.3. RESEARCH PROJECT STRUCTURE

This research project is designed in the following way:

- Chapter 1: Introduction. The introduction presents the overview of road traffic accident data, and the reason for their collection, storage and analysis
- Chapter 2: Literature review. This chapter includes the review of available documents on road traffic accident in global view, at international level, at region level and in country level especially in Rwanda. The previous situations of road accident statistics are reviewed. Sources of data, the methods of data recording, storage and analysis were also reviewed.
- Chapter 3: Data Collection and methods
- Chapter 4: Data analysis and discussion
- Chapter 5: Conclusion and recommendations
- References
- Appendices

CHAPTER 2: LITERATURE REVIEW

Every year the lives of almost 1.24 million people are cut short as a result of a road traffic crash. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability as a result of their injury. Road traffic injuries cause considerable economic losses to victims, their families, and to nations as a whole. These losses arise from the cost of treatment (including rehabilitation and incident investigation) as well as reduced/lost productivity for those killed or disabled by their injuries, and for family members who need to take time off work (or school) to care for the injured [9].

Road traffic injuries have been neglected from the global health agenda for many years, despite being predictable and largely preventable [10]. Evidence from many countries shows that dramatic successes in preventing road traffic crashes can be achieved through concerted efforts that involve, but are not limited to, the health sector.

2.1. ROAD TRAFFIC ACCIDENT

In global view [1], the number of road traffic deaths each year has not increased but remains unacceptably high at 1.24 million per year. Many countries have successfully reduced the number of deaths on their roads, while deaths are increasing in others.

Although the aim of reducing the annual burden of road traffic deaths has yet to be realized, the lack of increase suggests that interventions to improve global road safety may have mitigated deaths that would otherwise have occurred. The survey conducted by the World Health Organisation for 182 countries [1] showed that between 2007 and 2010, the number of road traffic deaths decreased in 88 countries, suggesting that progress can be made with sufficient national commitment. Of these 88 countries, 42 are high-income countries, 41 are middle-income, and five are low-income.

According to the World Health Organisation [1], middle-income countries are hardest hit. The overall global road traffic fatality rate is 18 per 100 000 population. However, middle-income countries have the highest annual road traffic fatality rates, at 20.1 per 100 000, while the rate in high-income countries is lowest, at 8.7 per 100 000.

Eighty per cent of road traffic deaths occur in middle-income countries, which account for 72% of the world's population, but only 52% of the world's registered vehicles.

This indicates that these countries bear a disproportionately high burden of road traffic deaths relative to their level of motorization.

2.1.1. Accident deaths rates by region

The African region has the highest road traffic fatality rate. There are large disparities in road traffic death rates between regions. The risk of dying as a result of a road traffic injury is the highest in the African region (24.1 per 100 000 population), and lowest in the European region (10.3 per 100 000) [1].

2.1.2. Accident deaths rates by road users

Half of all road traffic deaths are among pedestrians (22%), cyclists (5%) and motorcyclists (23%) i.e. vulnerable roads users with 31% of deaths among car occupants and the remaining 19% among unspecified road users [1].

In most low and middle income countries, a much higher proportion of road users are pedestrians, cyclists and users of motorized two or three-wheeled vehicles than in high income countries. In much of the African region, walking and cycling are important forms of mobility for a large proportion of the population, while in many South –East Asia and Western Pacific countries, motorcycles are used frequently because they are relatively affordable to buy and run. These different traffic mixes are reflected in road traffic fatality breakdowns. For example, 38% of all African road traffic deaths occur among pedestrians, while 36% of road traffic deaths in the Western pacific region are among motorcyclists.

2.1.3. Traffic deaths by age groups

Young adults aged betwee 15 and 44 years account for 59% of global road traffic deaths [1]. More than three-quarters (77%) of all road traffic deaths occur among men. Regional variations are evident but mostly follow the same pattern, except in high income countries, where the proportion of deaths among those over 70 years is noticeably greater than in low and middle income countries. This difference is mostly related to lingetivity in these countries, combined with the greater risk posed by reduced mobility and increased frailty [1].

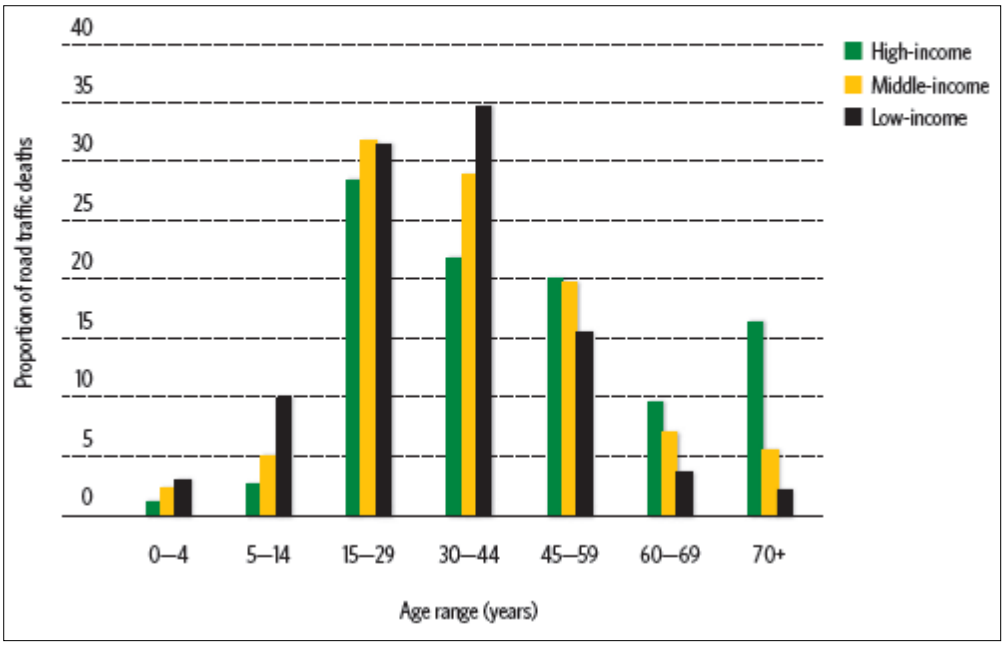

Figure 1: Proportion of road traffic deaths by age range and country income status [1]

2.2. ROAD TRAFFIC ACCIDENT CONTRIBUTION FACTORS

Road accidents can be associated with three main areas of causation categories:

- Human factors
- Vehicle factors
- Environment (i.e. road layout)

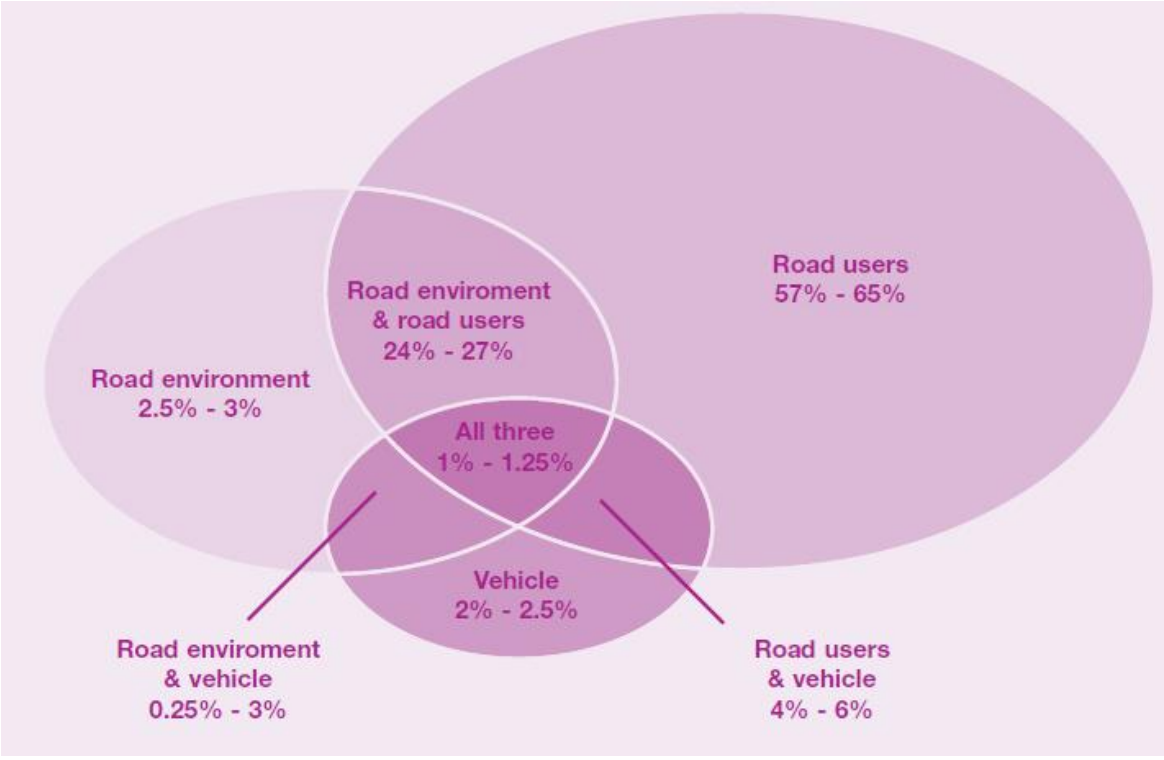

Figure 2: Contribution of the three main factors in road crashes [11]

This diagram illustrates the typical percentages of the main causation factors involved in road crashes as judged by experts in on the spot accident research studies [11]. The areas where the ellipses overlap denote multifactor causes. The figure can be directly affected by the feasibility study [11].

It is important to consider the inter-relationships between these three factors and the part they play in the wider spatial system. Those are explained in speed, alcohol, and the helmet use risk factors.

2.2.1. Speed

Speeding is a major road safety problem in all countries. Faster driving speeds increase the likelihood of a crash occurring, and the severity of the crash consequences. Excessive speed is a worldwide problem affecting the entire road network (motorways and highways, and rural and urban roads) [1].

2.2.1.1. The relationship between speed and accidents

It is vital to note that one cannot isolate a group of accidents as being "speed-related" and then conclude that only this minority of accidents will be affected by increasing compliance with speed limits. Perrett and Stevens, (1996) [12] have been based on the findings of in-depth accident studies and concluded that the proportion of accident related to speed is in the range of 10 to 30%.

It is obvious that all accidents are in an important sense "speed-related". With lower speeds, there is greater time to collision, and therefore a greater opportunity to avoid the accident. With lower speeds, drivers have less chance of losing control so that the risk of a single-vehicle accident is greatly reduced and the risk of a loss of control in severe braking or swerving to avoid collision is also greatly reduced. The lowering of driving speed drastically affects collision speeds and thereby the risk of injury, serious injury and fatality

2.2.1.2. Mean speed and accident risk

Finch et al. (1994) [13] reviewed the extensive body of literature on the relationship between traffic speed on a road and the injury accident risk for that road. Most of the studies that they reviewed were before and after studies of the number of accidents following some intervention to change travel speed. They fitted models to the data reported from the various studies. Their overall conclusion was that, for each 1 mph (1.6 km/h) change in mean speed the change in accident risk was as follows:

Low estimate 3.75%

Best estimate 5.00%

High estimate 9.70%

Speed also affects accident severity. Andersson and Nilsson (1997) [14] concluded that, for a given type of road, the injury accident rate changes with the square of a change in mean speed (where the new mean speed is expressed as a proportion of the old mean speed), the severe injury (including fatal) accident rate changes with the cube of speed change and the fatal accident rate changes with mean speed to the fourth power (Figure 3). This is known as the "power model", and it has been confirmed by a meta-analysis conducted by Elvik et al. (2004) [15].

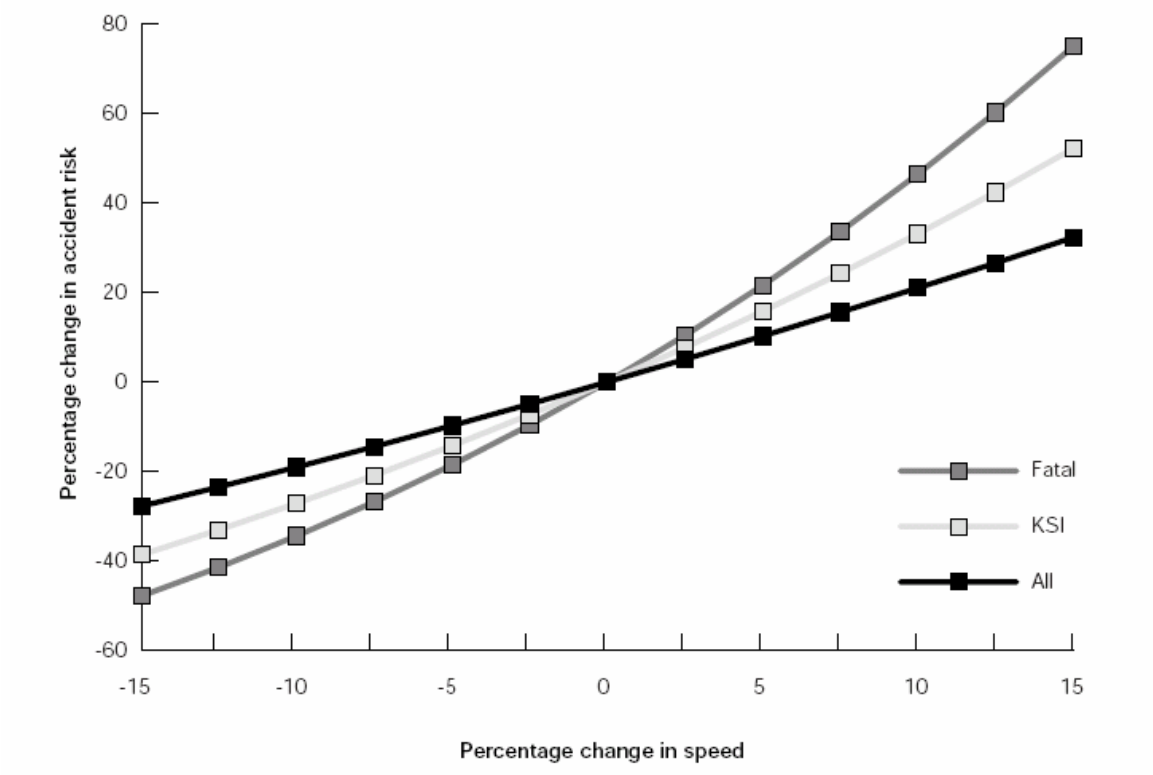

Figure 3: Relationship between change in speed and change in accidents [14]

2.2.1.3. Individual vehicle speed and accident risk

Theoretically it can be argued that accident risk is related to the variability of traffic speed on a road. Higher speed variance leads to less smooth road operation and a greater chance of shock waves resulting from sudden changes in speed. High speed variance can result from:

- Large differences in speed between different categories of road user or vehicle (e.g. slow HGVs and fast cars, or slow elderly drivers and fast young drivers)
- Very high flows along a road (at saturation level), producing the phenomenon of sudden accelerations and decelerations in the traffic stream. This often occurs on crowded motorways.

Based on this, it can be argued that both slow moving vehicles in a faster traffic stream and faster vehicles in a slower traffic stream are incurring added risk.

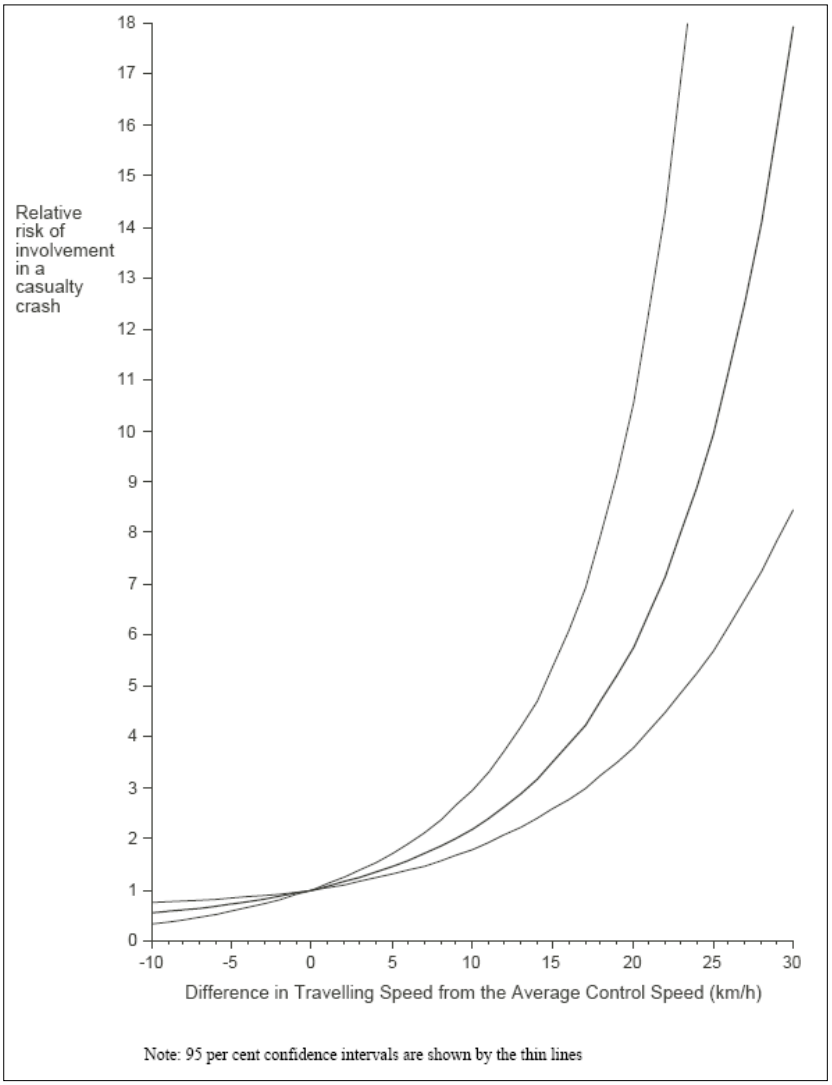

Figure 4: Relative risk of involvement in a serious crash compared to a driver travelling at mean traffic speed on rural roads [16]

2.2.1.4. Speed and pedestrian risk

There is widespread consensus on the effect of speed on pedestrian risk, particularly on the risk of pedestrian fatality. If struck at 30 km/h a pedestrian has a 5% chance of dying; struck by a car at 50 km/h, the pedestrian has a 50% risk of dying; and struck at 60 km/h, the pedestrian has a 90% chance of a fatality (Figure 5). These figures provide much of the justification for traffic calming in residential areas.

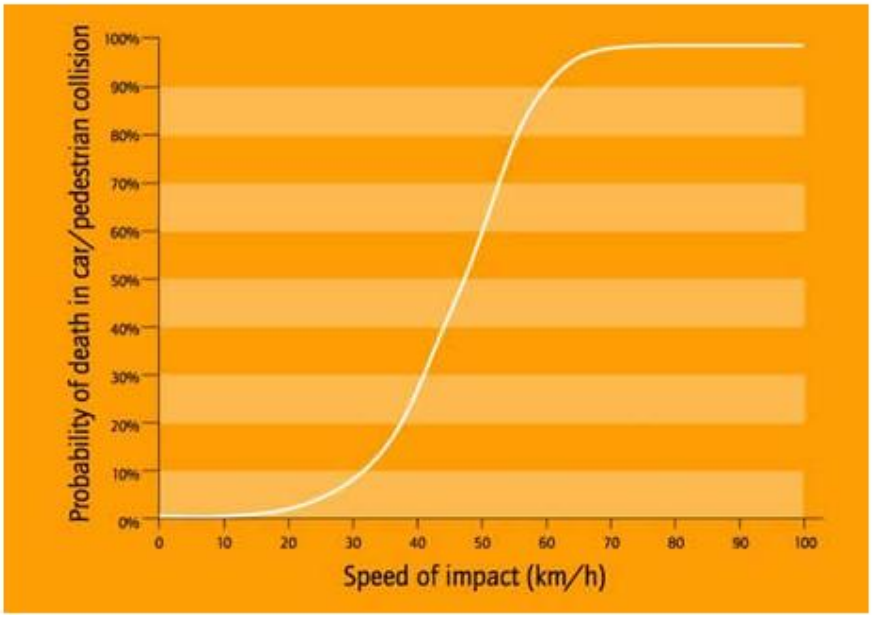

Figure 5: Impact speed and probability of pedestrian death [17]

2.2.1.5. Ways to lower traffic speeds [18]

The engineering, enforcement and education can be applied to lowering speeds, although it must be said that engineering and enforcement have generally been more effective than education. But perhaps education, particularly in the form of advertising campaigns, has a role in increasing public support for the harder measures.

Engineering

Traffic calming has been shown to be highly effective in reducing accidents. Evaluation of 30 km/h zones in residential areas has concluded that such zone reduces injury accidents by 60%. Traffic calming for main roads is more difficult, but most accidents involving pedestrians occur on urban arterials. Some schemes are effective, but extensive calming of such roads is difficult.

Enforcement

Setting speed limits according to the designated function of particular roads is an effective measure to reduce road traffic injuries. But it is almost impossible to secure compliance with speed limits through mobile or spot enforcement by police officers. Such enforcement does not affect more than the location of the enforcement. Hence the attractiveness of automatic enforcement in the form of the speed camera is a highly cost effective tool for obtaining safety benefits.

2.2.2. Speed and Road category

Studies in the UK by Transport Research Laboratory ([18]; [19]) have looked at the relationship between mean speed and accidents by road category. One study has shown that there are substantial differences in the relationship for different types of urban road (Figure 6). A further study has looked at rural single carriageway roads and again has found differences by road category (Figure 7). The categories established by the analysis were as follows:

Group 1: Roads which are very hilly, with a high bend density and low traffic speed. These are *low quality* roads.

Group 2: are roads with a high access density, above average bend density and below average traffic speed. These are *lower than average quality* roads.

Group 3: Roads with a high junction density, but below average bend density and hilliness, and above average traffic speed. These are *higher than average quality* roads.

Group 4: Roads with a low density of bends, junctions and accesses and a high traffic speed. These are *high quality* roads.

The same study concluded that, at junctions on single-carriageway roads, accident risk goes up with the means speed of the main-road traffic to the fifth power. This result shows the impact of quite small changes in mean speed on accident risk.

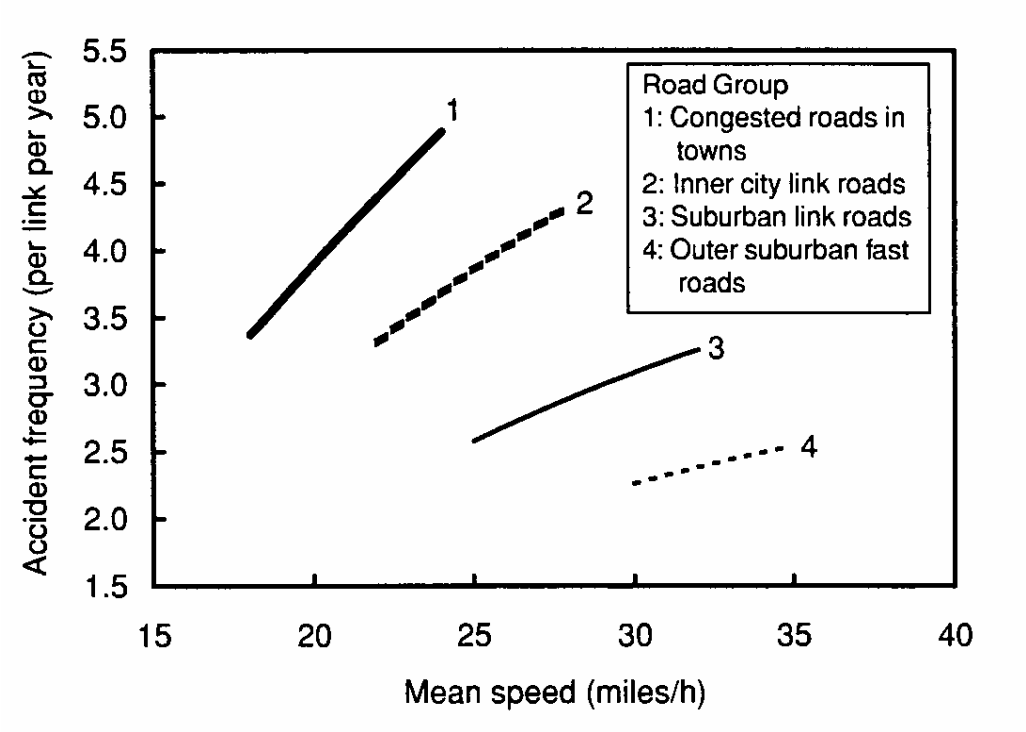

Figure 6: Mean speed - accident frequency relationship for urban roads [18]

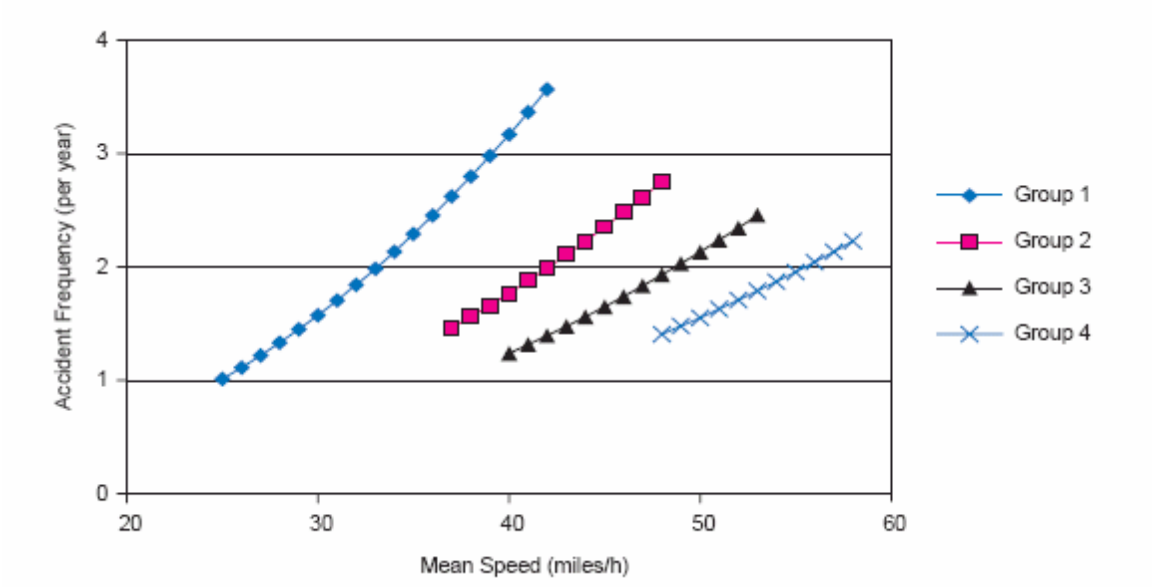

Figure 7: Mean speed - accident frequency relationship for rural roads [19]

2.2.3. Drinking and driving

Drinking and driving increases the risk of being involved in a crash, as well as the severity of resulting injuries. Driving starts to be impaired at very low alcohol consumption levels of with the risk of crash involvement growing rapidly as consumption increases [1].

2.2.3.1. The physiological effects of alcohol

Alcohol is a central nervous system depressant, i.e. tranquilliser. As the amount of alcohol in the blood increases, so does the effect of the drug on capabilities, judgement and behaviour. Among the principal driving-related effects of alcohol are:

- Impairment of visual and perceptual judgement at low alcohol levels.
- Impairment of cognitive decision-making capabilities at intermediate levels.
- Gross motor incoordination at blood alcohol concentrations (BAC) of 115 mg/100 ml or above. In one study using a driving simulator, the probability of straying out of lane was found to be 500 times greater for those with a BAC of 110 than for sober drivers.

These impairments manifest themselves in such subsidiary effects as:

- Poor detection of roadway signs
- Misjudgment of speed and distance
- The "tunnel vision" effect, in which the field of view is narrowed to objects directly in front of the driver. It should be noted that the ability to detect peripheral targets has been found to be crucial to the driving task.

One particular by-product of the cognitive impairment that occurs at moderate levels of alcohol concentration deserves special mention: that is, as intoxication increases, the capability of making rational decisions about how to avoid subsequent driving decreases.

2.2.3.2. The link between alcohol and risk of accident

The link between alcohol and elevated risk of accident involvement has been known almost since car driving began. The first analysis of the issue was conducted in 1904. But it was not until the landmark Grand Rapids study of 1964 by Borkenstein et al. that the exact relationship of BAC level to risk of accident involvement was demonstrated in figure below.

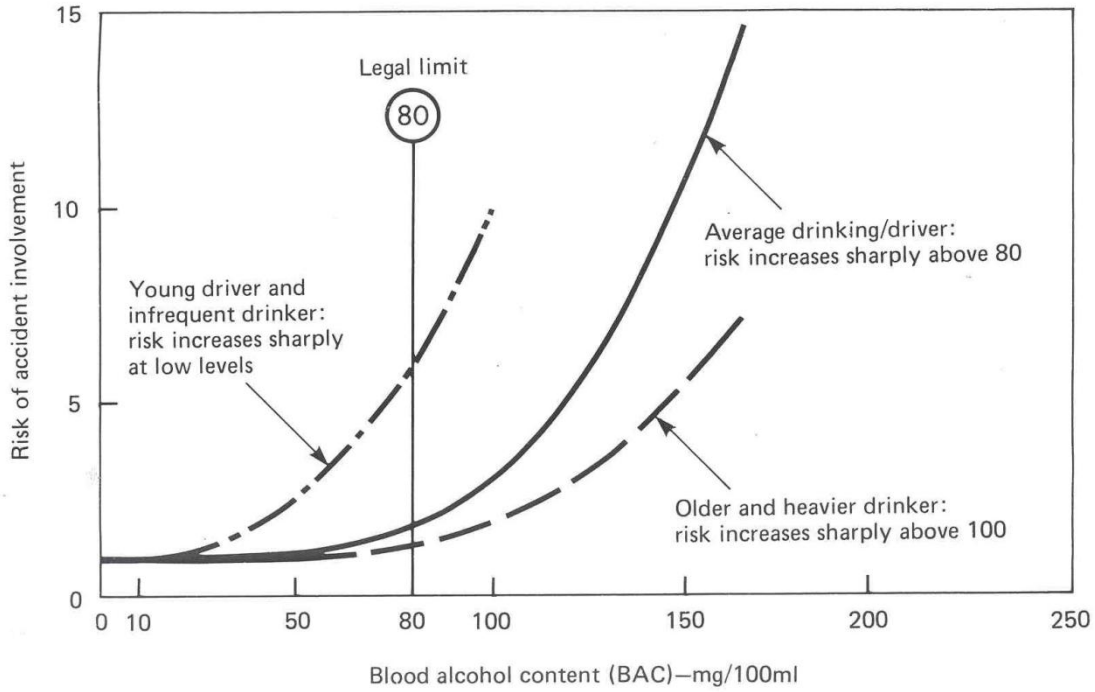

Figure 8: Results of the Grand Rapids study and subsequent reanalysis by Allsop (1966) [20]

The vast majority of adult drivers are affected or impaired with a blood alcohol concentration (BAC) of 0.05 g/dl, while at a BAC level of 0.1 g/dl the crash risk is approximately five times higher than that of someone with a BAC level of zero. Young and novice drivers who drink and drive have a greatly increased risk of a crash compared to more experienced drivers. The effects of alcohol impairment are magnified when combined with fatigue. This explains why alcohol is considered a particular risk for commercial drivers, who spend long hours on the road and also have legal responsibilities for the passengers or cargo they carry.

2.2.3.3. Reducing drinking-drive risk of accident

A variety of BAC limits are in place across the world. Setting and enforcing legislation on BAC limits of 0.05 g/dl can lead to significant reductions in alcohol-related crashes.

Inexperienced young adults driving with a BAC level of 0.05 g/dl are more than twice as likely to have a road traffic crash than are more experienced drivers, while commercial drivers are also considered a high-risk group for alcohol related crashes.

Setting lower BAC limits (0.02 g/dl or less) for both groups is an effective means of reducing crashes related to drink–driving [1].

Enforcement

Enforcement of drink–driving laws has been shown to be more effective when it includes random breath tests for all drivers (not just those suspected of drinking), and when it is carried out at times and in locations when drink–driving is more likely to occur. Such measures that increase drivers' perception of the likelihood of being apprehended are keys to the success of this intervention [1].

2.2.4. Motorised two-wheeled vehicles

Rapid growth in the use of motorized two-wheeled vehicles in many countries has been accompanied by increases in injuries and fatalities among their users [1]. Motorcyclists comprise a third of all road traffic deaths in the South-East Asia and Western Pacific Regions, but are also increasingly represented among deaths in Africa and the Americas, which are seeing rapid increases in motorcycle use. Head and neck injuries are the main cause of severe injury, disability and death among motorcycle users [1].

Wearing a standard, good quality motorcycle helmet can reduce the risk of death by 40% and the risk of serious injury by over 70% [1]. Introducing and enforcing legislation on helmet use is effective at increasing helmet-wearing rates and reducing head injuries.

2.2.4. Use of seat-belt

Failure to use a seat-belt is a major risk factor for road traffic injuries and deaths among vehicle occupants. When a motor vehicle crash occurs, a car occupant without a seat-belt will continue to move forward at the same speed at which the vehicle was travelling before the collision and will be catapulted forward into the structure of the vehicle – most likely into the steering wheel column if driving, the dashboard if a front seat passenger, or the back of the front seats if a rear seat passenger [1]. Alternatively, failure to use a seat-belt can cause drivers or passengers to be completely ejected from the vehicle, greatly increasing the risk of serious injury or death [1].

Wearing a seat-belt reduces the risk of a fatal injury by 40–50% for drivers and front seat occupants, and between 25–75% for rear seat occupants [1].

Seat-belt wearing rates vary greatly between countries, and to a large extent are governed by the existence and enforcement of mandatory seat-belt laws. In many countries, drivers and front seat passengers are legally obliged to use seatbelts, but this does not always apply to rear seat occupants.

2.3. ROAD ACCIDENT DATA AND SOURCES

Accident data, especially collected at a national level are particularly useful for the description, monitoring and prognosis of accident developments, the detection of positive and negative safety developments, the definition of safety targets and the evaluation of long term and large scale safety measures [21].

Reliable and accurate data are needed to raise awareness about the magnitude of road traffic injuries, and to convince policymakers of the need for action. They are also needed to correctly identify problems, risk factors and priority areas, and to formulate strategy, set targets and monitor performance. Data-led diagnosis and management of the leading road traffic injury problems enables appropriate action and resource allocation. Without this, there will be no significant, sustainable reductions in exposure to crash risk or in the severity of crashes.

2.3.1. The need of accident data

1. Historically the way in which a country's accident database tends to develop is originally with the police needing to record basic accident details for their own records and for use in court in the prosecution process.
2. A uniform accident report form or booklet is fairly quickly introduced from which the police can produce basic statistics, usually for their own administration purposes.
3. With parties such as engineers requesting information about blackspots, the need for an improved database system tends to be acknowledged and often a new report form designed.
4. With the improved system parties, universities use the data, a detailed annual accident report is published and disseminated, and highway authorities are better able to plan and carry out blackspot improvement programmes.
5. When the data system is working well it is relatively accurate with under-reporting kept in regular check. It is available to all and able to be cross -referenced with other database systems like those from hospital, crime or vehicle databases.

The monitoring of safety for a country or region over a year, use the total number of accidents in order to compare this number with the outcome of the year before. If sequences of accidents are given over several years, then trends in the developments can be detected and accident numbers predicted for following years. Once such a trend is established, then the

value for the next year or years can be predicted, together with its error bounds. Deviations from a given trend can also be tested afterwards, and new actions planned.

2.3.2. Sources of accident data

Bhalla et al. (2014) [22] enumerate different sources of accident data and the methods for their collection. Some of them are described in the following.

2.3.2.1. Vital registration

Traditionally, public health researchers estimate national cause-specific mortality through analysis of data reported in national vital registration systems. Most countries around the world have civil registration systems that aim to provide individuals with an official government record of births and deaths that can be used for establishing legal status, nationality, and inheritance. In many countries, civil registers also include information about causes of death certified by a medical professional (Figure 9), giving civil registration the potential to be one of the most comprehensive sources for tracking national cause-specific mortality patterns

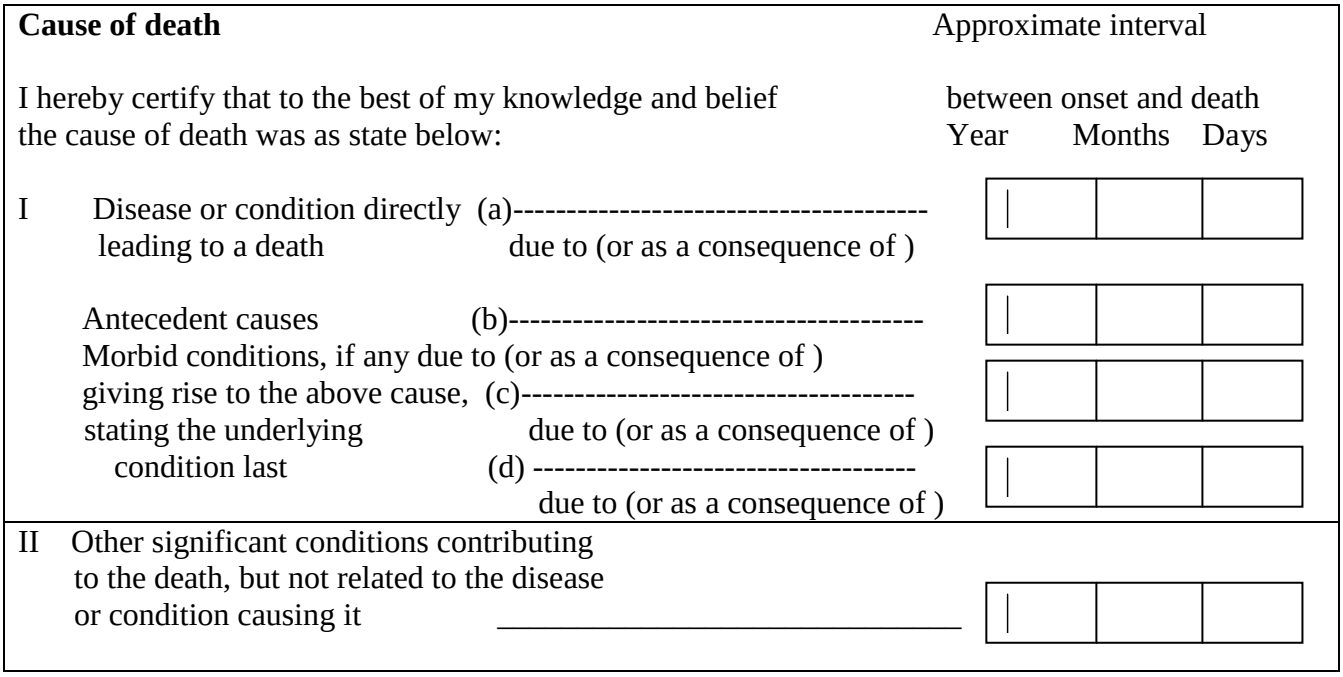

Figure 9: Cause of death section of a sample medical certificate of death

2.3.2.2. Verbal autopsy

Verbal autopsy is a method used to ascertain the cause of a death based on an interview with next of kin or other caregivers. This is done using a standardized questionnaire that elicits information on signs, symptoms, medical history and circumstances preceding death. The cause of death, or the sequence of causes that led to death, are assigned based on the data collected by a questionnaire and any other available information [23].

In the absence of high quality vital registration systems, alternate sources for estimating cause-specific mortality are particularly important. One approach for this involves assessing causes of death via a verbal autopsy, where family members of the deceased are asked about the circumstances and symptoms prior to death. Verbal autopsies may be conducted as large sample surveys or as part of surveillance in smaller communities. The process typically involves a team of trained researchers who use a structured list of questions (Figure 10). The validity of the causes of death identified by verbal autopsy methods has received substantial attention in recent years. In comparison with other causes of death, road injuries are usually identified accurately using verbal autopsies [24].Verbal Autopsy data are usually analyzed by physician-coded verbal autopsy.

2.3.2.3. Mortuary and burial registers

Even in countries that do not have a properly functioning vital registration system, local law can require a range of medico-legal practices that can create opportunities for obtaining statistics related with causes of injury deaths. The investigations in sub-Saharan Africa [22] revealed that the mortuaries attached to hospitals in the main urban centers of many countries routinely conduct investigation into the causes of deaths that do not have a history of disease. Similarly, in many countries in the region, laws require relatives to obtain a permit before a dead body can be buried or cremated. The government offices issuing these certificates often keep records that identify causes of death as reported on the medical death certificate, if available, or as reported by the individual requesting the permit. Mortuaries typically employ trained professionals, who are often trained as forensic pathologists, and accurately identifying the causes of death. From the mentioned investigation, the analysis of mortuary data revealed that the cause-of-death patterns are substantially biased towards injury deaths as expected from the medico-legal framework in which the mortuaries function. This bias implies that mortuary data cannot be used to estimate patterns for all causes of death. Thus, the use of mortuary data is restricted to identifying causes of injury deaths.

	2012 WHO VERBAL AUTOPSY [Form 3] DEATH OF A PERSON AGED 15 YEARS AND ABOVE	
No.	QUESTIONS AND FILTERS	CODING CATEGORIES
	SECTION 6. HISTORY OF INJURIES/ACCIDENTS	
x100	Did s/he suffer from any injury or accident that led to her/his death?	Yes ☐ No ☐ Don't know ☐
x110	+ Did s/he suffer from a road traffic accident?	Yes ☐ No ☐ Don't know ☐
x120	++ Was s/he injured as a pedestrian/walking?	Yes ☐ No ☐ Don't know ☐
x130	++ Was s/he injured as an occupant of a car vehicle?	Yes ☐ No ☐ Don't know ☐
x140	++ Was s/he injured as an occupant of a bus/heavy transport vehicle?	Yes ☐ No ☐ Don't know ☐
x150	++ Was s/he injured as a driver or passenger of a motorcycle?	Yes ☐ No ☐ Don't know ☐
x160	++ Was s/he injures as a pedal cyclist?	Yes ☐ No ☐ Don't know ☐

Figure 10: Questions related with road injuries in a typical verbal autopsy questionnaire

2.3.2.4. National population censuses and large sample surveys

Censuses are conducted decennially in most countries to generate information on the size and distribution of national population for planning and administration. A census, which in principle involves canvassing all households, may be followed by a large post-census nationally representative sample survey. In recent years, such surveys in many countries have included questions about household deaths in the previous year with the aim of estimating adult mortality and maternal mortality. Further, in order to improve estimates of maternal mortality, these surveys often include a "weed-out" question asking if the death was due to injury or violence. In such cases, the census data are a useful source of information for constructing national estimates of deaths that occur from external causes. Although road injuries are not specifically identified in most censuses, the accurate estimates of injury totals derived from census data, substantially reduces uncertainty in estimates of all sub-categories of injuries, including road injuries.

2.3.2.6. Traffic police reports

In most countries, statistics of deaths from road injuries are available from national traffic police. These statistics are usually the basis of official government statistics of national road injury death. The assessment of these official statistics done by [22] suggested dramatic underreporting of road deaths especially in the most information poor regions. Hence the police data set is the one most heavily relied upon and most commonly used, though ideally checks should be made on its completeness from other sources.

2.3.2.7. Hospital Episode Statistics data

Hospital databases rarely cover entire national populations making them a poor source for estimating the population incidence of injuries. They does not tend to give any information about the actual accident incident itself and will not include many minor injuries, deaths and, of course, damage only accidents. However, they contain detailed medical descriptions of the sequelae of road crashes, which are needed for estimating the disability burden of injuries and they are the most reliable on individual casualties [5]. Table below presents a comparison between hospital data and data recorded at scene after the accident by police.

Table 1: Police vice Hospital records

Recorded by police	**Hospital Episode Statistics**
Accidents on public highway reported to police	Includes accidents not reported to police
Includes injuries where patients not admitted to hospital	Patients admitted to hospital only. Record duplicated if admitted more than once
Almost all fatalities within 30 days of accident recorded	Fatalities can be more than 30 days after accident
Fatal, serious or slight only	Does not include fatalities at scene or those not admitted
Severity fudged by police who are not medically trained	More accurate severity diagnosis
Extensive details of accident provided	Few accident details provided
Age (estimated), sex, postcode in 75% of cases	More accurate and detailed personal information

2.3.2.8. Insurance Company record

Insurance company data is rarely collated on a national scale or even within a region and may have rather biased reporting. Some insurance companies may also be unwilling to reveal all their data for fear of competition.

2.3.2.9. In-depth studies

Numerous previous researches, professionals, medical institutions, and national and international health and transport agencies are good sources of accident data because when they are dealing with road safety they try to get more information about accidents, in order to study these more in-depth.

2.3.3. Problems of accident data

In some countries there are many sources of data for estimating both the incidence of deaths and non-fatal injuries from road crashes. In many others, the data sources for estimating deaths are fairly reliable but sources for estimating the incidence and burden of non-fatal injuries are not. And, in several others, there are comparatively few data sources available that allow population-based estimates of the incidence and public health burden of injuries.

In these countries and regions, available data may not represent the entire national population, may have biases towards certain causes of diseases and injury, and may be poorly coded [22] or underreported.

2.3.3.1. Under-reporting

Injury severities in traffic accidents are usually recorded on ordinal scales, and statistical models have been applied to investigate the effects of driver factors, vehicle characteristics, road geometrics and environmental conditions on injury severity [25]. The unknown parameters in the models are in general estimated assuming random sampling from the population. Traffic accident data however suffer from underreporting effects, especially for lower injury severities. As a result, traffic accident data can be regarded as outcome-based samples with unknown population shares of the injury severities. An outcome-based sample is overrepresented by accidents of higher severities [25].

It must be noted that there will inevitably be a substantial number of road accidents that are not reported to the police at all and the level of this under-reporting varies considerably from country to country. Even where there is a legal requirement to report only those accidents involving personal injury, studies of hospital data have demonstrated considerable under-reporting, though the level tends to be lower for the higher severities of injury [5].

2.3.3.2. Poor documented non-fatal crash injuries and accuracy

The severity of injuries sustained from those that can be treated immediately and for which medical care is not needed or sought, to those that result in a permanent disability. Reliability assessing injury severity requires clinical experience; police in many countries who record official information on injuries often do not have sufficient training to reliability categorise injuries. Different definitions of injury severity further complicate reporting of injuries [1]. In additional drivers tend to explain their traffic accidents by reporting circumstances of lowest culpability compatible with credibility.

Information on the extent of non-fatal injuries is important in assessing the type of medical care needed. Some countries have hospitals with injury surveillance systems in place. Data from these systems indicate the severity of the problem, what staffs are required and what treatment is provided, as well as identify primary prevention measures that could be implemented [1].

Unfortunately, even in high-income countries, this information is rarely national in scope because of the workload associated with high numbers of patients seen in hospital emergency rooms each day, and the complexities of accurately collecting this information. Consequently, many countries use systems that collect this information from a geographic sample, and then generalize results to the whole country [1]. In most low- and middle-income countries, sophisticated injury information systems are even rarer – only 77 countries reported having a national injury surveillance system (47% of high-income and 46% of middle-income countries, but only 24% of low-income countries) [1]. The ability to accurately count the actual number of non-fatal injuries worldwide thus remains a challenge.

2.3.4. Accident data recording

The database of the road traffic accident should answer to the following questions:

- Where accidents occur
- When accidents occur
- Who was involved
- What was result of collision
- What environmental conditions existed
- Why or how did collision occur

This does not mean that only 6 items of data need to appear on an accident report form. During the accident recording there may be several people involved, and thus all their ages and sexes need to be recorded. Therefore, question like “who” needs to include much more than person’s name. The vehicle types involved in the collision must be known, and for police purposes driver’s contact addresses, date of birth, driver licence details, vehicle registration, ownership, etc all need recording.

Obviously, road or police authorities have their own and often very different views on what information about each accident should be recorded [5]. Therefore, it is unlikely that a completely unified report form would be ever being accepted internationally and it is even difficult to draw up a definitive list of factors that will be required in all cases. A list of factors appearing on accident report forms in many countries of the world is suggested in Table 2. They have generally been found to be useful to satisfy most of the needs of the various interested bodies [5].

Three main sections: General details, vehicle + Driver details, and casualty details can be identified (Table 2). As the relationship between these three sections can be one to many, accident data tend to be stored as a relational database.

Three important components which certainly need to be included in an accident report form are listed in Table 3

Each accident should have its own unique reference number to avoid duplication and aid quick reference. In order that individual databases from different regions in a country can be easily combined to provide a comprehensive national database, this reference number can be a combination of a number of different fields like the serial number of the incident given by the police station at which it was reported; the year; and the individual police station identifier.

It is important that sketches are made of the accident site indicating how the collision took place [5].

Table 2: Recommended factors for accident database [5]

General details/attendant circumstances	***Road type***	***Environmental features***	***Precise location***
Police reference Year Month Date Time Region	Class of road/ road number Carriageway type/no. of lanes Speed limit Junction type Road width Road shoulder width	Light condition Road lighting Road surface condition (dry, wet) Road surface quality (potholed, rutted, ...)	Map reference - X coordinate - Y coordinate Kilometre post to nearest 100m Plain language Location description (free text abbreviated) Accident description (free text abbreviated)
Vehicle/Driver details Vehicle type Vehicle manoeuvre Vehicle damage Length of skid marks		Driver age Driver sex Licence no. Seat belt/helmet Alcohol/drugs suspected	
Casualty details Type of the road user Age Sex Severity of injury Passenger location		Pedestrian location Pedestrian movement Passenger location School pupil	

Table 3: Important components of an accident record [5]

Unique accident reference:
Police station incident no.
Year
Police station identifier
Sketches:
Collision
Location
Accident location coding:
X-Y coordinates
Kilometre posts
Node-Link-Cell
Plan language description

2.4. TYPES OF ACCIDENTS

Accidents may be classified as fatal, serious, slight or minor and damage-only accidents. They are defined below [26].

- A fatal accident is one in which one or more persons are killed as a result of the accident, provided death occurs within 30 days
- A serious accident is one in which there are no deaths but one or more persons are seriously injured i.e. usually detained in hospital as an 'inpatient'
- A slight accident is an accident in which there are no deaths or serious injuries but a person sustains an injury of a minor character such as a cut, sprain or bruise or receives outpatient treatment
- Damage-only accident is one in which no one is injured but damage to vehicles and/or property is sustained.

2.5. RWANDA AND INTERNATIONAL ACCIDENTS PATTERNS

When accident statistics are evaluated, the tendency is usually to compare a country's statistics to those of neighboring countries. Others factors that are to be taken into account are the Gross national income and the number of registered vehicles.

The Gross National Income provides an indication of the country's income level and is therefore a reasonable indication of vehicle population and car ownership [8].
The Figure below shows the gross national income per capita in different countries.

The table 4 and graph at figure 11 shows some countries with High, middle and low income and the number of registered vehicles. It is meaningful to evaluate the accident rates between countries in the same income rate conditions. Country like Rwanda, Tanzania, Uganda, Sudan, Ghana, Kenya, Ethiopia, Democratic Republic of Congo and Burundi are at almost the same level in terms of gross national income and registered vehicles. Therefore a comparison between Rwanda and its neighboring countries is made to find the trends of accident in those countries.

Table 4: GNI and registered vehicles for some low, middle and high income level [10]

Country	**Year**	**Population**	**Gross national income (US $)**	**Income level**	**Registered vehicles**
Burundi	2010	8 382 849	230	Low	
DRC	2010	65 965 796	180	Low	350 000
Ethiopia	2010	82 949 544	390	Low	377 943
Kenya	2010	40 512 678	810	Low	
France	2010	62 787 430	42 190	High	34 276 000
Gabon	2010	1 505 463	7680	Middle	195 000
Germany	2010	82 302 468	42970	High	50 184 000
Ghana	2010	24 391 823	1250	Middle	1 122 700
Italy	2010	60 550 850	35530	High	52 586 499
Japan	2010	126 535 916	42050	High	89 871 090
Singapore	2010	5 086 418	39410	High	945 829
South Africa	2010	50 132 820	6090	Middle	9 587 781
Spain	2010	46 076 990	31460	High	31 086 035
Sudan	2010	43 551 940	1300	Middle	116 711
Uganda	2010	33 424 683	500	Low	
Rwanda	2010	10 624 005	520	Low	93 532
United Kingdom	2010	62 035 568	38140	High	35 170 629
United Republic Tanzania	2010	44 841 224	530	Low	977 468

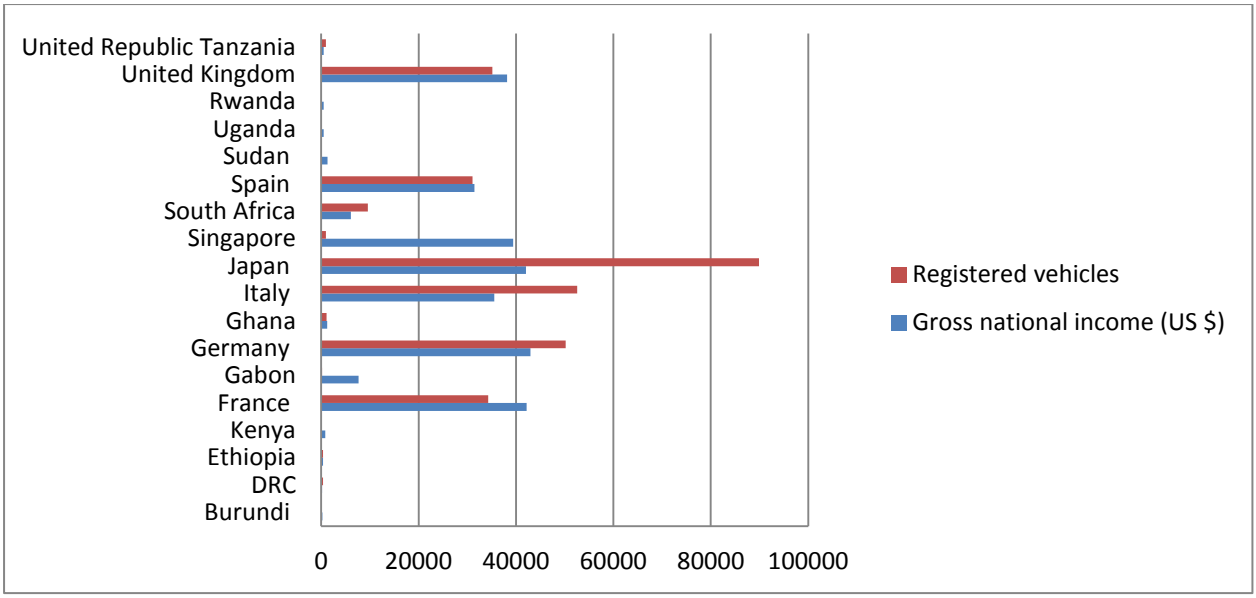

Figure 11: Gross National income and registered vehicles for some low, middle and High income level [10]

2.5.1. Rwanda and regional accident patterns

2.5.1.1. Extent of road traffic fatalities and injuries in EAC countries

Across the EAC partner states during the year 2007 there were 8,699 and 45,712 fatalities and injuries respectively due to road traffic crashes reported to the police (except for Burundi where their information is from the ministry responsible for health) [27]. The total population was around 127,108,000 and was distributed across the partner states as shown in Figure 12. Road traffic crash fatalities in the member states was defined as shown in Table 5, which implies that reported fatalities for Kenya are not comparable to the other partner states if their reporting comply with their legal definition of road traffic injury fatality. The World life expectancy (Table 6) provides a more realistic number of road traffic injury fatalities. The road traffic system risk of the countries expressed in terms of fatalities reported to the police per 10,000 registered vehicles shown in Figure 13. The figure shows that Kenya's road traffic system risk lower than that of Rwanda, Uganda and Tanzania. However, given their different definition of road traffic injury fatality, this may not be the reality. The data for Burundi is considered uncomparable to the other partner states and the actual road safety situation is worse than suggested by the data.

Table 5: Definition of Road traffic injury fatalities [27]

Country		**Definition**	**Data source**
Burundi		Defined as died any time after the crash	Health
Kenya		Defined as died at the crash scene	Police
Rwanda		Defined as died within 30 days of the crash	Police
Uganda		Defined as died within 30 days of the crash	Police
Tanzania	Mainland	Defined as died within 30 days of the crash	Police
	Zanzibar	Defined as died within 24 hours of the crash	

Table 6: Number of Road traffic injury fatalities in EAC countries according to reports of cause of death [27]

Country	Number of fatalities	Rate per 100,000 population	Ranking of road traffic accident as a cause of death
Burundi	1786	29.5	13th
Kenya	7801	28.2	10th
Rwanda	1638	24.2	15th
Tanzania	9029	29.6	12th
Uganda	8192	34.7	12th

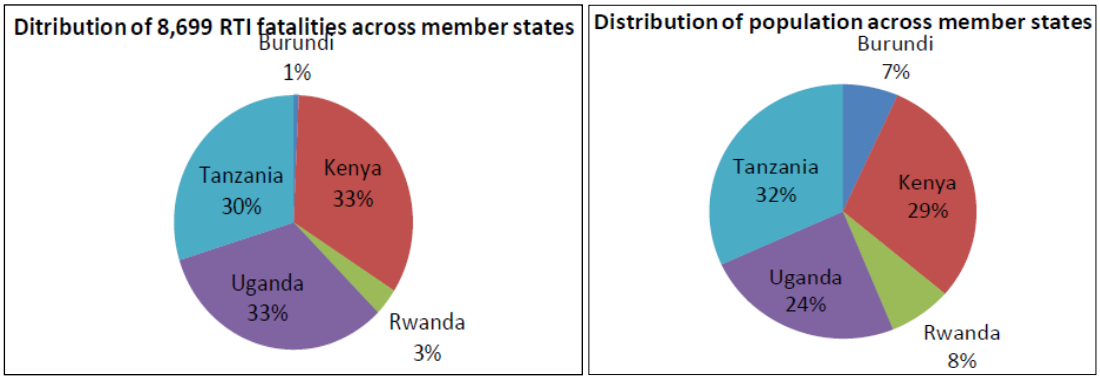

Figure 12: Distribution of road traffic accident and population in EAC countries [27]

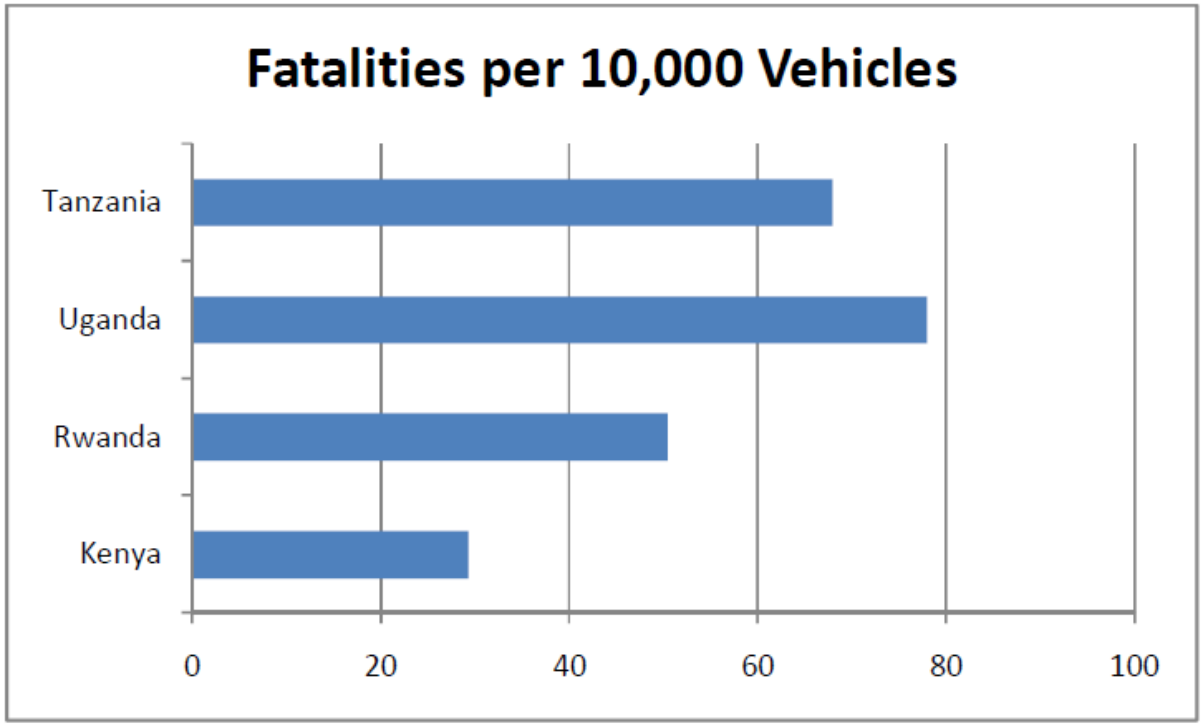

Figure 13: Road traffic system risk (fatalities per 10,000 registered vehicles) [27]

2.5.1.2. Trend of road traffic accident

The trend of road accident fatalities is generally increasing in all EAC countries except for Rwanda. It is the case in many countries where experiencing rapid motorization without road safety interventions to ensure safety of road users [27]. The estimate of fatalities per 100, 000 populations presented in Figure 14 suggest that in Uganda the condition is serious.

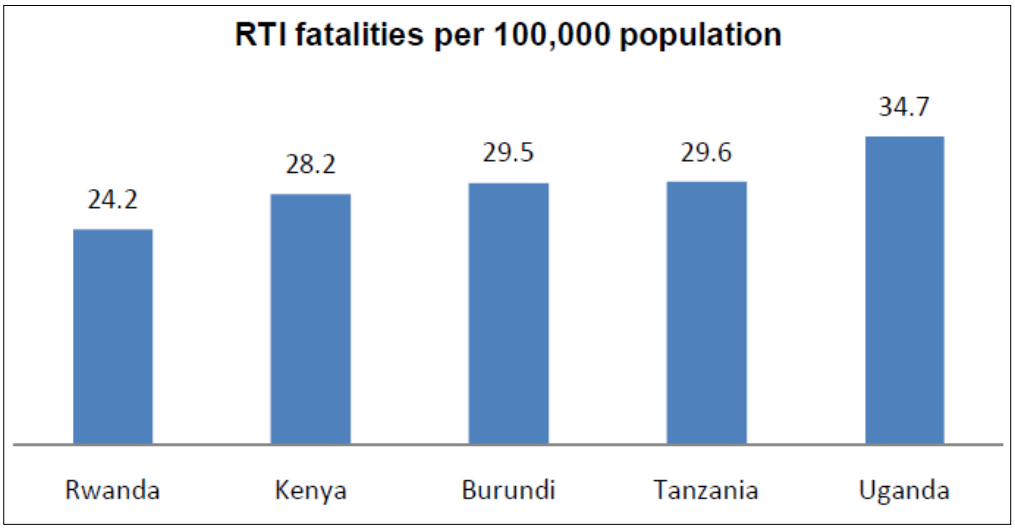

Figure 14: Fatalities due to road traffic accident per 100,000 populations

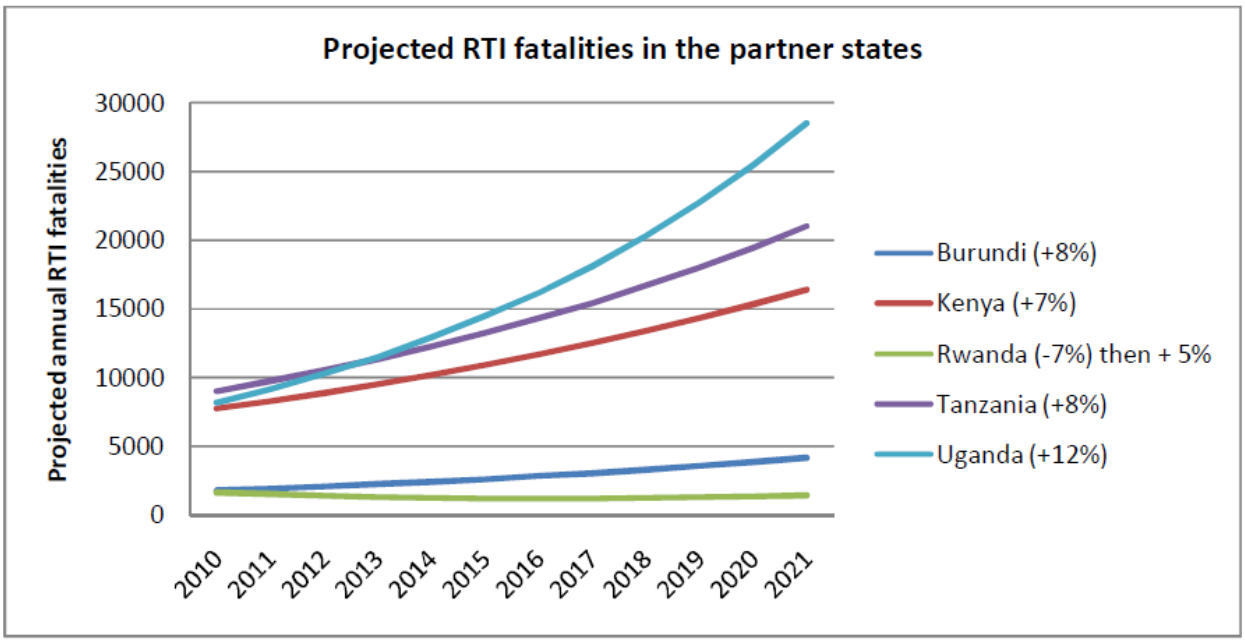

Figure 15: Projection of the increase of road traffic injury fatalities in EAC countries [27]

The above figure (Figure 15) shows a conservative scenario of the number of road traffic injury fatalities in EAC countries if the current rate of economic growth and registration of motor vehicles prevails without corresponding implementation of road safety interventions. Uganda suffers from great increase, then Tanzania, Burundi and Kenya well as for Rwanda there is a decrease due to enforcement of road traffic laws. For Kenya generally the increase is about 7% per year. For Rwanda there is increase in 1997/1999 then a general downward trend about 7% per year from 2008 to 2010. For Burundi there is a lack of data then about 8% were estimated

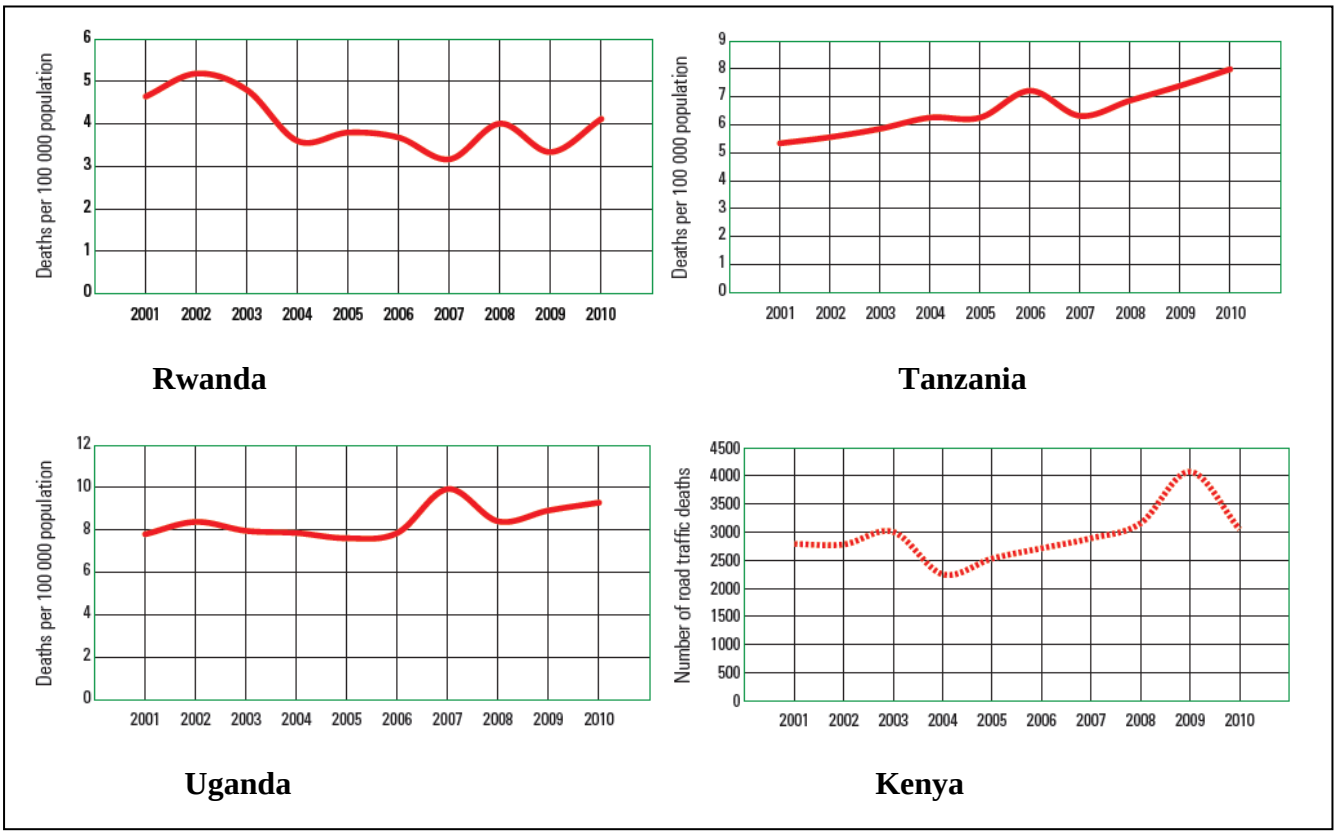

Figure 16: Trends in road traffic deaths in EAC countries from 2001 to 2010 [1]

2.5.1.3. Road traffic accident by road user

The study done by Odero et al. (2003) [28] revealed in Kenya the distribution of fatalities by road user category from 1971 to 1990 were that about 40% of road traffic injuries fatalities were pedestrians, 40% were passengers, 14% drivers and about 6% cyclists. Pedestrians were more often killed in urban areas whereas passengers were the majority of casualties from traffic crashes on rural highways. Macharia et al (2009) [29] reported that 81.2% of road traffic injury victims were aged between 15 and 49 years while 12% were above 49 years.

Figure 17 highlights the fatalities by road user group across the EAC countries in years from 2006 to 2007 [27]. The proportion of pedestrians and passengers killed in all countries ranging from 70% for Tanzania to 80% for Kenya. For Rwanda the proportion is 52% which is due to the high proportion of motorcyclists and cyclist. The road safety work needs to focus on improving safety of passengers and the vulnerable road users.

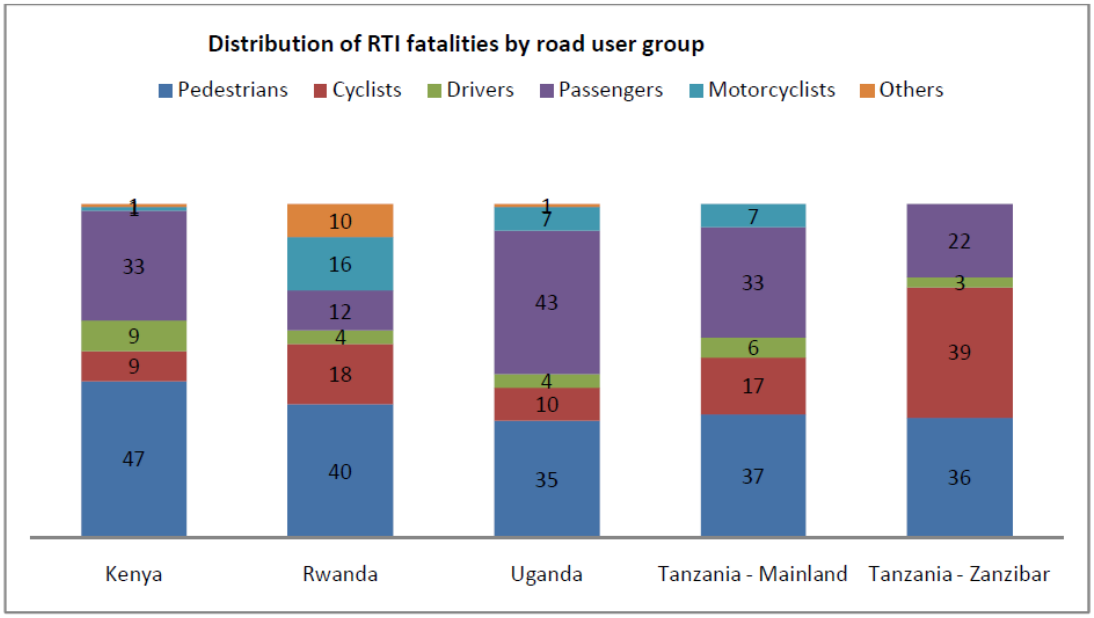

Figure 17: Fatalities by road user group across the EAC countries in years from 2006 to 2007 [27]

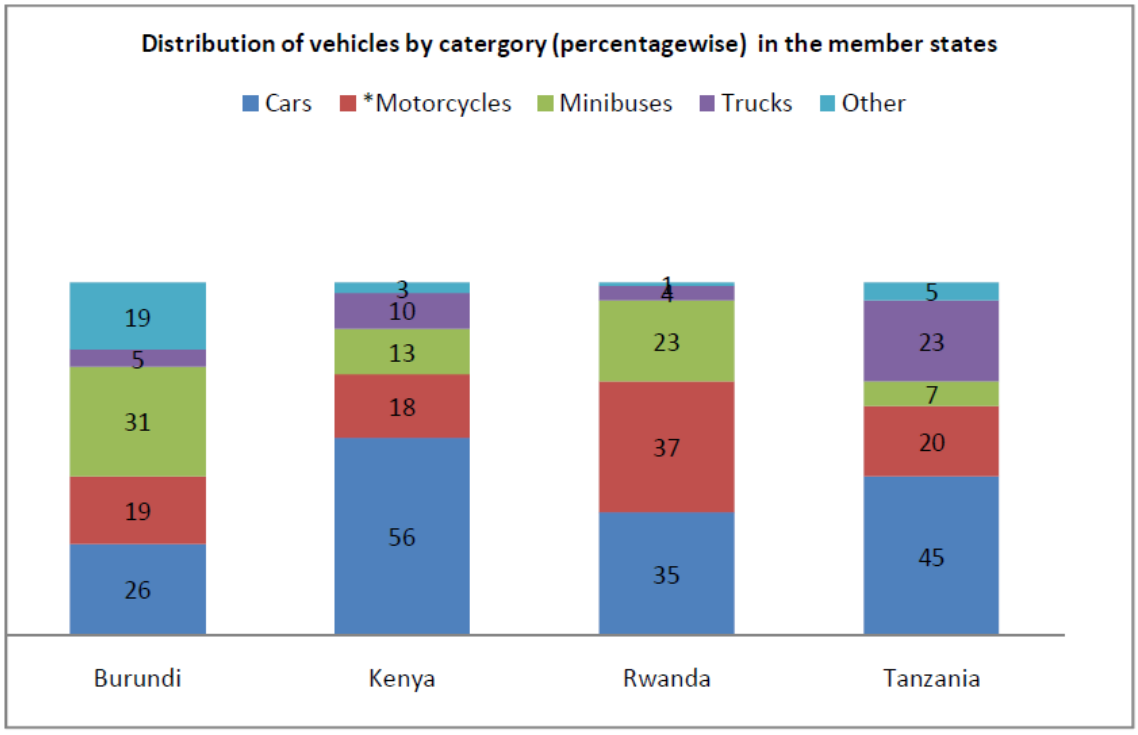

Figure 18: Distribution of vehicles by categories across the EAC countries [27]

2.5.2. Rwanda accident analysis

Road traffic accident statistics in Rwanda are collected by the police. The Aurecon Ltd (2012) [8] interviewed RTDA and the Ministry of Infrastructure (MININFRA), it was established that Rwanda does not have a good data record.

But, RTDA has very accurate data for year 2010 only. This has been justified by the fact that the roles and responsibilities for road safety are neither clearly stipulated nor enforced. The available road accident data are based on to present the accident environment in Rwanda.

In 2007 MININFRA reported that there were 2398 road accidents and over 2400 injuries in Rwanda.

The following figure 24 presents the number of road accidents in the country by province from 2007 and 2010.

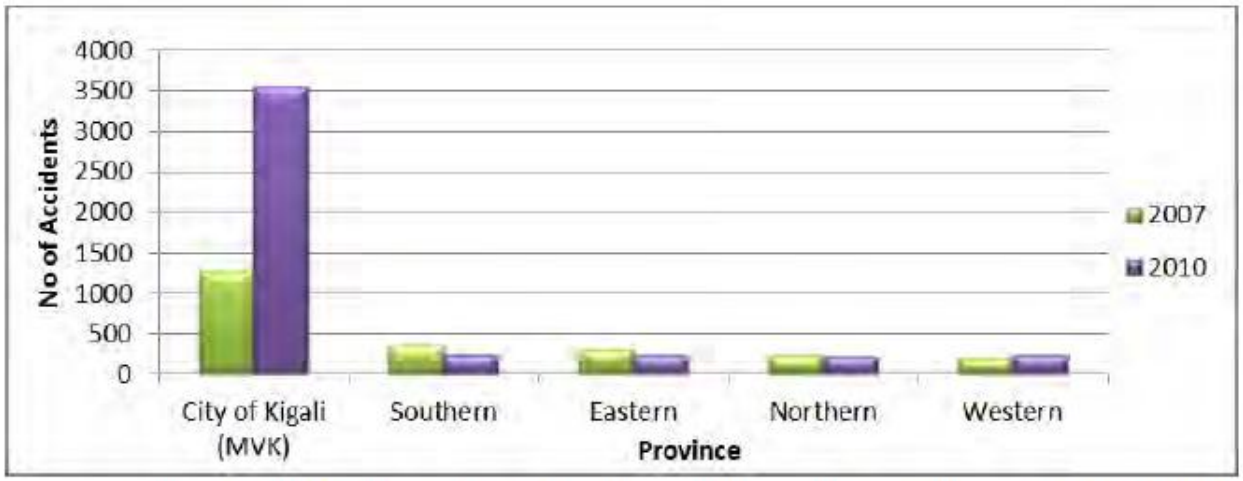

Figure 19: Number of Road Accidents in Rwanda by Province, 2007 and 2010 [8]

According to the figure:

- The Kigali City experienced most accidents, i.e 53% in 2007 and 79 % in 2010
- Southern, Eastern and Northern provinces experienced a decrease in total road accidents between 2007 and 2010.
- The lowest number of accidents occurred in the Western province i.e 203 in 2007 and in the Northern Province i.e 226 in 2010.

2.5.2.1. High accident zones

Accident statistics in year 2010 shows that the highest rate of accident in the country is in Nyarugenge District of Kigali City (Table 7).

Table 7: Highest Accidents zones [8]

	Location	Accidents in 2010
National/ Province Level	Kigali City	3851
	Southern Province	270
	Western Province	261
	Eastern Province	261
	Northern Province	242
District level	***Kigali City***	
	Nyarugenge	1738
	Gasabo	1619
	Kicukiro	494
	Southern Province	
	Ruhango	60
	Huye	49
	Kamonyi	35
	Western Province	
	Rubavu	49
	Rusizi	48
	Ngororero	40
	Eastern Province	
	Rwamagana	55
	Gatsibo	53
	Bugesera	38
	Northern Province	
	Musanze	66
	Gakenke	55
	Gicumbi	48

The high rate of accidents in Kigali City can be justified by the fact that more than 70% of the registered vehicles in the country are found in the City of Kigali ([8] in Asiimwe, 2011).

2.5.2.2. Accident by vehicle types

The road accidents in Rwanda by vehicle type in years from 2002 to 2005 and 2010 are presented in the following figure:

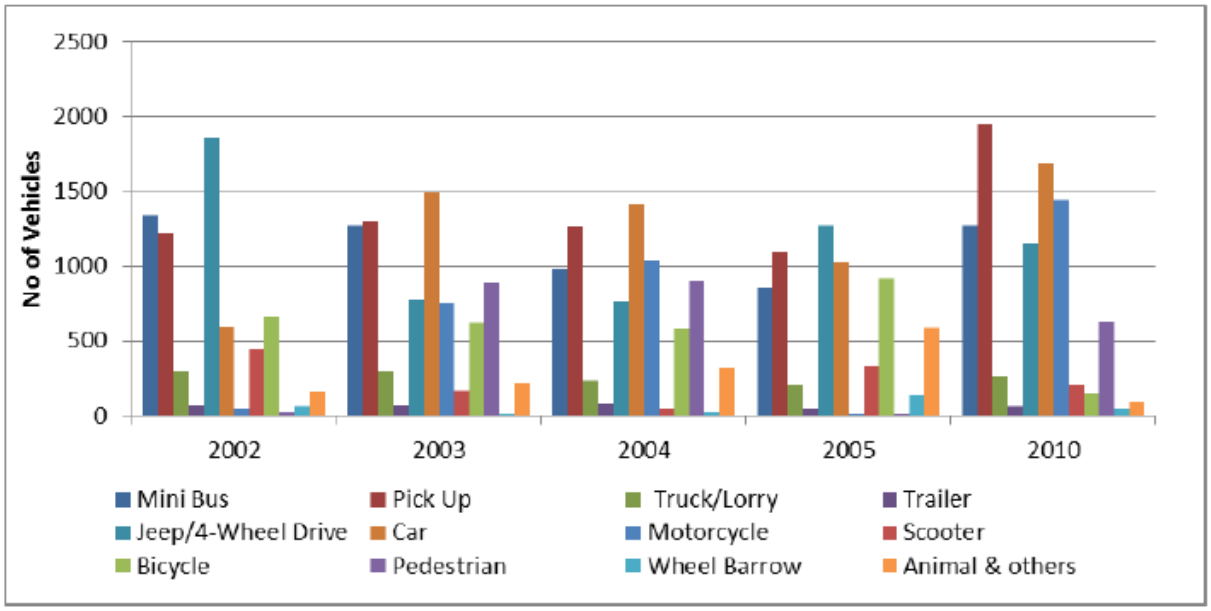

Figure 20: Road accident in Rwanda by vehicle type [8]

From the figure it is evident that:

- Minibuses, pickups, 4x4, cars and motorcycles are the main types of vehicles involved in accidents
- In year 2010, pickups accounted for 1944 accidents. Cars and motorcycles accounted for 1684 and 1442 accidents respectively. Wheelbarrows and pedestrians were involved in 44 road accidents and in 628 respectively.
- Pedestrians were more involved in accidents in 2003, 2004 and 2010. They were 888, 904 and 628 respectively.
- The highest accident rate was recorded in 2010. Pickups had the most accidents.

Statistics showed that in year from 2007 to 2010, percentage of severe accident decreased from about 32% to 26% [8].

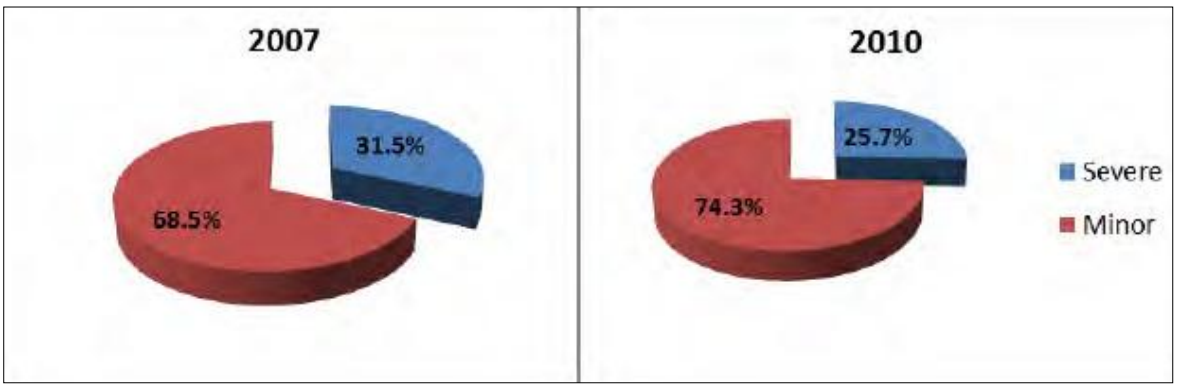

Figure 21: Types of accident in Rwanda, 2007 and 2010

2.5.2.3. Causes of accidents in Rwanda

The negligence, over speeding, bad maneuvers, rain, alcohol, mechanical problem, road signs, road condition etc are the main causes of accident in Rwanda according to the report done by Aurecon Ltd (2012) [8]. The negligence occupies the major cause than others. The figure 27 shows that road accidents about 58% are related to negligence, 20.3% related to bad maneuvers, 8.1% related to excess speed and 5% related to mechanical problems.

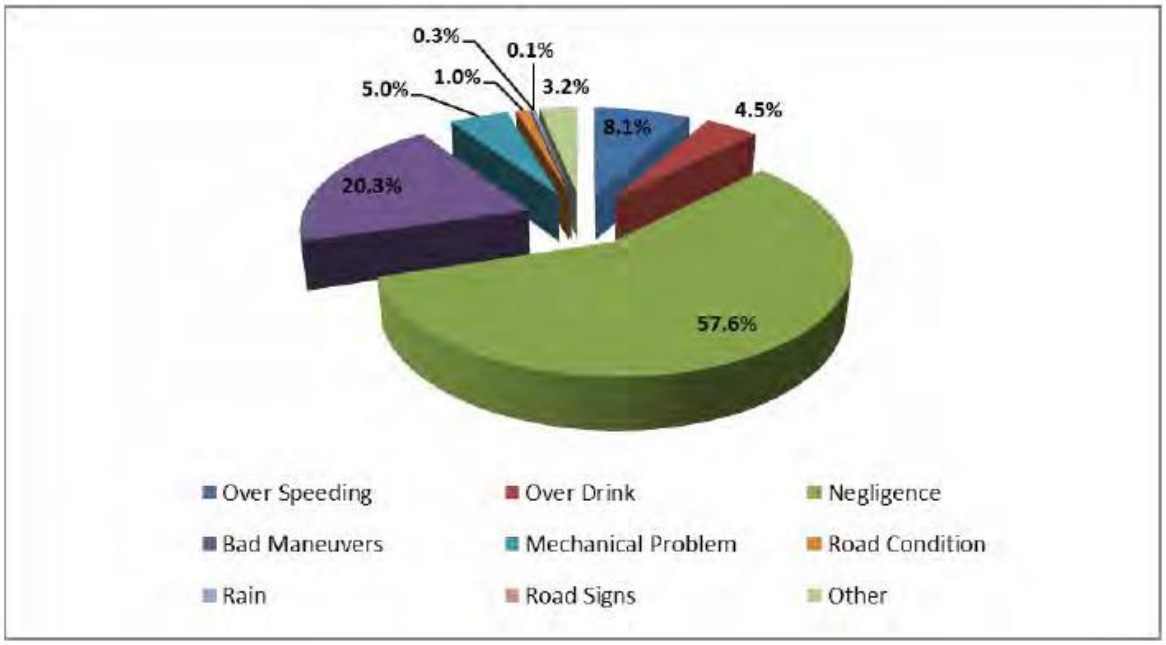

Figure 22: Causes of accident in Rwanda, 2010 [8]

The rain accounted 0.3% of the causes of road accident. But it has been noted that most of the accident occurred in the wet seasons. Figure 23 shows that high numbers of accidents were in April, September and November (wet season).

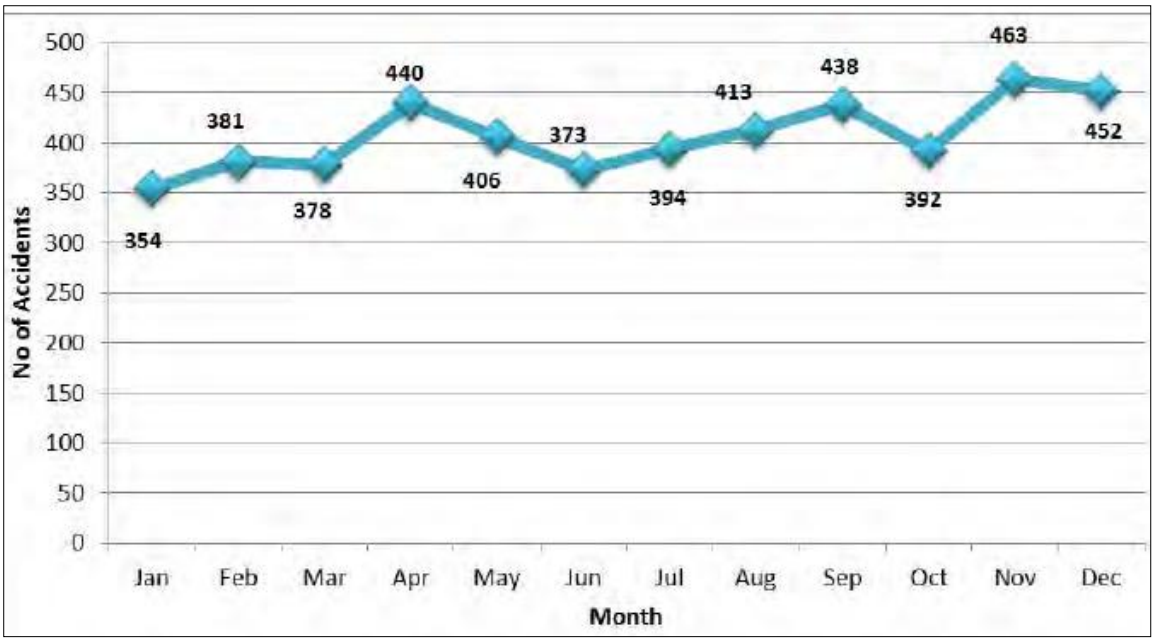

Figure 23: Road Accidents in Rwanda per Month, 2010 [8]

2.5.2.4. Age of drivers involved in Road accident

In Rwanda in 2010, about 48% of drivers fell in the age groups 25 to 35 years. About 995 accidents were linked to drivers aged between 40 and 50 years and only 16 were linked to drivers aged 70 to 85 years.

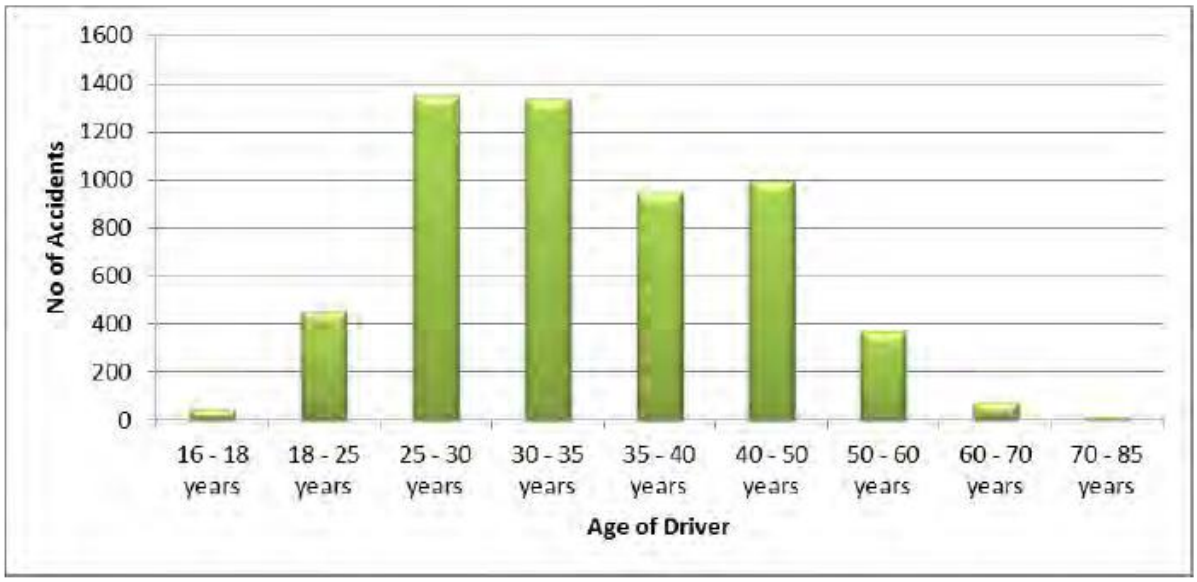

Figure 24: Age of drivers involved in Road accidents

2.5.2.5. Traffic data in Rwanda

Road traffic data are mostly available from police. It was established that Rwanda does not have a good data record. Presently, RTDA collected very accurately data for 2010 only [8]. The department of statistic at hospitals is also a source of data in Rwanda. But those data miss accuracy and details. They are not systematic means for recording accident data. Their data do not precise the location of accident and all injuries involved in the same accident.

2.6. ANALYSIS METHODS OF ACCIDENT DATA

There are a range of scales at which road traffic incidents can be analysed. For example, local authorities may record incident rates along a specific segment of road to understand the cause in terms of road engineering. The police collect accident data for their authority which can cover many counties. This data is then broken down into subsequent areas and so the cycle continues. It is an important point that due to the variability of scales, it makes the data incompatible and therefore worthless for and valid comparison.

To ensure that safety objectives are met, a distinction must be made between: locations which are hazardous as identified based on accident experiences, and locations and elements that are potentially hazardous due to their geometrics or physical features.
A location can be identified as hazardous by the occurrence of an abnormal number, rate, or severity of accidents over a given period of time.
Accident based procedures are used to identify locations defined as hazardous based on past experience. These procedures involve the review and analysis of system wide accident information to compare the accident experience of several locations fairly, the period of time over which accidents are counted and the length of roadway section. They should ideally be the same at each location. They take into consideration the time period and the length of the segment.

2.6.1. Analysis based on period considerations

Accident data for the most recent 1 to 3-year period is normally used and is generally sufficient. About 2 or 3 year analysis periods are more appropriate at locations with low traffic volumes, where a 1-year period may not provide sufficient information. Accident data should only be used when there are no major changes in facility characteristics or land use.

2.6.2. Analysis based on Roadway length

The roadway network can be divided into spots and/or segments. Isolated curves, bridges, and intersections are examples of spot locations. Segments are typically defined by a particular length or as the section of highway between two defined spots.

When selecting the spots the following are considered:

- Segment (long roadway) lengths should be no shorter than the minimum distance used by police officers to describe an accident location.
- For areas where accident reporting is subject to errors or less accuracy (i.e., rural areas or areas where field reference markers are far apart), longer segment lengths should be used for analysis purposes
- Spot (short roadway) lengths should include the area of influence around a hazard. For instance, the analysis of intersections should include all accidents that occur within a specified radius, such as 75 m, from the center of the intersection. Driveway accidents occurring within 75 m from the center of an intersection should, therefore, be included in the count of accidents for that intersection. Logically, it should be the stopping sight distance, plus the queue length at intersections

2.6.3. Identifying high Accidents locations

The methods for analyzing the hazardousness of locations include the following:

- Spot map method
- Accident frequency method
- Accident rate method

2.6.3.1. Spot map method

The simplest method for identifying hazardous locations is to examine an accident spot map. The map will show the spots or segments having the greatest numbers of accidents. This is an effective way to get a picture of the accident clusters in small areas.

2.6.3.2. Accident Frequency method

The frequency method ranks locations by the number of accidents. The location with the highest number of accidents is ranked first, followed by the location with the second highest number of accidents, and so on. This method does not take into account the differing amounts of traffic at each location. Therefore, the frequency method tends to rank high volume

locations as high accident locations, even if those locations have a relatively low number of accidents for the traffic volume. Many agencies use the frequency method to select a group of high-accident locations, and then use some other method to rank the locations in order of priority.

This method can also used to normalize the data or convert the accident frequencies to a common base, in terms of accidents per km per year. It takes into account for varying section lengths and time period of accidents.

2.6.3.3. Accident Rate Method

The accident rate method compares the number of accidents at a location with the number of vehicles at a location. This comparison results in an accident rate. The rate is stated in terms of "accidents per million vehicles" for intersections (and other spots) and for segments. The locations are then ranked in descending order by accident rate.

2.6.4. Spatial analysis

Spatial data analysis is involved when data are spatially located [30]. Road traffic incidents occur in time and space and therefore all incidents have an exact geographical location which is identified as a point on a map therefore the analysis used could be point pattern analysis, looking at the locations of particular events and seeing of if there is any pattern [30]. The points of the incidents all lie on or near a road network so therefore the lines are the elemental units of analysis. The spatial analysis regarding road traffic incidents is usually area analysis because the data is broken down into authority areas then the data will get broken down further into force areas. This depends on the organisation of the particular authority, whereby some have centralised traffic units and others have devolved traffic units. Spatial analysis is especially important to the analysis of road accidents because road traffic incidents will only occur on roads and therefore the patterns will always have the same shape, of being along a road; however the road needs to be broken down into segments of analysis [30].

2.7. VARIABILITY OF ACCIDENTS NUMBERS

There is a large random variation in the number of accidents at a site from one year to another. This variation is around the underlying true accident rate. Accident numbers by period of time (e.g. year to year) are held to be Poisson distributed [31].

When in one year accidents have varied a lot from the underlying true accident rate, they will tend in the next year to revert towards the underlying true accident rate [31]. This is known as "regression to the mean".

In statistics, **regression toward** (or **to**) **the mean** is the phenomenon that if a variable is extreme on its first measurement, it will tend to be closer to the average on its second measurement—and, paradoxically, if it is extreme on its second measurement, it will tend to have been closer to the average on its first [32].

The variability of numbers of accidents in the City of Kigali is analysed in those three Districts year to year in the period from 2012 to mid 2014.

CHAPTER 3: METHODOLOGY AND DATA COLLECTION

The analysis of variation of road accidents needs a collection of data in different years. In this chapter, the geography and demography, the means of transport, the methods of data collection are presented.

3.1. STUDY AREA

3.1.1. Geography and demography

Kigali City, the capital of Rwanda, is situated almost in the centre of the country. Its geographical position is on latitude 1º 57'S and on longitude 30º 04' E [33]. The city is built in hilly country, sprawling across about four ridges and the valleys in between. The tops of the ridges have an average elevation of 1,600 meters, while the valleys are around 1,300 m. The bigger houses and office buildings tend to be on the tops of the ridges, while the poorer people live in the valleys. The city is ringed most of the way round by higher hills, with some suburban sprawl rising up these. The City of Kigali is composed of three Districts (Nyarugenge, Gasabo and Kicukiro) (Figure 26).

According to the 2012 Population Census Provisional Results [7] Gasabo District has the highest population (274,342 males and 256,565 females), Nyarugenge (148,242 males and 136,578 females) and then Kicukiro (162,755 males and 156,906 females).

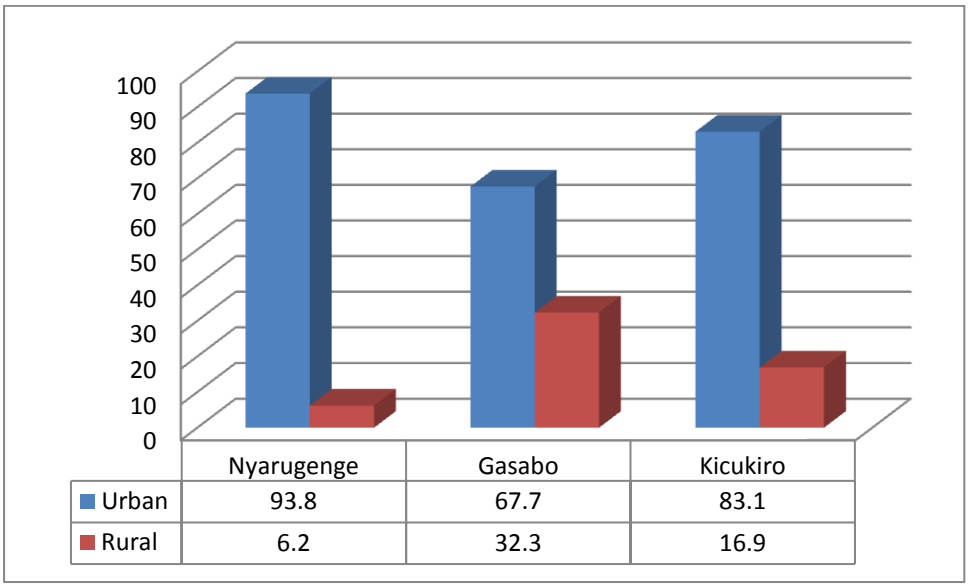

Figure 25: Distribution of Kigali City population (%)

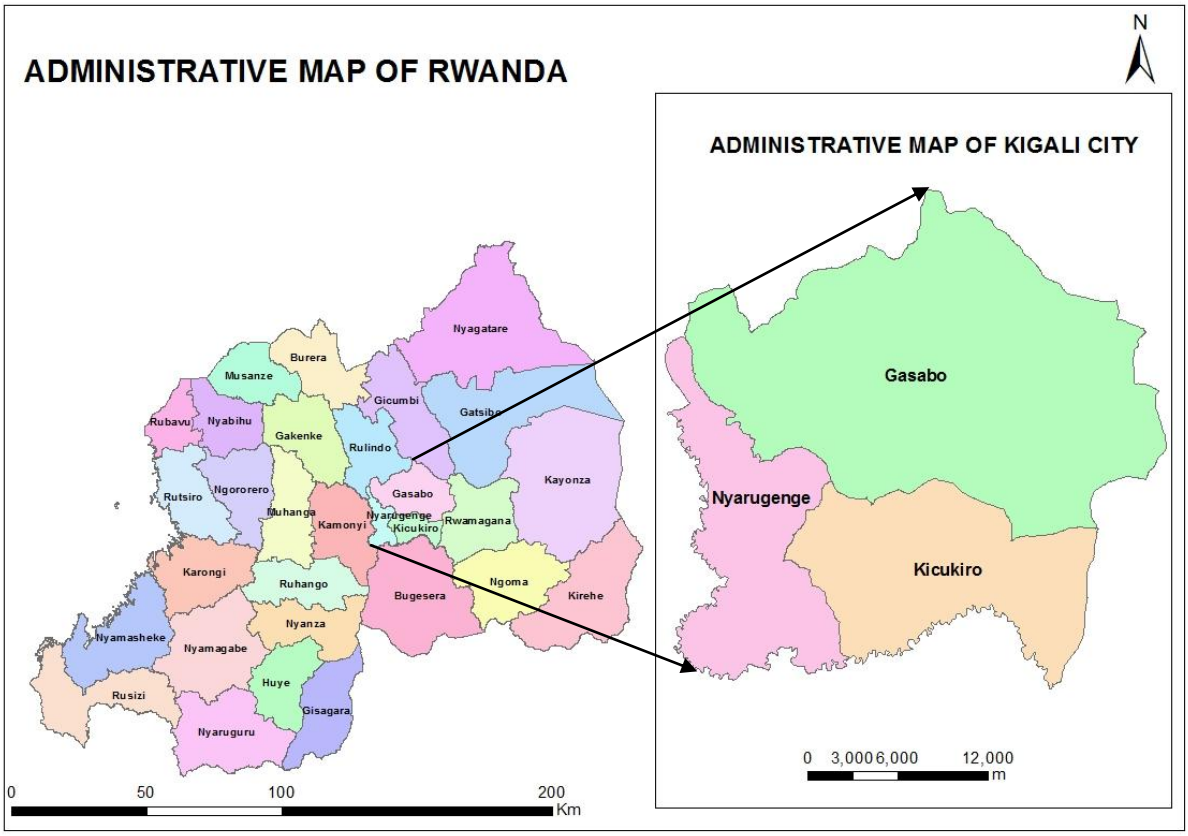

Figure 26: Administrative map of Kigali City

3.1.2. Economy of Kigali City

Kigali has been the economic, and transport hub of Rwanda ever since it became the capital upon independence in 1962. It has a population of over 1.135 million [33]. Kigali is 70% urban with a population which is relatively young- the youth make up about 60% and women make slightly more the 50% [34]. The rapidly growing city, Kigali is the country's most important commercial centre and main port of entry. It is serviced by an efficient International Airport and connected to neighboring Uganda, DRC, Tanzania and Burundi by tarmac roads.

3.1.3. Transportation of the City

Kigali City is the centre of the transport system in Rwanda (Figure 27). The road network in City of Kigali is generally good as over 90% of the residents have access to all weather roads [33]. However, access to means of transport is low. Over 70% of the City commuters either walk long distances or use motorbikes to access public transport [33]. It means many residents of the districts walk for long distances to get transport or they use motorbikes and bicycles to reach their destinations.

Because of the rapid development of City of Kigali, there has been a massive increase in the number of motor vehicles plying within and out of Kigali. This has created serious strain on the transport infrastructure. Increase of population from less than 1 million in 2007 to over 1.2 million in 2012 has also exerted a lot of pressure on other infrastructural facilities [33].

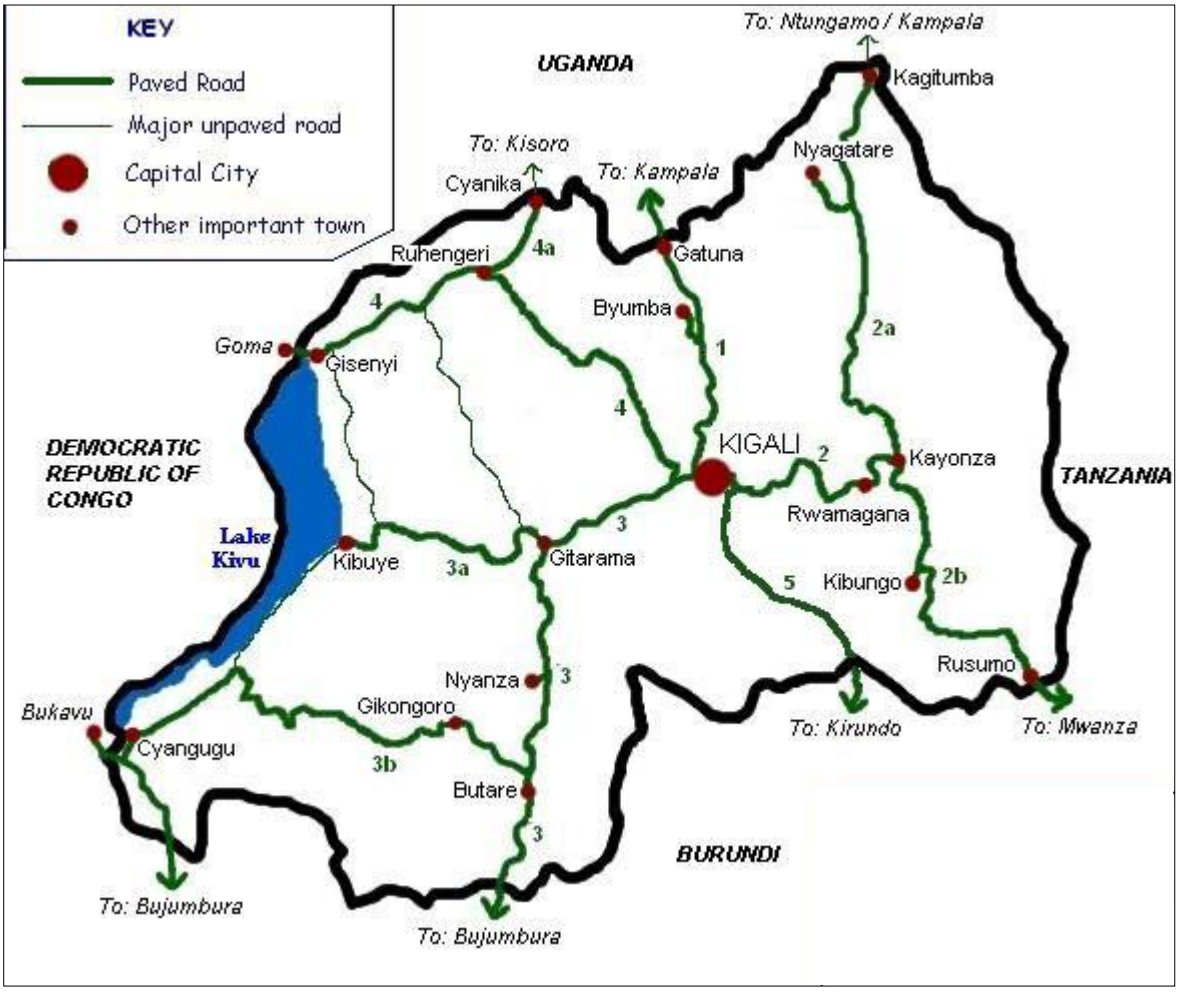

Figure 27: Main road network from Kigali to other District of Rwanda

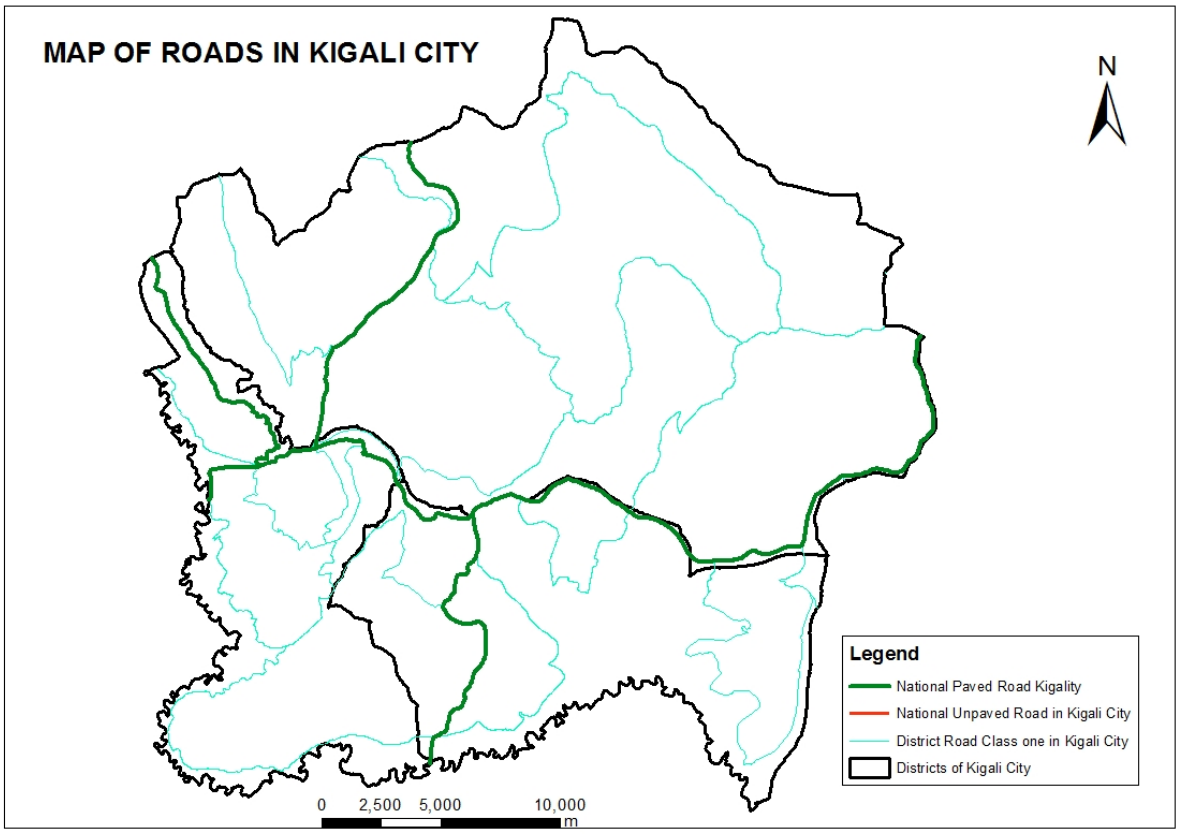

Figure 28: Road Network in Kigali City

3.1.4. Public transport

Car ownership in Rwanda is one of the lowest in the world with 8 cars per 1000 population [35] Car ownership in Kigali City is about 40 cars per 1000 population. About 80% of motorised trips is by public transport. The majority of the population walks, cycles, or takes transport as means of transport.

There are five types of public transport services provided in Kigali: Mini-buses, Bus, Taxi, Motorcycle taxi, Bicycle taxi.

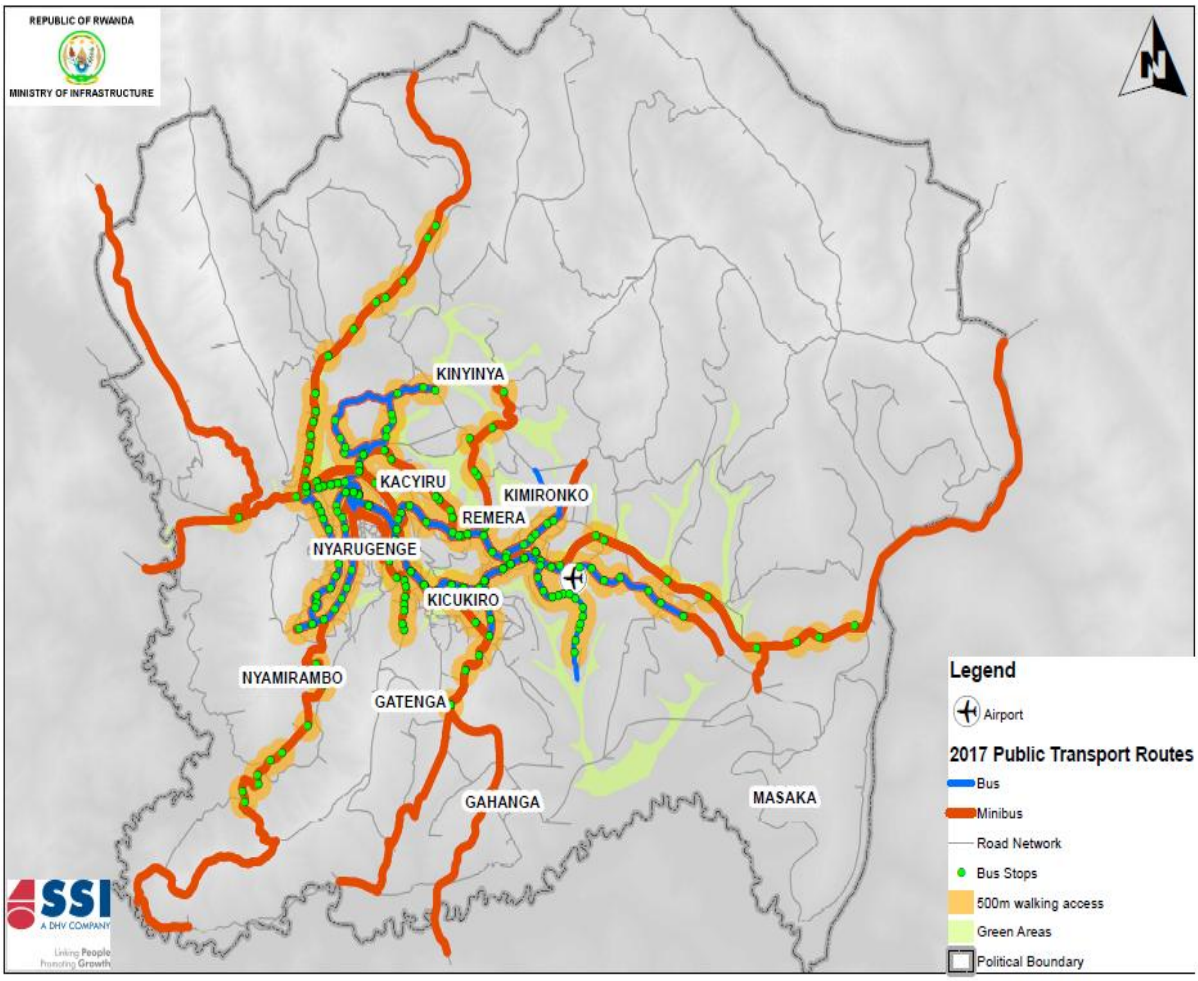

Figure 29: Public transport routes [35]

3.1.5. Traffic management system

According to the Kigali City report [35] the majority of road junctions are unsignalised. Traffic management systems such as traffic signals and roundabouts are found in the urban areas, mainly in Nyarugenge District. Currently, there are a total of 16 traffic light junctions. These traffic signs operate on a fixed time plan only and do not have any traffic sensors to respond to changing demand. Multiple manufactures of traffic light are used in the City and the City of Kigali intends to replace all the old traffic lights with new ones. This will assist the standardisation of the traffic light so that a centralised traffic lights coordinating system could be implemented in the future to optimize the performance of the junctions.

3.1.6. Road Safety

The statistics also indicate that Kigali city is still registering more accidents than any other part of the country, claiming more than about 80% of all accidents registered per month [35]. This can be due to a higher number of motorised vehicles on the road in the City as compared to the rural areas (Table 7; Table 8).

Table 8: Total number of accidents in 2010

Location	**Number of accidents**
Nyarugenge	1738
Gasabo	1619
Kicukiro	494
City of Kigali	**3851**

Rurangirwa said in the Bulletin of the World Health Organisation reported by Hannan Brown [36] that urban centres, such as the capital Kigali, saw frequent violent collisions, sometimes because drivers refused to respect others' right of way. Night-times were particularly hazardous because of the excess speed resulting generally from alcohol consumption. In rural areas, where roads are in a far worse condition than those in urban centres, drivers regularly went too fast to maintain control on the uneven carriageway surface.

Since 2004, the World Health Organization (WHO) has been working with the Rwandan government to help raise community awareness of road safety. The World Health organisation negotiated with schools and unions through a campaign organized by the ministries of health and infrastructure, the police force and WHO.

They were the enforcement of new laws for safe driving. The regulations started to be enforced since 2001 [36], included mandatory wearing of seatbelts, speed limits, vehicle inspections to ensure standards of roadworthiness and limits on blood-alcohol concentrations. The new laws had an almost immediate effect, as the number of deaths dropped by about 30% [36] (before the strict observation of law from 1995 to 2001, the number of deaths per annum reached between 450 and 550 but dropped to between 320 and 370 under the new law). The types of accidents also changed. Before the new laws came into force, excessive speed resulted in high rates of pedestrian injuries and deaths. But speed limits and penalties for drunk-driving reduced these incidents. The installation also of pavements and crossings for pedestrians also contributed to the reduction in these types of accidents [36].

3.2. METHODOLOGY

The data needed in this research were the numbers of accidents resulting from road traffic accidents in different location of the Kigali City. The administrative boundary of the city of Kigali is presented on Figure 27. Different methods of data collection have been discussed in section 2.3.2. But as presented in section 2.5.2.5., road traffic data in Rwanda are mostly available from police. It was established that Rwanda does not have a good data record. The department of statistic at hospitals is also a source of data in Rwanda. But those data miss accuracy and details. They are not systematic means for recording accident data. Their data do not precise the location of accident and all injuries involved in the same accident. The data collected from Rwanda National Police are from 2012 to mid 2014. They are presented for each year and for every month. They were filled in tables.

The collected data were then collated, analysed and presented in form of maps to show the spatial distribution of Road Traffic Accidents casualties by District in the City of Kigali. Accidents are classified into serious and minor accident.

3.3. DATA COLLECTION

3.3.1. Numbers of accidents in Kigali City

The accident data summarised in the following tables are from the Rwanda National Police

Table 9: Road accidents in 2012

Accidents in 2012									
	Nyarugenge			Kicukiro			Gasabo		
	Serious	Minor	Total	Serious	Minor	Total	Serious	Minor	Total
January	13	90	**103**	7	33	**40**	26	80	**106**
February	20	109	**129**	6	27	**33**	21	98	**119**
March	14	100	**114**	8	26	**34**	24	94	**118**
April	20	103	**123**	0	43	**43**	28	77	**105**
May	10	139	**149**	2	68	**70**	11	113	**124**
June	14	135	**149**	6	66	**72**	21	109	**130**
July	14	128	**142**	8	43	**51**	28	106	**134**
August	18	120	**138**	9	50	**59**	29	100	**129**
September	15	173	**188**	5	96	**101**	15	131	**146**
October	4	216	**220**	2	100	**102**	3	203	**206**
November	3	218	**221**	2	104	**106**	4	183	**187**
December	4	78	**82**	4	38	**42**	6	69	**75**
Total	**149**	**1609**	**1758**	**59**	**694**	**753**	**216**	**1363**	**1579**

Table 10: Road accidents in 2013

Numbers of Accidents in District in 2013									
	Nyarugenge			Kicukiro			Gasabo		
	Serious	Minor	Total	Serious	Minor	Total	Serious	Minor	**Total**
January	2	177	**179**	1	81	**82**	6	182	**188**
February	1	151	**152**	2	68	**70**	6	147	**153**
March	1	170	**171**	2	95	**97**	2	153	**155**
April	6	128	**134**	4	112	**116**	3	156	**159**
May	3	127	**130**	1	92	**93**	2	127	**129**
June	2	151	**153**	1	82	**83**	2	155	**157**
July	1	152	**153**	2	100	**102**	4	137	**141**
August	1	131	**132**	0	87	**87**	2	134	**136**
September	2	126	**128**	1	95	**96**	5	133	**138**
October	-	-	-	-	-	-	-	-	-
November	0	162	**162**	0	82	**82**	1	154	**155**
December	3	134	**137**	2	81	**83**	4	133	**137**
Total	**22**	**1609**	**1631**	**16**	**975**	**991**	**37**	**1611**	**1648**

Table 11: Road accidents in mid 2014

Numbers of Accidents in District in 2014									
	Nyarugenge			Kicukiro			Gasabo		
	Serious	Minor	Total	Serious	Minor	Total	Serious	Minor	Total
January	0	146	**146**	2	140	**142**	2	85	**87**
February	2	152	**154**	2	148	**150**	1	83	**84**
March	1	146	**147**	1	136	**137**	1	86	**87**
April	0	131	**131**	3	155	**158**	3	80	**83**
May	1	113	**114**	2	147	**149**	1	97	**98**
June	6	118	**124**	3	135	**138**	0	85	**85**
Total	**10**	**806**	**816**	**13**	**861**	**874**	**8**	**516**	**524**

3.3.2. Data for the cause of accidents

Table 12: Causes of accidents

	2012			2013			Mid 2014		
Causes	NNGE	KRO	GBO	NNGE	KRO	GBO	NNGE	KRO	GBO
Over speeding	85	42	84	36	33	60	16	32	12
Over drunk	63	41	56	28	14	28	7	10	7
Negligence	1030	394	908	984	491	873	513	605	276
Bad maneuvre	428	194	373	515	402	606	247	199	208
Mechanic faults	29	21	32	50	32	39	14	6	6
Road condition	3	5	1	4	1	7	12	14	10
Rain	0	8	0	0	0	0	5	0	2
Road signs	0	0	4	3	2	0	0	0	0
Others	17	8	15	11	16	35	0	6	0

3.3.3. Vehicles types involved in accident

Table 13: Vehicles involved in accidents

	2012			2013			Mid 2014		
	NNGE	KRO	GBO	NNGE	KRO	GBO	NNGE	KRO	GBO
Pick ups	454	119	387	310	224	334	241	199	191
Lorry	82	16	55	99	45	39	55	40	21
Minibus – Bus	547	173	341	348	160	233	244	169	123
Trailers	6	4	13	26	12	19	30	5	15
Four wheel vhs	227	133	347	222	122	294	169	275	104
Cars	591	193	676	364	188	436	317	344	209
Motor Cycle	531	225	360	372	246	391	281	330	175
Moped	58	45	35	18	16	7	3	2	8
Bicycle	28	14	36	16	12	15	4	6	7
Pedestrian	292	119	186	65	39	-	-	-	-
Wheelbarrows	0	3	4	3	0	0	0	0	0
Animals & Others	24	5	28	11	9	3	4	3	0

3.3.4. Injuries in accidents

Table 14: Numbers of injuries

	2012			2013		
	NNGE	KRO	GBO	NNGE	KRO	GBO
Minibus+Bus	85	56	83	73	48	73
Pick Ups	61	19	36	30	59	45
Lorry	26	7	15	3	7	4
Trailers	1	0	3	7	0	2
Cars	52	26	46	43	47	53
Four wheel vehicles	18	26	53	23	17	26
Motor Cycles	294	105	260	341	220	389
Bicycles	15	1	39	16	19	23
Pedestrians	182	40	144	203	83	188
others	42	12	39	0	0	0

3.3.5. Deceased in accidents

Table 15: Deceased in accidents with vehicle types

Deceased in accidents						
	2012			2013		
	NNGE	KRO	GBO	NNGE	KRO	GBO
Minibus+Bus	0	0	0	0	0	2
Pick Ups	0	1	2	1	1	7
Lorry	0	1	0	0	0	0
Trailers	0	0	0	0	0	0
Cars	1	1	1	0	0	0
Four wheel vehicles	0	0	3	0	0	0
Motor Cycles	7	4	13	3	8	6
Bicycles	4	3	1	1	0	0
Pedestrians	12	7	25	16	6	19
others	2	1	3	0	0	0

3.3.6. Victims and deceased in road accident by age and sex

The data of road accident by age and sex were only available for the year 2014.

Table 16: Persons dead by sex

Persons dead						
	Mid 2014					
	NNGE		KRO		GBO	
	M	F	M	F	M	F
Minibus+Bus	1	0	3	0	0	0
Pick Ups	1	0	2	0	5	0
Lorry	1	0	0	0	1	0
Trailers	0	0	0	0	0	0
Cars	1	0	2	0	4	0
4/wheel vehicles	0	0	0	0	0	0
Motor Cycles	2	0	4	0	2	0
Bicycles	1	0	0	0	0	0
Pedestrians	4	1	1	1	2	0
others	0	0	0	0	0	0

CHAPTER 4: DATA ANALYSIS, INTERPRETATIONS AND DISCUSSIONS

4.1. DATA ANALYSIS

The analysis is done in time (period from 2012 to mid 2014) for three Districts of the City of Kigali. The total number of accidents, the causes of accidents, types of accidents, the number of fatalities and number of injuries, monthly variation of accidents data are presented and ranked. This analysis is at Districts level.

Data are presented on maps and graphs presenting a variation of accidents in three Districts of the City of Kigali. The analyses were carried out using Microsoft Excel.

The accident frequency method and accident rate per km length per year (section 2.6.3) of the network were used for analysis. The method ranks Districts by the number of accidents and accident rate**.**

4.2. ROAD TRAFFIC ACCIDENT BY DISTRICTS

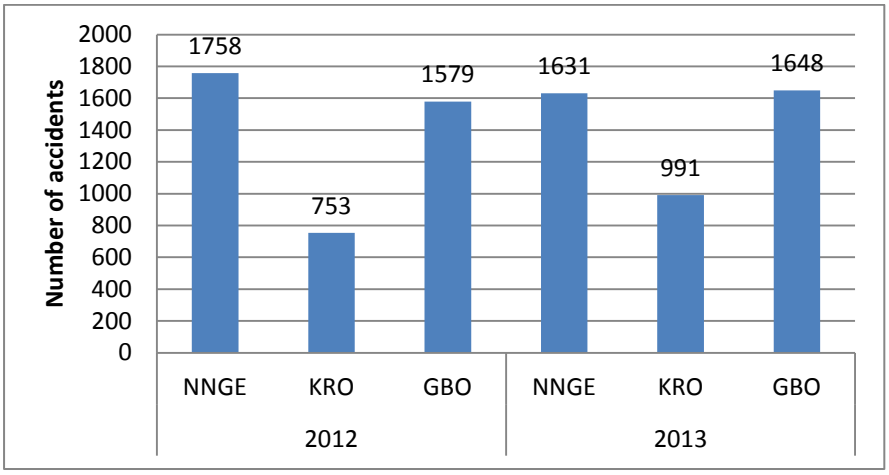

Figure 30**:** Total number of accidents in City of Kigali by Districts

Figure 30 above presents the total number of accidents in each District of the City of Kigali in 2012 and 2013. It is the total of accidents occurred for all types road users and all types of accidents. In year 2012, the total number of accident in Nyarugenge District is the highest with 1758 accidents, followed by Gasabo District with 1579 accidents and then Kicukiro District with 753 accidents. In year 2013, Gasabo District is the first followed by Nyarugenge District and then Kicukiro District with 1648, 1631, 991, accidents respectively.

High number of accidents in Nyarugenge District may be due to the facts that it the centre of business in the city. Most of traffic travel to the centre of the City (Nyarugenge District).
From 2012 to 2013, accidents reduced in Nyarugenge while they increased in Gasabo Districts in Kicukiro District. The numbers of accident in the year 2014 are not presented at the same graph because the available data were till the month of June. This is possible after normalization in the same period. The accident rate per km road length in a year is used.

Accident rate per km road length

On this basis the total accident hazard is expressed as the number of accident of all types per km length per year. The figure below presents the accident rate per km per year in each District of the Kigali City.

$$Accident\ rate = \frac{Number\ of\ Accidents}{Length\ of\ road * years}$$

Table 17: Length of the road network in each District

Districts	Nyarugenge	Kicukiro	Gasabo
Road network length (km)	82.46	60.54	138.23

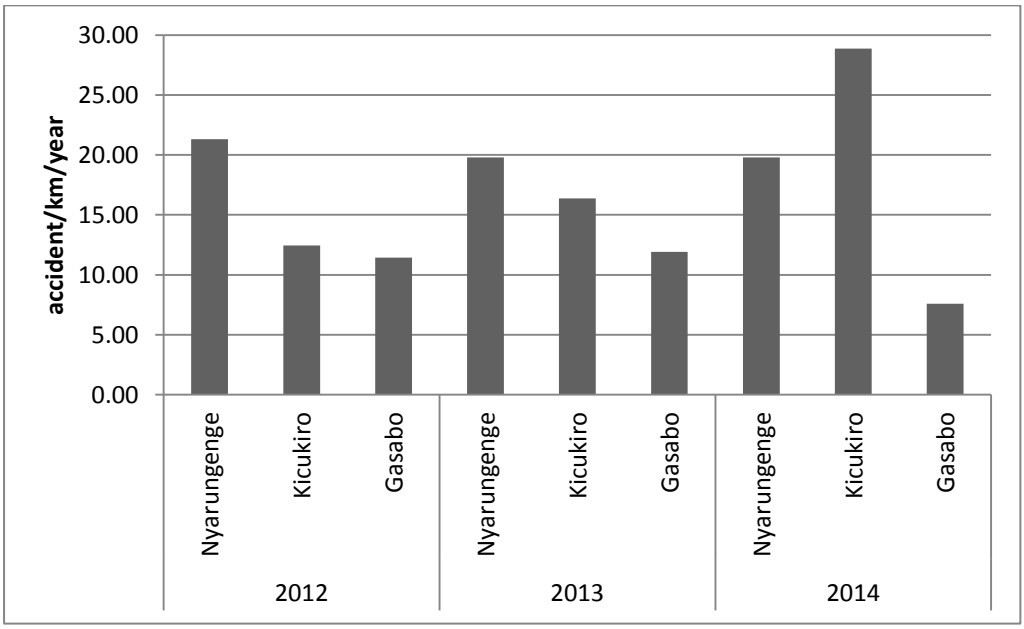

Figure 31: Accidents rate/km length/year

District of Nyarugenge has the highest rate in 2012 and 2013. It is followed by the District of Kicukiro and then Gasabo. But in 2014 the sequence of accident rates changes to Kicukiro,

Nyarugenge and then Gasabo. Comparing Figure 30 and Figure 31, the sequence of District in the number of accidents is Nyarugenge, Gasabo, then Kicukiro while basing on this approach of accident rate per km, the sequence is Nyarugenge, Kicukiro and then Gasabo. It is seen that the length of the road network contribute to the accidents occurrence in those Districts. In addition, in the harmonization in the same period, it is assumed that the same number of accident occurred in the first semester of 2014 will be the same in the second semester in this year.

4.2.1. Trend compared in the year 2012

Table 18: Change in accidents numbers

Districts	Total Accidents		
	2012	2013	Change 2012-2013
Nyarugenge	1758	1631	-7.2
Kicukiro	753	991	31.6
Gasabo	1579	1648	4.4

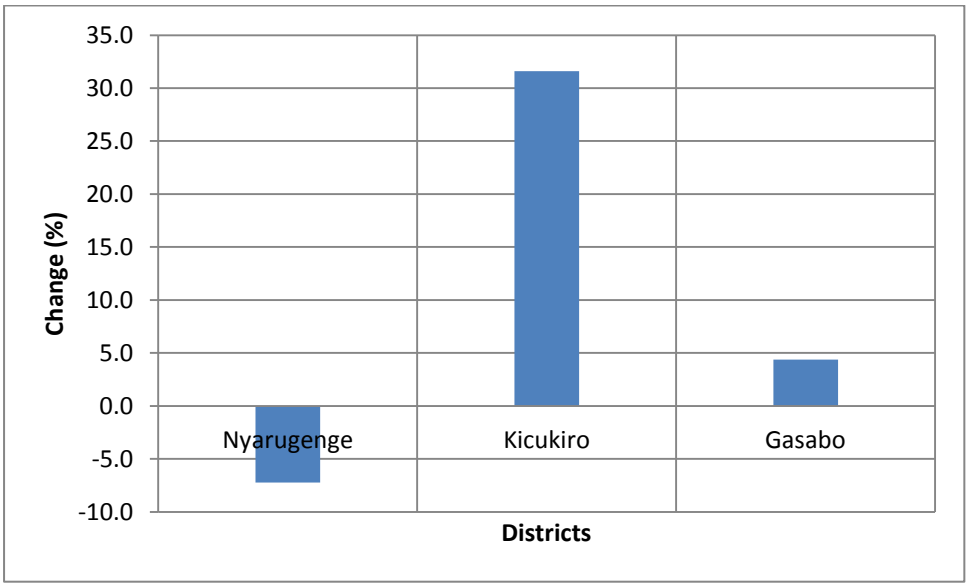

Figure 32: Accidents trend in 2013 in comparison to 2012

From 2012 to 2013, there was a great increase of about 32% in Kicukiro District, and about 4.4 % in Gasabo District but decrease in Nyarugenge of about 7.2%.

4.2.2. Trend for year 2014 compared to the same period in 2013

The trend of number of accident were analysed for the first semester (till June) of each years to do a comparison in the three years without harmonization in the whole years for year 2014.

The accidents data for 2014 are till June. The trend from the beginning of each year till June is presented in the following.

Table 19: Total number of accidents in mid 2012, 2013 and 2014

	2012			2013			2014		
Districts	NNGE	KRO	GBO	NNGE	KRO	GBO	NNGE	KRO	GBO
Number of Accidents	767	753	702	919	541	941	816	874	524

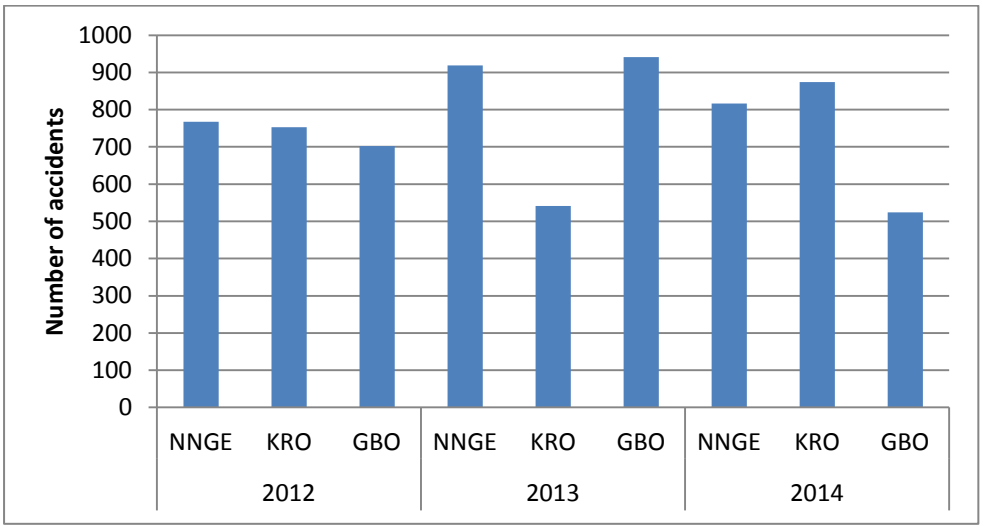

Figure 33: Total number of accidents in mid 2012, 2013 and 2014

The graph above shows numbers of accidents in mid year 2012, 2013 and 2014, the total number of accidents were high in Nyarugenge District in year 2013.

Table 20**:** Trend in the first semester of each year

Districts	**Total Accidents**					
	2012	**2013**	**Change 2012-2013**	**2014**	**Change 2013-2014**	**Change 2012-2014**
Nyarugenge	767	919	**19.8**	816.0	**-11.2**	**6.4**
Kicukiro	753	541	**-28.2**	874.0	**61.6**	**16.1**
Gasabo	702	941	**34.0**	524.0	**-44.3**	**-25.4**

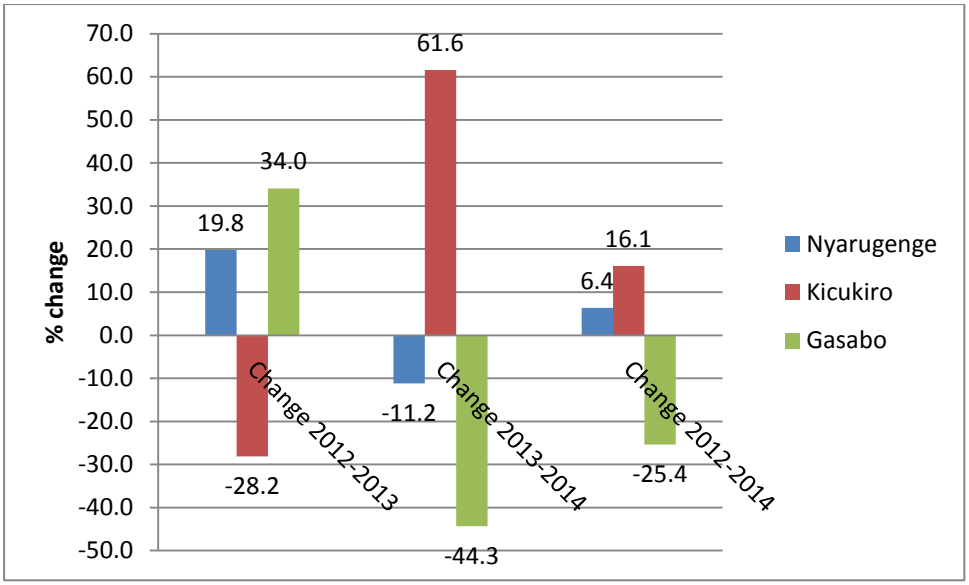

Figure 34: Trend of number of accident in the first semester of each year

- It is seen that in the first semester of each year from 2012 to 2014, the total number of accidents change considerably from one year to another. From 2012 to 2013 there is an increase in total accident in Gasabo Districts (34%) while they decreased in Kicukiro Districts (-28%). From 2013 to 2014, only District of Kicukiro experience a considerably increase in accidents about 62%. In others Districts (Nyarugenge and Gasabo) there were a negative trends.
- Comparing figure 33 and figure 31 in year 2012 and 2013, in Kicukiro District the trend started negatively and completed at the end of the year in positive side. Most road accidents in 2013 were recorded in the second semester of the year. In Nyarugenge District, year 2013 started with high number of accidents in comparison to 2012 and completed with less number of accidents.
- From year 2013 to 2014 (till June), there were much variation of the total number of accidents. Considerable increase is in Kicukiro District.

The negative trends in mid years 2012 and 2013 and then positive trend at the end of year lead to the analysis of the variation of total accidents per months. There are presented in the following figure.

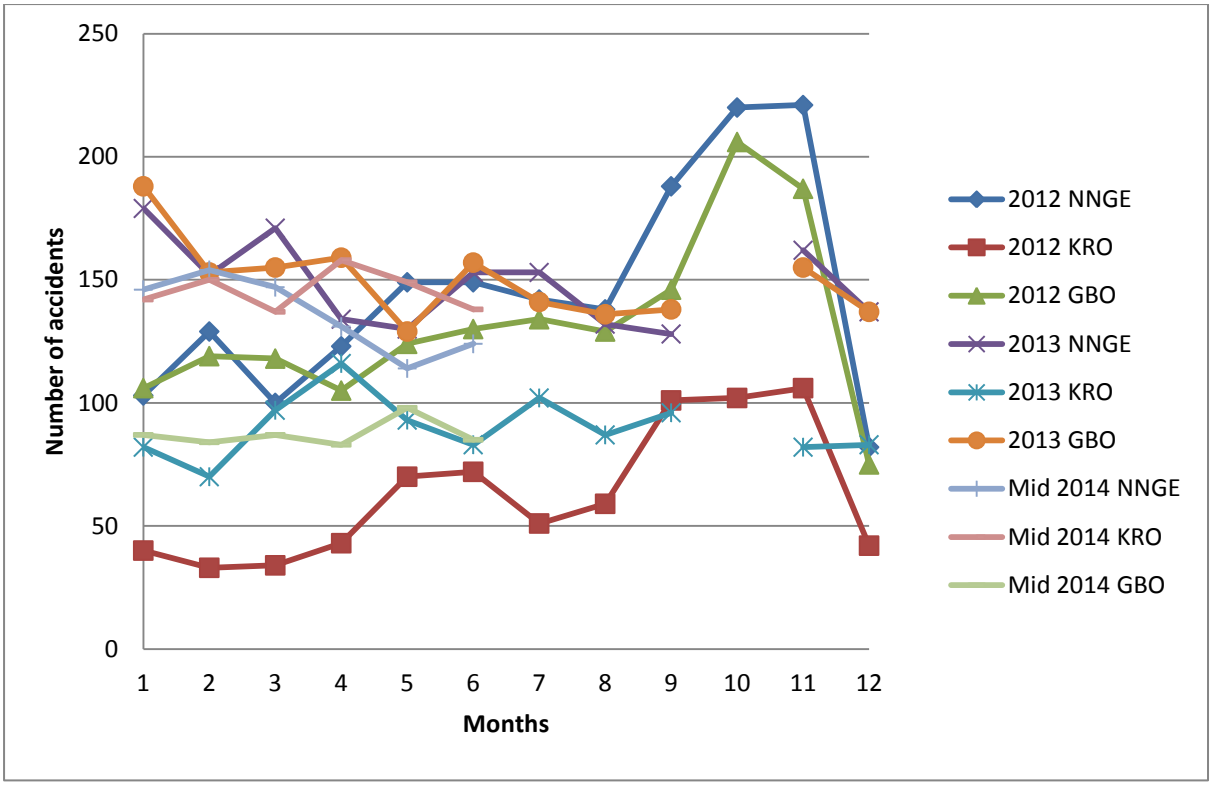

Figure 35: Road accident per month in 2012, 2013 and 2014

- In 2012, road accidents increased in all District over the year. They were 40 in Kicukiro, 106 in Gasabo, 103 in Nyarugenge in January and in December they were 106, 187 and 221 in each District respectively. A higher number of accidents occurred in November. Accident increased from April to June, decreased in the month of July, started to increase again from August to November and then much decreased in December in all Districts. The month of December have less number of accidents may be due the enforcement of regulations by police during the period of Christmas and New Year holidays. But the month of January of the next year, the number increased.
- In 2013, there were high number of accidents in January that were decreasing over the year in Nyarugenge and Gasabo Districts. The month of December have less number of road accidents. Data for the month of October were missing.
- The year 2014 started with high number of accidents in Nyarugenge and Kicukiro Districts than in Gasabo District. It is seen that the number of accidents were not increasing over the period (middle 2014).
- Generally in all years and each District, the period from May to August experienced less number of road accidents while the period from September to November

experienced high rate of road accidents. In section 2.5.2.3, the rain is presented as one cause of accident. It was seen that during the dry season there is a reduction in road accidents. Hence, from May to August there was also the reduction of accidents.

4.3. REGRESSION TO THE MEAN

The variability of numbers of accidents in the first semesters of years 2012, 2013 and 2014 are analysed for those three Districts.

The average number of accidents in this period is 760 in all districts. The accidents are found to vary around the mean. The accidents in the same district tend towards the mean.

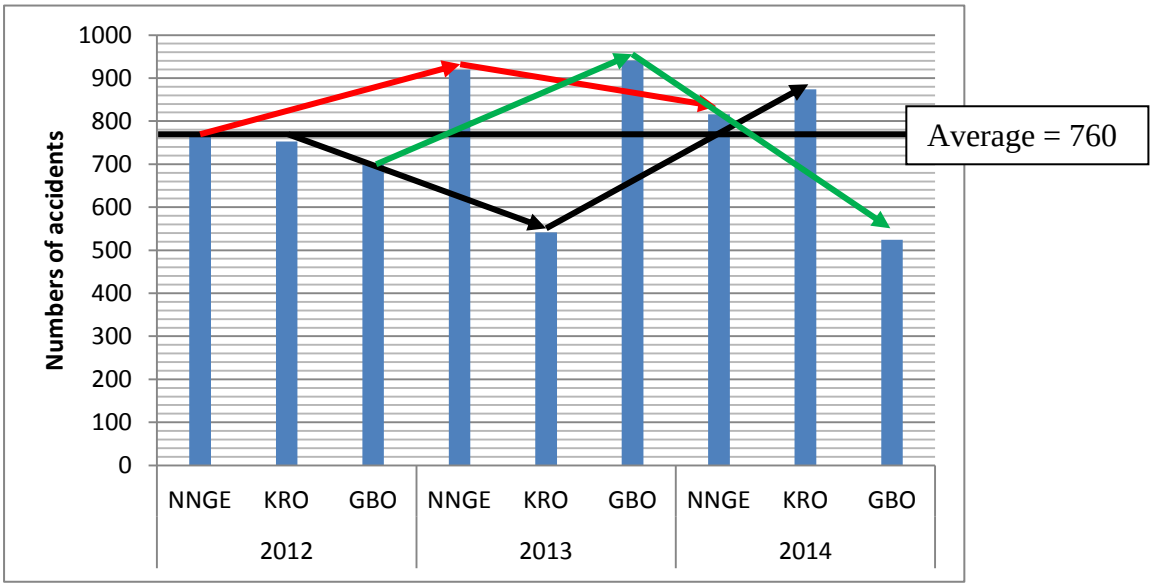

Figure 36: Variation of accidents in mid year 2012, 2013 and 2014

Accidents vary in all Districts either from high number to the low number or from low to the high number around the mean number. In Nyarugenge District accidents increased from 2012 to 2013 and then decreased in 2014. It is the same for Gasabo District. In Kicukiro District the accidents decreased in 2013 and then increased in 2014. The decrease in accident numbers from the previous year to the next year may be due to the enforcement of regulations at the location where the accident numbers were high. The increase or decrease from one year to another may also be justified by the phenomena of regression to the mean as discussed previously at section 2.7.

4.4. CAUSES OF ACCIDENTS

The causes of accidents identified are the over speeding, drunk, negligence, bad maneuver, mechanical faults, road condition and rain. The road condition and rain do not present significant figures.

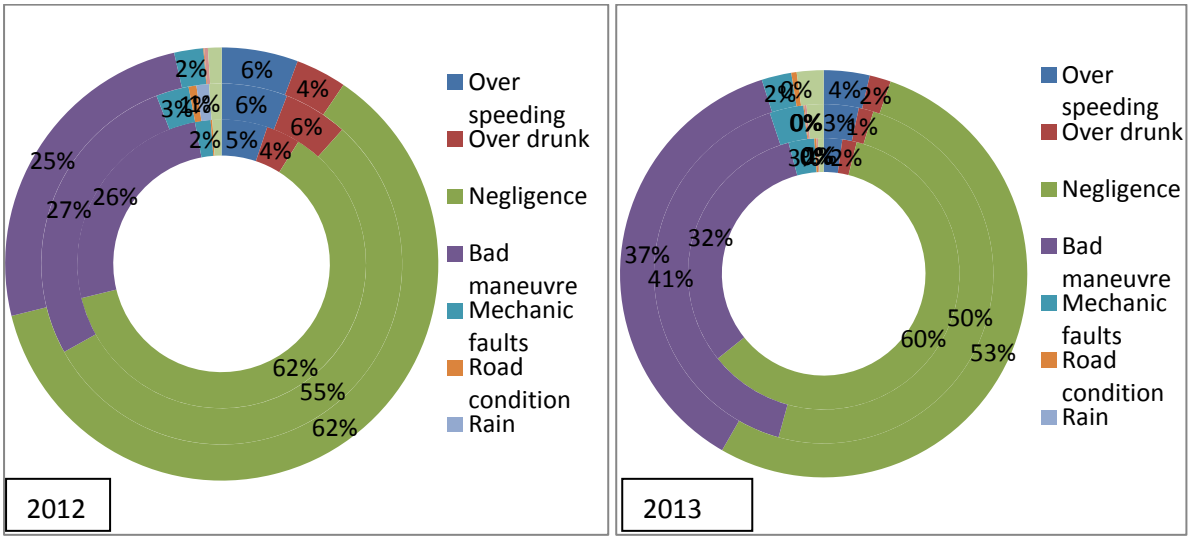

Figure 37: Causes of accidents by districts

The circles represent from internal to external Nyarugenge, Kicukiro and Gasabo Districts respectively.

- The negligence is the most causes (50-62%) of accident in all districts of the City of Kigali followed by the bad maneuver (25-41%). Over speeding occupies the third place.
- From 2012 to 2013 the bad maneuvers were increasing as the factor of the cause of accident

4.5. TYPES OF ACCIDENTS

Accident data are recorded as either serious or minor.

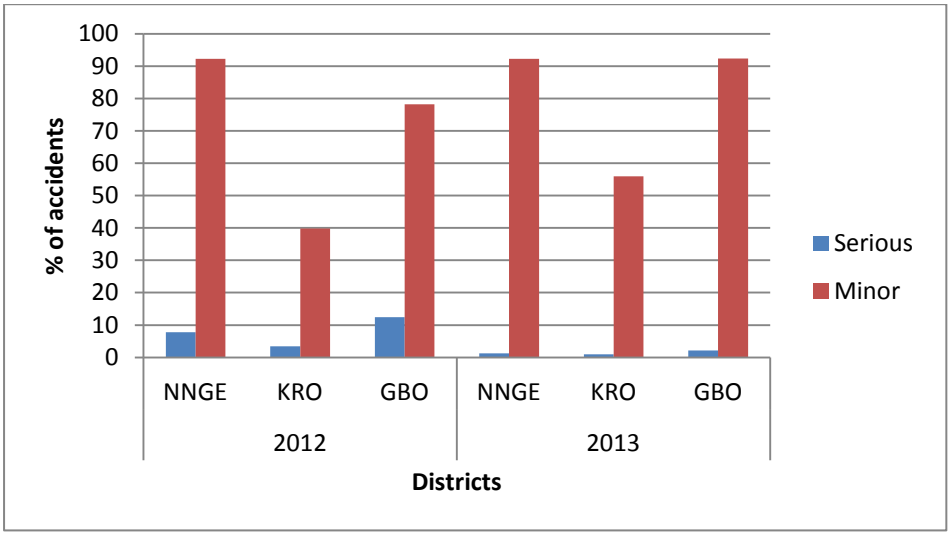

Figure 38: The types of accidents by Districts

The serious accidents reduced in 2013 in comparison to 2012. But the minor increased in all Districts of the City of Kigali. The reduction of major accidents may be due the strict enforcement laws governing the driving. In addition there was much input in the improvement of traffic signals such road marking, provision of humps, and locate road traffic policemen at many places.

4.6. VEHICLES INVOLVED IN ACCIDENTS

The road users classified and being involved in road traffic accident in Rwanda are the pickup, lorry, minibus-bus, trailers, four wheel vehicles, cars, motorcycle moped bicycle, pedestrian, wheel barrows, animals and others (Table13).

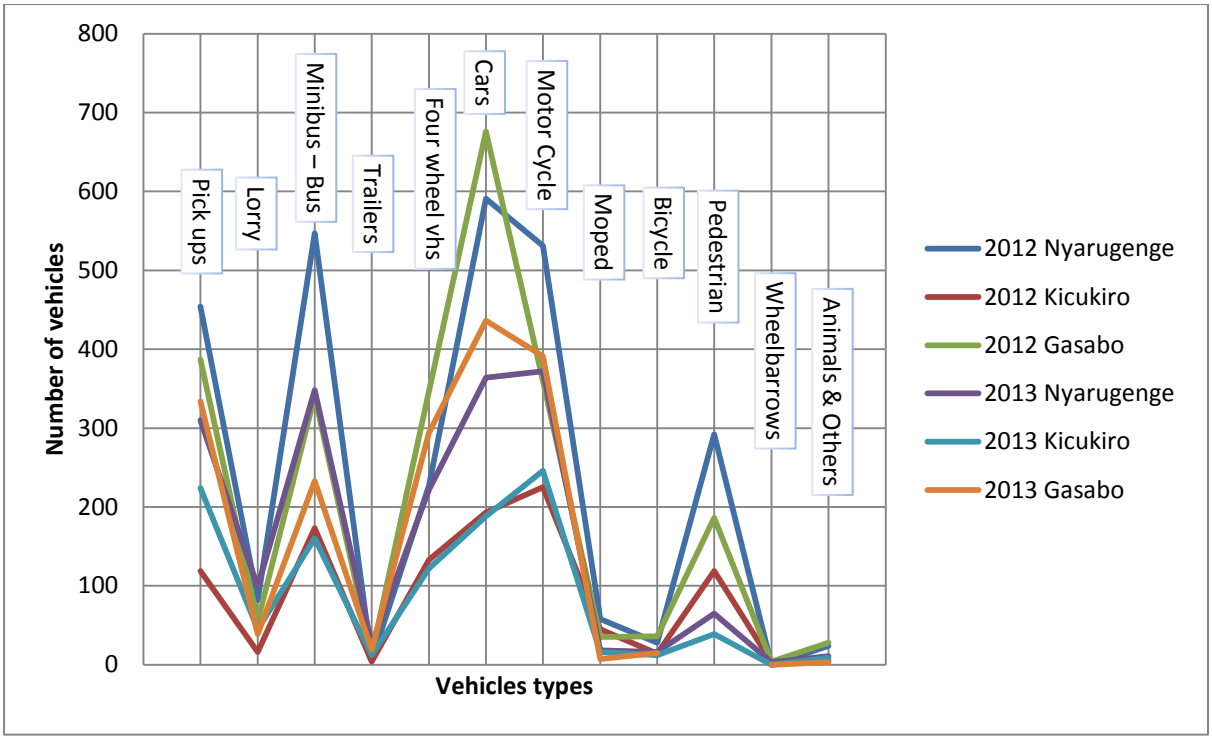

Figure 39: Number and types of vehicles involved in accidents

It is seen that:

- Cars are the most involved vehicles in road accidents, followed by minibus-bus and pickups. This may be due to the fact that they are the most registered vehicles in the country (Table 19). The number of cars registered in 2012 is more than other vehicles. These are presented in the following table 19.

Table 21: Total Number of Registered vehicles in Rwanda as at August 2012 [37]

Vehicle types	**Number of vehicles**
Cars	21422
Pickups	13834
Jeeps	15254
Minibuses	5451
Buses	511
Trucks	3849
Motor cycles	57650
Others	685
Total	118656

4.7. INJURIES IN ACCIDENT

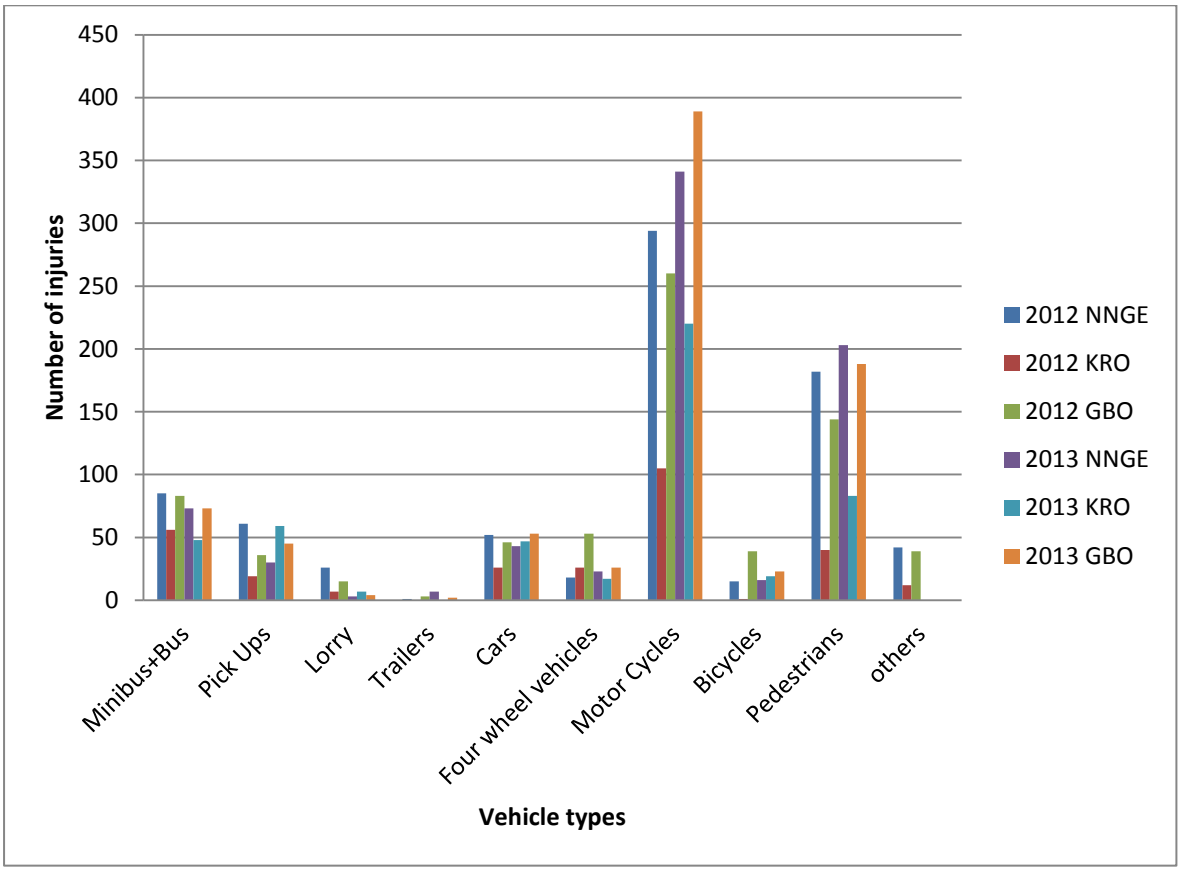

Figure 40: Number of injuries by the types of vehicles and District

Although, cars are the most involved vehicle in accidents, motorcycles users are the most vehicles injured during accident. They are followed by the pedestrian. The District of Gasabo has high number of injuries than other Districts of the City of Kigali. This may be due to high number of rural population in rural zones (Figure 25). People used to travel on motorcycles and walking.

Numbers of injuries were decreasing in other types of vehicles rather than pedestrians and motocycles. Generally injuries increased from 2012 to 2013 in Kicukiro District.

4.8. DECEASED IN ACCIDENTS IN CITY OF KIGALI

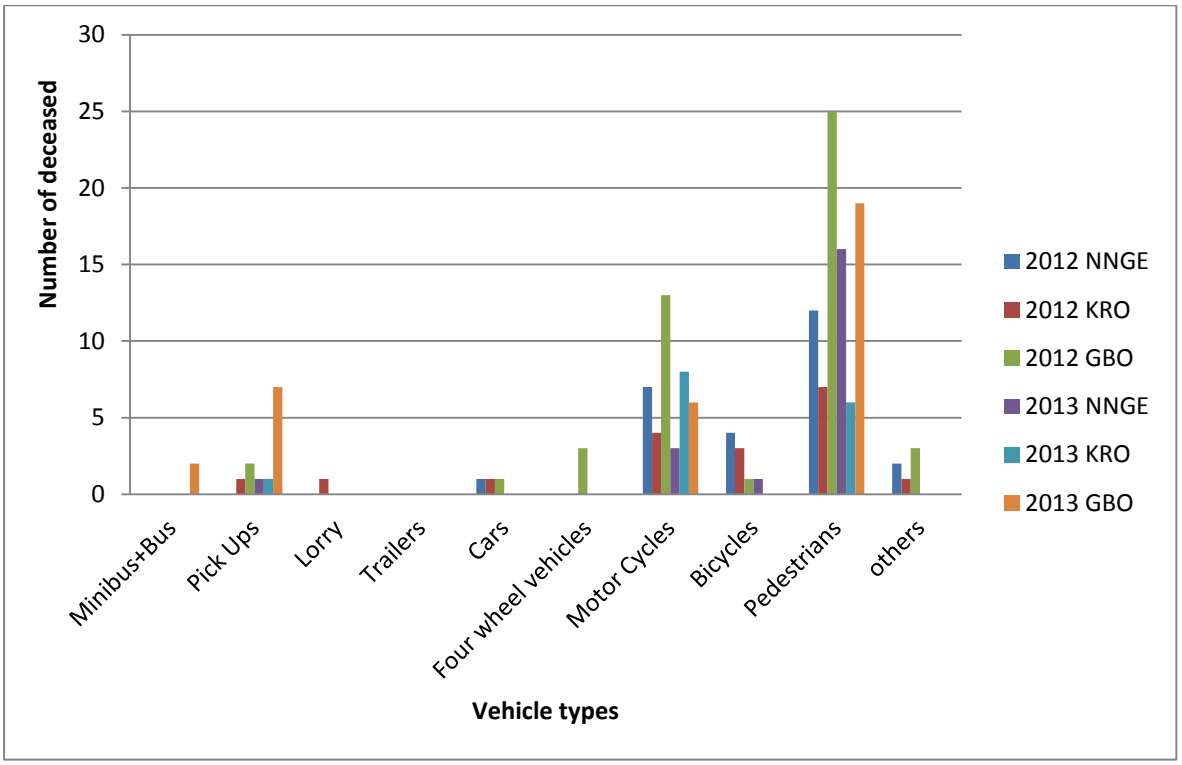

Figure 41: Deceased persons by vehicle types and Districts

Pedestrians are the most vulnerable in road accidents in all Districts. The number of killed in accidents are pedestrian, followed by the motorcycles users and then pickups. It is found that Gasabo experienced high rate of deceased persons in accidents. The number decreased from 2012 to 2013 for pedestrians, four-wheel vehicles, bicycles whereas they increased for minibus + bus, pickups, motorcycles. The decrease of death may be due to the provision of community road safety education involved teaching children, adults to be safer road users.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSION

Due to the rapid increase of population and traffic volumes in recent years, traffic congestion and the deterioration of roads have increased remarkably in Kigali City.

Based on the accident analysis which were conducted, it can be concluded that:

- Gasabo District experiences most of the accidents in the Kigali city. This was based on the number of accidents occurrence. Based on the accidents rate per km per year, Nyarugenge District was found to be the most to have higher rate. The higher rate of accident in Nyarugenge may be to due to high daily movement of traffic to the centre city.
- Negligence is the main cause of road accidents, followed by bad maneuvers and excessive speeding.
- Motorcycles were involved in most road-related accidents and fatalities in 2012-2013.
- Pedestrian and passengers are the main victims of road accidents.
- Cars were found to be the most types of vehicles involved in accidents in 2012-2013. This is justified with the fact that they are the most registered vehicles in the country.

5.2. RECOMMENDATION

The rapid increase of traffic volumes should go with the enforcement of regulations in order to reduce safety problems in the country. For the decisions making accidents that should be collected with detailed information showing the precise location. The Ministry of Infrastructure should set out the institutional structure for road safety to reduce the long way of sharing the information from National Police with MININFRA and RTDA. The increasing number of road accident and the consequent loss of lives and resources indicate a need to develop a strategy on road safety.

In addition Rwanda Road Accident Database must set up to standard, because; there is no national database providing historical figure of road accident occurrence. Nonetheless, it was possible to obtain (incomplete) monthly data before 2014 (e.g. Accident by Age) from Traffic Police Records.

Well; the road safety for the users should be also taken into account. That is why it is recommended to the Rwanda-National Police (Traffic Police Department) to undertake the regulation of traffic flow regulation, driver, and vehicle controls for this purpose.

Enforcement is an essential component for improving road safety. Traffic law enforcement is meant to achieve the safe and efficient movement of all road users including non-motorized traffic and pedestrians. In this regard, enforcement of traffic rules (such as speed limits, stop signs and rules at pedestrian crossing facilities) can be used to significantly improve road user behavior and safety.

Finally; it recommends further detailed research on roads safety in KIGALI CITY in order to identify alternative solutions which will improve the problem of transports safety in Rwanda.

In addition the accident rate per km per vehicles should be investigated taking into account the average daily traffic in each district. This may increase the precision in the analysis of the accident exposure in each district of Kigali City.

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APPENDIXES

REPORT OF ACCIDENTS HAPPANED IN JANUARY 2012

INTARA		MVK		
IMPANUKA ZABAYE	AKARERE	Nyarugenge	Kicukiro	Gasabo
	Izikomeye	13	7	26
	Izoroheje	90	33	80
	Total	103	40	106

IBYAGIZE URUHARE MU MPANUKA	AKARERE	Nyarugenge	Kicukiro	Gasabo
	Camionnette	35	10	41
	Camion	6	1	6
	Minibus – Bus	50	17	26
	Camion Remorque	0	0	0
	Jeep	23	13	46
	Voiture	54	18	65
	Moto	54	14	32
	Vélomoteur	4	0	5
	Bicyclette	1	0	5
	Pedestrian	21	4	13
	Brouettes	0	1	1
	Animaux & Autres	4	0	7
	Total	**252**	**78**	**247**

ABAKOMERETSE MU MPANUKA	AKARERE	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	6	8	7
	Camionnettes	8	1	1
	Camion	6	0	3
	C Remorque	0	0	0
	Voiture	1	0	4
	Jeep	1	2	8
	Motos	46	17	40
	Bicyclette	1	0	6
	Pedestrian	20	2	17
	Total	**89**	**30**	**86**

ABAPFIRIYE MU MPANUKA	AKARERE	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Camionnettes	0	0	0
	Camion	0	0	0
	C Remorque	0	0	0
	Voiture	0	0	0
	Jeep	0	0	0
	Motos	0	0	1
	Bicyclette	3	0	0
	Pedestrian	1	1	1
	TOTAL	**4**	**1**	**2**

REPORT OF ACCIDENTS HAPPANED IN FEBRUARY 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	20	6	21
	Minor	109	27	98
	Total	129	33	119

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	7	1	7
	Over drunk	8	1	5
	Negligence	84	18	81
	Bad maneuvers	28	13	20
	Mechanical faults	1	0	5
	Road Condition	1	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	1
	Total	**129**	**33**	**119**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	35	8	39
	Lorry	6	1	4
	Minibus – Bus	44	13	22
	Trailers	1	0	0
	Four wheel vhs	16	12	41
	Cars	51	14	55
	Motor Cycle	50	11	25
	Moped	4	0	4
	Bicycle	1	0	3
	Pedestrian	21	4	9
	Wheelbarrows	0	0	1
	Animals & Others	1	0	1
	Total	**230**	**63**	**204**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	3	1	3
	Pick Ups	3	0	2
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	4
	Four wheel vehicles	1	0	0
	Motor Cycles	20	7	11
	Bicycles	0	0	4
	Pedestrians	14	4	15
	others	**41**	**12**	**39**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	0	0
	Bicycles	0	0	0
	Pedestrians	1	1	2
	others	**2**	**1**	**2**

REPORT OF ACCIDENTS HAPPANED IN MARCH 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	14	8	24
	Minor	100	26	94
	Total	**114**	**34**	**118**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	4	1	7
	Over drunk	2	2	5
	Negligence	76	21	79
	Bad maneuvers	32	10	23
	Mechanical faults	0	0	1
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	3
	Other	0	0	0
	Total	**114**	**34**	**118**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	35	8	29
	Lorry	4	1	4
	Minibus – Bus	44	15	23
	Trailers	0	0	0
	Four wheel vhs	13	11	14
	Cars	48	13	39
	Motor Cycle	50	11	29
	Moped	4	0	4
	Bicycle	2	0	1
	Pedestrian	21	4	9
	Wheelbarrows	0	0	1
	Animals & Others	3	0	1
	Total	**224**	**63**	**154**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	3	3	2
	Pick Ups	3	1	1
	Lorry	2	0	1
	Trailers	0	0	0
	Cars	1	0	1
	Four wheel vehicles	1	2	7
	Motor Cycles	37	13	35
	Bicycles	1	0	2
	Pedestrians	8	2	10
	others	0	0	0
	Total	**56**	**21**	**59**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	0
	Bicycles	1	0	0
	Pedestrians	2	1	0
	others	0	0	0
	Total	**3**	**2**	**0**

REPORT OF ACCIDENTS HAPPANED IN APRIL 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	20	0	28
	Minor	103	43	77
	Total	**123**	**43**	**105**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	4	1	7
	Over drunk	2	4	5
	Negligence	88	19	69
	Bad maneuvers	29	10	21
	Mechanical faults	0	4	1
	Road Condition	0	5	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	2
	Total	**123**	**43**	**105**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	35	8	28
	Lorry	4	1	4
	Minibus – Bus	44	13	22
	Trailers	1	0	0
	Four wheel vhs	13	11	14
	Cars	46	13	39
	Motor Cycle	50	11	28
	Moped	9	3	0
	Bicycle	2	0	0
	Pedestrian	21	4	0
	Wheelbarrows	0	0	0
	Animals & Others	3	0	0
	Total	**228**	**64**	**135**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	6	2	4
	Pick Ups	8	1	6
	Lorry	3	0	0
	Trailers	0	0	0
	Cars	4	1	4
	Four wheel vehicles	1	2	7
	Motor Cycles	27	10	28
	Bicycles	2	0	4
	Pedestrians	16	5	15
	others	0	0	0
	Total	**67**	**21**	**68**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	1	2
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	1
	Total	**0**	**2**	**3**

REPORT OF ACCIDENTS HAPPANED IN MAY 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	10	2	11
	Minor	139	68	113
	Total	**149**	**70**	**124**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	10	6	5
	Over drunk	4	5	4
	Negligence	101	34	86
	Bad maneuvers	26	23	25
	Mechanical faults	8	2	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	2
	Total	**149**	**70**	**124**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	35	8	14
	Lorry	5	1	3
	Minibus – Bus	39	15	22
	Trailers	0	0	1
	Four wheel vhs	12	12	16
	Cars	41	14	55
	Motor Cycle	46	17	25
	Moped	4	0	4
	Bicycle	1	0	5
	Pedestrian	20	4	9
	Wheelbarrows	0	1	0
	Animals & Others	0	0	0
	Total	**203**	**72**	**154**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	6	13	2
	Pick Ups	3	1	1
	Lorry	0	0	3
	Trailers	0	0	0
	Cars	1	0	3
	Four wheel vehicles	1	2	2
	Motor Cycles	14	8	15
	Bicycles	1	0	1
	Pedestrians	11	2	5
	others	0	0	0
	Total	**37**	**26**	**32**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	0	2
	Bicycles	0	0	0
	Pedestrians	0	0	2
	others	0	0	0
	Total	**1**	**0**	**4**

REPORT OF ACCIDENTS HAPPANED IN JUNE 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	14	6	21
	Minor	135	66	109
	Total	**149**	**72**	**130**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	12	2	3
	Over drunk	3	4	5
	Negligence	99	41	90
	Bad maneuvers	32	25	28
	Mechanical faults	2	0	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	1	0	2
	Total	**149**	**72**	**130**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	29	6	15
	Lorry	5	1	3
	Minibus – Bus	39	15	25
	Trailers	0	0	1
	Four wheel vhs	11	14	16
	Cars	44	20	53
	Motor Cycle	51	17	25
	Moped	3	0	2
	Bicycle	1	0	2
	Pedestrian	22	10	16
	Wheelbarrows	0	0	0
	Animals & Others	0	0	0
	Total	**205**	**83**	**158**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	14	8	4
	Pick Ups	6	1	1
	Lorry	6	0	0
	Trailers	0	0	0
	Cars	6	2	4
	Four wheel vehicles	1	2	4
	Motor Cycles	25	11	14
	Bicycles	0	0	4
	Pedestrians	11	4	10
	others	0	0	0
	Total	**69**	**28**	**41**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	1
	Bicycles	0	0	0
	Pedestrians	0	1	2
	others	0	0	0
	Total	**0**	**1**	**3**

REPORT OF ACCIDENTS HAPPENED IN JULY 2012

Provinces		Kigali City		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	14	8	28
	Minor	128	43	106
	Total	**142**	**51**	**134**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	5	2	7
	Over drunk	3	3	5
	Negligence	98	33	90
	Bad maneuvers	34	13	27
	Mechanical problem	1	0	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	1	0	3
	Total	**142**	**51**	**134**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	35	9	41
	Lorry	6	1	5
	Minibus – Bus	48	16	25
	Trailers	0	0	0
	Four wheel vhs	20	7	33
	Cars	45	16	49
	Motor Cycle	47	12	29
	Moped	4	0	3
	Bicycle	1	0	2
	Pedestrian	21	4	14
	Wheelbarrows	0	1	1
	Animals & Others	4	0	7
	Total	**231**	**66**	**209**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	6	4	6
	Pick Ups	5	1	1
	Lorry	6	0	3
	Trailers	0	0	0
	Cars	4	0	4
	4 Wheehs VHS	2	2	4
	Motor Cycles	25	10	35
	Bicycles	3	0	4
	Pedestrians	19	2	18
	others	0	0	0
	Total	**70**	**19**	**75**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	1	0
	Trailers	0	0	0
	Cars	0	0	0
	4Wheels vhs	0	0	3
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	1	1	3
	others	0	0	0
	Total	**1**	**2**	**6**

REPORT OF ACCIDENTS HAPPENED IN AUGUST 2012

Provinces		VK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	18	9	29
	Minor	120	50	100
	Total	**138**	**59**	**129**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	5	10	13
	Over drunk	6	2	3
	Negligence	75	19	57
	Bad maneuvers	36	12	40
	Mechanical problem	8	7	10
	Road Condition	2	0	1
	Rain	0	8	0
	Road Signs	0	0	0
	Other	6	1	5
	Total	**138**	**59**	**129**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
VEHICLES INVOLVED IN ACCIDENTS	Pick ups	47	11	55
	Lorry	8	2	1
	Minibus – Bus	42	4	33
	Trailers	0	0	2
	Four wheel vhs	22	9	34
	Cars	63	13	72
	Motor Cycle	37	9	38
	Moped	4	0	3
	Bicycle	1	0	1
	Pedestrian	15	5	12
	Wheelbarrows	0	0	0
	Animals & Others	1	0	4
	Total	**240**	**53**	**255**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	7	2	23
	Pick Ups	9	2	5
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	4	1	5
	Four wheel vehicles	2	2	7
	Motor Cycles	19	7	22
	Bicycles	2	0	2
	Pedestrians	18	5	12
	others	0	0	0
	Total	**61**	**19**	**76**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	1	2
	Bicycles	0	0	1
	Pedestrians	0	0	1
	others	0	0	0
	Total	**1**	**1**	**4**

REPORT OF ACCIDENTS HAPPENED IN SEPTEMBER 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	15	5	15
	Minor	173	96	131
	Total	188	101	146

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	10	8	13
	Over drunk	11	5	7
	Negligence	115	62	86
	Bad maneuvers	48	22	38
	Mechanical problem	3	3	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	1	1	0
	Total	188	101	146

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	47	16	38
	Lorry	10	2	11
	Minibus – Bus	58	21	42
	Trailers	1	1	4
	Four wheel vhs	30	14	43
	Cars	57	22	72
	Motor Cycle	46	39	38
	Moped	7	12	3
	Bicycle	7	6	5
	Pedestrian	36	25	30
	Wheelbarrows	0	0	0
	Animals & Others	3	0	1
	Total	**302**	**158**	**287**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	7	5	8
	Pick Ups	4	5	4
	Lorry	0	1	1
	Trailers	0	0	1
	Cars	4	7	1
	Four wheel vehicles	2	4	2
	Motor Cycles	17	7	13
	Bicycles	2	0	2
	Pedestrians	14	5	9
	others	0	0	0
	Total	**50**	**34**	**41**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	1	1	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	2
	Bicycles	0	2	0
	Pedestrians	2	0	6
	others	0	0	0
	Total	**3**	**4**	**8**

REPORT OF ACCIDENTS HAPPENED IN OCTOBER 2012

Provinces		VK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	4	2	3
	Minor	216	100	203
	Total	220	102	206

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	12	4	10
	Over drunk	9	7	7
	Negligence	125	61	121
	Bad maneuvers	69	25	66
	Mechanical problem	2	2	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	3	3	0
	Total	220	102	206

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	47	14	38
	Lorry	11	2	6
	Minibus – Bus	60	18	41
	Trailers	1	1	2
	Four wheel vhs	27	12	38
	Cars	61	20	72
	Motor Cycle	46	36	38
	Moped	7	12	3
	Bicycle	5	3	5
	Pedestrian	39	22	30
	Wheelbarrows	0	0	0
	Animals & Others	3	2	3
	Total	307	142	276

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	14	5	10
	Pick Ups	4	5	5
	Lorry	0	1	1
	Trailers	0	0	1
	Cars	10	6	6
	Four wheel vehicles	3	4	3
	Motor Cycles	27	6	19
	Bicycles	1	0	4
	Pedestrians	22	4	15
	others	0	0	0
	Total	81	31	64

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	2	0	1
	Bicycles	0	0	0
	Pedestrians	2	0	3
	others	0	0	0
	Total	4	0	4

REPORT OF ACCIDENTS HAPPENED IN NOVEMBER 2012

		VK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	3	2	4
	Minors	218	104	183
	Total	**221**	**106**	**187**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speeding	9	5	7
	Over drunk	7	5	7
	Negligence	133	64	109
	Bad maneuvers	68	29	60
	Mechanical fault	2	1	3
	Road condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	1
	Others	2	2	0
	Total	**221**	**106**	**187**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
VEHICLES INVOLVED IN ACCIDENTS	Pick ups	45	14	35
	Lorry	11	2	5
	Minibus- Bus	47	18	39
	Trailers	1	1	2
	Four wheel vhs	24	12	38
	Cars	46	20	70
	Motor cycle	33	36	37
	Moped	6	12	3
	Bicycle	3	3	5
	Pedestrian	35	22	29
	Wheelbarrows	0	0	0
	Animals & Others	1	2	3
	Total	**252**	**142**	**266**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURED IN ACCIDENTS	Minibus+Bus	6	2	8
	Camionnettes	6	1	6
	Camion	2	0	2
	C Remorque	0	0	1
	Voiture	12	6	7
	Jeep	2	2	7
	Motos	22	6	18
	Bicyclette	1	1	4
	Pedestrian	18	2	11
	Autres	0	0	0
	Total	**69**	**20**	**64**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Camionnettes	0	0	0
	Camion	0	0	0
	C Remorque	0	0	0
	Voiture	0	0	1
	Jeep	0	0	0
	Motos	1	0	3
	Bicyclette	0	1	0
	Pedestrian	3	1	4
	Autres	0	0	0
	TOTAL	**4**	**2**	**8**

REPORT OF ACCIDENTS HAPPANED IN DECEMBER 2012

Provinces		MVK		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	4	4	6
	Minor	78	38	69
	Total	**82**	**42**	**75**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	7	2	5
	Over drunk	8	3	3
	Negligence	36	22	40
	Bad maneuvers	26	12	25
	Mechanical faults	2	2	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	3	1	0
	Total	**82**	**42**	**75**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	29	7	14
	Lorry	6	1	3
	Minibus – Bus	32	8	21
	Trailers	1	1	1
	Four wheel vhs	16	6	14
	Cars	35	10	35
	Motor Cycle	21	12	16
	Moped	2	6	1
	Bicycle	3	2	2
	Pedestrian	20	11	15
	Wheelbarrows	0	0	0
	Animals & Others	1	1	1
	Total	**166**	**65**	**123**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	7	3	6
	Pick Ups	2	0	3
	Lorry	1	5	1
	Trailers	1	0	0
	Cars	5	3	3
	Four wheel vehicles	1	2	2
	Motor Cycles	15	3	10
	Bicycles	1	0	2
	Pedestrians	11	3	7
	others	1	0	0
	Total	**45**	**19**	**34**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	0	1
	Bicycles	0	0	0
	Pedestrians	0	1	1
	others	0	0	0
	Total	**1**	**1**	**2**

REPORT OF ACCIDENTS HAPPANED IN JANUARY 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	2	1	6
	Minor	177	81	182
	Total	**179**	**82**	**188**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	9	6	6
	Over drunk	10	4	9
	Negligence	117	47	104
	Bad maneuvers	38	20	62
	Mechanical faults	2	2	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	3	3	5
	Total	**179**	**82**	**188**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	38	11	38
	Lorry	11	3	6
	Minibus – Bus	47	13	41
	Trailers	1	1	10
	Four wheel vhs	25	12	38
	Cars	59	20	70
	Motor Cycle	40	34	38
	Moped	6	12	3
	Bicycle	5	3	5
	Pedestrian	30	19	30
	Wheelbarrows	0	0	0
	Animals & Others	3	2	3
	Total	**265**	**130**	**282**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	9	6	8
	Pick Ups	4	7	7
	Lorry	2	1	1
	Trailers	0	0	1
	Cars	7	7	7
	Four wheel vehicles	2	4	8
	Motor Cycles	16	8	16
	Bicycles	1	1	4
	Pedestrians	13	9	21
	others	0	0	0
	Total	**54**	**43**	**73**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	0	2
	Bicycles	0	0	0
	Pedestrians	1	0	2
	others	0	0	0
	Total	**2**	**0**	**4**

REPORT OF ACCIDENTS HAPPANED IN FEBRUARY 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	1	2	6
	Minor	151	68	147
	Total	**152**	**70**	**153**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	8	3	7
	Over drunk	7	3	6
	Negligence	100	42	89
	Bad maneuvers	33	20	49
	Mechanical faults	2	2	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	2	0	0
	Total	**152**	**70**	**153**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	32	11	38
	Lorry	11	2	6
	Minibus – Bus	38	12	36
	Trailers	1	1	4
	Four wheel vhs	25	10	27
	Cars	54	19	63
	Motor Cycle	40	25	33
	Moped	6	4	3
	Bicycle	5	2	3
	Pedestrian	9	7	11
	Wheelbarrows	0	0	0
	Animals & Others	3	2	3
	Total	**224**	**95**	**227**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	4	3	7
	Pick Ups	6	5	4
	Lorry	0	1	1
	Trailers	0	0	0
	Cars	7	6	7
	Four wheel vehicles	2	4	3
	Motor Cycles	11	6	11
	Bicycles	1	1	4
	Pedestrians	9	7	11
	Total	**40**	**33**	**48**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	2
	Bicycles	0	0	0
	Pedestrians	1	1	5
	Total	**1**	**2**	**7**

REPORT OF ACCIDENTS HAPPENED IN MARCH 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	1	2	2
	Minor	170	95	153
	Total	**171**	**97**	**155**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	6	5	3
	Over drunk	8	3	2
	Negligence	97	47	83
	Bad maneuvers	54	40	62
	Mechanical faults	6	2	4
	Road Condition	0	0	1
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	0
	Total	**171**	**97**	**155**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	45	25	31
	Lorry	8	3	7
	Minibus – Bus	41	13	22
	Trailers	3	7	3
	Four wheel vhs	39	15	33
	Cars	31	20	53
	Motor Cycle	52	20	46
	Moped	4	0	0
	Bicycle	3	2	1
	Pedestrian	9	1	8
	Wheelbarrows	0	0	0
	Animals & Others	1	0	0
	Total	**236**	**106**	**204**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	7	2	4
	Pick Ups	2	6	3
	Lorry	0	1	1
	Trailers	0	0	0
	Cars	2	4	2
	Four wheel vehicles	3	1	4
	Motor Cycles	44	14	44
	Bicycles	3	2	2
	Pedestrians	13	4	12
	Total	**74**	**34**	**72**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	0
	Bicycles	0	0	0
	Pedestrians	0	2	1
	Total	**0**	**3**	**1**

REPORT OF ACCIDENTS HAPPENED IN APRIL 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	6	4	3
	Minor	128	112	156
	Total	**134**	**116**	**159**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over Speeding	7	7	5
	Over drunk	0	1	0
	Negligence	72	58	83
	Bad maneuvers	51	46	64
	Mechanical faults	4	4	7
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	0
	Total	**134**	**116**	**159**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	28	35	33
	Lorry	8	10	2
	Minibus – Bus	26	20	26
	Trailers	0	0	0
	Four wheel vhs	10	13	23
	Cars	25	15	37
	Motor Cycle	36	22	33
	Moped	0	0	0
	Bicycle	0	0	1
	Pedestrian	1	1	4
	Wheelbarrows	0	0	0
	Animals & Others	0	0	0
	Total	**134**	**116**	**159**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	5	1	0
	Pick Ups	4	6	2
	Lorry	0	2	0
	Trailers	0	0	0
	Cars	2	4	1
	Four wheel vehicles	1	1	0
	Motor Cycles	42	30	43
	Bicycles	0	2	0
	Pedestrians	16	15	19
	Total	**70**	**61**	**65**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	1	1	2
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	5	1	2
	Total	**6**	**2**	**4**

REPORT OF ACCIDENTS HAPPENED IN MAY 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	3	1	2
	Minor	127	92	127
	Total	**130**	**93**	**129**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	2	2	8
	Over drunk	1	1	2
	Negligence	71	34	62
	Bad maneuvers	43	53	53
	Mechanical faults	8	1	0
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	1	0
	Other	5	1	4
	Total	**130**	**93**	**129**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	25	26	22
	Lorry	4	1	4
	Minibus – Bus	30	9	21
	Trailers	0	0	0
	Four wheel vhs	16	5	22
	Cars	30	22	26
	Motor Cycle	20	25	29
	Moped	0	0	0
	Bicycle	1	1	0
	Pedestrian	4	3	2
	Wheelbarrows	0	0	0
	Animals & Others	0	1	3
	Total	**130**	**93**	**129**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	6	8	0
	Pick Ups	5	9	0
	Lorry	0	0	0
	Trailers	1	0	0
	Cars	4	6	6
	Four wheel vehicles	4	2	1
	Motor Cycles	12	25	27
	Bicycles	1	3	0
	Pedestrians	22	2	26
	others	**55**	**55**	**52**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	0
	Bicycles	0	0	0
	Pedestrians	2	0	2
	Total	**2**	**1**	**2**

REPORT OF ACCIDENTS HAPPENED IN JUNE 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	2	1	2
	Minor	151	82	155
	Total	**153**	**83**	**157**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	1	0	5
	Over drunk	1	0	0
	Negligence	89	47	91
	Bad maneuvers	53	29	54
	Mechanical faults	9	4	2
	Road Condition	0	1	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	2	5
	Total	**153**	**83**	**157**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	37	22	30
	Lorry	4	3	2
	Minibus – Bus	27	8	15
	Trailers	0	1	0
	Four wheel vhs	19	12	29
	Cars	26	15	39
	Motor Cycle	36	20	40
	Moped	0	0	0
	Bicycle	0	0	0
	Pedestrian	2	1	1
	Wheelbarrows	0	0	0
	Animals & Others	2	1	1
	Total	**153**	**83**	**157**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	9	6	3
	Pick Ups	0	13	1
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	3	5	10
	Four wheel vehicles	3	1	3
	Motor Cycles	43	28	49
	Bicycles	2	0	1
	Pedestrians	31	7	20
	others	**0**	**0**	**0**
	Total	**91**	**60**	**87**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	2	2
	Total	**0**	**2**	**2**

REPORT OF ACCIDENTS HAPPENED IN JUNE 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	1	2	4
	Minor	152	100	137
	Total	**153**	**102**	**141**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	0	1	3
	Over drunk	0	0	0
	Negligence	88	53	77
	Bad maneuvers	59	43	54
	Mechanical faults	4	5	5
	Road Condition	1	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	1	0	2
	Total	**153**	**102**	**141**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	31	22	27
	Lorry	4	1	2
	Minibus – Bus	40	19	16
	Trailers	0	1	1
	Four wheel vhs	18	23	24
	Cars	25	12	30
	Motor Cycle	32	23	35
	Moped	2	0	0
	Bicycle	0	0	2
	Pedestrian	0	0	1
	Wheelbarrows	0	0	0
	Animals & Others	1	1	3
	Total	**153**	**102**	**141**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	4	13	0
	Pick Ups	3	1	1
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	3	3	5
	Four wheel vehicles	2	2	1
	Motor Cycles	47	20	36
	Bicycles	0	2	3
	Pedestrians	26	9	20
	others	0	0	0
	Total	**85**	**50**	**66**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	2	1
	Bicycles	0	0	0
	Pedestrians	0	0	3
	Total	**1**	**2**	**4**

REPORT OF ACCIDENTS HAPPANED IN AUGUST 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	1	0	2
	Minor	131	87	134
	Total	**132**	**87**	**136**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	0	1	9
	Over drunk	0	0	1
	Negligence	84	46	71
	Bad maneuvers	45	35	49
	Mechanical faults	3	3	2
	Road Condition	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	2	4
	Total	**132**	**87**	**136**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	21	13	26
	Lorry	8	6	4
	Minibus – Bus	29	26	16
	Trailers	0	0	0
	Four wheel vhs	10	8	26
	Cars	29	16	32
	Motor Cycle	30	18	28
	Moped	0	0	0
	Bicycle	1	0	0
	Pedestrian	1	0	1
	Wheelbarrows	3	0	0
	Animals & Others	0	0	3
	Total	**132**	**87**	**136**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	5	3	2
	Pick Ups	0	0	7
	Lorry	0	0	1
	Trailers	0	0	0
	Cars	6	4	5
	Four wheel vehicles	2	0	0
	Motor Cycles	30	23	43
	Bicycles	2	0	1
	Pedestrians	21	8	21
	others	0	0	0
	Total	**66**	**38**	**80**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus	0	0	1
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	3	0	2
	Total	**3**	**0**	**3**

REPORT OF ACCIDENTS HAPPANED IN SEPTEMBER 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	2	1	5
	Minor	126	95	133
	Total	**128**	**96**	**138**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	0	2	3
	Over drunk	0	1	5
	Negligence	78	43	60
	Bad maneuvers	46	41	47
	Mechanical faults	3	4	9
	Road Condition	1	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	5	14
	Total	**128**	**96**	**138**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	28	19	24
	Lorry	3	2	1
	Minibus – Bus	23	15	9
	Trailers	0	1	1
	Four wheel vhs	16	9	20
	Cars	26	27	33
	Motor Cycle	23	18	35
	Moped	0	0	0
	Bicycle	1	3	2
	Pedestrian	7	2	9
	Wheelbarrows	0	0	0
	Animals & Others	1	0	4
	Total	**128**	**96**	**138**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	10	0	20
	Pick Ups	3	2	10
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	3	5	6
	Four wheel vehicles	2	1	3
	Motor Cycles	33	27	37
	Bicycles	3	5	3
	Pedestrians	20	7	11
	others	0	0	0
	Total	**74**	**47**	**90**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	3
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	1	1	0
	Bicycles	1	0	0
	Pedestrians	1	0	0
	Total	**3**	**1**	**3**

REPORT OF ACCIDENTS HAPPENED IN NOVEMBER 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	0	0	1
	Minor	162	82	154
	TOTAL	**162**	**82**	**155**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	1	2	2
	Over drunk	1	0	1
	Negligence	98	39	71
	Bad maneuvers	54	36	70
	Mechanical faults	6	4	5
	Road Condition	2	0	6
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	1	0
	Total	**162**	**82**	**155**

THE VEHICLES INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Pick ups	4	22	29
	Lorry	31	6	1
	Minibus – Bus	22	12	16
	Trailers	18	0	0
	Four wheel vhs	24	4	31
	Cars	30	10	27
	Motor Cycle	33	24	44
	Moped	0	0	0
	Bicycle	0	1	0
	Pedestrian	0	3	4
	Wheelbarrows	0	0	0
	Animals & Others	0	0	3
	Total	**162**	**82**	**155**

INJURIES IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	4	9
	Pick Ups	2	9	6
	Lorry	1	0	0
	Trailers	6	0	1
	Cars	0	2	1
	Four wheel vehicles	0	0	1
	Motor Cycles	45	18	43
	Bicycles	3	2	3
	Pedestrians	19	8	14
	others	0	0	0
	Total	**76**	**43**	**78**

DECEASED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Minibus+Bus	0	0	0
	Pick Ups	0	0	1
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	Total	0	0	1

DRIVERS DL INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	International	0	0	0
	Foreigner	4	0	4
	Exchanged	0	0	2
	Definitive	193	98	187
	Ancien-Rwa	0	0	0
	Provisional license	0	0	0
	B.M.	0	0	0
	Without driving license	0	1	0
	TOTAL	**197**	**99**	**193**

REPORT OF ACCIDENTS HAPPENED IN DECEMBER 2013

Provinces		KC		
ACCIDENTS	DISTRICT	Nyarugenge	Kicukiro	Gasabo
	Serious	3	2	4
	Minor	134	81	133
	TOTAL	**137**	**83**	**137**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
CAUSES OF ACCIDENTS	Over speed	2	4	9
	Over drunk		1	2
	Negligence	90	35	82
	Bad maneuvers	39	39	42
	Mechanical faults	3	1	1
	Road Condition		0	
	Rain		0	0
	Road Signs	3	1	0
	Other		2	1
	Total	**137**	**83**	**137**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
THE VEHICLES INVOLVED IN ACCIDENTS	Pick ups	21	18	36
	Lorry	7	8	4
	Minibus – Bus	25	13	15
	Trailers	3	0	0
	Four wheel vhs	20	11	21
	Cars	29	12	26
	Motor Cycle	30	17	30
	Moped	0	0	1
	Bicycle	0	0	1
	Pedestrian	2	2	1
	Wheelbarrows		0	
	Animals & Others		2	2
	Total	**137**	**83**	**137**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
INJURIES IN ACCIDENTS	Minibus+Bus	14	2	20
	Pick Ups	1	1	4
	Lorry		2	0
	Trailers		0	0
	Cars	6	1	3
	Four wheel vehicles	2	1	2
	Motor Cycles	18	21	40
	Bicycles		1	2
	Pedestrians	13	7	13
	others		0	0
	Total	**54**	**36**	**84**

	DISTRICT	Nyarugenge	Kicukiro	Gasabo
DECEASED IN ACCIDENTS	Minibus+Bus		0	1
	Pick Ups		0	1
	Lorry		0	0
	Trailers		0	0
	Cars		0	0
	Four wheel vehicles		0	0
	Motor Cycles		2	1
	Bicycles		0	0
	Pedestrians	3	0	
	Total	**3**	**2**	**3**

REPORT OF ACCIDENTS HAPPENED IN JANUARY 2014

ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Serious	0	2	2
	Minor	146	140	85
	Total	**146**	**142**	**87**

	DISTRICT	Nyarugenge	gasabo	kicukiro
CAUSES OF ACCIDENTS	Over speed	1	7	1
	Over drunk	1	1	0
	Negligence	89	95	43
	B/maneuvers	48	34	41
	Pedestrian	0	0	0
	Mech/ faults	5	2	2
	Road Cond.	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	2	3	0
	Total	**146**	**142**	**87**

THINGS INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Pick ups	45	25	34
	Lorry	6	5	2
	Minibus – Bus	34	26	16
	Trailers	0	0	1
	4/wheel vhs	26	37	17
	Cars	45	39	24
	Motor Cycle	39	41	28
	Moped	0	0	1
	Bicycle	2	1	0
	Wheelbarrows	0	0	0
	Animals & Others	1	1	0
	Total	**198**	**175**	**123**

VICTIMS OF ROAD ACCIDENTS BY AGE AND SEX

Provinces		KC		
MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	0	0	0
	6-17yrs	23	36	2
	18-35yrs	29	34	31
	35-40yrs	5	12	3
	Total	**57**	**82**	**36**

Provinces		KC		
FEMALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	0	0	0
	6-17yrs	0	0	0
	18-35yrs	2	1	0
	35-40yrs	0	1	0
	Total	**2**	**2**	**0**

MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Minibus+Bus	4	2	1
	Pick Ups	4	1	1
	Lorry	0	1	0
	Trailers	1	0	0
	Cars	2	2	2
	4/wheel vehicles	0	2	1
	Motor Cycles	21	49	21
	Bicycles	1	1	0
	Pedestrians	24	24	10
	others	0	0	0
	Total	57	82	36

VICTIMS(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	2	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	4/ wheel vehicles	0	0	0
	Motor Cycles	0	1	0
	Bicycles	0	0	0
	Pedestrians	0	1	0
	others	0	0	0
	Total	**2**	**2**	**0**

PERSONS DEAD(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	0	0	0
	Pick Ups	0	2	1
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	1
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**0**	**2**	**2**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**0**	**0**	**0**

REPORT OF ACCIDENTS HAPPENED IN FEBRUARY 2014

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
ACCIDENTS	Serious	2	2	1
	Minor	152	148	83
	Total	**154**	**150**	**84**

	DISTRICT	Nyarugenge	gasabo	kicukiro
CAUSES OF ACCIDENTS	Over speed	2	7	1
	Over drunk	1	1	0
	Negligence	89	103	46
	B/maneuvers	56	35	34
	Pedestrian	0	0	0
	Mech/ faults	1	4	2
	Road Cond.	5	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	1
	Total	**154**	**150**	**84**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
THINGS INVOLVED IN ACCIDENTS	Pick ups	52	32	33
	Lorry	5	5	0
	Minibus – Bus	34	27	16
	Trailers	26	1	1
	4/wheel vhs	0	37	13
	Cars	57	47	23
	Motor Cycle	39	49	28
	Moped	0	0	0
	Bicycle	0	1	1
	Wheelbarrows	0	0	0
	Animals & Others	0	0	0
	Total	**213**	**199**	**115**

VICTIMS OF ROAD ACCIDENTS BY AGE AND SEX

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	0-5yrs	6	1	0
	6-17yrs	31	26	5
	18-35yrs	23	43	29
	35+	0	6	2
	Total	**60**	**76**	**36**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	**0-5yrs**	0	0	0
	6-17yrs	0	0	0
	18-35yrs	5	4	2
	35+	0	0	2
	Total	**5**	**4**	**4**

VICTIMS(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	12	0	6
	Pick Ups	4	0	5
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	2	2	9
	4/wheel vehicles	0	2	0
	Motor Cycles	19	48	12
	Bicycles	1	1	0
	Pedestrians	22	23	4
	others	0	0	0
	Total	60	76	36

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	2	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	4/ wheel vehicles	0	0	0
	Motor Cycles	3	0	3
	Bicycles	0	0	0
	Pedestrians	2	2	1
	others	0	0	0
	Total	**5**	**4**	**4**

PERSONS DEAD(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	0	0	0
	Pick Ups	0	1	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	1
	Bicycles	0	0	0
	Pedestrians	2	0	0
	others	0	0	0
	Total	**2**	**2**	**1**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**0**	**0**	**0**

REPORT OF ACCIDENTS HAPPENED IN JANUARY 2014

ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Serious	1	4	1
	Minor	146	136	86
	Total	**147**	**140**	**87**

	DISTRICT	Nyarugenge	gasabo	kicukiro
CAUSES OF ACCIDENTS	Over speed	0	4	4
	Over drunk	1	3	1
	Negligence	100	94	44
	B/maneuvers	44	33	36
	Pedestrian	2	3	2
	Mech/ faults	0	0	0
	Road Cond.	0	0	0
	Rain	0	0	0
	Road Signs	0	3	0
	Other	0	0	0
	Total	**147**	**140**	**87**

THINGS INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Pick ups	42	33	30
	Lorry	18	5	6
	Minibus – Bus	45	24	14
	Trailers	1	0	0
	4/wheel vhs	35	54	17
	Cars	69	59	45
	Motor Cycle	54	60	37
	Moped	0	0	0
	Bicycle	0	0	1
	Wheelbarrows	0	0	0
	Animals & Others	1	0	0
	Total	**265**	**235**	**150**

VICTIMS OF ROAD ACCIDENTS BY AGE AND SEX

Provinces		KC		
MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	0	0	0
	6-17Yrs	13	15	8
	18-34Yrs	36	21	26
	35+	2	1	8
	Total	**51**	**37**	**42**
FEMALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	0	0	0
	6-17yrs	0	0	0
	18-35yrs	13	8	2
	35+	3	1	0
	Total	**16**	**9**	**2**

VICTIMS(MALE,FEMALE)

MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Minibus+Bus	1	2	1
	Pick Ups	0	2	4
	Lorry	1	1	0
	Trailers	0	0	
	Cars	4	3	5
	4/wheel vehicles	2	0	1
	Motor Cycles	35	22	25
	Bicycles	0	2	2
	Pedestrians	17	8	7
	others	0	0	0
	Total	60	40	45

FEMALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Minibus+Bus	0	1	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	3	0	0
	4/ wheel vehicles	1	0	0
	Motor Cycles		4	0
	Bicycles	0	0	0
	Pedestrians	6	1	1

	others	0	0	0
	Total	**10**	**6**	**1**

PERSONS DEAD(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	1	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	1	0
	Bicycles	1	0	0
	Pedestrians	1	1	1
	others	0	0	0
	Total	**2**	**3**	**1**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	1
	others	0	0	0
	Total	**0**	**0**	**1**

ACCIDENTS REPPORT HAPPENED IN APRIL 2014

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
ACCIDENTS	Serious	0	3	3
	Minor	131	155	80
	Total	**131**	**158**	**83**

	DISTRICT	Nyarugenge	gasabo	kicukiro
CAUSES OF ACCIDENTS	Over speed	1	5	2
	Over drunk	0	2	3
	Negligence	85	106	42
	B/maneuvers	43	38	33
	Pedestrian	0	0	2
	Mech/ faults	2	3	0
	Road Cond.	0	0	0
	Rain	0	0	0
	Road Signs	0	3	0
	Other	0	1	1
	Total	**131**	**158**	**83**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
THINGS INVOLVED IN ACCIDENTS	Pick ups	47	49	29
	Lorry	9	7	7
	Minibus – Bus	40	23	14
	Trailers	1	0	0
	4/wheel vhs	40	48	22
	Cars	55	71	36
	Motor Cycle	40	65	30
	Moped	0	0	0
	Bicycle	0	3	2
	Wheelbarrows	0	0	0
	Animals & Others	1	1	1
	Total	**233**	**267**	**141**

VICTIMS OF ROAD ACCIDENTS BY AGE AND SEX

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	0-5yrs	0	0	0
	6-15yrs	0	0	0
	15-20yrs	3	9	1
	20-25yrs	6	9	3
	25-30yrs	16	16	7
	30-40yrs	13	15	7
	40-50yrs	5	5	1
	50-60yrs	5	2	0
	50-60yrs	3	1	0
	60-70yrs	0	1	0
	70+	0	0	0
	Total	**51**	**58**	19
	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	0-5yrs	0	0	0
	6-20yrs	0	0	1
	6-17yrs	0	0	1
	18-25yrs	0	1	1
	25-30yrs	1	2	5
	30-40yrs	0	0	4
	40-50yrs	1	0	1
	50-60yrs	0	0	0
	60-70yrs	0	0	0
	70+	0	0	0
	Total	**2**	**3**	**13**

VICTIMS(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	1	3	0
	Pick Ups	3	2	2
	Lorry	0	1	0
	Trailers	0	0	0
	Cars	4	6	2
	4/wheel vehicles	5	4	0
	Motor Cycles	21	30	14
	Bicycles	0	2	0
	Pedestrians	17	10	1
	others	0	0	0
	Total	51	58	19

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	2
	4/ wheel vehicles	0	0	0
	Motor Cycles	2	1	7
	Bicycles	0	0	0
	Pedestrians	0	2	4
	others	0	0	0
	Total	**2**	**3**	**13**

PERSONS DEAD(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	0	0	3
	Pick Ups	0	1	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	1	0
	others	0	0	0
	Total	**0**	**2**	**3**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0

	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**0**	**0**	**0**

ACCIDENTS REPPORT HAPPENED IN MAY 2014

ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Serious	0	3	3
	Minor	131	155	80
	Total	**131**	**158**	**83**

	DISTRICT	Nyarugenge	gasabo	kicukiro
CAUSES OF ACCIDENTS	Over speed	1	5	2
	Over drunk	0	2	3
	Negligence	85	106	42
	B/maneuvers	43	38	33
	Pedestrian	0	0	2
	Mech/ faults	2	3	0
	Road Cond.	0	0	0
	Rain	0	0	0
	Road Signs	0	3	0
	Other	0	1	1
	Total	**131**	**158**	**83**

THINGS INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Pick ups	47	49	29
	Lorry	9	7	7
	Minibus – Bus	40	23	14
	Trailers	1	0	0
	4/wheel vhs	40	48	22
	Cars	55	71	36
	Motor Cycle	40	65	30
	Moped	0	0	0
	Bicycle	0	3	2
	Wheelbarrows	0	0	0
	Animals & Others	1	1	1
	Total	**233**	**267**	**141**

VICTIMS OF ROAD ACCIDENTS BY AGE AND SEX

MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	0	0	0
	6-15yrs	0	0	0
	25-30yrs	16	16	7
	30-40yrs	13	15	7
	40-50yrs	5	5	1
	50-60yrs	5	2	0
	50-60yrs	3	1	0
	60-70yrs	0	1	0
	70+	0	0	0
	Total	**51**	**58**	19
FEMALE	**DISTRICT**	**Nyarugenge**	**Gasabo**	**Kicukiro**
	0-5yrs	0	0	0
	6-20yrs	0	0	1
	6-17yrs	0	0	1
	18-25yrs	0	1	1
	25-30yrs	1	2	5
	30-40yrs	0	0	4
	40-50yrs	1	0	1
	50-60yrs	0	0	0
	60-70yrs	0	0	0
	70+	0	0	0
	Total	**2**	**3**	**13**

VICTIMS(MALE,FEMALE)

MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Minibus+Bus	1	3	0
	Pick Ups	3	2	2
	Lorry	0	1	0
	Trailers	0	0	0
	Cars	4	6	2
	4/wheel vehicles	5	4	0
	Motor Cycles	21	30	14
	Bicycles	0	2	0
	Pedestrians	17	10	1
	others	0	0	0

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	2
	4/ wheel vehicles	0	0	0
	Motor Cycles	2	1	7
	Bicycles	0	0	0
	Pedestrians	0	2	4

PERSONS DEAD(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	0	0	3
	Pick Ups	0	1	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	1	0
	others	0	0	0
	Total	**0**	**2**	**3**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**0**	**0**	**0**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	1	0	0
	others	0	0	0
	Total	**1**	**0**	**0**

ACCIDENTS REPORT HAPPENED IN JUNE 2014

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
ACCIDENTS	Serious	6	3	0
	Minor	118	135	85
	Total	**124**	**138**	**85**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
CAUSES OF ACCIDENTS	Over speed	11	6	2
	Over drunk	4	1	2
	Carelessness	67	98	53
	F/maneouvers	29	25	22
	Pedestrian	9	3	2
	Mech/ faults	4	5	4
	Road Cond.	0	0	0
	Rain	0	0	0
	Road Signs	0	0	0
	Other	0	0	0
	Total	**124**	**138**	**85**

THINGS INVOLVED IN ACCIDENTS	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Pick ups	25	32	43
	Lorry	12	10	4
	Minibus – Bus	61	40	36
	Trailers	2	3	1
	4/wheel vhs	27	47	19
	Cars	46	64	42
	Motor Cycle	69	58	20
	Moped	3	2	7
	Bicycle	2	1	0
	Wheelbarrows	0	0	0
	Animals & Others	0	1	0
	Total	**247**	**258**	**172**

VICTIMS OF ROAD ACCIDENTS BY AGE AND SEX

MALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	3	1	6
	6-15yrs	7	4	3
	15-20yrs	16	0	2
	20-25yrs	14	13	12
	25-30yrs	21	15	6
	30-40yrs	13	17	9
	40-50yrs	1	4	5
	50-60yrs	1	1	0
	50-60yrs	0	0	0
	60-70yrs	0	0	0
	70+	0	0	0
	Total	**76**	**55**	**43**

FEMALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	0-5yrs	0	0	0
	6-20yrs	2	0	2
	6-17yrs	0	0	1
	18-25yrs	4	1	2
	25-30yrs	4	4	2
	30-40yrs	3	5	3
	40-50yrs	1	0	1
	50-60yrs	0	0	1
	60-70yrs	0	0	0
	70+	0	0	0
	Total	**14**	**10**	**12**

VICTIMS(MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Minibus+Bus	20	10	9
	Pick Ups	11	9	5
	Lorry	3	1	4
	Trailers	0	3	0
	Cars	13	11	7
	4/wheel vehicles	7	2	0
	Motor Cycles	19	19	18
	Bicycles	1	0	0
	Pedestrians	2	0	0
	others	0	0	0
	Total	76	55	43

FEMALE	DISTRICT	Nyarugenge	Gasabo	Kicukiro
	Minibus+Bus	2	2	2
	Pick Ups	0	2	1
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	1	3	2
	4/ wheel vehicles	5	1	3
	Motor Cycles	6	2	4
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**14**	**10**	**12**

DEAD PEOPLE (MALE,FEMALE)

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
MALE	Minibus+Bus	1	0	0
	Pick Ups	1	1	0
	Lorry	1	0	0
	Trailers	0	0	0
	Cars	1	2	
	Four wheel vehicles	0	0	0
	Motor Cycles	2	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**6**	**3**	**0**

	DISTRICT	Nyarugenge	Gasabo	Kicukiro
FEMALE	Minibus+Bus	0	0	0
	Pick Ups	0	0	0
	Lorry	0	0	0
	Trailers	0	0	0
	Cars	0	0	0
	Four wheel vehicles	0	0	0
	Motor Cycles	0	0	0
	Bicycles	0	0	0
	Pedestrians	0	0	0
	others	0	0	0
	Total	**0**	**0**	**0**