

Risk Avoidance Study

Action-Learning Research on Road Traffic Accidents

Study Area (Kenyan Cities)

Kisii

&

Kisumu

*Addressing Disaster Avoidance Strategies in
Urban Areas*

By

Dr. Andre Yitambe

Dr. Isaac Mwanzo

Mr. Steve Mogere

African Urban Risk Analysis Network (AURAN)

TABLE OF CONTENTS

Table of Contents	2
Acronyms and List of Abbreviations	3
List of Tables and Figures	4
1. Project purpose and summary of progress report	5
2. Study objectives	6
3. Action-research activities (Outputs)	6
4. Implications of the outputs for achieving the overall project goal	6
5. Research findings: The case of Kisumu City	7
6. Research findings: The Case of Kisii City	13
7. Summary of the draft technical report	21
8. Recommendation and follow-up	21

ACRONYMS AND ABBREVIATIONS

RTA (s)	Road Traffic Accidents
ACC	Accident Course Code
GNP	Gross National Product
GDP	Gross Domestic Product
DALY (s)	Disability – Adjusted Life Years
WHO	World Health Organization
GBD	Global Burden of Disease
SII	Self Inflicted Injuries
UNICEF	United Nations Children’s Education Fund
AWRNSS	Awareness of New Traffic Rules
PRD SIGNS	Pedestrian Observation of Road Signs
DRD SIGNS	Rating of Drivers’ Observation of Road Signs
DRDEFFECT	Rating of Traffic Police Effectiveness in Enforcing New Traffic Rules.
IPIFA	The Injury Prevention Initiative for Africa
<i>Matatus</i>	Minibuses that provide transport services to people
<i>Boda boda</i>	Cyclists that provides transport services

LIST OF TABLES AND FIGURES

Table 5.1	Factors that determine the occurrence of road traffic accidents	7
Table 5.2	Frequency of respondents regarding the awareness of new traffic rules	9
Table 5.3	Frequency of respondents' use of safety belts	10
Table 5.4	Frequency for compliance to road signs by pedestrians	11
Table 5.5	Frequency of respondents' rating of drivers' observation of road signs	12
Table 5.6	Frequency of respondents' rating of traffic police effectiveness in enforcing the new traffic rules	12
Table 5.7	Distribution of respondents in the study	14
Table 5.8	Rating of behavioural factors in RTA	14
Table 5.9	Different types of vehicles involved in RTA	15
Table 6.0	Rating of police' effectiveness in RTA avoidance	15
Table 6.1	Belting by the passengers	16
Table 6.2	Types of injuries reported	17
Table 6.3	Deaths from RTA	18
Table 6.4	Knowledge of new traffic rules	18
Table 6.5	Observation of road signs by drivers	19
Table 6.6	Compliance to road signs by pedestrians	20
Figure 5.1	Bar chart showing the frequency of respondents regarding the awareness of new traffic rules	9
Figure 5.2	Bar chart showing the frequency of respondents' use of safety belts.	10
Figure 5.3	Bar chart showing frequency of respondents' observation of road signs as pedestrians	11
Figure 5.4	Bar chart showing respondents' rating of drivers' observation of road signs	12
Figure 5.5	Bar chart showing respondents' rating of traffic police effectiveness in enforcing the new traffic rules	13
Figure 5.6	Figure showing the rating of police's effectiveness in RTA avoidance	16
Figure 5.7	Bar chart showing frequency of belting by the passengers	17
Figure 5.7	Bar chart showing different types of injuries reported	17
Figure 5.8	Responses regarding the occurrence of death resulting from road traffic Accidents	18
Figure 5.9	Bar chart showing rating of knowledge of new traffic rules	18
Figure 6.0	Bar chart showing compliance to road signs by drivers	19
Figure 6.1	Bar chart showing compliance by pedestrians to road signs	21

FINAL TECHNICAL REPORT

DATE:

29th December, 2005

TITLE OF PROJECT

Road Traffic Accidents (RTAs): Action-Learning on RTAs as a Mechanism for Urban Disaster Avoidance in Kenya. A Twin City Action Research Project in (Kisii, Kisumu) Western Kenya

PROJECT MANAGEMENT

African Urban Risk Analysis Network (AURAN)

AURAN INVESTIGATING TEAM:

PRINCIPAL INVESTIGATOR (PI)	Dr. Andre Yitambe	
CO-INVESTIGATORS (CI)	Dr. Isaac Mwanzo	Mr. Steve Mogere

REPORTING PERIOD

FROM:		TO:
1 July 2005		31 st December 2005

NARRATIVE SUMMARY

1. Project purpose and summary of progress Report

The project purpose was to determine the underlying causes of road traffic accidents initially, in Kisii, Kisumu and Kakamega Districts located in Western Kenya. However, due to limitation of funds, the current study was only feasible in two sites – Kisii and Kisumu. These districts fall within accident-prone zones and therefore the findings are envisaged to impact on current policy framework, research, and development.

During this second and last period of the project life the major key activities for the team involved carrying out a field study to determine the contributory factors to RTA in the twin cities. After successful completion of Phase I; Phase II which ended in December 2005 entailed a series of field activities with a whole range of road users, different segments of road safety enforcers, health facilities and professionals working in the two sites (Kisii and Kisumu) and policy makers.

In order that the project would have better outcomes and to involve the local practitioners, we worked with resident public health officers to assist to mainstream the study results after project life. Only then was it easy to commence and complete this participatory work activity on schedule. As such we managed to recruit 2 students undertaking a course in public health to participate in the study. Their participation will definitely assist in information dissemination in the twin cities.

The investigating team nevertheless, has actively continued lobbying for the commitment and participation of different stakeholders. We have continued to profile the project at different fora. We have already presented part of these results in 2 seminars presentation at Kenyatta University. It is illustrative to note with the introduction of breathalysers in the detection of drunken driving in police surveillance training and public education will be useful for its effectiveness.

There was a useful debate with the cyclists especially in Kisumu who are willing to undergo traffic safety training and vetting. The establishment of the separate traffic lane for the cyclist was emphasised in Kisumu. It has been clarified that this project is action-research looking at best practice in the RTA avoidance systems which include professional support, rather than a more authoritative comparison of RTA in the two cities. The government has just introduced the use of breathalysers linked to the careless driving to reduce road carnage in Kenya. Learnings in the sustainability of such police surveillance

systems as breathalysers and speed governors require investigation. Similarly the RTA literature review is not a comparison, but to clarify its purpose has been re-titled in our project documents as “International Lessons in RTA Avoidance Systems”. This review will be updated from the learnings from each city, as well as the study tours to inform the policy makers and practitioners in the field.

2. Study objectives

The objective of the study still remains the same as for the 1st phase that the investigators should have:

- An understanding of the present mechanisms, structures and systems that are (or will be) put in place for RTAs avoidance in terms of government legislation and guidelines and/or practices used in the twin cities (Kisii and Kisumu).
- Identified learnings and gaps in the current approaches in the RTA
- Help to create learning network of people in Western Kenya interested in action-learning on RTAs in their professional practice.

The study assisted by the public health department staff in the two cities, identified a total of 385 respondents. The respondents included those from different stakeholders beyond the immediate RTA players, including the insurance, police officer, pedestrians, victims and cat pushers.

Overall the aim of this project was to contribute to risk avoidance and accident reduction through evidence-based road transport policy formulation. It endeavoured to exchange experiences and generate lessons among stakeholders on Road Traffic Accidents management/avoidance strategies.

3. Action-research activities

Output.1. Good practice in application of RTA Avoidance systems documented and shared including mechanisms, opportunities, constraints and policy issues

In total, two field visits to the twin cities were implemented, arrangements with stakeholder representatives were done including developing the interview schedule and study instruments structure in close consultation. Identification of 2 public Health officers to assist in delivery of the study objectives was done successfully. There was an initial lag typical of such participatory activities but after clarification from the team leader activities went as planned. Clarifications was mainly on the nature of support and that ours was simply a documentation of learning experience on RTA avoidance since the government instituted new measures in the transport system in 2003.

Output 2. Training of 2 Public Health Officers in RTA issues in the area of disasters, community mobilisation and awareness on impact of RTA in the 2 cities

The best that ever happened was to have the 2 having registered as graduates of public health, alongside this research project work. We believe their involvement will go a long way to building the much needed, dedicated expertise to move forward the RTA issues. They will have also gained from the learnings of this study, that they can apply the principles in their official practice.

Preparation and drafting of 2 scientific papers on RTA in the two cities are at an advanced stage. Although still not an authoritative document, we believe that these papers will assist awareness creation and as a lobbying tool with interested stakeholders. The training of the practicing public health officers will form part of the network of practitioners in the area of RTA.

N/B. The 2 have been able to do studies in this area alongside our RTA project. This would go along way in dissemination, sensitization and networking. Generally building capacity within the public health department of the two cities.

4. Implications of the outputs for achieving the overall project goal:

While some project activities are happening later than originally planned, the project is still on track to achieving the overall goal given the limitation of funds. First, the study sites had to be reduced to two – Kisii and Kisumu cities instead of the three as originally thought. The establishment of the Disaster Research Unit team within the newly formed department of public health is a notable development. A draft departmental strategic plan and research policy framework document undoubtedly opens up new spheres

of research in the area of disaster management. The government has just established the use of the breathalysers in national surveillance for drunken driving, supportive to RTA avoidance systems approach. Public education and sustainability of such systems however still remain a challenge. Research to support policy formulation in this area is necessary.

5. Research Findings: The case of Kisumu City

The results and analysis of the data collected for the study are presented in this section. In this section, descriptive statistics, that is, frequency distributions, percentages and graphic presentations (i.e. bar charts) were used to describe and summarize the data in reference to the objectives of the study. The study addressed the following objectives:

- (i) Determinants of road traffic accidents in Kisumu
- (ii) The perceptions and attitudes of new traffic rules of the year 2003
- (iii) The type of injuries incurred reported at the police stations/hospitals, and whether or not there are deaths reported from the accidents.

In order to address the above objectives, the analysis of the respondents' responses was done under the following sub-headings:

5.1 Determinants/Causes of road traffic accidents:

The respondents reported a number of causes related to road traffic accidents in Kisumu, which were categorized as physical environmental, behavioural and vehicular/mechanical factors. In these categories the behavioural factors were reported to be the leading causes of RTA in Kisumu, followed by the vehicular/mechanical then environmental factors. This information is summarized in table 4.1 below.

Table 5.1 Factors that determine the occurrence of road traffic accidents:

CAUSAL FACTOR	FREQUENCY REPORTED	TOTAL PERCENTAGE
Environmental	32	15
Behavioural	128	61
Vehicular/Mechanical	50	24
TOTAL	210	100

From table 5.1 above it is evident that behavioural factors account for the highest number of RTA in Kisumu as reported by 61% of the respondents. This is followed by vehicular/mechanical factors, as reported by 24% of the respondents, and last but not least, the environmental factors as reported by 15% of the respondents in the total sample. The specific factors in these categories are discussed as follows:

5.1.1 Environmental factors:

Weather condition is the main environmental factor that was reported to be directly or indirectly related to RTA in Kisumu. Different weather conditions and the resultant factors associated with weather conditions create vulnerability for vehicle accidents to occur. According to the respondents, during rainy seasons, road surfaces get slippery for vehicles hence increasing chances of accidents to occur. In addition, due to rain, that occurs in some places, for example, along Kiboswa road, land slides (stone falling). Landslides eat up the surface of the road making it narrow for motorists, while stone falling are dangerous obstacles on the road, especially during night hours. These factors increase chances of RTA. Related to weather conditions is the occurrence of mist or fog that interferes with clear vision on the part of the drivers, increasing the likelihood of accidents. Conversely, as weather related factor reported by the respondents, too much sunshine results in heated road surfaces that occasionally cause tyre bursts thus causing unsuspecting accidents.

5.1.2 Behavioural factors:

The respondents reported diverse causes of RTA related to behavioural factors, which implicated drivers, conductors, pedestrians, passengers, traffic police and road authorities, at large. Among these factors include over speeding, intoxicated drivers (i.e. use of alcohol and other drugs), unqualified drivers, unnecessary stopping (for *matatus*) where there is no designated bus stops, overloading, arrogance or lack of respect for the traffic code by drivers (i.e. overtaking at sharp corners), negligence by drivers, overloading drivers, pedestrians, *boda boda* men (even other cyclists) and cart pushers (e.g. reading and use of *zebra* crossings, reading of railway crossings by drivers, among others). In addition, there is lack of road signs to direct all road users, giving bribes by motorists (especially *matatus*) to compromise the police, poor roads (i.e. un-maintained roads with pot holes and narrow roads), among other factors.

Passengers and traffic police are especially blamed for their reluctant tendency on the messes that *matatu* drivers and conductors make. *Matatus* as it will be seen later in a more critical data analyses, are the leading cause of accidents in Kisumu. Passengers are blamed for their reluctance in reporting incidences of over speeding and careless driving on the part of drivers. In addition, passengers seldom complain and report cases of overloading to the concerned authorities, and this aggravate chances of RTA. Police on their part are blamed for accepting bribes and letting dangerous cases on drivers go unpunished (i.e. letting drunk drivers go on driving and road unworthy vehicles pass their road blocks after giving in *kitu kidogo - bribes*).

5.1.3 Mechanical factors:

Among the vehicular/mechanical factors reported by the respondents leading to RTA include road unworthy vehicles, poorly maintained vehicles, tempering or total removal of speed governors, faulty brakes and worn out tires and or inaccurate tire pressure. The respondents emphasized the fact that because most traffic police are reluctant and corrupt, they let these mechanical related factors to thrive on the roads in Kisumu, hence contributing to the occurrence of motor accidents.

It is therefore obvious as evident from table 5.1 that the behavioural factor (or error for that case) contributes a lot to motor accidents in Kisumu as the environmental and mechanical factors. Furthermore, varieties of factors in the behavioural category have been reported by the respondents than in the environmental and mechanical categories, and this proves the fact that behavioural factors are significant when it comes to RTA. Thus, measures taken to curb road carnage must highly address the behavioural factors.

Indeed, with such understanding, even the year 2003 new traffic rules were put in place targeting the behavioural factors in the control of RTA. This being the case, it was important for this study to assess the perceptions and the attitudes of people with regard to the new traffic rules of 2003. And this brings us to the analysis of the results on the second objective, which addresses the perceptions and attitudes of the respondents with regard to the 2003 traffic rules.

5.2 The perceptions and attitudes of new traffic rules of the year 2003:

This objective was analyzed in four sub-sections addressing specific rules redesigned for passengers, pedestrians, drivers and the traffic police. Nevertheless, it was important to first of all establish the level of awareness of the 2003 traffic rules among the respondents. The analysis of responses on the specific rules followed as indicated below:

- (i) Whether the respondents belt up or not while traveling
- (ii) If the pedestrians observe road signs
- (iii) Observation of the road signs by the drivers
- (iv) If the traffic police are effective in enforcing the new traffic rules

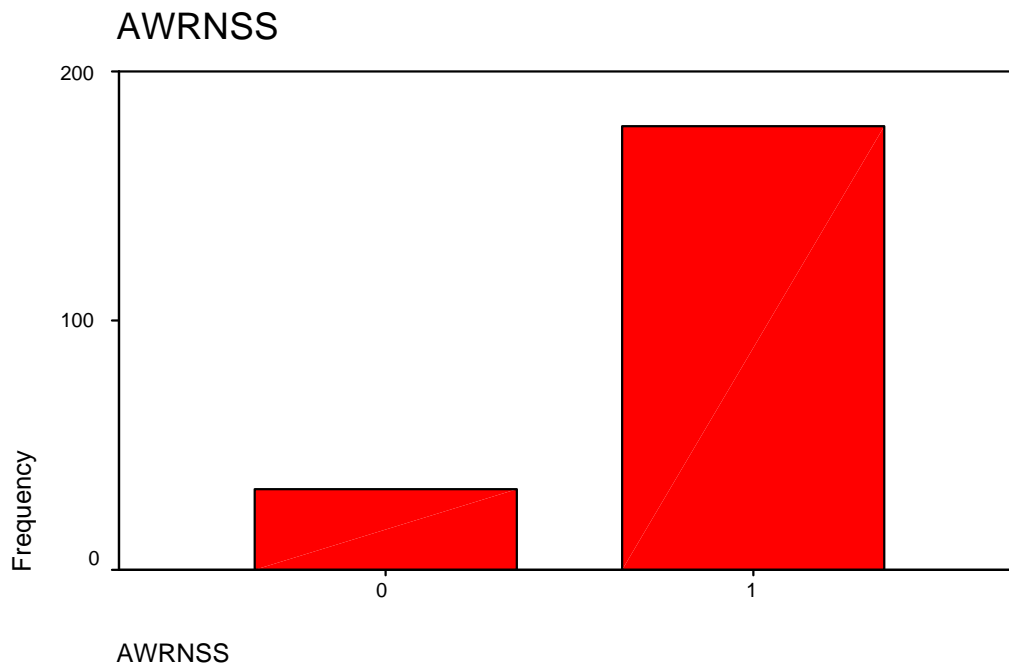
5.2.1 Awareness of the new traffic rules:

The respondents were asked whether they were aware of the new traffic rules of the year 2003. Their responses were recorded as yes or no. The summary of their responses is shown in table 5.2 and figure (bar graph) 5.1 below.

Table 5.2 Frequency of respondents regarding the awareness of new traffic rules:

RESPONSE	FREQUENCY REPORTED	TOTAL PERCENTAGE
Yes	178	85
No	32	15
Total	210	100

Figure 5.1 Bar chart showing the frequency of respondents regarding the awareness of new traffic rules:



Key: 0 – No, 1 – Yes

As shown in both table 4.2 and figure 4.1 above 85% (178 respondents) of the total sample said that they are aware of the new traffic rules, against 15% (32 respondents) who said they were not. With such figures, it is therefore obvious that the level of awareness of the new traffic rules among the respondents in Kisumu is high.

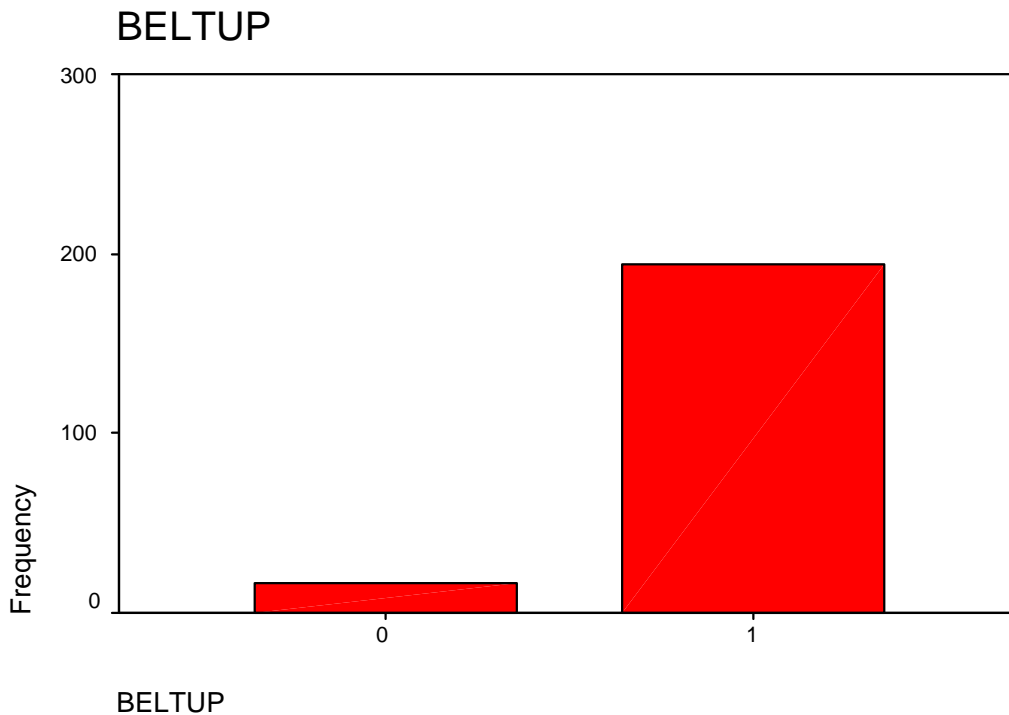
5.2.2. Use of belts while travelling:

As a way of assessing the attitudes of the respondents towards the new traffic rules, the respondents were asked to indicate whether or not they belted up while travelling. Table 5.3 and figure 5.2 below shows the summary of their responses.

Table 5.3 Frequency showing respondents' use of safety belts:

RESPONSE	FREQUENCY REPORTED	TOTAL PERCENTAGE
Yes	194	92
No	16	08
Total	210	100

Figure 5.2 Bar chart showing the frequency of respondents' use of safety belts:



Key: 0 – No, 1 – Yes

From table 5.3 and figure 5.2 above it is evident that most of the respondents (92%) belt up while travelling, and only 8% do not belt up while travelling. Since the level of awareness of the new traffic rules was 85% (and with police enforcement) it is then most appropriate that also the rule on belting up will be highly observed by the respondents as shown in table 5.3 and figure 5.2.

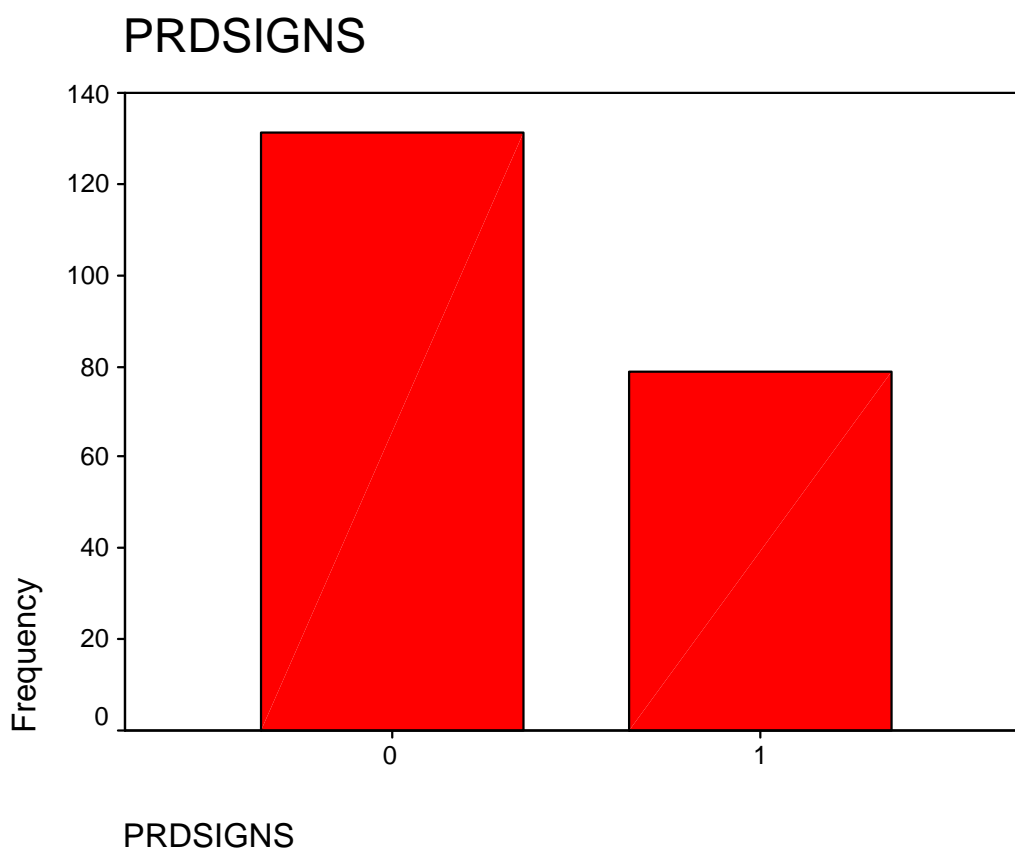
4.2.3 Pedestrians' observation of road signs:

Still, as part of examining the attitudes of the respondents towards the new traffic rules, the respondents were asked to indicate whether or not they observe road signs while walking along roads or crossing the roads. This information is summarized in table 5.4 and figure 5.3 below.

Table 5.4 Frequency for compliance to road signs by pedestrians:

RESPONSE	FREQUENCY REPORTED	TOTAL PERCENTAGE
Yes	79	38
No	131	62
Total	210	100

Figure 5.3 Bar chart showing the frequency of respondents' observation of road signs as pedestrians:



Key: 0 – No, 1 – Yes

Table 5.4 and figure 5.3 above indicate that as pedestrians, most respondents (62%) rarely observe road signs as one of the measures of the new traffic rules, and only 38% make an attempt to observe road signs. This perhaps shows difference in emphasis of traffic rules, whereby, for example, the use of belts has been emphasized more by the police than such other rules like strict observation of road signs by the pedestrians.

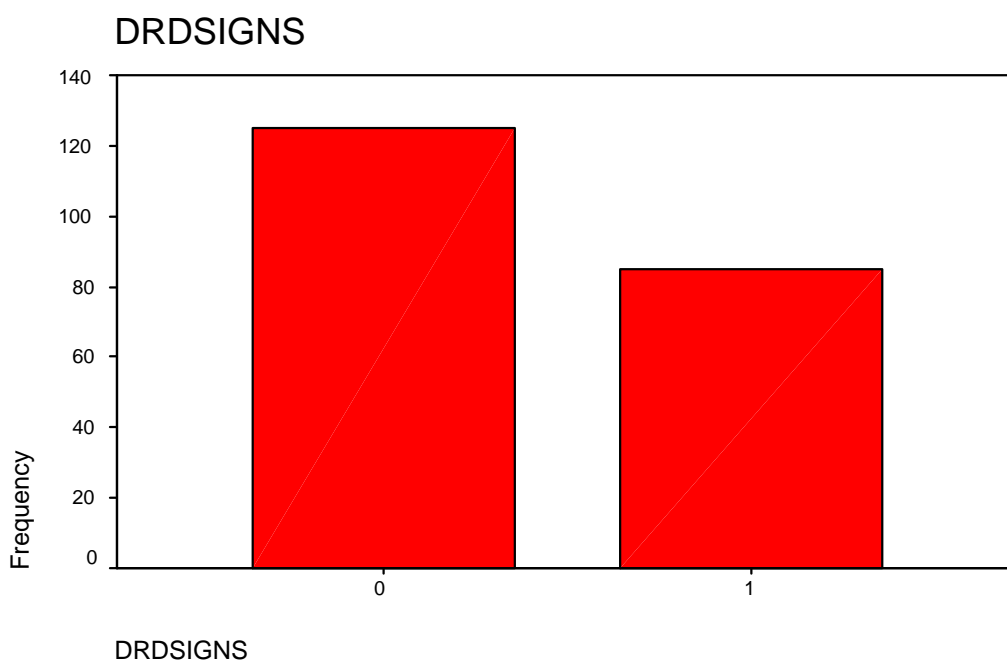
5.2.4 Respondents' rating of drivers' observation of road signs:

The respondents were also asked to rate the attitudes of other drivers regarding the observation of road signs, and their responses are summarized in table 5.5 and figure 5.4 below.

Table 5.5 Frequency of respondents' rating of drivers' observation of road signs:

RESPONSE	FREQUENCY REPORTED	TOTAL PERCENTAGE
Yes	85	40
No	125	60
Total	210	100

Figure 5.4 Bar chart showing respondents' rating of drivers' observation of road signs:



Key: 0 – No, 1 – Yes

The results of analysis in table 4.5 and figure 4.4 above show that 60% of the respondents rated drivers as non observant of road signs, against 40% of the respondents who rated drivers as observant of road signs. These results prove the evidence discussed under behavioural factors in RTA (i.e. 4.1.2 above) that drivers' arrogance of road signs is one of the leading behavioural factor in RTA in Kisumu.

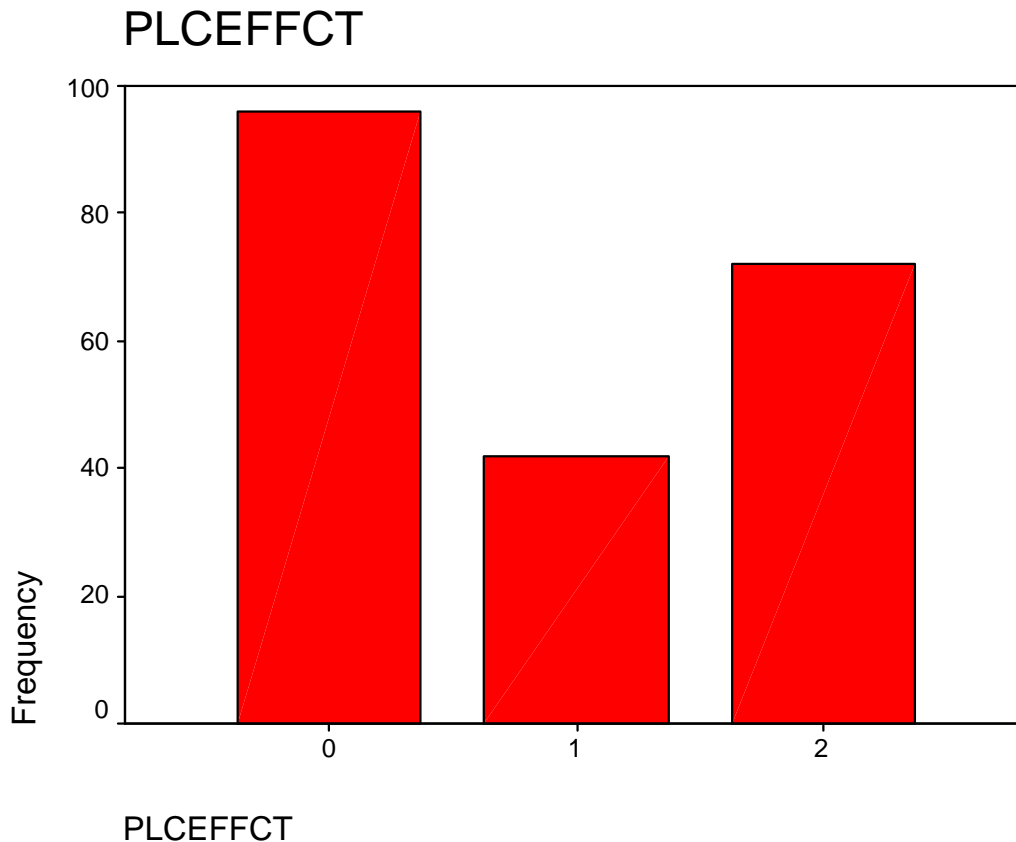
5.2.5 Respondents' rating of traffic police effectiveness in enforcing the new traffic rules:

In order to establish whether the traffic police are effective in performing their law enforcement job of the new traffic rules, the respondents were asked to rate the traffic police on this basis. This was also important in finding out the relative position of the police factor (as a behavioural factor) in other diverse factors related to road accidents. The summaries of the respondents' responses are shown in table 5.6 and figure 5.5 below.

Table 5.6 Frequency of respondents' rating of traffic police effectiveness in enforcing the new traffic rules:

RESPONSE	FREQUENCY REPORTED	TOTAL PERCENTAGE
Yes	42	20
No	96	46
Somehow	72	34
Total	210	100

Figure 5.5 Bar chart showing respondents' rating of traffic police effectiveness in enforcing the new traffic rules:



Key: 0 – No, 1 – Yes, 2 – Somehow

The summary of the results in table 5.6 and figure 5.5 above indicate that 46% of the respondents felt that the police are not performing an effective work in enforcing the new

6. Research Findings: The case of Kisii City

The present study sought to attain a number of objectives. Broadly, it sought to find out the factors influencing road traffic accidents (RTAs) in the study locale (Kisii district), perceptions and attitudes of the people within this area towards the new traffic rules as introduced by the Ministry of Transport in 2003. It is sought to generally determine the type of injuries incurred and reported at the hospital and police station. However, the first broad objective was broken down into a number of categories that included a number of categories that included physical environmental, behavioural and mechanical factors.

6.2 Contextual Sample Characteristics

The sample of this study involved a total population of 175 respondents. There were drawn both randomly and purposively from the area with an aim of coming up with categories of respondents. The categories of this population included, 45 drivers, 50 passengers, 24 pedestrians, 34 hand cart pushers, 16 cyclists and 6 key informants totalling to 175 respondents. This distribution of the sample was a mixed gender composition and is represented in the table below:

Table 5.7 Distributions of Respondents

Category	No. of respondents
Drivers	45
Passengers	50
Pedestrians	24
Hand cart pushers	34
Cyclists	16
Key informants	6
Total	175

6.3 Factors Influencing Road Traffic Accidents in Kisii.

6.3.1 Environmental factors

Under this category, respondents allude to factors related to weather conditions such as much rain that makes roads to be very slippery thus reducing the friction between the roads and the tyres of vehicle bringing about a situation of skidding and at times causing road to give in to the factors alluded to is the fog that often occurs during the rainy season. This interferes with the sight of the drivers disabling them from seeing vehicles ahead and thus increasing the probability of occurrence of accidents.

6.3.2 Behavioural Factors

This category of factors was generated by the question that sought for the common causes of these accidents as asked to the various categories of respondents. Indeed in our analysis, we tried sorting them out regrouping them into those that originate from behavioural beings themselves as behavioural factors. In this way a number of factors came up and these include over speeding, careless driving, drunkenness, unqualified drivers, overloading, among other. These factors are tabulated below in their order of importance.

Table 5.8 Behavioral factors.

Factor	Percentage
Careless driving	37
Over speeding	36
Drunkenness	8
Loud music	4
Failure to abide by traffic rules	3
Over loading	1
Others	1

N/B. "Others" captures factors including obstruction by pedestrians or cart pushers and forgetfulness etc.

Table 4.2 shows that drunkenness too contributes to RTA. The few drivers who mentioned drunkenness however, did not implicate themselves. Overloading was least mentioned, perhaps, as one may argue here, overloading is no longer a problem as compared to the situation before the new traffic rules, during which time, passenger service vehicles could carry double the stipulated number of passengers but with the introduction of the new traffic rules, even the number of seats in the passenger vehicles has been reduced and all the travellers including the conductor should be seated. In this way, the problem of overloaded appears to have been effectively overcome by these rules.

6.3.3 Mechanical Factors

This category of factors focused on the mechanical state of the vehicle. These included un-roadworthy vehicles, congestion on the roads due to narrowness of the road, lack of speed governors in those vehicles and many more. Closely related to the mechanical factor is the issue of the type of vehicles

mostly involved in these accidents. In this case the vehicles were ranked according to their type and more so as per the frequency of their mention.

Table 5.9 Different types of vehicles involved in RTA

Type of vehicle	Percentage
<i>Matatu</i>	90
Buses	3
Pickups	2
Private vehicles	2
Others	3

As indicated in the table above, *matatus* form the majority of the vehicles involved in Road Traffic Accidents with 90% followed by buses. Several reasons were given to account for this scenario: -

- *Matatus* operators have the habit of rushing for passengers (customers).
- They are many and so they get congested on the roads.
- Due to the rush for customers, they are often involved in over-speeding.
- Their drivers often indulge in careless driving.
- Non-compliance with rules.
- Existence of unqualified drivers (despite the new rules)
- Frequent usage of *matatus*.

For the other categories, different reasons were given. For instance, for the private vehicles, the respondents observed that these vehicles were taking advantage of the fact that the new rules do not apply to them to a great extent. Other reasons given for the buses were that they are big relative to the narrow roads and so this in itself makes it difficult to maintain a smooth flow of vehicles leading to vulnerability to road traffic accidents in this area.

6.4 Perceptions and Attitudes to New Traffic Rules of 2003

When in 2003, new rules relating to road traffic operations were introduced and enforced, they were received with mixed feelings and attitudes. These attitudes were also examined in the present study in terms of the police effectiveness and even the peoples response in the way in which they behave e.g. by belting.

Table 6.0 Perceptions on police effectiveness in implementation of new traffic rules

Code	Frequency	Percent
No (0)	124	70.9
Yes (1)	16	9.1
Sometime (2)	35	20.0
Total	175	100.0

In table 6.0 above, the largest population sample do not feel that the police are effective in so far as enforcing the new traffic rules. In that case, it would appear that the majority of the respondents (70.9%) do not hold these new traffic rules in high esteem and as such, their attitude towards them is not positive. Only a few constituting 9.1% are of the opinion that the police are effective. Only 20% of the respondents were not categorical.

A short reflection on these findings would give hints on the people's behaviour as relates to road traffic rules. What comes out clearly here is the fact that, when certain rules are not reinforced, then people would not be motivated towards internalizing and abiding by them. Perhaps this perceived laxity on the part of the law enforcers could then be argued out to be a factor positively influencing the occurrence of the road traffic accidents. For meaningful change in people's attitudes, change must start with law enforcers. Either way, there appears to be a situation of even the law enforcers not having a very positive attitude towards these new traffic rules and so fall short of changing the people's attitudes and channel them towards these rules.

The study also sought to find out whether the passengers belt up while on board in the public service vehicles. In this regard, we tabulated these results as shown below:

Table 6.1 Belting by passengers.

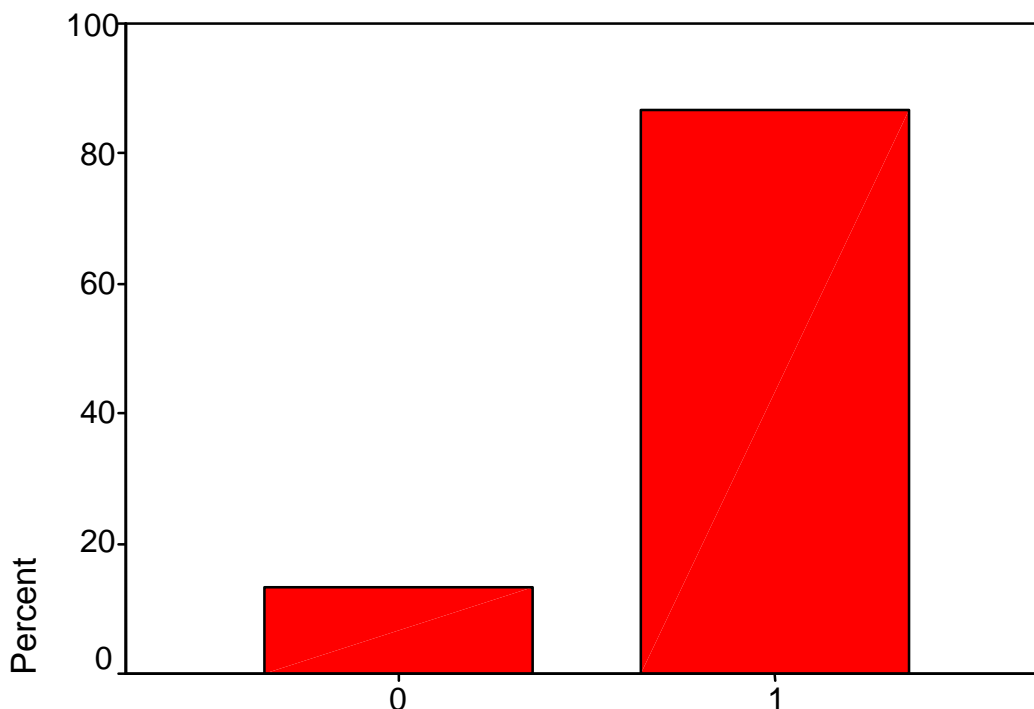
Code	Frequency	Percent
No (0)	23	13.1
Yes (1)	152	86.9
Total	175	100.0

The table above clearly indicates that those holding onto the practice of belting up while in the passenger service vehicles are the majority. While the present study did not go beyond this quantitative level and find out why given their relatively dominant negative attitudes towards the new traffic rules, many of them appear to be observant. This has therefore been left to speculation. However, in the present study, it is in our considered opinion that the passenger, perhaps, belt up just to avoid the penalties leveled against them whenever they are found by the police. Also, it has been observed that occasionally, the conductor normally, thought not always, reminds the passengers to belt up.

It would therefore appear that majority of the passengers mainly belt up just because they have been made to do so but not because most of them find it from within themselves to be the logical thing to do.

This would perhaps explain the seeming mismatch between their relatively negative altitudes towards the new traffic rules and the seeming positive action/response to these rules. These findings, as presented in the table above and has represented in the Fig below:

Figure 5.6: BELTING



6.5 Types of Injuries Incurred and Reported

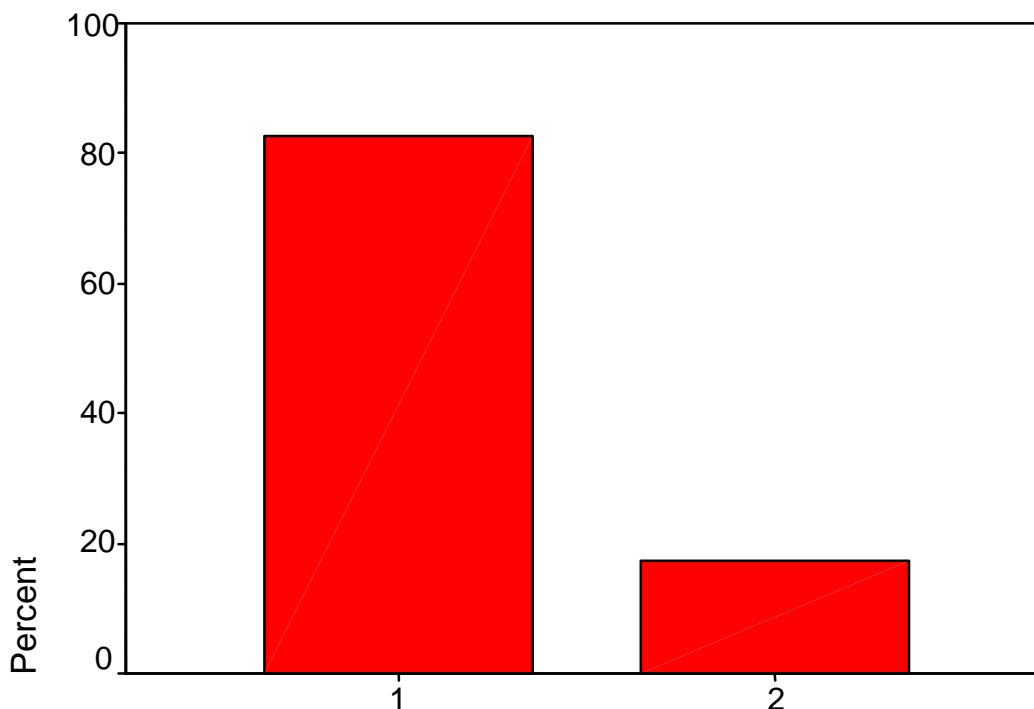
This study also sought to find out the types of injuries incurred and reported either at the police station or the hospitals. In this case, the idea was to use the nature of injuries so as to get an idea of the extent of the road accidents that take place within the sample area. The table below provides these findings.

Table 6.2: Types of Injuries Reported during the Study Period.

Code	Frequency	Percentage
Bruises (1)	145	82.9
Fractures (2)	30	17.1
Total	175	100.0

The table above indicates that of the accidents that occur and injuries incurred subsequently, a large percentage of them 82.9% are minor ones in form of bruises while a minority of them are serious in terms of fractures. These findings are also represented in the graph below.

Figure 5.7 – Graph showing different types of injuries



This trend can be interpreted in a number of ways. But for the purposes of the present study, the most meaningful way of explaining or interpreting this observation would be that in the light of the fact that more respondents have been observed to be belting up and also most vehicles on the road having been fitted with speed governors before being allowed to operate on the road, the number as well as the severity with which these accidents occur has been put under control. This in a way would also be trying to uplift the vigilance of the transport and licensing board in Kenya.

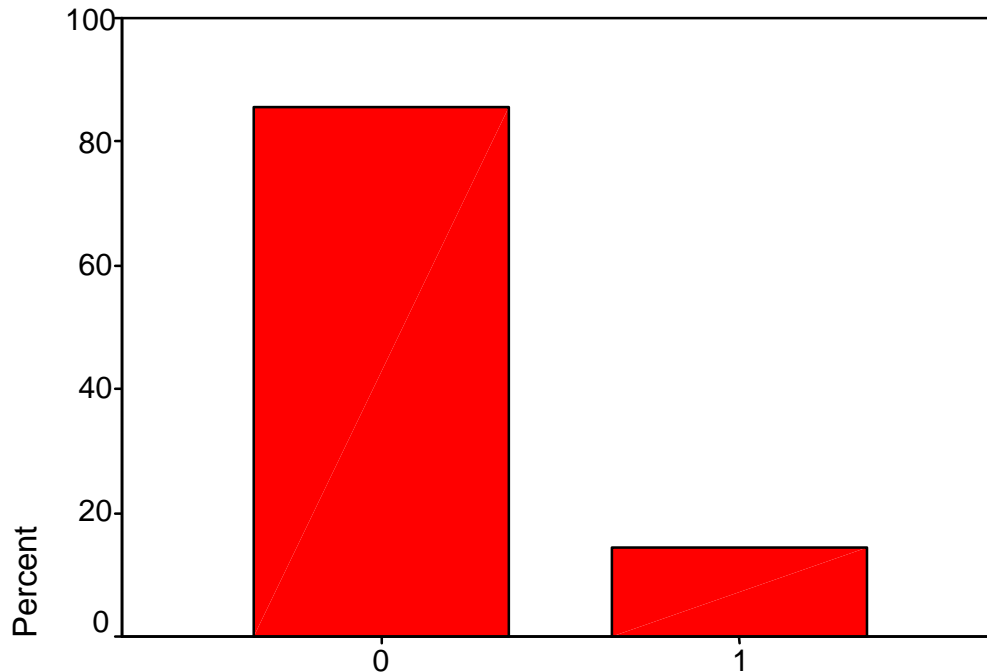
Closely related to this are the reported deaths arising from the events of accidents. These instances are tabulated as below.

Table 6.3 Deaths from Road Traffic Accidents during the Study Period.

Code	Frequency	Percentage
No (0)	150	85.7
Yes (1)	25	14.3
Total	175	100.0

The table indicates that the largest percentage of the sample population (85.7%) confess no instances of death. In the event of Road traffic accidents. While only 14.3% have confessed situations of death in the course of road traffic accidents. This further confirms the position held in this study that the measures that have been put in place by both the ministry of transport and the transport licensing board have gone a long way in reducing the instances of death that results form road traffic accidents. Below is a graphical representation of the responses regarding the occurrence of death resulting from road traffic accidents.

Figure 5.8: Responses regarding the occurrence of death resulting from road traffic accidents



4.6 Knowledge Regarding New Traffic Rules.

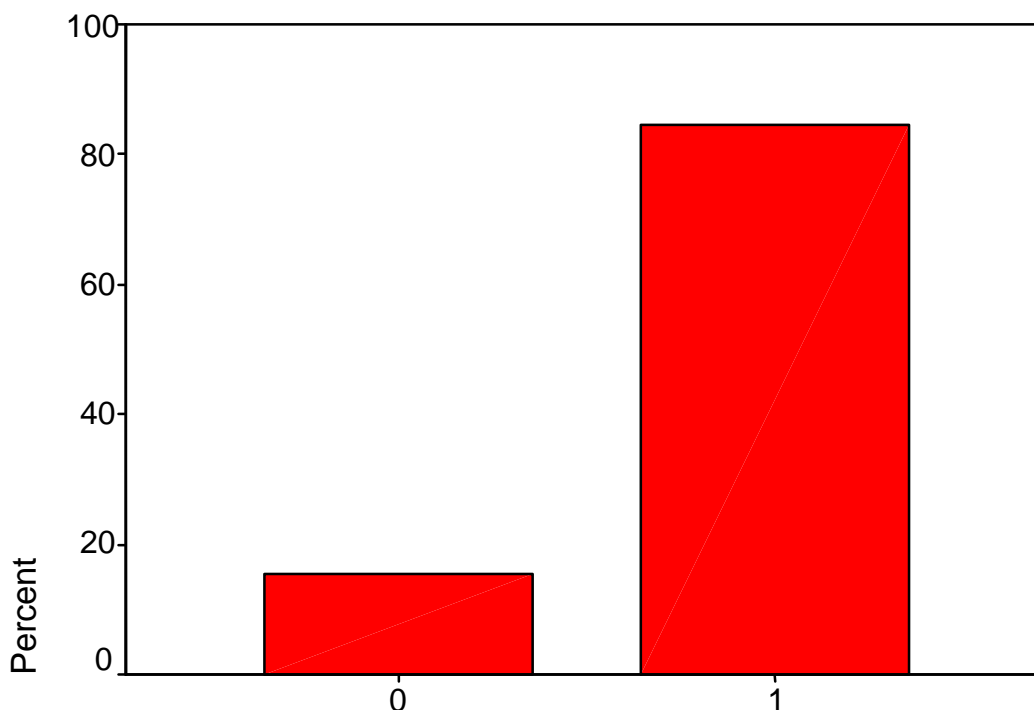
As earlier on indicated, this study also sought to find out the relative knowledge of the public/responses regarding the new traffic rules. In so doing it sought for this information using the question of whether the respondents were aware of the new traffic rules. Below is a table showing their responses.

Table 6.4: Knowledge of new traffic rules

Code	Frequency	Percentage
No (0)	27	15.4
Yes (1)	148	84.6
Total	175	100.0

Table 6.4 above shows clearly that the majority of the respondents (84.6%) confessed having the knowledge of the new traffic rules. This is in comparison with a minority of 15.4% who clearly indicated that they were unaware of these new traffic rules and regulations. These results are also shown in the graph below:

Figure 5.9: Knowledge of new traffic rules



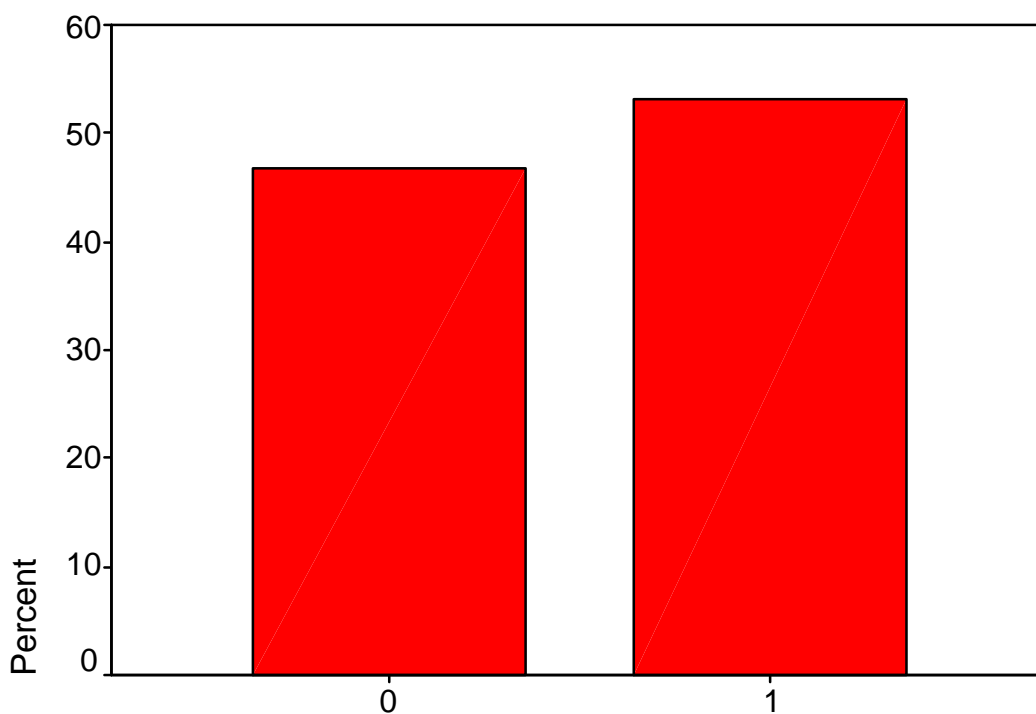
Closely related to knowledge, and which is in fact an expression of this knowledge is the observation of the road signs both by the drivers and the pedestrians. In the case of the drivers, the following results were obtained.

Table 6.5: Observation of road signs by drivers.

Code	Frequency	Percentage
No (0)	123	70.3
Yes (1)	52	29.7
Total	175	100.0

The table indicates that many of the drivers, despite knowledge of these traffic rules, do not observe the road signs (70.3%) against a minority of 29.7% who care to observe the road signs. This situation is also presented graphically as shown below:

Figure 6.0: Observation of road signs by drivers



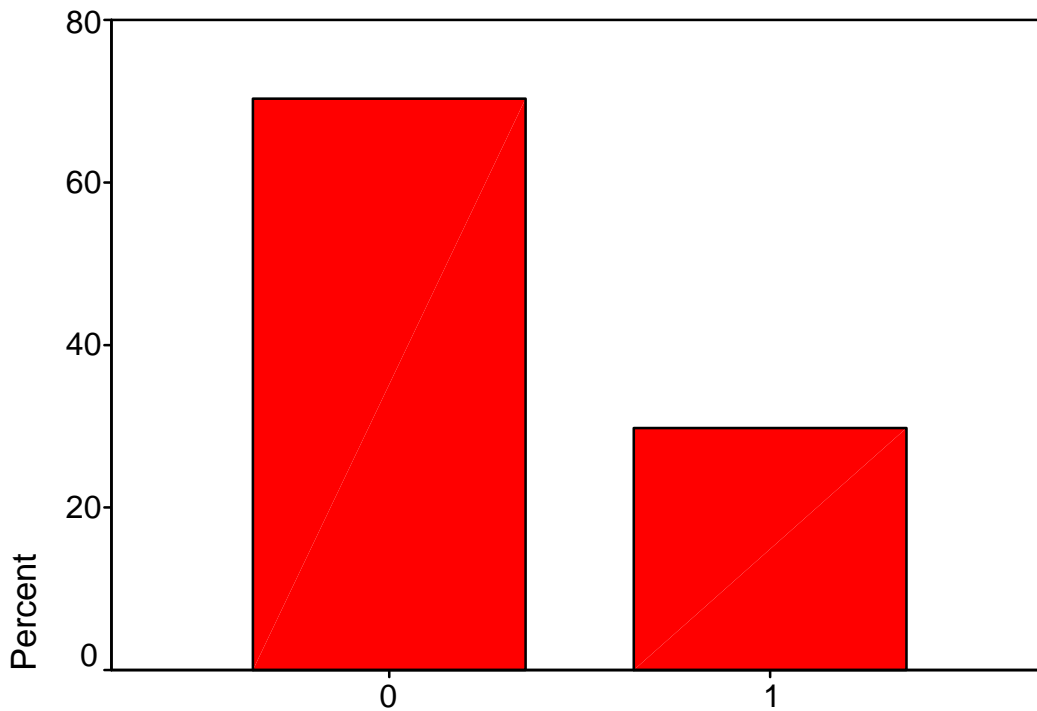
As for the pedestrians, the following results were obtained.

Table 6.6 Observation of road signs by pedestrians

Code	Frequency	Percentage
No (0)	82	46.9
Yes (1)	93	53.1
Total	175	100.0

Table 5.0 shows a relatively higher percentage of pedestrians 53.1% confirming their commitment to observation of road signs compared to the 29.7% of drivers. These results are also presented in the graph below

Graph 6.1: Compliance by pedestrians to road signs



This Fig above shows knowledge of traffic rules in the sampled population.

7 Summary of the Draft Final Report

This draft report has presented an analysis of the data collected. In so doing, it has summarized the findings into tables and graphs (descriptive statistics) for ease of interpretation. Based on set objectives presentation is given on analyses on the factors contributing to RTA mainly into three categories of physical environmental, behavioural factors and mechanical factors. The knowledge of the public regarding the new traffic rules shows that it is relatively high. However, knowledge levels mismatch the behaviour especially of the drivers who were found to least observe road signs.

8 Recommendation for follow - up (Listings)

1. There is need to implement educational/sensitization programmes. This would foster awareness on RTA avoidance by both road users and law enforcers
2. Road marking and signs especially designations of black spots need put in place. A study on the black spots RTA mechanisms and avoidance strategies would be very handy.
3. Trainings in first aid and particularly to selected members of the public (especially public health department) to improve skills in this area is important.
4. There is need for research on the RTA vulnerability of RTA in children and cyclist (*boda boda*) and constraints to enforcing safety measures to particularly primary school going children