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Causes and Mitigation Measures for Road Traffic Accidents in Public Service Vehicles in Kenya

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Abstract
Road Traffic Accidents are a worldwide concern as they lead to injury of persons, loss of lives and damage to property. The paper reviews the causes, trends and patterns of RTAs and evaluates the strategies that can be adopted to mitigate or prevent the RTAs within Kakamega Town. The research involved accidents associated with PSVs in Kakamega Town from 2005 to 2012. Descriptive research design was employed in the study. Purposive sampling was used for key informants while stratified random sampling was employed for sampling. Questionnaires, interview guides and observational checklist were used to gather primary data while reports and other publications were reviewed for secondary data. Descriptive and inferential statistics and norm thematic evaluation were used to carry out the analysis of the data collected. Data was analyzed using regression, spearman rank order and chi-square test of independence. The findings of the study are useful to other scholars, the government and other stakeholders in their persuit to reduce accidents in Kenya.
Keywords: Road traffic accidents, mitigation measures

1.0 Introduction

Over 3,000 people die on the world's roads every day and nearly 1.3 million people die of road accidents annually (WHO, 2009). These deaths will rise to an estimated 2.4 million a year by 2030 if trends continue unabated. Around the world, between 20 and 30 million sustain non-fatal injuries annually (Humphries, 2009).

The severity of road traffic accidents is also likely to be much greater in Africa than anywhere else, because many vulnerable road users are involved, poor transport conditions such as overcrowding, and hazardous vehicle environments. Death/injury ratios are however, not easy to compare because of the differential reporting bias for fatal and non-fatal injuries (Antwi *et al,* 2003).

While developing countries already account for more than 85% of all road traffic deaths in the world, the upsurge in the number of vehicles per inhabitant will result in an anticipated 80% increase in injury mortality rates between 2000 and 2020 (Nantulya *et al,* 2002). In Africa, it has been estimated that 59,000 people lost their lives in road traffic crashes in 1990 and that this figure will be 144,000 people by 2020, a 144% increase (Kopits *et al,* 2005).

RTAs account for over 3,000 deaths daily and 1.3 million deaths annually on the world's roads (WHO, 2009). Lagarde (2007) observes that research into road safety in developing countries is scarce, and thus predicts that by 2020, road traffic injuries will rank as high as third among causes of disability-adjusted life years lost.

GOK (2010) predicts that by 2015 road traffic accidents are likely to overtake deaths caused by malaria or HIV and AIDS. As a result of this, a number of structural and non-structural measures that would prevent the RTAs are well known, well tested, cost-effective and publicly acceptable, however, very little has been achieved. RTAs are still being reported almost on daily basis in Kenya. KTPR (2010) indicates that Kakamega Town's vast growth has been accompanied by increasing road traffic accidents that have threatened safety of the road users. It is because of this concern that this study aimed to clearly bring out an understanding of the problem of RTAs, causal factors and remedial measures and improvements strategies that can be instituted to reduce the RTAs in the Town.

2.0 Methodology

The study was carried out in Kakamega Town of Kakamega County, Kenya (Figure 1).

Though Kakamega town is cosmopolitan, majority of the Inhabitants of the Town are native the Luhya community, whose economic activity is mainly small scale farming. The main sources of income include: Sale of farm produce, Petty trade, casual/waged labour, and formal employment, Maize, Livestock and Livestock products, Brokerage services and transport services in Public Service Vehicles, bicycles and motorcycles (Emmanuel, 2011).

The main mode of transport is by Public Service Vehicles. The Town has a Bus park for PSVs, nonetheless, PSVs have been allowed to carry passengers at designated road side on the specific routes they ply within the Town. Infrastructure in the Town consists of class B (National trunk), C (Primary), D (Secondary), E

(Minor), SPR (Government, Settlement, Rural Access and Tea Roads) and U (Unclassified) Roads (Kakamega District Strategic Plan, 2005-2010).

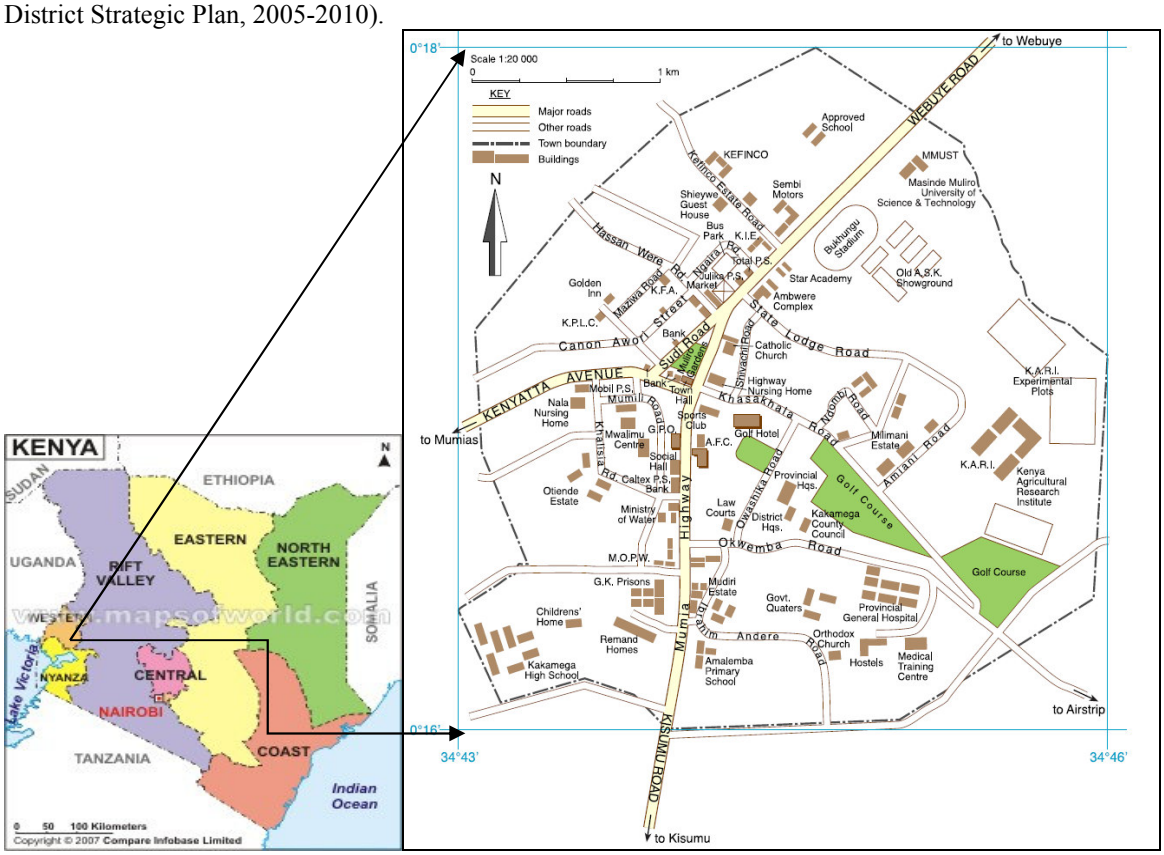


Figure 1: Map showing Kakamega Town, Kenya

Source: Researcher (2013); www.maps.com

The study population included PSV operators (Drivers and Conductors), passengers and pedestrians, Cyclists, lorry and tractor drivers. Key informants included: Owners, Accident victims, Police traffic department, insurance companies, Kakamega Municipal Council, Provincial General Hospital, Transport companies such as *Matatu* Saccos and Bus Companies.

The study employed a correlational research design. The study area was divided into three stratas based on the main highways in the Town (Kakamega – Webuye, Kakamega – Mumias and Kakamega – Kisumu). Bus and *Matatu* parks were purposively sampled based on their location (in the CBD) and high population. PSV operators, cyclists, passengers, pedestrians, tractor, and lorry drivers were randomly selected from the sampled stratas. Snowball sampling was used to select PSV owners whereby the PSV operators linked the researcher to the PSV owners. Snowball sampling was also used to select families of victims who had directly been involved in RTAs. The Stratified Sample consisted of 384 respondents (Passengers and pedestrians, PSV operators, cyclists, lorry and tractor drivers) distributed proportionally in the ratio of 3:2:1:1.

Interviews were conducted using interview guides for the key informants; Insurance Companies, Hospital Staff, Traffic Department, the Kakamega Municipal Council, PSV owners and Officials in public Transport Companies as in Appendices 5, 8, 4, 4, 10 and 6 respectively. A pretest study at a designated place within the Town was done before actual data collection. The responses obtained from the exercise helped the researcher identify some of the shortcomings likely to be experienced during the actual data collection exercise.

3.0 Results and discussions

This chapter presents the findings of the study at three levels guided by and in accordance to the study objectives and research questions. Section 4.2 describes the socio- demographic characteristics of respondents in terms of gender, age and education level. Section 4.3 analyzes causes, trends and patterns of RTAs in Kakamega Town. This section is designed so as to fulfill specific objective one of the study. Section 4.4 presents a detailed exploration on effects of RTAs in PSVs on livelihoods of victims in Kakamega Town so as to address specific objective two. Section 4.5 presents mitigation options/ measures for RTAs, in line with objective three, in Kakamega Town.

3.1 Causes of RTAs

Respondents were asked to indicate the causes of RTAs and the results gathered are given in Table 1.

Table 1: Causes of RTAs within Kakamega Town, Kenya

	PSV Operators		Passengers and Pedestrians		Lorry and tractors drivers		Cyclists	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**
Over speeding	31	28.0	46	28.0	14	25.5	16	29.1
Pot holes	7	6.7	11	6.7	7	12.7	5	9.1
Inadequate road signs	23	20.7	33	20.7	11	20.0	8	14.5
Wreck less vehicles	17	14.7	24	14.7	4	7.3	5	9.1
Overloading	8	7.3	12	7.3	7	12.7	4	7.3
Increase in number of vehicles	2	2.0	3	2.0	4	7.3	8	14.5
Drivers' fault	18	16.7	29	17.7	7	12.7	7	12.7
Other	4	4.0	6	3.7	1	1.8	2	3.6
Total	**110**	**100.0**	**164**	**100.0**	**55**	**100.0**	**55**	**100.0**

A Chi Square test of independence conducted on the causes of RTAs showed that there was no significant (P>0.05) association in responses on causes of road traffic accidents and respondent type ($\chi^2_{11,0.05} = 29.39$). Majority of the respondents (PSV operators, 28.0%; Passengers and pedestrians, 28.0%; Lorry and tractor drivers, 25.5% and cyclists, 29.1%) cited overspeeding as the major cause of RTAs within Kakamega Town. PSV operators, passengers and pedestrians, lorry and tractor drivers cited inadequate road signs (20.7%, 20.7% and 20.0% respectively) as a second major cause of RTAs within the Town. Cyclists indicated that increase in number of vehicles and inadequate road signs were second major causes of RTAs in the Town. PSV operators (2.0%), Passengers and pedestrians (2.0%) cited increase in the number of vehicles to be the least cause of accidents within Kakamega Town while Cyclists (3.6%), tractor and lorry drivers (1.8%) cited other causes of RTAs as being least. Other causes were increase in motor cycles, carelessness of motor-cycle riders, narrow roads within the Town and picking of passengers by *matatus* in wrong places. The findings are in agreement with results of a study in Texas by Vance (2008) who established that most motorists blamed roadway design for accidents. The results also agree with those of Angela (2011) who established that 80 per cent of public service vehicles (PSVs) were not observing speed limits, were unroadworthy and had been fraudulently issued with inspection papers.

According to WHO (2004), there are four main factors that contribute to the vast majority of RTAs are: Equipment Failure, Roadway Design, Poor Roadway Maintenance and Human factors. According to (Kirui, 2011), most of the accidents occur as a result of negligence and are avoidable. In his view, there is need to address the increasing cases of indiscipline among PSV drivers (Kirui, 2011). Results from PSV operators, passengers and pedestrians disagree with Thompson *et al* (1999) who conducted a study in Bangladesh, India and noted that the growth in numbers of motor vehicles was a major contributing factor in the rising toll of fatalities and injuries from road traffic crashes in poor countries. This is because the said respondents' ranked ncrease in motor vehicles as a least contributing cause of RTAs in Kakamega Town.

From FGDs, various stakeholders in the transport sector were asked to rank the causes of RTAs giving the results in Table 2.

Table 2: FGD Rankings on the causes of RTAs in Kakamega Town, Kenya

	Pedestrians and Passengers	Tractor & Lorry drivers	PSV Conductors and Drivers	Cyclists
Over speeding	1	3	2	1
Inadequate road signs	2	1	1	4
Un-road worthy Vehicles	3	5	4	6
Drivers Fault	4	6	9	2
Pot holes	5	2	6	3
Overloading	6	9	5	7
Poor Weather	7	8	8	7
Increased number of Vehicles	7	7	7	5
Others (increase in motor cycles, carelessness of motor cycle riders)	3	4	3	8

Based on the rankings in Table 2, a rank order correlation was calculated to find out if there were similarities or differences in the rankings by the various stakeholders in the transport sector.
The results are given in Table 3.

Table 3: Spearman's rank order correlations for rankings by various stakeholders in the transport sector in Kakamega Town, Kenya

	Passengers and pedestrians	Tractor and lorry drivers	PSV drivers and conductors
Passengers and pedestrians		r = -0.8±0.12*	r = 0.34±0.31
Cyclists, tractor and lorry drivers			r = 0.89±0.07*

From the results, the correlations computed between the ranking by passengers and pedestrians Vs cyclists, tractor and lorry drivers showed that there was a significant similarity in the responses ($r>6P.E._r$). Similarly, the ranking for cyclists, tractor and lorry drivers Vs ranking by PSV drivers and conductors showed significant similarity in the rankings ($r>6P.E._r$). From the results, drivers and conductors rank inadequate road signs as leading cause of RTAs while passengers and pedestrians ranked overspeeding as the leading cause of RTAs. This indicates that most drivers blamed RTAs on environmental conditions such as poor state of roads and not on their error. On the other hand, passengers and pedestrians laid much blame on the drivers. However, Spearman's rank order correlation for passengers and pedestrians Vs that of PSV drivers and conductors showed differences in the ranks ($r<6P.E._r$) . From personal observation, it was evident that that some road sections within the Town were in a deplorable state. The roads were narrow, most places lacked road signs and there were no traffic lights. The results support those of Odero *et al.* (2003), human factors including road user behaviour and incapacitation are the most common factors, accounting for more than 85% of all traffic crashes. Among them, the two key known contributing factors are speeding and drinking and driving. Data from the traffic police department also gave carelessness of PSV drivers and their conductors as one of the major contributing factors RTAs within the Town.

According to (Enoch 2011), system of laws and regulations directly affect road user behaviour e.g, the behaviour of the driver, pedestrian, cyclist, and passenger. Also, the characteristics of the vehicle and the environment influence pedestrian and driver behaviour in ways that lead to accidents. Road user behaviour equally impacts the environment and the vehicle. For instance, a fatigued driver or a distracted driver can become involved in traffic crashes because his physiological or mental states are challenged.

3.2 Trends and Patterns of Road Traffic Accidents

The study further sought to establish the trends and patterns of RTAs. To achieve this, the researcher asked the respondents to indicate in their view whether there had been an increase in the number of RTAs in Kakamega Town between 2005 and 2012. The results are given in Table 4:

Table 4: Respondents views on whether there is an increase of RTAs in Kakamega Town

		PSV Operators	Passengers and Pedestrians	Lorry and Tractor drivers	Cyclists
Yes	**F**	60	137	32	35
	%	54.8	83.7	58.1	63.0
No	**F**	50	27	23	20
	%	45.2	16.3	41.9	37.0
No	**F**	50	27	23	20
	%	45.2	16.3	41.9	37.0
Total	**F**	110	164	55	55

A Chi Square test of independence conducted on the causes of RTAs showed that there was a highly significant (P>0.05) association between responses on increase in RTAs and respondent type ($\chi^2_{9,0.05} = 22.18$). From the results, most respondents (PSV operators 54.8%, Passengers and pedestrians 83.7%, Cyclists 63.0%, Lorry and tractor drivers 58.1%) were of the view that RTAs had increased. Key informant interviews with hospital officials and traffic police confirmed that indeed RTAs were on the rise. Insurance companies also indicated that the number of RTAs had increased particularly *Matatu*s and motorcycle accidents. Data from the Kakamega Traffic Police department also showed that the number of RTAs had increased in Kakamega Town.

Data obtained from the traffic police department in Kakamega was used to establish trends in the number of RTAs in Kakamega Town. This was represented as shown in the Figure 2.

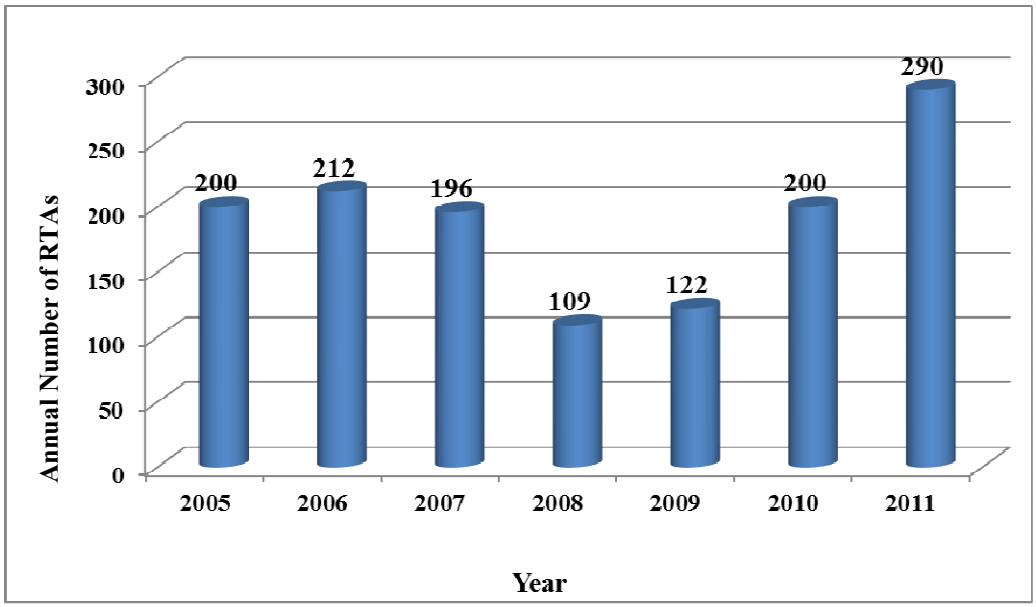


Figure 2: Accident trends in Kakamega Town from 2005 to 2011
(KTPR, 2012)

The regression analysis showed that there was a significant ($p<0.05$) increase in the number of accidents from 2005 to 2012. From Figure 2, it can be noted that the numbers of RTAs have been generally on the increase although there was a considerable decline in the number of accidents between the year 2007 and 2009. The decline could be attributed to the fact that after the 2007 general election, there was violence which disrupted the normal life of individuals. There was minimal travelling due to fear of being attacked, some *Matatu* owners opted to withdraw their vehicles from doing business with fear of being set on fire and generally due to few *matatus* being in operation, bus fare was increased. FGD with PSV operators also revealed that the decline of RTAs between 2007 and 2008 was associated with post election violence which led to some of them being evicted, some owners who were not natives of Kakamega Town had to either withdraw or operate their vehicles from other regions they felt were less volatile. In 2009 calm had began to be experienced, life began to get to normalcy, people began to run their businesses and travel, Matatu owners who had withdrawn their vehicles returned them on their respective routes in the Town and operators reported back to their jobs hence the gradual rise in the number of accidents.

Data from the traffic police department in Kakamega was also used to establish monthly trends of the road traffic accidents in the Town and presented as in Figure 3.

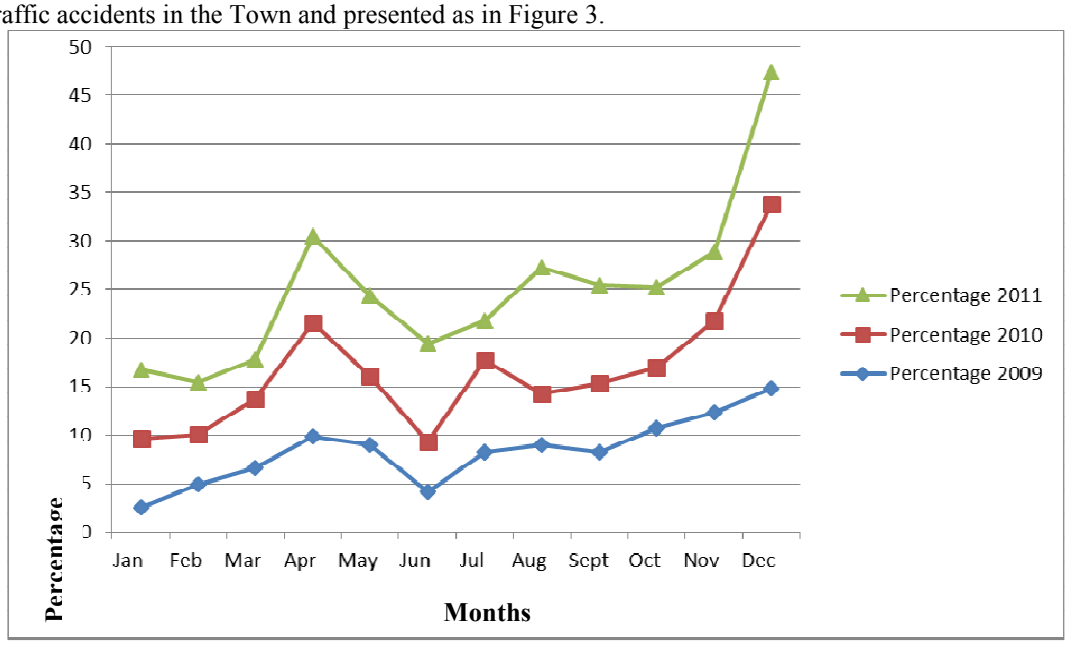


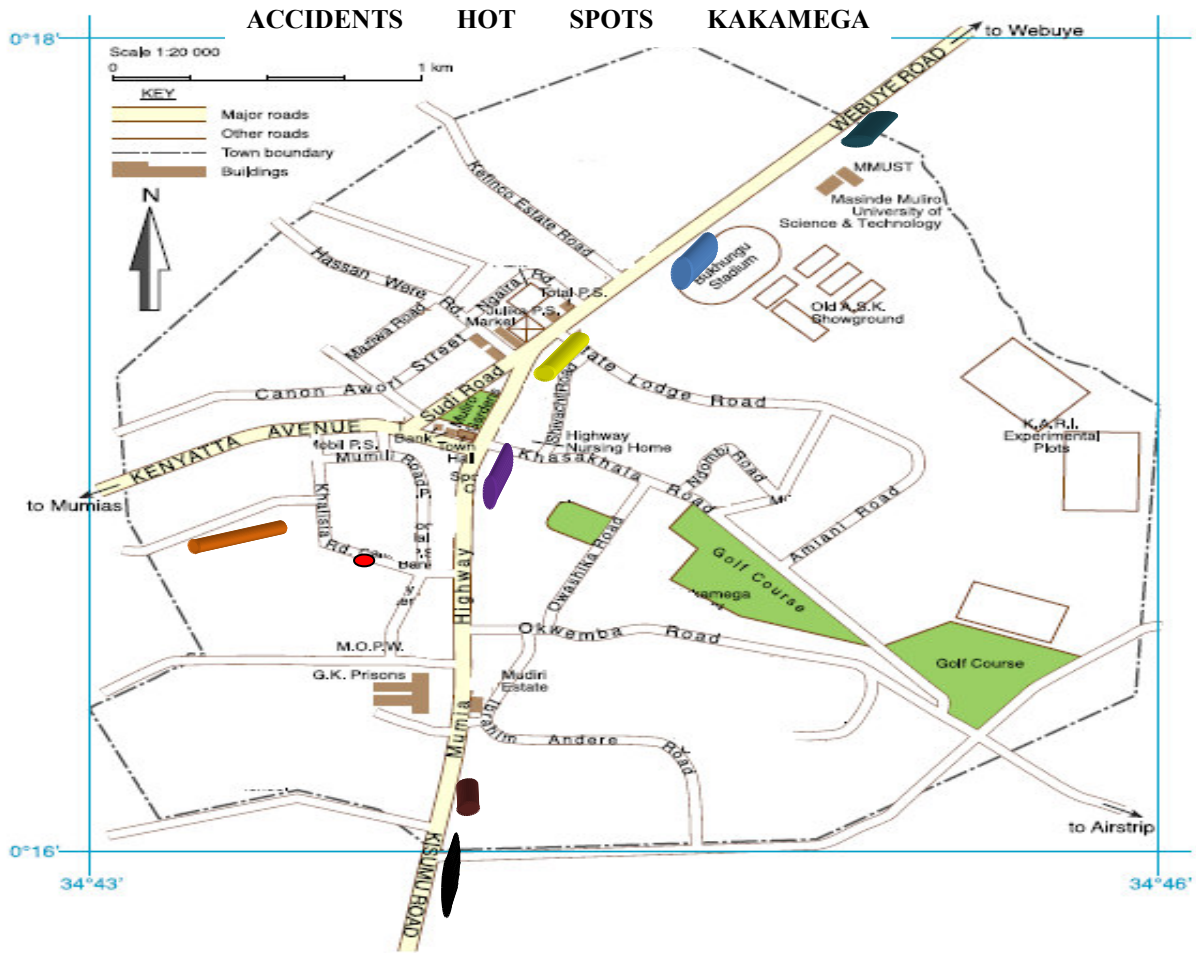
Figure 3: Monthly trends of accidents from 2009 to 2011in Kakamega Town, Kenya

The results indicate that the number of RTAs was on the increase. The results also indicate that the rates of occurrence of accidents were high between April and June, August and December. These are periods when

most learning institutions are on holiday leading to a high number of road users. From 2009 to 2011, December was having the highest number of accidents. During this month, students and most workers are on holiday and most celebrations go on during this period.

The results are in agreement with those of Peden *et al* (2004) who observed that the road traffic crash fatality rate in Africa as a whole was anticipated to increase by 80% between 2000 and 2020, if major changes are not taking place.

Data from the traffic police department in Kakamega was used to show the spatial distribution in terms of patterns of RTAs within Kakamega Town and the results are as presented in Figure 4.



Key

Lurambi
Stadium-Mmust
Webuye Bus Terminus
Between Muliro Gardens and Tuskys
AP Line Stretch
Between Amalemba Shopping Centre and Shirere shopping centre
Canon Awori Street
Kenyatta Avenue on Mumias Road

Figure 4: Patterns of RTAs within Kakamega Town
(Researcher, 2013: KPTR, 2013)

3.3 Need for other traffic rules to curb RTAs

Majority of respondents (92.6%) were of the view that there was no need to introduce other road traffic rules while 7.4% were of the view that the existing road traffic rules were good hence no need to introduce others. Those against introduction of other road traffic rules were of the opinion that the existing traffic rules were good, only that traffic policemen were not doing much to ensure that the rules were being observed. Khayesi (2012) argues that the existing traffic rules need to be reviewed and amended so as to fit the current situation in Kenya. He adds that by so doing, there will be proper focus on RTAs and therefore solve the problem. It is in this regard

that the findings differ since only a small percentage (7.4%) of respondents held the same view.

The results further showed that those who were of the view that the Traffic amendment act (2004) was being observed were 23.0% while those of a contrary opinion were 77.0%. These results showed clearly that there was a lapse in the application of the rules. The results agree with Khayesi (2012) who observed that traffic rules were being flouted hence an increase in RTAs.

The results, 83.3% indicated that the police were to blame for RTAs while 16.7% were of a contrary opinion. FGDs with drivers and conductors showed that indeed traffic police were to blame for most of the RTAs as they were interested in extorting bribes at the expense of the lives of Kenyans using PSVs. Mohan (2002) notes that setting and enforcing speed and blood alcohol concentration limits have proven to be perhaps the most successful interventions contributing to the decrease in injury in developed countries.

Those respondents who were of the view that traffic police were to blame for RTAs in Kakamega Town were further asked to give reasons why they were of this opinion. The results are presented in Table 5.

Table 5: Reasons why traffic police were to blame for RTAs in Kakamega Town

Reason	Frequency	Percentage
Corruption	221	69.1
Don't enforce the law	10	3.2
Damage insurance cover	4	1.1
Negligence	85	26.6
Total	**320**	**100.0**

An FGD conducted with PSV operators revealed that traffic police harassed them on daily basis and attempted to take them to court in case they are found with defective *Matatus.* Since they did not want to lose their daily income and waste time, they preferred to offer bribe on daily basis and flout some of the traffic rules such as carrying excess passengers, picking passengers at any point and overspeeding. The results support those of Chitere *et al* (2005) who showed that many police officers were still reluctant to enforce the laws long even after the introduction of the so called " Michuki Rules''. Whereas the government was fighting corruption, many police officers were still extorting bribes from PSVs. Findings by Webala (2010) showed that the RTAs rates in Kenya had been on increase, apart from 2004 to around 2006 when Michuki rules were introduced. During the period, speed governors were introduced in Public Service Vehicles, old Publishingand unroadworthy vehicles were impounded and use of safety belts was introduced. As a result, RTAs were reported to decline (Simiyu, 2010).

3.4 Programmes to help curb RTAs

The study sought to determine the educational programmes that could be put in place to help curb RTAs. This was analyzed for different respondents in order to cater for the diverse views and come up with more valid deductions. The results are outlined in Table 6.

Table 6: Educational programmes that can help curb RTAs in Kakamega Town

Educational Programme	Frequency	Percentage	Rank
Use of media in promoting road safety programmes	276	71.9	1
Curriculum development in school	76	19.8	2
Production and distribution of road safety leaflets and brochures by the government	27	7.0	3
Introduction of new laws by government in driving schools	5	1.3	4
Total	**384**	**100.0**	

A Chi Square test conducted on the responses showed that there was a highly significant ($P<0.01$) variation in the responses ($\chi^2_{3,0.01} = 180.15$). From Table 6, 71.9% proposed use of media in promoting road safety programmes, 19.8% proposed curriculum development in schools, 7.0% proposed production and distribution of road safety leaflets and brochures by the government, while 1.3% suggested introduction of new laws by the government in driving schools.

3.5 Engineering measures that can be put in place to help curb RTAS

The study sought to establish the engineering measures that could be put in place to reduce road traffic accidents. Respondents were asked to indicate the best engineering measures that could help reduce RTAs giving rise to the results in Table 7.

Table 5: Engineering measures that can help reduce RTAs in Kakamega Town

Engineering measures	Frequency	Percentage
Construction of cyclist lanes	175	45.6
Construction of bumps	75	19.5
Putting up road signs	125	32.6
Others	9	2.3
Total	**384**	**100.0**

A Chi Square test conducted on the responses showed that there was a highly significant P<0.01) variation in the responses($\chi^2_{0.01} = 47.70$). From the results in Table 7, 45.6% proposed construction of cyclic lanes, 19.5% proposed putting up of road signs, 32.6% proposed construction of bumps in sloppy areas and 2.3% proposed putting up of road signs. From observation, the researcher realized that Kakamega had a cyclist lane running from Amalemba shopping centre to lurambi shopping centre. However, the lane was in poor and dilapidated state in that it had many pot holes, no proper drainage system and was narrow in that it cannot accommodate all the cyclists in the Town plying the routes. The road connecting Kakamega town and Mumias had no cyclist lane.

3.6 Other measures that can be put in place to help curb RTAS

The study sought to establish the other measures that could be put in place to reduce RTAs in Kakamega Town. The results are given in Table 8.

Table 8: Other measures that can be put in place to help curb RTAs

Other ways of reducing RTAs	Frequency	Percentage
Arresting and prosecuting corrupt traffic police	160	40.6
Educating cyclists on road safety	133	29.3
Proper maintenance of roads	20	5.3
Widening roads	15	4.0
Decongestion of the Town by construction of other by-passes	12	3.0
Prosecution of law breakers	12	3.0
Reduce motorcycles on roads	12	3.0
Use of speed governors	10	2.7
Mark black spots	9	2.3
Regular education to all road users	9	2.3
Total	**384**	**100.0**

A Chi Square test conducted on the responses showed that there was a highly significant (P<0.01) variation in the responses ($\chi^2_{0.01} = 300.90$). From the results, measures suggested include; arresting and prosecuting corrupt traffic policemen/women should be (40.6%), was suggested as a major measure that will return sanity in the PSV sector and help to curb RTAs within Kakamega Town. An FGD with PSV operators pointed out that demanding of bribes by traffic police was on the rise and this significantly affected the operations of PSVs within the Town. Kariuki (2009) adds that Matatu drivers and conductors found bribing traffic police officers should also be prosecuted. He adds that arresting and prosecuting traffic police alone cannot solve the whole problem of bribes without including the PSV operators who are ready to give. It is worth noting that respondents suggested reduction of motorcycles on roads as a measure of curbing RTAs.

Conclusion

The study findings revealed the causes of RTAs were overspeeding, inadequate road signs, unroadworthy vehicles, drivers' fault, poor road conditions (pot holes), overloading, poor weather conditions and increase in the number of vehicles. Other causes were increase in the number of motorcycles and carelessness of motorcycle riders. The findings also revealed that accidents in Kakamega Town were generally on the increase and most of them happened during vacations (in the months of April, August and December probably due to closure of many institutions and a lot of travelling within and out of the Town).

Measures suggested to curb RTAs included arresting and prosecuting corrupt traffic policemen/women, educating cyclists on road safety, proper maintenance of roads, widening of roads, construction of by-passes to ease congestion, arrest and prosecution of law breaker, use of speed governors, marking black spots, regular education to all road users, construction of cyclist lanes, putting up of road signs and construction of bumps on sloppy areas.

For the road traffic accidents to reduce, the Kenya Highways Authority in conjunction with the Kakamega County government should put in place all necessary road signs, widen roads, create cyclist lanes and repair all the diplorable roads within the Town. The Ethics and Anti-Corruption Commission should strive to arrest and prosecute all corrupt Traffic police officers as well as members of the public found giving bribes in an effort to ensure there is strict enforcement of existing traffic laws. Public sensitization by use of mass media and trainings in schools on road safety should be adopted as a continuous process that will see a reduction in the number of road accidents and more so during vacations. There is need for the government to come up a policy to ensure that all PSV drivers and conductors take personal accident insurance cover. This will guarantee their treatment if injured and compensation to their families in case of death. It is important for a policy to be developed which will ensure that all motorcyclists get trained in driving schools.

References

Angela, C. (2011). *Public service vehicles (PSVs) Kenyan motorists speeding to death on Fake permits*. http://www.kenyacarbazaar.com.

Antwi, P., Afukaar F., K., and Ofosu-Amaah, S. (2003*). Pattern of road traffic injuries in Ghana: Implications for control*.doi: *Medical journal.* www.plosmedicine.org.

Chitere, P.,and Kibua, T. (2005). *Efforts to improve road safety in Kenya achievements and limitations of reforms in the Matatu industry*.

Emmanuel, I. (2011). *Kakamega County*. http://softkenya.com.

Enoch T., (2011) *A Public Health Perspective of Road Traffic Accidents.* www.ncbi.nlm.nih.gov/.

GOK .(2010). *Alcohol Drinks Control amendment act* 2010, Government Printer, Nairobi.

Humphries (2009) *The causes and incidence of occupational accidents and ill-health across the globe*.

Kariuki, J. (2009). *Why Michuki rules failed*. www.nairobichronicle.wordpress.com

Kakamega District Strategic Plan, 2005-2010. http://www.ncapd ke.org/UserFiles/File/District%20Strategic%.

Khayesi, M. (2012). *An analysis of the pattern of Road Traffic Accidents in relation to selected Socio- economic dynamic and intervention measures in Kenya.* www.roadaccidents.com.

Kirui, K. (2011). *TLB Call for Matatu, PSV Drivers to Be Retrained and Vetted*. http://allafrica.com.

Kopits, E. and Cropper, M. (2005). *Traffic fatalities and economic growth*. Washington, DC,

USA. www.ncbi.nlm.nih.gov. Accessed on 19th September, 2011.

KTPR. (2010). *Kakamega Traffic Police Report*, Government printers, Nairobi.

Lagarde, E. (2007). *Road Traffic Injury Is an Escalating Burden in Africa and Deserves Proportionate Research*. www.ncbi.nlm.nih.gov.

Mohan (2002) *Social Cost of Road Traffic Crashes in India*. http://tripp.iitd.ernet.in/publications/paper/safety/dnmrk01.PDF.

Nantulya, V.M., and Reich, M.R. (2002). *The neglected epidemic: Road traffic injuries in developing countries.* vmnantul@hsph.harvard.edu..

Odero, W., Garner, W., and Zwi, A. (2003). *Magnitude of road traffic accidents in Kenya. www.utrc2.org/.../road traffic-safety-african-countries.*

Peden, M., and Sminkey, L. (2004) *World report on road traffic injury prevention: summary.*

Simiyu, N. R. (2010). Road Traffic Accidents and the Traffic Police in Kenya, *the International Journal of Disaster Management and Risk Reduction*. Masinde Muliro University press.

Thompson, A., Tay, R., Barua, U., and Kattan, L. (1999). *Factors contributing to hit-and-run in fatal crashes.* EBA Consultants Ltd., Canada. www.sciencedirect.com.

Vance, J. (2008). *What Causes Car Accidents*? http://www.smartmotorist.com.

Webala, P. (2010). *Traffic fatalities in Africa*.www.roadaccidents.org Accessed on 10th July 2011

WHO. (2004). *Violence and Injury prevention and disability (VIP).*www.who.int.

WHO. (2009).*Violence and Injury Prevention*. www.who.int/violence.