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COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

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DEPARTMENT OF DESIGN & TECHNOLOGY EDUCATION

INVESTIGATING INTO DRIVER ATTITUDES AND VEHICLE BEHAVIOURS AS CONTRIBUTORY FACTORS TO ROAD ACCIDENTS ON KUMASI-DUNKWA TRUNK ROAD

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SEPTEMBER, 2011

DECLARATION

*I, **GABRIEL KINGSFORD OSEI**, DECLARE THAT THIS THESIS WITH THE EXCEPTION OF QUOTATIONS AND REFERENCES CONTAINED IN PUBLISHED WORKS WHICH HAVE ALL BEEN IDENTIFIED AND ACKNOWLEDGED IS ENTIRELY MY OWN ORIGINAL WORK AND IT HAS NOT BEEN SUBMITTED EITHER IN PART OR WHOLE FOR ANOTHER DEGREE ELSEWHERE.*

CANDIDATE ..... *DATE*.....

GABRIEL KINGSFORD OSEI

SUPERVISOR ..... *DATE* .....

DR. A. AGYEI-AGYEMANG

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DEDICATION

This research work is dedicated to my family for their continuous support and encouragement throughout my life especially during my study period.

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ABSTRACT

Road traffic accident records indicate that Ashanti Region is the second highest in fatalities in the country and in the Region; the Kumasi–Dunkwa road records the highest road traffic accidents in all the trunk roads. This prompted the researcher to investigate the driver attitudes and the vehicle characteristics that account for this and to suggest appropriate remedial measures to curtail it. The study was necessary and important since road accidents are mostly blamed on road users' attitudes, especially drivers while the drivers also shift the blame to the vehicle. The study sourced information from the National Road Safety Commission (NRSC), the Police Motor Traffic and Transport Unit (MTTU), and the Driver and Vehicle Licensing Authority (DVLA) and supplemented with road user questionnaire. Several vehicle factors were investigated and the major defects that were found contributed to road traffic accidents are defective brakes, poor tyres especially used tyres from United Kingdom or USA, over age and structural weakness as well as overloading. The study also established that the major driver attitudes contributing to road traffic accidents in the region are aggressive diving behaviour (which 66% agreed upon), over speeding (where 73.9% agreed), and lastly fatigue (17.9%), which many people believe could be avoided. With regards to road safety awareness 96% of respondents agreed that it is effective in changing driver behaviour and improving safety when combined with education and media campaign. However, enforcement, of safety measures in the region is inadequate which needs to be improved by the enforcement agencies. Based on these findings appropriate remedial measures have been recommended based on the National Road Safety Commission (NRSC) strategy, the 3E's (Engineering, Education, and Enforcement).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Road transportation is the major system of transportation in Ghana, which uses various kinds of vehicles as means of transport. According to the Ministry of Transport report MRT (2008), most people in the country rely on road transport for their daily commutation, as well as the conveyance of raw materials and food commodities. Statistics show that about 96% of the country‟s freight use road transport. With such a high reliance on road transport, majority of Ghanaian entrepreneurs are of the view that the most lucrative business venture today is transport operation, because everyone is bound to travel at least twice a month either for economic or social activity notwithstanding, whether this assertion is true or not, is left to the public to judge.

In the light of this, there is a tremendous increase in importation of second-hand vehicles into the country to enable those who believe that transport business is good to be in business. In fact it is better to own a brand new vehicle than a second-hand one, but comparing the difference in prices, one would easily go for the less expensive one which can serve the same purpose without considering the effects on the society. Obviously, every year the number of road traffic accidents increase due to the increasing number of vehicles on the roads (WHO, 2009). The present increase in second-hand vehicles not only creates vehicular congestion but also lead to road accidents that result in road carnages draining the country economically.

According to statistical report, Ghana loses an amount of GH¢165,000 representing 1.6% of our GDP, yearly in solving road accident situations such as medical expenses of victims, damage to vehicles and insurance cost among others. The country, in all, loses about

2% of her GDP annually due to road accidents. Statistics available reveal that, every person stands the risk of this menace. Since about 1.2 million people die globally, due to road traffic accidents every year (The Chronicles, 2011). The World Health Organization, (WHO), a specialized agency of the United Nations, in its Global Status Report on Road Safety 2009, states that over 90% of the world‟s fatalities on the roads occur in low-income and middle-income countries, which have only 48% of the world‟s registered vehicles, and predicts that road traffic injuries will rise to become the fifth leading cause of death by 2030.

Rumar (1999), using British and American crash reports as data, found that 57% of crashes were due solely to driver factors, 27% to combined roadway and driver factors, 6% to combined vehicle and driver factors, 3% solely to roadway factors, 3% to combined roadway, driver, and vehicle factors, 2% solely to vehicle factors and 1% to combined roadway and vehicle factors. According to the Motor Traffic and Transport Unit (MTTU), report, driver error, mechanical failure and pedestrian action are the major causes of road accidents.

In summary, the state has encouraged people to own cars in three different ways. Firstly, large investments in roads have enticed people to drive. Secondly, through the liberalization of the economy, it has become relatively easy to import cars. Thirdly, by consistently under-investing in public transport, bit by bit the state has promoted a strong desire among urbanites to use private cars either as owners or as passengers. It is important to analyse the social cost of increasing number of roads, cars and congestion in Ghana. Road accidents and their effects are fairly obvious here. However, pollution and transport-related emissions, which could cause climate change, could also be considered.

1.2 Statement of the Problem

The escalating increase in road accidents in the country has become a public menace in every corner with government and other social commentators calling for an intervention to curb it. According to the study conducted by Dugan (2005), unpublished thesis on the topic "Characteristics and Contributory factors to road accident in Ghana", the Motor Traffic and Transport unit (MTTU) of the Ghana Police accident unit confirmed that in Ashanti Region, Kumasi–Dunkwa trunk road is the most accident prone road. It is rated first in all the trunk roads in the region. It is also one of the most plied roads serving both the western and central corridors of the country, where a lot of food commodities and raw materials come from. They also attribute the road fatalities to bad drivers since in their view Kumasi-Dunkwa road is not a bad one.

Statistics show that, majority of the vehicles plying this road for commercial purposes are mini buses carrying 15–33 passengers, with about 75 % being Mercedes Benz brands. The most identified type is the "207" which is popularly known and called "honourable" due to the high rate at which such vehicles cause accidents. According to Mr David Osafo-Adonten, of the National Road Safety Campaign team, speaking on GTV programme „Talking Point" admitted that most vehicles on our roads have engineering problems as a result of alterations made on them when they arrive in the country. He further admitted that the structurally weak vehicles are as a result of conversions made especially from goods carrying to passengers leading to discomfort to occupants of the vehicle when used for travelling long distances.

Again a report by the Police accidents unit indicates that Kumasi-Dunkwa trunk road experiences bloody accidents every year. The National Road Safety Commission also iterated that about 98% of road accidents can be avoided if drivers as well as road users were disciplined. Despite increased road safety campaigns, the rate at which accidents occur on our

roads is very alarming. With the country relying greatly on road transport, and has been battling with how to control the high rate of accidents that have been claiming lives and brought sorrows to families, it must be the agenda which concerns everyone. Upon this background the author deems it necessary to look critically into the situation using Kumasi-Dunkwa trunk road as a case study.

1.3 Purpose of the Study

The ultimate goal of this study is to investigate into the combined driver attitudes and vehicle behaviours as contributory factors to road accidents on Kumasi-Dunkwa road. The classes of vehicles that the study will consider are the commercial minibuses which include Mercedes Benz "207" and Nissan Urvan buses, since they are the most commuted vehicles on the road. The main objectives set out for the study are:

1. To identify the characteristics of vehicle that causes road traffic accidents on the trunk roads.
2. To assess driver attitudes and behaviours that lead to road traffic accidents.
3. To look into existing road safety interventions and suggest remedial measures to reduce road traffic accidents in the region.

1.4 Significance of the Study

Against the background that carnage on the roads is causing a great harm to Ghana, the menace has gained public concern and that governments for the past decade have also shown concern, as seen in the government"s Better Ghana Agenda manifesto that has led to the establishment of National Youth Employment Programme (NYEP) in road maintenance in addition to the National Road Safety Commission. Coupled with the World Bank and World

Health Organization (WHO) estimate that if swift action is not taken, by the year 2020, the number of road traffic deaths will shoot up to 2,000,000, the study is worth considering (The Chronicle, 2011). Citing United State and Europe as example, over 95% of motor vehicle accidents in the USA, or Road Traffic Accidents in Europe involve some degree of driver behaviours combined with one of the following factors: Equipment Failure, Roadway Design, or Poor Roadway Maintenance (TRL 2006; WHO, 2009)

Drivers always try to blame road conditions, equipment failure, or other drivers for those accidents. The situation is not different in Ghana when there is an accident the behaviour of the implicated driver is usually the blame game citing other factors as the primary cause. Apparently, since precious innocent souls are lost through road traffic accidents with the most vulnerable being the youth who are the manpower base for the future of the nation, the study is justifiable. Although the statistics show that the region does not necessarily record the highest road accident, it consistently has the highest fatality rate (BRRI/NRSC, 2009). This notwithstanding, little or no research has been done to identify the main factors leading to the high fatalities in the region.

It is also apparent that road safety interventions in the region is largely based on subjective instincts of the key stakeholders. Even as the bad road safety situation is generally blamed by drivers, the stakeholders as well as other road users whose views are going to be sampled will provide formidable evidence which could be used to develop a more efficient road safety programme for the region and for the nation Ghana at large.

Regarding re-fabrication, it is obvious that a number of commercial mini buses on the roads conveying passengers were brought into the country as vans and goods carrying vehicles but have been tempered with by local craftsmen who form the Suame Magazine

Industrial Development Organization (SMIDO). As much as we appreciate their efforts, there is the need to support them through research so that they would improve upon their expertise to help in manpower development of the country.

1.5 Research Questions

In order to have reasonable, accurate and realistic response to the problem, the researcher wishes to pose the following questions to enable him examine the identified problem.

1. What vehicle factors cause road traffic accidents in the region and why?
2. What behaviours of drivers cause road traffic accidents in the region?
3. What interventions and measures would have to be enforced to minimize road traffic accidents in the region?

1.6. Limitations to the Study

The study could have been conducted on all trunk roads in the region, but due to time constraints it was limited to only the Kumasi-Dunkwa road where the researcher finds appropriate since it was conducted alongside other academic activities. Although questionnaire survey allows a wide range of distribution, it was difficult for the researcher to obtain responses from the sampled population since a cross-section of them was not ready to offer the needed responses, which accounted for non-retrieval of some questionnaires.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to provide relevant information on the study area to enhance the understanding of the topic. In order to have a clear view of the problem, the study reviews the following:

1. Accidents situation around the World and in Ghana.
2. Contributory factors to road traffic accidents in Ghana
3. Vehicle factors that cause road traffic accidents
4. Driver attitudes and behaviours that cause road traffic accidents and
5. Enforcement and Road safety interventions that can curtail the menace.

2.2 Review of Accidents

2.2.1 Global Accident Situation

Road accidents are a comparable concern in both developed and developing countries because of their impact on social, economic and health issues. Research by the World Health Organization (WHO) (2009) has indicated that the number of people dying annually in road crashes may increase from 1 million to 1.3 million in the next 10-20 years. According to WHO and the World Bank estimates, death in road accidents will continue to rise by 65% until the year 2010. The organization further predicts that by the year 2030, it can increase to 2 million if swift action is not taken.

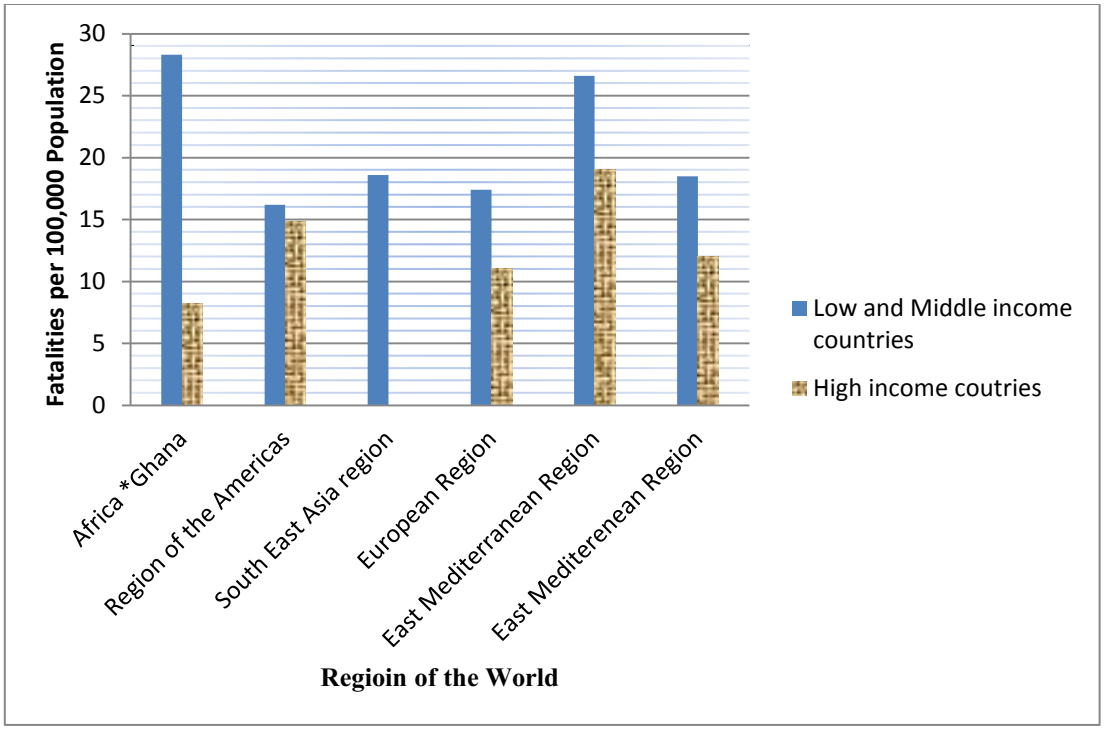

Figure 2.1: Ghana's Position in relation to World Road traffic Crash Fatalities per 100,000 Population

According to Ghee *et al*. (1997), a study by the Transport Research Laboratory (TRL) (1999) compared road fatalities with other violent causes of death such as fire, drowning, suicide, homicide, etc. The study showed that road accidents were in the first position in both developed and developing countries. The studies in 1990 shows that road accidents took ninth position in a total of over 100 separately identified causes of death or disability. In most developed countries, the number of injuries and fatalities is in slow but steady decline, in spite of the natural population growth and the increase in the number of vehicles. In contrast, in developing countries, the number of injuries and fatalities is increasing. Another important factor influencing the seriousness of the situation as regards accident victims in developing countries is the low level of medical facilities available for treatment as compared to developed countries (Baguley and Jacobs, 2000).

In Europe and USA, for instance, the cause of over 95% of motor vehicle accidents, or Road Traffic Accidents, involve some degree of driver behaviour combined with one of the other three factors (TRL, 2006; WHO, 2009), regarding this the review will focus on these three key areas:

2.2.2 Review of Accident Situation in Ghana

The accident situation in Ghana is not different from the global perspective, as reported by many researchers and credible institutions such as, the Motor Traffic and Transport Unit of the Ghana Police (MTTU), the National Road Safety Commission (NRSC), and Driver and Vehicle Licensing Authority (DVLA). A survey conducted by Sarpong (2011), reported that "In 2001 the country was rated the second highest road traffic accidents prone among six West African countries with statistics proven that the fatality rate per 10,000 accidents in the country being 73 deaths and the number of car accidents increasing every year (GNA, 2011). Since 1991, over 21,000 people have died from road accidents and some 90,000 more have been injured (NRSC, 2009; CEPA, 2009; GSS, 2008).

2.1: Accident Severity by Vehicle Type–Ashanti Region-2009

Source: (MOT/BRRI/NRSC, 2009)

Vehicle Type	Accident Severity				Total
	Fatal	Serious	Slight	Damage only	
Car	150	274	54347	378	1149
HGV	96	106	119	201	521
Bus/Minibus	166	235	252	231	884
Motorcycle	31	66	60	5	162
Pick-up	29	39	51	69	18
Bicycle	14	18	19	0	51
Others	5	5	6	8	24
Total	490	743	8	892	2979

The most current accident statistics reported that in Ashanti Region the type of vehicle killing people on road is minibus registering 884 accidents in 2009 only (BRRI/NRSC,2009). Table 2.1 shows that between 2000 and 2006, there were over 11,300 road accidents on average every year and a total of 79,544 road accidents for that period. These accidents commonly result in death, injury and damage to property.

As shown in Table 2.2 between 2000 and 2006, the number of road accidents increased by about 40%. During the same period, the number of fatalities from road accidents increased by about 96%.

Table 2.2: Road accidents in Ghana: injuries, fatalities and damage

Source: (NRSC, 2009)

Year	All accidents	Fatal accidents	Injury accident	Damage only
2000	11,714	1,199	6,886	4,828
2001	11,291	1,257	6,829	4,462
2002	10,715	1,245	6,594	4,124
2003	10,644	1,345	6,919	3,725
2004	12,164	1,599	6,348	4,217
2005	11,328	1,391	5,645	4,292
2006	11,688	1,419	7,137	4,531

Table 2.3: Road traffic fatalities by gender (2000-2007)

Source: (NRSC, 2009)

Year	Male	Female	Male share
2000	1091	441	71.21
2001	1193	441	73.01
2002	1175	480	71.00
2003	1280	437	74.55
2004	1568	587	72.76
2005	1292	463	73.62
2006	1348	492	73.26
2007	1554	489	76.06

Table 2.3 shows that over 70% of all fatalities since 2000 are men. The combination of this increase in accidents among people of working age and the high incidence of fatalities among men have adverse effect on the dependency ratio and economic growth in the formal sector of the economy. In addition, the cost of road accidents to lives and property has adverse effect on the general economic growth in the country. It is striking that the increasing number of road accidents is happening at the same time as the increasing vehicular population in Ghana.

Road accidents increased in 2001 to 11,291 with 1660 fatalities, while decreasing slightly in 2002 to 10, 718 but with 1665 fatalities. Though road accidents further declined to 10,644 in 2003, fatalities harshly rose to 11,718. Accra alone recorded, from January to March 2003, 1,417 motor accidents involving 2,125 vehicles. According to the officials of Motor Traffic and Transport Unit (MTTU) of the Ghana Police, during this period, there were 78 fatalities, 373 serious injury cases and 966 minor accidents among others. The figure of road accidents in the country sharply went up to 12, 164 in 2004 but decreased to 11, 305 in

2005. Ghana records about 10,000 fatal road traffic accidents, every year, out of which 1,600 people perished while 15,000, are seriously injured, robbing the nation of some precious lives. Such persons may die or become incapacitated, denying them the ability to contribute to the nation's development meaningfully (The Chronicle, 2008).

According to Mr Noble Appiah, the Acting chief executive of the NRSC; statistics available shows that about 96% of the country freight use road transport. With such high reliance on road transport, the country has been battling with how to control the high rate of accidents that have been claiming lives and brought sorrows to families (GNA, 2011).

2.3 Vehicle Characteristics that Cause Road Traffic Accidents

The condition of the vehicle plays a vital role in controlling the vehicle as well as the driver‟s ability to communicate to on-coming vehicles and other road users. The chances for staying out of an accident are better with a vehicle in tip-top condition than it is with one that has operational defects. It is imperative that a good driver is the one who knows when something does not work on his vehicle, and is able to spot every possible defect (MRT/NRSC, 2006).

2.3.1 Maintenance Culture

Proper maintenance of vehicle components such as lights and wiring, windscreen, mirrors and windows, bodywork, steering, suspension, wheels, tyres, brakes, engine, and others is necessary to keep the vehicle roadworthy. This can be achieved by annual inspections combined with frequent random checking of vehicles on road by the enforcement agencies.

A well-designed and well-maintained vehicle, with good brakes, tyres and well-adjusted suspension will be more controllable in an emergency and thus be better equipped to avoid collisions. Some mandatory vehicle inspection schemes include tests for some aspects of roadworthiness, such as the DVLA‟s conformance inspection. Routine maintenance which includes wheel alignment, oil changing, brake adjustment is of vital importance to the control of the vehicle. When a vehicle is not carefully maintained, it will render the vehicle unworthy to be used on the road (Grey, 1992).

Running transport requires scheduled maintenance, as well as preventive maintenance to ensure that the vehicle is kept up to standard always Breakdown maintenance is undesirable since it is very expensive sometimes (Grey, 1992). However, it is not the habit of Ghanaians to plan and carry out maintenance of their vehicles as specified by the manufacturer, putting their vehicles in danger.

2.3.2 Design Modifications and Second-Hand Parts

The design of vehicles has also evolved to improve protection after collision, both for vehicle occupants and for those outside of the vehicle. Much of this work was led by automotive industry competition and technological innovation, leading to measures such as safety cage and reinforced roof pillars of Introduction of standard fit seatbelts in 1959. Other initiatives were accelerated as a reaction to consumer pressure, after publications some people accused motor vehicle manufacturers of indifference towards safety (Robinson, 2000).

In the early 1970s British Leyland started an intensive programme of vehicle safety research, producing a number of prototype experimental safety vehicles demonstrating various innovations for occupant and pedestrian protection such as: air bags, anti-lock brakes, impact-absorbing side-panels, front and rear head restraints, run-flat tyres, smooth and

deformable front-ends, impact-absorbing bumpers, and retractable headlamps. Some crash types tend to have more serious consequences in recent years, perhaps due to increased popularity of taller and higher centre of gravity than standard passenger cars. Design has also been influenced by using government legislation to reduce the risk of rollover and meet US federal requirements that mandate anti-rollover technology by September 2011.

According to Robinson (2000), engineers of vehicles recommend the need for well trained staff and a highest standard of workmanship in the vehicle repair industry. However, in Ghana the local craftsmen and technicians especially at Suame magazine, try to temper with some of the vehicles imported to the country by re-fabricating or re-constructing some parts irrespective of their technical knowhow. This in one way or the other leads to the structural weakness and damages, which in some cases contribute to road traffic accidents.

Grey (1992) postulates that, the criteria for selecting a wheel-base of a light commercial vehicle depends upon several factors but chiefly on the type of work the vehicle is to be used for; thus a shorter wheel-base recommended if the vehicle is to be used for carrying heavy loads. This implies that if the wheel-base is tempered with, it should be done with strict care, which is not the case in Ghana. The technicians and the master craftsmen can make any alteration without approval from any statutory body, making most vehicles unworthy to be on the road.

In addition, brake failure has been identified as a major cause of accidents on our roads recently, due to the alterations made to them hoping that it will provide the vehicle with high speed if they are condemned. In the same way, influx of second–hand vehicle parts make most vehicles accident prone since failure can set in at any time due to their age. Currently, the rate at which vehicles are imported into the country (10.84%) is about three times higher

than the rate at which the national population is growing (3.8%). At a total vehicular population of 932,540 versus a human population of about 24,000,000, the number of vehicles per capita is only 0.04, which suggests that the cars in the country are concentrated in few hands. The majority of the population simply cannot afford to own cars; yet the number of cars in the country is increasing at an alarming rate. It is useful to consider alternative reasons for the growth in the population of cars in Ghana.

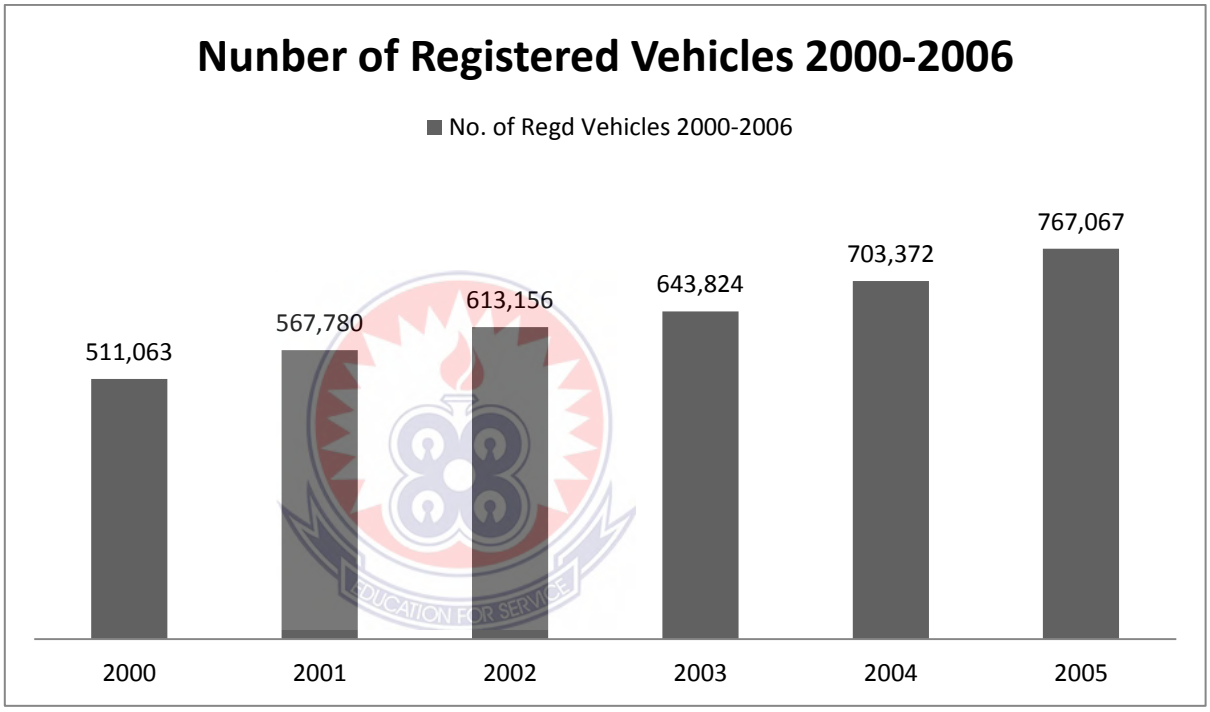

Figure 2.2: Number of Registered Vehicles in Ghana (2000-2006)

Source: (GSSR, 2008)

Linder (2006) postulates that only about 8% of the cars imported into Ghana are brand new cars. The remaining 92% could be second-, third-, fourth- or even fifth- hand cars. Some of the vehicles are so old that they have been nicknamed 'Eurocarcas' (Yeboah, 2000). These cars, often imported by individuals who have relatives or business partners abroad or shuttle between some developed countries and Ghana, are mostly put to commercial use. In a recent study, the National Road Safety Commission of Ghana found that “a significant proportion of

the commercial vehicles in the country are old. Closely related with increasing old cars in Ghana is the increasing number of accidents. The age profile is mostly above five (5) years. Only 13% are below 5 years, about 34% are up to ten (10) years with those up to (15) years and above constituting over 50%" (NRSC,2009).

2.3.3 Mechanical Failure

Manufacturers are required by law to design and engineer cars that meet a minimum safety standard. Computers, combined with companies' extensive research and development, have produced safe vehicles that are easy and safe to drive. The term „active safety" which refers to the features designed into the vehicle which reduces the possibility of an accident is carefully noted. These safety factors include dual-circuit braking systems, anti-lock braking systems, orthopaedic, seating installation of air bags, etc. (Robinson and Livesey, 2000). The most cited types of mechanical failure are loss of brakes, tyre burst or blowouts or tread separation, and steering/suspension failure. With the exception of the recent rash of Firestone light-truck tyre failures, combined totals for all reported equipment failure accounts for less than 5% of all motor vehicle accidents (Hill, 2010).

2.2.3.1 Brakes and Brake Failure

The brakes of a vehicle have been designed to stop the vehicle safely under all conditions. Brakes are the main mechanical road safety feature. It is therefore extremely important that the brakes are always maintained in a first class condition. If so done properly, brakes will not fail suddenly. Modern vehicles normally have power assisted brakes. Most of them have split circuit hydraulic or dual-circuit brake system; carefully designed to suit the particular vehicle, (MRT, 2006).

Most dual-circuit brake systems have made total brake failure an unlikely event. If one side of the circuit fails, the other side is usually sufficient to stop a vehicle. Disc brakes, found on the front wheels of virtually every modern vehicle, are significantly more effective than the older drum braking systems, which can fade when hot. Anti-Lock Braking System (ABS) prevents the wheels from locking up during emergency braking manoeuvres, allowing modern vehicles to avoid many accidents that previously would have occurred (Hill, 2010).

From manufacturer‟s perspective, vehicle brakes are designed in a way that they should not be modified in any way whatsoever (MRT, 2006). However, in Ghana the situation is on the contrary, instead of modern vehicles that do not demand any modification, importers prefer second-hand ones due to the difference in cost. So majority of vehicles used on commercial transportation are old ones which are over-aged and abandoned in their country of origin having high tendency to modifications even to the extent of condemning the rear brakes that leads to brakes failing on roads (Spurr and Newcomb, 1989).

A number of things can go wrong if the brakes are not properly maintained and correctly adjusted. Corrosion can pin holes in pipelines, which may then fail in an emergency stop. Corrosion of wheel cylinders and shoes can interfere with the movement of the shoes to the extent that the brake becomes inoperative. Fluid may leak or become so contaminated with water that pressure is not built up. Fluid may leak onto the rubbing parts drastically reducing the friction between linings and metal surface. Rubber seals can perish and allow fluid to leak past them or stick to make the brake bind (Rhone, 1996).

2.3.3.2 Tyres

Today's radial tyres are significantly safer than the cross-ply tyres of 25 years ago for their low rolling resistance as well as greater road holding capacity. But they are comparatively

expensive (Grey, 1992). Yet they still need attention regularly. Under inflation, the most frequent cause of tyre failure is considered the main culprit in the recent Firestone tyre-failure fatalities. Uneven or worn-out tyres are the next most serious problem and can also lead to tyre failure. Uneven wear is caused by improperly balanced tyres, or misaligned or broken suspensions (Dolan, 1995).

The unfortunate situation in Ghana is that, every tyre construction has been made to suit certain conditions. For example, the load index and the speed rating as indication of expected speed the vehicle should not exceed is irrelevant to a Ghanaian driver. Tyre pressures also need to be checked frequently, if you don't check your own, it is important to have your mechanic check them at least every two weeks to avoid the adverse effect that lead to loss of control which result in road accidents (Hillier, 2005).

Apparently, it has become a norm for most Ghanaians to purchase imported tyres that have been used and rejected elsewhere in Europe or USA. Evidence available show that winter tyres have been observed fitted on most vehicles plying the major roads in Ghana, because they are seen fresh on market. However, the age of the tyre matter most even if they are not being used, they can fail regardless of the tread wear (MRT/NRSC, 2006). Table 2.4 gives detailed information on tyres with respect to their loadings and speed.

Table 2.4: The Speed Symbol/Load Index under Service Conditions.

Source: (MRT/NRSC, 2006)

Speed Symbol	Speed (km/h)	Speed Symbol	Speed (km/h)	Speed symbol	Speed (km/h)	Speed symbol	Speed (km/h)
A1	5	A8	40	J	100	R	170
A2	10	B	50	K	110	S	180
A3	15	C	60	L	120	T	190
A4	20	D	65	M	130	U	200
A5	25	E	70	N	140	H	210
A6	30	F	80	P	150	V	240
A7	35	G	90	Q	160	W	270

2.3.3.3 Steering and Suspension

Suspension keeps vehicle tyres in contact with the roadway in stable and predictable manner. The steering enables one to go around road obstacles and avoid potential accidents. Even a safe, well-trained driver is helpless in the event of a steering or suspension system failure. Such failures are catastrophic, especially at high speeds. Manufacturers recommend that you have your suspension and steering systems checked out by a mechanic every 16,000km. With regular component inspections by trained individuals, equipment failures can be virtually eliminated.

2.4. Driver Attitudes and Behaviours

Humans tend to blame someone or something else when a mistake or accident occurs. A recent European study concluded that 80% of drivers involved in motor vehicle accidents believed that the other party could have done something to prevent the accident.

A survey conducted by Transport Research Laboratory (TRL) consistently reveal that Over 95% of motor vehicle accidents in the USA, or Road Traffic Accidents, in Europe involve some degree of driver behaviour combined with one of the other three factors. Drivers always try to blame road conditions, equipment failure, or other drivers for those accidents. When the facts are truthfully presented, however, the behaviour of the implicated driver is usually the primary cause. Most are caused by excessive speed or aggressive driver behaviour (WHO, 2009). Majority of the drivers consider them more skilful and safer than the average driver. Some mistakes occur when a driver becomes distracted, perhaps by a cell phone call or unsafe weather condition which can be avoided. Very few accidents result from an 'Act of God' like a tree falling on a vehicle. Some avoidable driver attitudes behaviours discussed are:

2.4.1 Human Error

In Ghana human error aspect contribute about 70% of road casualties. The most common classification of error recorded by the Ghana Police for a period between 2007 and 2009 were avoidable driver behaviours as seen in Table 2.5 with loss of control and inattention topping the list. Others such as physical impairments such as poor vision, drunk driving, and emotions such as anger and worry can blot out the alertness of a driver to drive safely. (Refer to Table 2.5).

Table 2.5: Persons killed through Road accidents as a result of driver errors

Source: (MOT/BRRI/NRSC, 2009)

Driver Errors	2007	2008	2009	total
None	327	294	316	937
Inexperience	22	15	14	51
Inattentive	442	363	642	1,447
Too fast	444	634	654	1,732
Too close	40	29	14	83
No signal	6	6	4	16
Improper overtaking	40	60	48	148
Fatigue/Sleeplessness	24	3	37	64
Other/Loss of control	649	501	466	1,120

2.4.2 Speeding

Speed has been determined as one of the most contributing factors in road accidents and severe injuries in both developed and developing counties. A study by Sabey (1983), suggested that excessive speed contribute to about 10-15% of all accidents. It has also been established that if the average speeds of vehicles can be reduced by 1km/h, accidents and injuries will be reduced by 3-5%. Thus the emphasis is on reducing accidents by reducing average speeds on trunk roads.

The higher the speed of a vehicle, the greater the risk of an accident, Forces experienced by the human body in a collision increase exponentially as the speed increases. Smart motorist recommends that drivers observe a 3 second rule in everyday traffic, no matter the speed. Most people agree that driving at 160km/h is foolhardy and will lead to disaster. The problem is that exceeding the speed limit by only 8km/h in the wrong place can be just as dangerous. Evidence on Kumasi–Dunkwa trunk road shows that rumble strips and speed humps are found as effective means of reducing speed, irrespective of that, drivers still drive above speed limits.

What then is the acceptable speed limit? Traffic engineers and local governments have determined the maximum speeds allowable for safe travel on the nation's roadways. Speeding is a deliberate and calculated behaviour where the driver knows the risk but ignores the danger. Fully 90% of all licensed drivers speed at some point in their driving career; 75% admit to committing this offense regularly (World Bank, 2009). For example**:** a pedestrian walks out in front of a car. If the car is traveling at just 40 km/h and the driver brakes when the pedestrian is 14metres away, there will be enough space in which to stop without hitting the pedestrian

2.4.3 Aggressive Drivers behaviour

Aggressive driving behaviour has various kinds of definitions. The most comprehensive one according to NHTSA (1998) is "the operation of a motor vehicle in a manner that endangers or is likely to endanger people or property." James and Nahl (2000), also listed factors as representative of aggressive driving behaviours as: running stop signals, Blocking intersections, Failing to yield right-of way, Chasing other vehicles, Communicating threats or insults with voice, gestures, or sounding the horn unnecessarily, Intentionally breaking suddenly, Blocking other vehicles, Speeding above the limit, Changing speed erratically, Weaving in/out of traffic and Failing to use indicators when required. Other factors such as careless driving, failure to stop for pedestrian, cell phone usage also contribute to aggressive driving behaviours.

As have been described, modern cars are manufactured to high safe standards, and the environment they are driven in is engineered to minimize the injuries suffered during an accident. The most difficult area to change is aggressive driver behaviour and selfish attitudes. A 1995 study by the Automobile Association in Great Britain found that 88% of the

respondents reported at least one of the behaviours listed below directed at them (in order of descending frequency):

1. Aggressive tailgating
2. Lights flashed at them because the other motorist was annoyed
3. Aggressive or rude gestures
4. Deliberate obstruction - preventing them from moving their vehicle
5. Verbal abuse and
6. Physical assault.

The same group was then asked about aggressive behaviour they had displayed towards other drivers. 40% indicated that they had never behaved aggressively towards another driver. A further 60% of the survey respondents admitted to one or more of the following behaviours (listed in order of descending frequency):

1. Flashed lights at another motorist because they were annoyed with them
2. Gave aggressive or rude gestures
3. Gave verbal abuse
4. Aggressively tailgated another motorist
5. Deliberately obstructed or prevented another from moving their vehicle
6. Physically assaulted another motorist (one positive response)

These behaviours are probably under-reported, since most people are not willing to admit to the more serious actions, even if no penalty exists. The majority of these incidents happened during the daylight hours (70%), on a main road (not freeway or divided highway).

2.4.4 Distractions

It has been observed that minor distractions may be major cause of accidents and undoubtedly figure in some mystery crashes. Below are some of the ways drivers become distracted which resulted in serious consequences as reported by the National Road Safety Commission in Ghana (NRSC), (2008).

i. Searching for something on the seat.
ii. Talking without keeping eyes on the road.
iii. Turning on radio on the vehicle.
iv. Trying to fasten seat belt while driving.
v. Trying to adjust the seating position while driving.

These attitudes even though are not done intentionally, but could be disastrous in driving.

2.5 Interventions

According to international review of road accidents literature, human error was seen to contribute to road accident more than any factor in developed countries but in developing countries other behaviours such as lack of knowledge, attitudes, vehicle type and culture of maintenance matters (Downing *et al,* 1991). In an attempt to reduce road accidents, the study suggested 3E‟s in which subsequent studies have expanded to the current 5E‟s as Engineering, Education, Enforcement, Encouragement and Environment.

2.5.1 Education and Enforcement

Many studies in developed countries have shown that an effective enforcement system has led to the improvements in driver behaviour (Downing et. al 1991). Hutabarat and Lam (2005) indicate that “enforcement efforts were very effective in changing driver behaviour

and improving safety, especially, when combined with education and media campaigns". With the influx of private media houses in Ghana for instance, and the modern automotive design technologies, most drivers can be educated if station masters and union chairmen are to see to the enforcement of the education campaigns and road safety measures. Mr. Adonten, the acting chief executive of the NRSC manifested this when he said in his address of the 2nd National Road Safety Awards in Accra that, there are a lot of bad drivers in the system They are young, middle-aged, and old; men and women who drive luxury cars, sports cars and family cars demonstrating some type of risky driving behaviour, most commonly speeding.

Some enforcement studies in developing countries show a positive impact on road traffic accidents reduction and changing driver behaviour (Gaber and Yarrell, 1983). In most developing countries, road traffic police are not well trained and equipped which as a result negatively influence the effectiveness of the enforcement system. The situation in Ghana for that matter Ashanti Region is no different MTTU statistics show that most accidents are caused by broken down vehicles on our roads. It is sad and disheartening to see a broken down vehicle on highway without warning signal to alert on-coming vehicles at the presence of Police officers and nothing is done until accident occurs before they come in. This account about gross indiscipline on the roads should be the responsibility of the law enforcement agencies but it is looked down upon

According to Al-Matawah (2008), enforcement system should be comprehensive because of the variety of violations and the enforcement strategies should be designed to target a high-risk behaviour and observed accident locations. Another school of thought is of the view that on the spot fine should be the best measure to make the drivers cautious, since the main aim of effective enforcement is not control; but it is about increasing the risk of being caught as perceived by the drivers. With the low income status of Ghanaian drivers

coupled with the corrupt nature of our Police officers, it must be noted that high fines may not be appropriate. Therefore, penalties other than spot-fines should be introduced.

2.5.2. Engineering, Encouragement and Environment

Road engineering network in the country has improved over the past decade as a means of creating enabling driving environment. However, there is still a gap to be filled, that is the encouragement. In Australia for instance, the government launched a programme in 2009 with the aim of boosting road safety in the country by establishing national road safety fund. The fund draws money from road safety contributions paid when reserving a personalized number plate. In Europe, however, European Union road safety Programme 2011-2020 published guidelines hoping to reduce road traffic accidents by 50%. The programme targeted 7 key priority areas as: education and training; increased enforcement of road rules; safer road infrastructure; safer vehicles; improve emergency and Post-injury services; and protection of vulnerable road user (ARS, 2010).

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Based on literature review in Chapter Two, and considering various statistics dealing with the accident situation in Ghana and around the globe, several problems and findings regarding drivers‟ attitudes and behaviours were found which needs to be investigated deeply in order to recommend appropriate measures to reduce road accidents. Therefore, the purpose of this chapter is to describe the research method used to gather information for the study, with emphasis on Research design, Sample and Sampling techniques, Instruments used Data preparation and collection, as well as coding and ranking the data.

3.2 Research Design

The research design used was a case study based on survey conducted by the researcher. Case study research excels at bringing people to understand a complex issue or object, and can extend experience or add strength to what is already known through previous research. It is a fact that many people have done a lot of research into road accidents, the researcher hopes that this is a way of adding to what others have done.

According to Yin (1984), case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. It is a proven fact that researchers have used the case study research method for many years across a variety of disciplines. Social scientists, in particular, have made wide use of this qualitative research method to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods. Yin (1984), therefore defines a case study research method

as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.

In this research verbal interviews and questionnaire were the major instruments used to gather basic inputs for the study. The questionnaires were designed with the aim of sourcing primary data for the study. The type of questions formulated comprised both closed and open ended specifically structured types.

3.3 Identification of Population

To make the study substantive, reliable and easier, a finite population was used which included commercial minibus drivers, mechanics and artisans from Suame magazine, travellers and road users, transport owners, road safety campaign crusaders as well as road traffic enforcement agencies such as DVLA and MTTU. Due to the fact that the population is quite large and considering the resources and constraints, a sample size of four hundred (400) road users was chosen based on the registered vehicle population in the region. With this population, a minimum statistical sample that could be a representative for analysis, i.e. simple random sampling was used to select both drivers and passengers, while purposive sampling was used to select mechanics and road safety campaign advocates. Interviewees were selected based on stratified sampling.

3.4 Sampling and Sampling Techniques

The sample was obtained using a multi-stage sampling design. First, 150 drivers were selected from the Kumasi Kejetia terminal and the Metro Mass Transport yard. Prior to selection, the drivers had been informed and ordered by their local managers popularly called station masters. The sample of 150 drivers was systematically selected from this list, with

probability proportional to size. Next, 50 mechanics were sampled from the Suame Magazine. The mechanics were sampled based on purposive sample technique due to the fact that not all mechanics undertake alterations. In addition to this, 200 passengers were selected randomly from the two transport terminals. This gave a total of 400 respondents.

3.5 Data Collection

3.5.1 Preparation to Collect the Data

The researcher collected data by first contacting each organization to be involved to gain their cooperation, explained the purpose of the study, and assemble key contact information. Since data to be collected and examined included documents and statistics, the researcher states his intent to request copies of these documents and statistics, and plans for storage, classification, and retrieval of these items, as well as the interview and survey data. The researcher developed a formal investigator training programme to include seminar topics on non-profit organizations and their structures in each of the four categories selected for this study. A pilot survey of 15 questionnaires was distributed to selected drivers, mechanics as well as travellers to respond in order to identify the potential problems of the design. This helped the researcher to structure the final questionnaire to meet the class of respondents at all levels. Based on the results of the pilot, the researcher made adjustments in the survey questions to remove those that were supposed to pose discomfort to respondents.

3.5.2 Field Data Collection

Both qualitative and quantitative instruments were used because of the fact that case study research generates a large amount of data from multiple sources; systematic organization of the data was importantly used to prevent the researcher from becoming

overwhelmed by the amount of data and to prevent the researcher from losing sight of the original research purpose and questions. Hence, advance preparation was made to assist in handling large amounts of data in a documented and systematic fashion. The reason why both qualitative and quantitative methods were employed was that, it provides researchers with opportunities to triangulate data in order to strengthen the research findings and conclusions.

The researcher examines raw data using three sources of data; the Police accident data records at BRRI from 2000 to 2009, structured questionnaire survey of road users and key stakeholders in road safety issues, and structured interviews. Three sets of questionnaires were designed to suit a particular class of the population. In each of the questionnaire, most of the questions were constructed using a 4-scale response; where respondents were asked to make a tick in appropriate boxes provided. In some cases 2-5 lines were provided for respondents to give their own comments related to the topic.

3.6 Questionnaire Development

The questionnaire was designed on the basis of information from a single focus group of drivers and road users‟ interviews with mechanics and transport owners, and a review of literature. Included in the questionnaires were:

- Background and demographic information of respondents,
- People‟s perception regarding road accidents
- People‟s views on drivers behaviour as well as
- Road safety interventions and enforcement in the country.

Respondents were asked to complete a four point Linkert scale questions in the questionnaire where 1- indicated ***strongly agree*** or ***always***, and 4- indicated ***strongly disagree***

or ***never***. In these questions respondents were asked to place a tick to the one that correspond to their answers. Some questions were demanding either "Yes" or "No" followed by justification where respondents were asked to give a comment or explain their views. A cover letter addressing the aims of the study and confidentiality issues were distributed to all stakeholders.

All questions were reviewed by the researcher and then developed in collaboration with the help of research assistants before being programmed. The survey programme was tested by the researcher and his team. Checks were made to ensure the sense of questionnaire wording and response options, as well as the accuracy. Scenarios were tested to ensure that routing was correct and that respondents would not be asked inappropriate questions dependent on the circumstances. There were also checks for screen layout, spelling and the clarity of instructions to interviewers.

3.7. Administration of Questionnaire

All the structured questionnaires were administered by the researcher with the help of two research assistants. The questionnaire for mechanics was administered at their various garages whereas that of drivers and passengers‟ was administered at the main lorry stations and some few principal streets. Interviews for driver and vehicle licensing authority (DVLA) and National Road Safety Commission (NRSC) officials were conducted at their respective offices and workplaces. Consequently, all these questionnaires and interviews sought to seek information based on the research objectives.

3.8 Coding and Rating the Questionnaire

Responses were divided according to the categories of respondents. Each response was given a unique and categorical identifier and entered into a database. The statistical data analysis packages used were SPSS and simple statistical tables. Choosing the appropriate statistical analysis depends upon the nature of the data and the kind of dependent and independent variables.

Since a four-point Linkert scale was used for most of the questions in the questionnaire, the designated codes attached to the responses were

1 ……. Always

2 ……. Sometimes

3 …… rarely

4 …….. Never

In this scale, 1 represents the worse behaviour or attitude and 4 represents the best behaviour or attitude towards driving. In another development, 1 and 2 represent agreement, and 3 and 4 represent disagreement.

1 ……. Strongly Agree

2 ……. Agree

3 …… Disagree

4 …… Strongly Disagree

3. 9 Data Analysis

The researcher examined raw data using many interpretations in order to find linkages between the research objectives and the outcomes with reference to the original research questions. Specific techniques used included categorizing and entering data into Excel, transporting data from Excel into SPSS (Statistical Package for Social Sciences), generating charts and tabulating frequency of events. Researcher then used the quantitative data that has been collected to collaborate and support the qualitative data which is most useful for understanding the Researcher categorised, tabulated, and combined data to address the initial propositions or purpose of the study, and conducted cross-checks of facts and discrepancies.

Another technique is to use multiple investigators to gain the advantage provided when a variety of perspectives and insights examine the data and the patterns. When the multiple observations converge, confidence in the findings increases. Conflicting perceptions, on the other hand, cause the researcher to pry more deeply.

CHAPTER FOUR

ANALYSIS OF RESULTS AND FINDINGS

4.0. Background to the Analysis of Data

This chapter is concerned with the analysis of data and interpretation of findings of the study. The results was based on the collectively gathered data from the three hundred and eighty one (381) questionnaires retrieved from four hundred questionnaires (400) administered, in which 12.1%, 49.3% and 38.6% were mechanics, transport owners/passengers and drivers respectively. Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) windows. Most of the data were collected in the form of ordinal scale from 1-4. The data was analysed according to the objectives of the study. The analysis in the study consisted of simple frequencies (or percentages) for each category in the questionnaire item.

4.1. Demographic Characteristics of Respondents

Table 4.1: Characteristics of respondents

Characteristics	Drivers (%)	Mechanics (%)	Transport Owners/ Passengers (%)
Gender			
Males	98.0	91.3	74.5
Females	2.0	8.7	25.5
Age			
16 – 25	4.1	4.3	19.1
26 – 35	20.4	21.7	23.4
36 – 45	55.1	26.1	51.1
46 – 55	14.3	30.4	6.4
56 - 65	6.1	17.4	19.1
Above 65	0	0	0
Level of education			
None	43.8	21.7	0
JHS/MSLC	43.8	39.1	2.1
SHS/GCE	8.3	4.3	25.5
HND	0	13.0	19.1
Degree	0	13.0	51.1
Others	4.2	8.7	2.1

From the 381 respondents gathered by the researcher on Drivers, Mechanics and Transport owners/Passengers for gender, the data showed that drivers had 98.0% for males and 2.0% for females; mechanics showed 91.3% for males and 8.7% for females and transport owners/Passengers indicated 74.5% and 25.5% for males and females respectively. Majority of the respondents fell between the ages 36-45 comprising 55.1% for drivers, 26.1% for mechanics and 51.15 for transport owners/Passengers. From the data, few respondents were between the ages of 16-25 and none of the respondents were above the age of 65. The educational level of the respondents as shown by the data in Table 4.1, for the three groups indicated that majority of the respondents were JHS/MSLC graduates which the drivers had 43.8%, 39.1% for mechanics and 2.1% for transport owners /Passengers. With SHS/GCE graduates 8.3% were drivers, 4.3% were mechanics and 25.5% were transport owners/Passengers. There were few respondents for others representing 4.2%, 8.7% and 2.1% for drivers, mechanics and transport owners respectively. There were also 43.8% of drivers and 21.7% of mechanics who had no education at all.

4.2. Characteristics of Vehicle that Cause Road Accident

4.2.1. Maintenance

Table 4.2: How often Drivers maintain their vehicle

Ages of drivers	How often drivers maintain their vehicles			Total
	Always	Sometimes	Rarely	
16-25 years	3	0	3	6
	5.0%	.0%	33.3%	4.2%
26-35 years	15	12	3	30
	25.0%	16.0%	33.3%	20.8%
36-45 year	30	45	3	78
	50.0%	60.0%	33.3%	54.
46-55 years	6	15	0	21
	10.0%	20.0%	.0%	14.6%
56-65 years	6	3	0	9
	10.0%	4.0%	.0%	6.2%
Total	60	75	9	144
	100.0%	100.0%	100.0%	100.0%

1=Always, 2= Sometimes, 3=Rarely, 4=Never; χ^2=31.206; df=8, P-value<0.001

The researcher wanted the respondents to indicate how often they do maintain their vehicle. From the data in Table 4.2, the respondents between the ages of 16-25 hardly maintain their vehicle which 3 out of the total respondents maintain their vehicle always and 3 rarely maintain their vehicle comprising 5.0% and 33.3% respectively. From the ages 26-35, 15 respondents do maintain their vehicle always constituting 25.0%, 12 respondents constituting 16.0% maintain their vehicle sometimes and 3 respondents constituting 33.3% do maintain their vehicle rarely. The majority of the respondents that do maintain their vehicle fell between the ages of 36-45 which 30 respondents comprising 50.0% do maintain their vehicle always, 45 constituting 60% do maintain their vehicle sometimes and 3 respondents constituting 33.3% rarely maintain their vehicles totalling 78 constituting 54.2% respondents out of the total population.

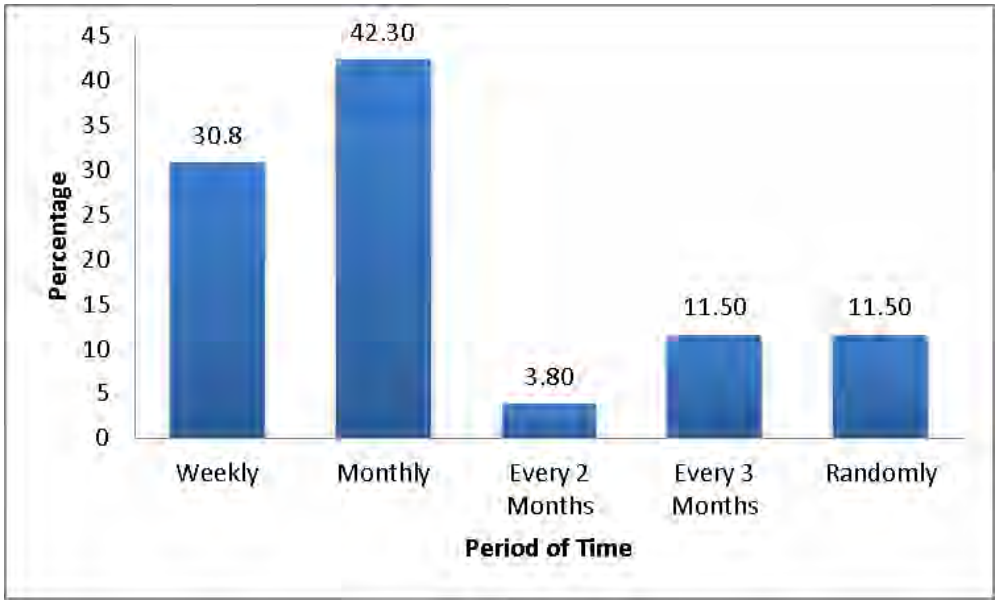

Figure 4.1: How often transport owners maintain their vehicle

In order to ascertain the reliability of vehicles on our roads the respondents were asked how often they do maintain or check their vehicles. From the data gathered it was disclosed that greater number of respondents representing 42.3% do maintain or check their vehicles monthly, 30.8% respondents do maintain or check their vehicle weekly. From data in Figure 4.1, few respondents representing 3.8% do maintain their vehicle in every two months and 11.5% of respondents do maintain their vehicles randomly.

4.2.2: Modified Vehicles and Second hand Vehicles

Table 4.3 Modified Vehicles **Respondents have driven before**

Driving of modified vehicles	Response Items		Total
	Yes	No	
16-25 years	0	6	6
	.0%	6.9%	4.1%
26-25 years	12	18	30
	20.0%	20.7%	20.4%
36-45 year	33	48	81
	55.0%	55.2%	55.1%
46-55 years	6	15	21
	10.0%	17.2%	14.3%
56-65 years	9	0	9
	15.0%	.0%	6.1%
Total	60	87	147
	100.0%	100.0%	100.0%

χ^2=18.500; df=4 p-value<0.001

From the data in Table 4.3, the respondents provided their view if they have ever used a vehicle that has been modified before. From the data 33 respondents said yes and 48 respondents said no to the questionnaire item above, the respondents were between the ages of 36-45 representing the majority of respondents. The respondents constituting a total of 55.1% of which 55.0% said yes and 55.2% said no. In case of the respondents between the ages of 56-65, 9 respondents said yes to the question comprising 15.0% and 0% said no indicating that the few respondents were found in between these ages. From the ages between 46-55 respondents 6 representing 10% said yes and 15 respondents representing 17.2% said no to the question. Few respondents of 6 between the ages of 16-25 said no constituting 6.9% and no respondent said yes.

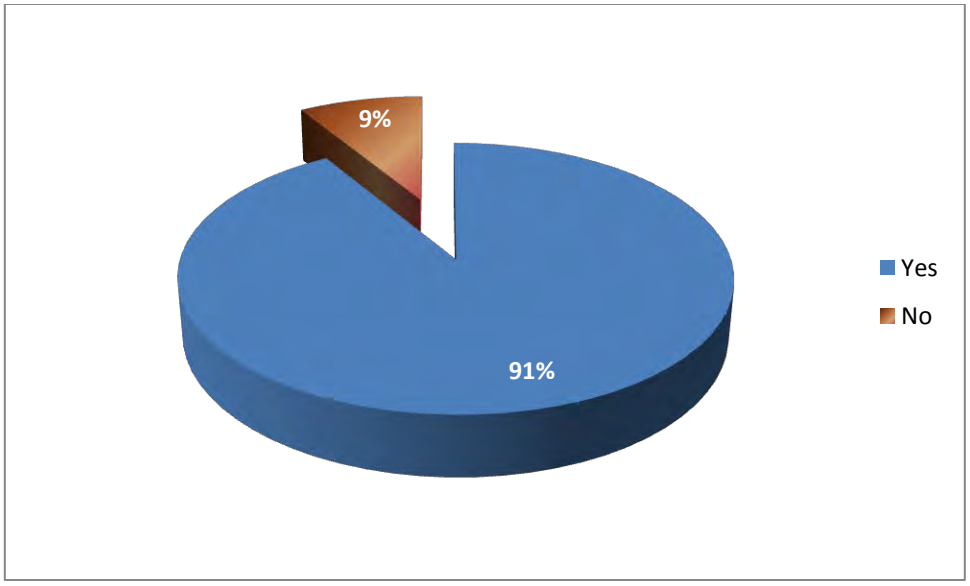

Figure 4.2: Whether Mechanics make Alteration on Second Hand Vehicles

From the above data the researcher wanted to know if the respondents who were mechanics have ever made alteration on home used vehicles before. With all perceptions of people on how drivers do alterations to their vehicle, a cross computation of the data provided by the respondents showed that a comparative majority of 91% of the respondents admitted they have made alteration on second-hand vehicle before and 9% said no to the question. Quite surprisingly, the majority respondents indicated that they have done alterations to their vehicle confirmed the view of the general population about how our vehicles are not that strong.

Table 4.4: Types of modifications respondents' mechanics usually make

Kind of Alteration	**Frequency**	**Percentage (%)**
Rear brake disconnection	16	34.78
Changing steering wheel position	18	39.13
Lengthening the chases frame	8	17.39
Others	4	8.70
Total	46	100

In response to the previous data above where respondents were asked whether they have ever made alteration to their vehicle which majority said yes to the question the researcher followed it with the kind of alterations that the majority have made to their vehicle. From the data above 16 respondents constituting 34.78% have made alteration to their real brake, 18 respondents comprising 39.13% making the majority of the respondents have altered their vehicle by changing steering wheel position. 8 respondents making 17.39% of the total percentage altered their vehicle by lengthening the chassis frame and 8 respondents representing 8.70% also have done alterations to their vehicle.

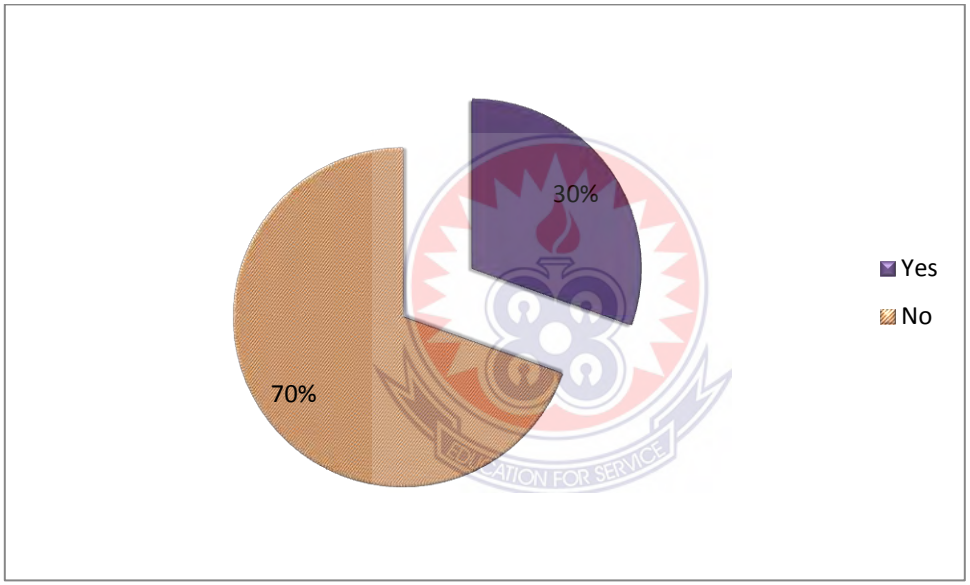

Figure 4.3: Response to the question: "would you recommend the use of second-hand tyres and other parts?"

In an attempt to find out whether the mechanics endorsed the use of second hand tyres and other vehicle parts, 70% of the respondents were of the view that second hand tyres and parts are not good for our public commercial transport with only 30% recommending its use.

4.2: Driver Attitudes that Cause Road Accident

Table 4.5: Common attitudes of drivers that contribute to fatal road accidents in the Region

Driver Attitudes	Frequency	Percentage (%)
Over speeding	34	73.91
Incompetency	2	4.35
Fatigue	8	17.39
Drunk driving	2	4.35
Total	46	100

From the above data, the researcher wanted to know from the mechanics about drivers attitudes that contribute to road accidents. Out of the 46 respondents, 34 respondents representing 73.91% said over speeding is the major driver attitude as against 17.39% being fatigue and 4.35% each for incompetency and drunk driving.

Table 4.6: How long drivers drive in a day

Ages of drivers	How long drivers normally drive in a day					Total
	>than 100 km	101 – 200 km	201-300 km	301-400 km	<than 400 km	
16-25 years	0	3	0	3	0	6
	.0%	14.3%	.0%	16.7%	.0%	4.1%
26-25 years	0	6	3	0	21	30
	.0%	28.6%	50.0%	.0%	21.9%	20.4%
36-45 year	6	12	3	6	54	81
	100.0%	57.1%	50.0%	33.3%	56.2%	55.1%
46-55 years	0	0	0	3	18	21
	.0%	.0%	.0%	16.7%	18.8%	14.3%
56-65 years	0	0	0	6	3	9
	.0%	.0%	.0%	33.3%	3.1%	6.1%
Total	6	21	6	18	96	147
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

χ^2=60.142; df=16, p-value<0.001

The respondents were requested to indicate how long they do drive in a day. With few respondents between the ages of 56-65 who were in favour that they do drive 6.1% daily.

However, majority of the respondents from the ages of 36-45 had a total of 81 respondents representing 51.1% which comprises 6 respondents drive less than 100 km, 12 respondents do drive an average of 101-200km, 3 of the respondents indicated that they do drive at 201-300 km per day, 6 respondents do drive at 301- 400 km per day and the greater number of 54 respondents representing 56.2% of the total respondents do drive above 401km a day, on the other hand a total of 4.1% of the respondents which received the lowest score were from the ages of 16-25.

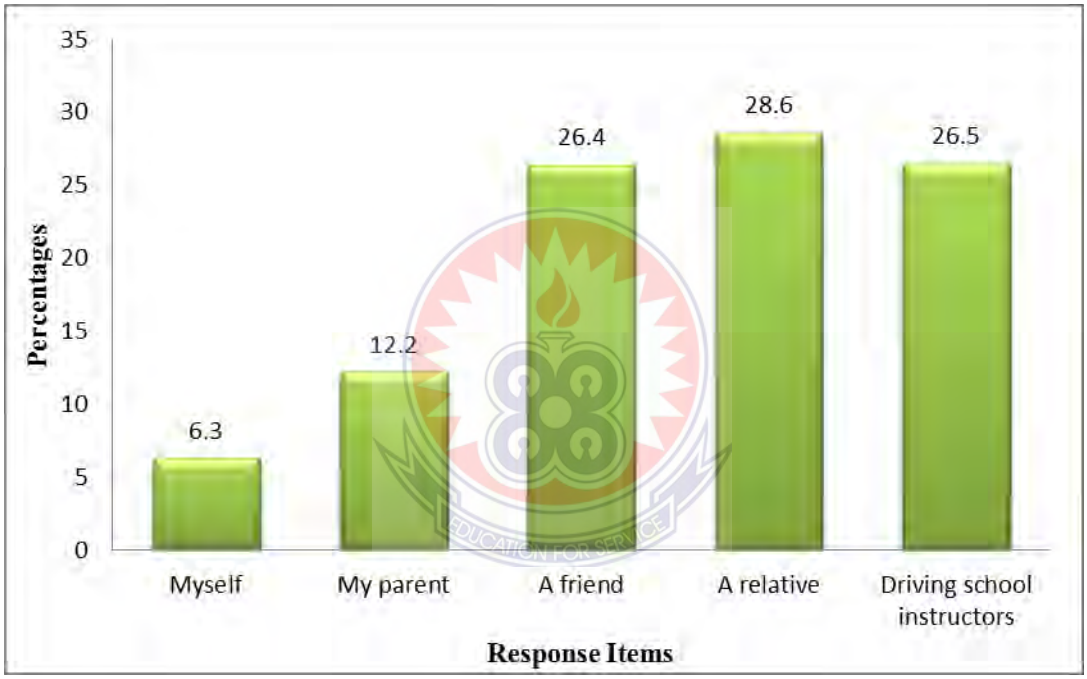

Figure 4.4: How the driver respondents learned driving

From the cross section of the data above the respondents were asked the means through which they learned driving. Out of the respondents 16.3% indicated they learn driving by themselves, 12.20% learned driving through the help of their parents, the majority of the respondents comprising 28.60% learned through their friends, 26.5% through relatives and 16.3% learned driving through a driving school instructor. From the data the majority of respondents got into driving through friends.

Table 4.7: Road safety education for drivers during their training

Response (Yes/No)	Educational level				Total
	None	JHS/MSLC	SHS/GCE	OTHERS	
Yes	45	54	6	0	105
	75.0%	85.7%	50.0%	0%	74.5%
No	15	9	6	6	36
	25..0%	14.3%	50.0%	100%	25.5%
Total	60	63	12	6	141
	100.0%	100.0%	100.0%	100.0%	100.0%

From the table, it is observed that public commercial vehicle drivers have the basic education which is JHS/MSLC and almost same number has no education at all. Only a few had secondary education which is SHS/GCE. Similar trend was observed when the respondents were requested to indicate whether road safety education was provided to them during their training. Majority of the respondents of 105 representing 74.5% said yes, few respondents of 36 representing 25.5% said no. It was evident that most drivers were giving road safety education during training, and are continually being educated as part of their professional obligation by their unions.

Table 4.8: Causes of accidents cited by the driver respondents

What caused the accidents	Educational level				Total
	None	JHS/MSLC	SHS/GCE	OTHERS	
Speeding	12	15	3	3	33
	19.0%	23.8%	25.0%	50.0%	22.9%
Lack of attention	18	21	0	0	39
	28.6%	33.3%	.0%	.0%	27.1%
Reckless driving	15	12	0	3	30
	23.8%	19.0%	.0%	50.0%	20.8%
Defective brake	12	6	6	0	24
	19.0%	9.5%	50.0%	.0%	16.7%
Defective tyre	6	9	3	0	18
	9.5%	14.3%	25.0%	.0%	12.5%
Total	63	63	12	6	144
	100.0%	100.0%	100.0%	100.0%	100.0%

From the table above, it could be observed that 33 drivers representing 22.9% attributed major cause of accident to speeding which comprised 12 respondents who had no formal education, 15 JHS/MSLC respondents and 3 SHS/GCE and 3 OTHERS respondents respectively. Also 39 respondents representing 27.1% attributed the causes of accidents to the lack of attention on the part of drivers which also constituted 18 respondents without formal education, 21 respondents with JHS/MSLC background, and none for SHS/GCE and OTHERS education. For reckless driving 30 of the respondents were in favour with a constituent of 15 for those without formal education, 12 being JHS/MSLC graduates and 3 SHS/GCE graduates but none for those with OTHERS background. For those in favour of defective brake and defective tyres they were 24 and 18 respectively, which is a characteristic of vehicle.

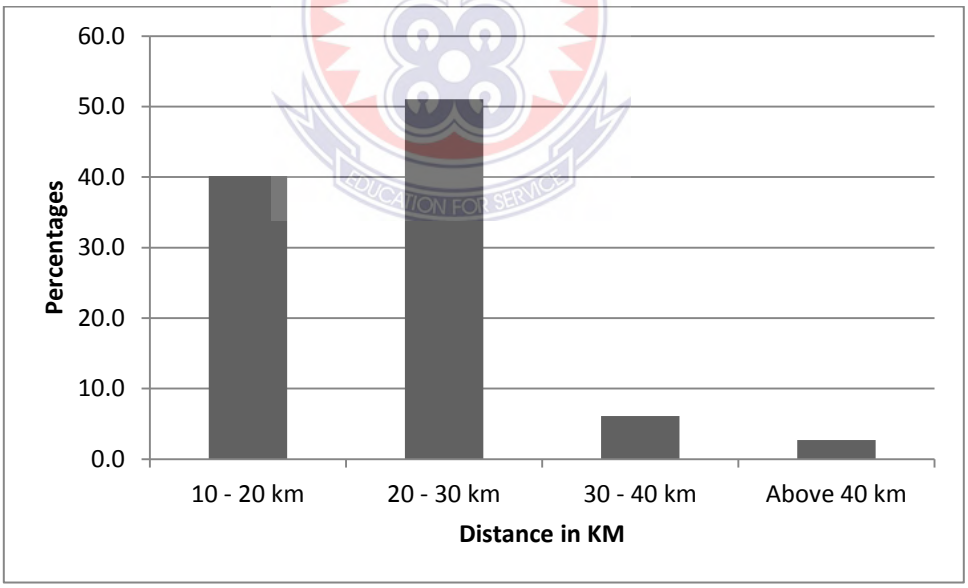

Figure 4.5: Kilometres drivers drive above the speed limit

The respondents from the above data were drivers who were requested to indicate the length of kilometres they drive above the speed limit. With the exception of respondents who

drive above 40 km who had 3% as represented above had the lowest score. The majority of respondents do drive above the speed limit of 20-30 km which represented 53% of the total percentage. 40% was indicated by respondents who drive above the speed limit of 10-20 km. The distance in km as driven by the respondents above 30-40 km had an aggregate percentage of 6.

Table 4.9: Responses to driver attitudes and behaviours

	Item	None	JHS/MSLC	SHS/GCE	HND	Total	P-value
1	How often are you in a hurry to get somewhere when you are driving	1.50	2.00	1.62	2.00	1.81	0.001
2	How often do you drive above the speed limit	2.00	2.30	2.25	2.25	2.26	0.837
3	How often do you overtake another vehicle	1.50	2.24	2.10	2.00	2.13	0.001
4	How often do you use fast acceleration or apply heavy braking as part of your driving	2.50	2.67	2.33	2.50	2.50	0.134
5	How often do you drive under the influence of alcohol	3.00	3.29	3.62	3.50	3.44	0.068
6	How often do you drive without seat belt	3.00	2.67	2.67	2.50	2.67	0.674
7	How often do you drive and at the same time use your mobile phone	3.00	2.80	2.71	3.00	2.79	0.589
8	How often do you become distracted by music, passengers or pedestrians	2.00	2.10	2.48	2.50	2.29	0.081
9	How often do you maintain your vehicle	2.00	1.62	1.65	1.75	1.66	0.471

1=Always, 2= Sometimes, 3=Rarely, 4=Never

The respondents from JHS, SHS; HND and NONE were requested to indicate the behaviours and attitudes of drivers in terms of their driving. The respondents from the JHS/MSLC and their counterparts from HND had the higher average score of 2 respondents when it comes to how hurry are drivers when they want to get to somewhere when driving. This then suggests that respondents from such sectors do not take their time in driving to their destination. The respondents were likely to hurry in driving to their destination as compared

to others. The respondents with a p-value of 0.471 indicated how often they do maintain their vehicle. The respondents were asked how often do they drive above the speed limit, the respondents from the HND and SHS scored the average of 2.25 respectively as against their counter parts from the JHS who scored an average of 2.30 in terms of driving above the speed limit. From the data above, the researcher wanted to find out how often do drivers drive without wearing seat belt, a p- value of 6.74 was scored for all the levels on seat belt. As usual with respondents from the JHS and SHS an average of 2.67 was scored by both educational levels. With regards to driving under the influence of alcohol, a p-value of 0.068 was obtained suggesting that few drivers take alcohol during driving.

Table 4.10: Response indicating whether there are Bad drivers on Kumasi – Dunkwa road

response	Educational level					Total
	JHS/MSLC	SHS/GCE	HND	Degree	Other specify	
Yes	4	16	24	76	4	124
	100.0%	33.3%	66.7%	79.2%	100.0%	66.0%
No	0	32	12	20	0	64
	.0%	66.7%	33.3%	20.8%	.0%	34.0%
Total	4	48	36	96	4	188
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

$\chi 2$= 34.350; df=4; p-value<0.001

From the statistical data above the respondents were requested to indicate if there are bad drivers on the Kumasi-Dunkwa road. The respondents from all the various educational level provided their view to the research question. Majority of the respondents of 124 representing 66.0% were in favour that there are bad drivers on the Kumasi-Dunkwa road. These respondents were suggested by transport operators/passengers with the degree level

holding the majority of 79.2% of the total percentage. On the other hand 64 respondents said no to the question representing 34.0% of the total percentage.

4: Road Safety Interventions and Remedial Measures

Table 4.11: Remedial measure by drivers

		None	JHS/ MSLC	SHS/ GCE	HND	Total	P-Value
1	It is important to have road safety course periodically for public commercial vehicle drivers	2.00	1.43	1.57	2.00	1.56	.003
2	The enforcement agencies help in reducing road accidents	1.50	1.85	1.86	1.75	1.83	.527
3	Having more police patrol could reduce trunk road violations	1.5	2.14	1.81	1.75	1.94	.016
4	There is enough road safety awareness for the public and drivers	2.5	2.71	2.67	2.5	2.67	.721
5	The National Road Safety Campaign system is very effective in the Ashanti region	1.5	2.29	2.33	2.75	2.31	.088
6	It is important that every driver have both theoretical and practical training before issuing driver‟s license	2	1.57	1.52	2.5	1.65	.001
7	Award scheme instituted by the National Road Safety Commission (NRSC) can help reduce road accidents	1.5	1.86	2.00	1.75	1.9	.205
8	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities.	2	1.85	1.95	2	1.91	.601

1=Strongly Agree, 2= Agree, 3=Disagree, 4=Strongly Disagree

Analysis of the table indicates that considering remedial measures by the various educational levels of the respondents depicted that those with HND and those with no educational background (2.00, 2.00 for each) tended to consider organizing periodic training programmes for drivers so as to update their knowledge on current trends in driving. It can be

found out that the factor of enforcement agencies helping in reducing road accidents had the lowest ratings as compared to the other factors with a mid-point of 1.83. However, in having more police patrol on the road to reduce accidents was highly favoured by those with Junior High School and Middle School leaving certificate background with 2.14 as against a mid-point of 1.94.

A further comparison of averages for the factors revealed that the factor of creating enough road safety awareness among the public had the highest of ratings when to compared to all the factors. It is also worthy of note that among these high rankings yet again those with Junior High School and Middle School Leaving certificate background were found to have considered this factor higher than the other with a mean average of 2.71 as against a mid-point of 2.67. It could be implied that more respondents considered creating enough road safety awareness for the public to be more important than the other factors. Refer to Table 4.11 for further details.

Table 4.12: Remedial Measures by Transport owners/Passengers

	Item	JHS/ MSLC	SHS/ GCE	HND	Degree	Others specify	Total	P-Value
1	Periodic road safety programs for Drivers	1.00	1.17	1.11	1.29	2.00	1.23	0.001
2	The enforcement agencies help in reducing road accidents	2.00	2.08	1.78	2.12	1.00	2.02	0.010
3	Having more police patrol could reduce trunk road violations	2.00	1.67	2.44	2.04	3.00	2.04	0.001
4	There is enough road safety awareness for the public and drivers	3.00	2.67	2.89	2.71	3.00	2.74	0.441
5	The National Road Safety Campaign system is very effective in the Ashanti region	4.00	2.58	2.56	2.75	2.00	2.68	0.001
6	It is important that every driver have both theoretical and practical training before issuing license	2.00	1.58	1.44	1.54	1.00	1.53	0.313
7	Award scheme instituted by the National Road Safety Commission (NRSC) can help reduce road accidents	2.00	1.83	1.67	1.79	3.00	1.81	0.002
8	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities	3.00	1.83	2.22	2.54	1.00	2.28	0.001

1=Strongly Agree, 2= Agree, 3=Disagree, 4=Strongly Disagree

Table 4.12 gives the summary of the mean averages for the remedial measures given by the transport owners and passengers. From the table, it could be observed that considering the factors the option of having every driver have both theoretical and practical training before issuing license tended to receive the least mid-point mean average total of 1.53 compared to the other factors. On the other hand creating enough road safety awareness for the public and drivers had the highest ratings than the others with a mean average mid-point total of 2.74 which is higher than for all the other factors.

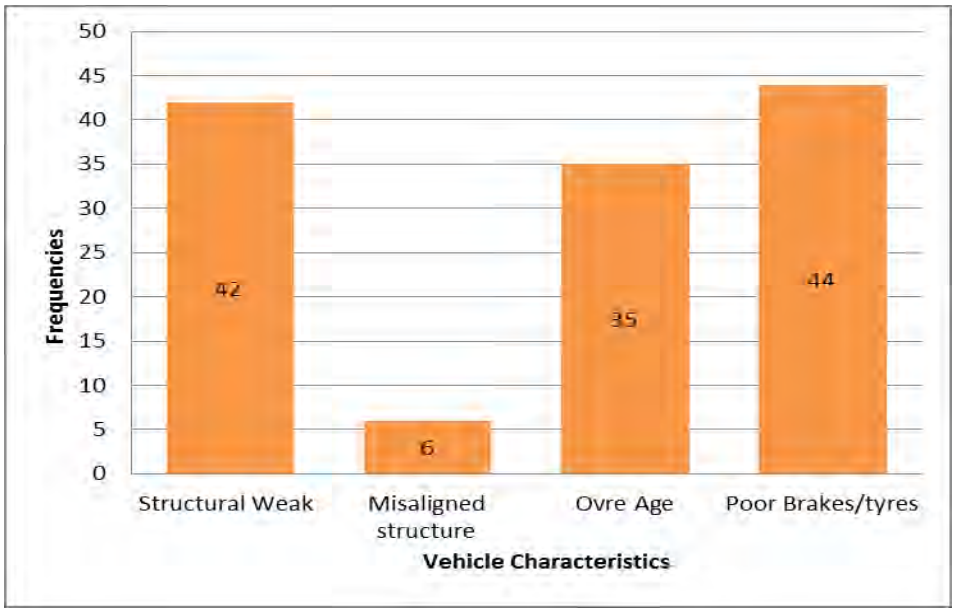

Figure 4.6: Characteristics of Modified Vehicle making it Accident Prone

The analysis of responses obtained from 46 mechanics was that two major characteristics of modified vehicle are poor brakes/tyres as a result of rear brake disconnection, over-age and structural weakness where 42, 35 and 44 respectively out of 46 respondents were mentioned.

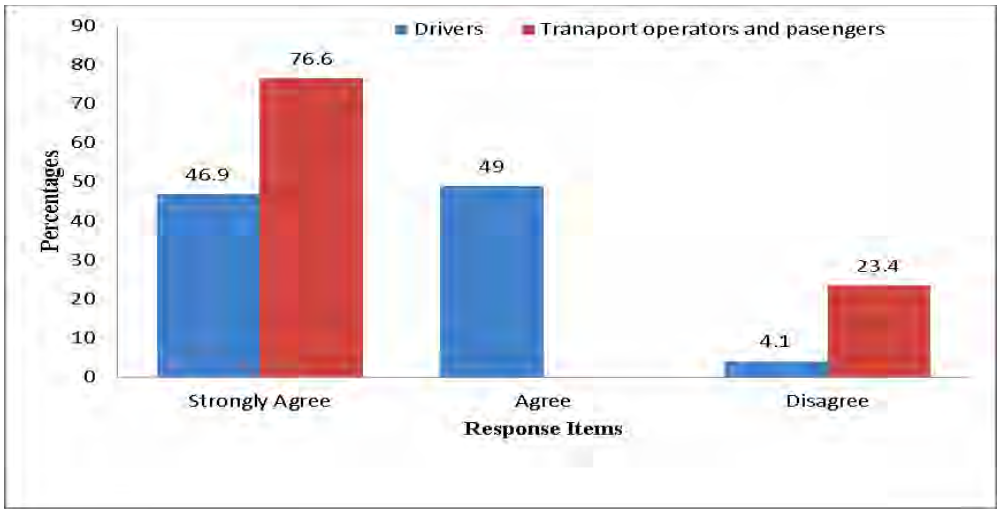

Figure 4.7: Response to the statement: "It is Important to Have Road Safety Course Periodically for Public Commercial Vehicle Drivers"

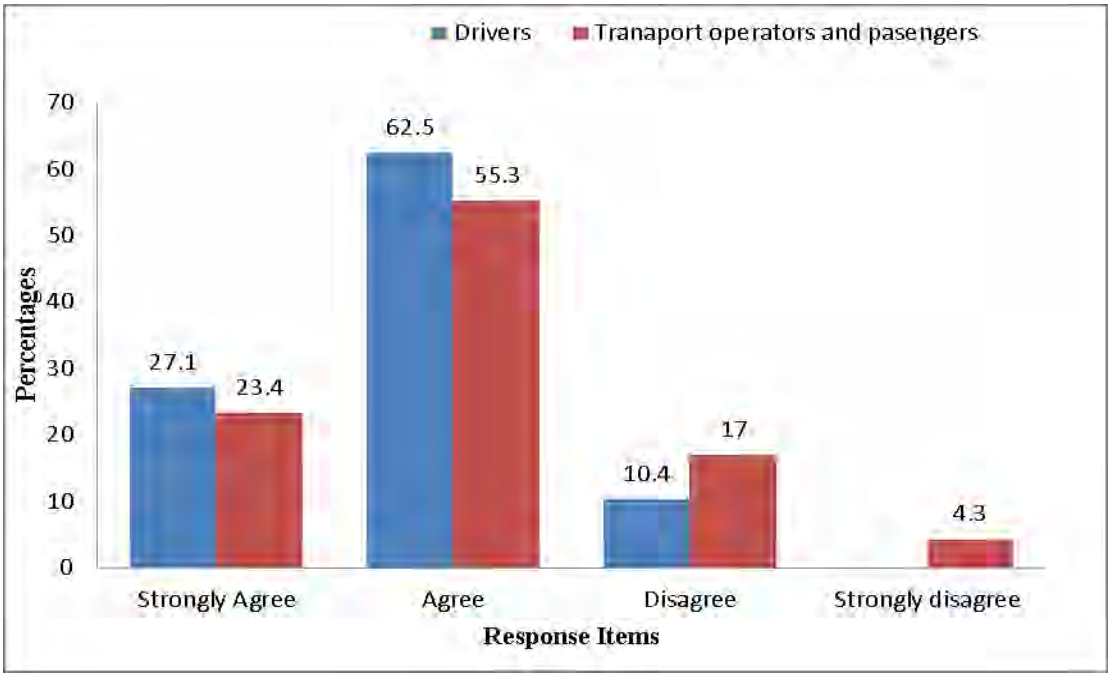

Figure 4.8: Response to the statement: "The Enforcement Agencies Help in Reducing Road Accidents"

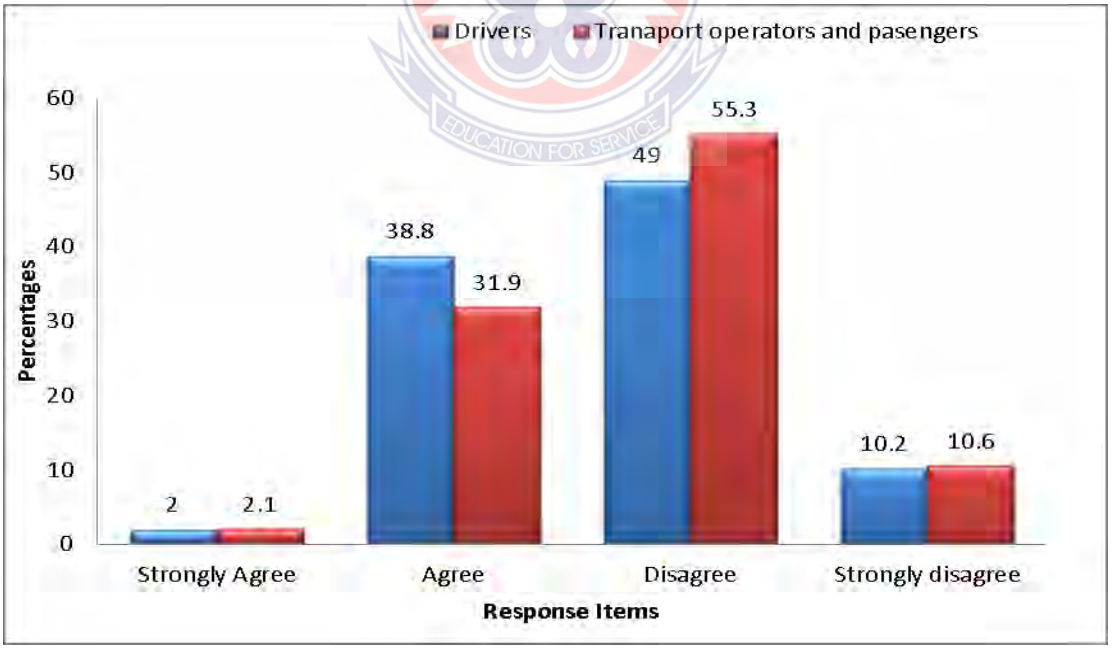

Figure 4.9: Response to the statement: "There is Enough Road Safety Awareness for the Public and Drivers"

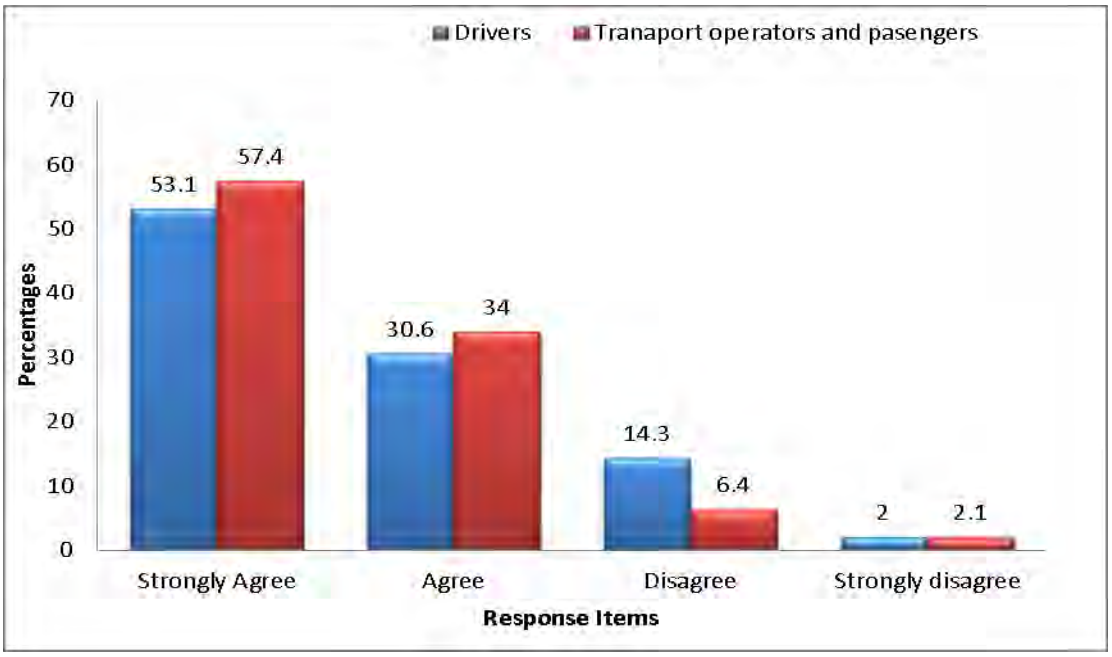

Figure 4.10 Response to the statement: "It is Important That Every Driver Have both Theoretical and Practical Training before Issuing Driving License"

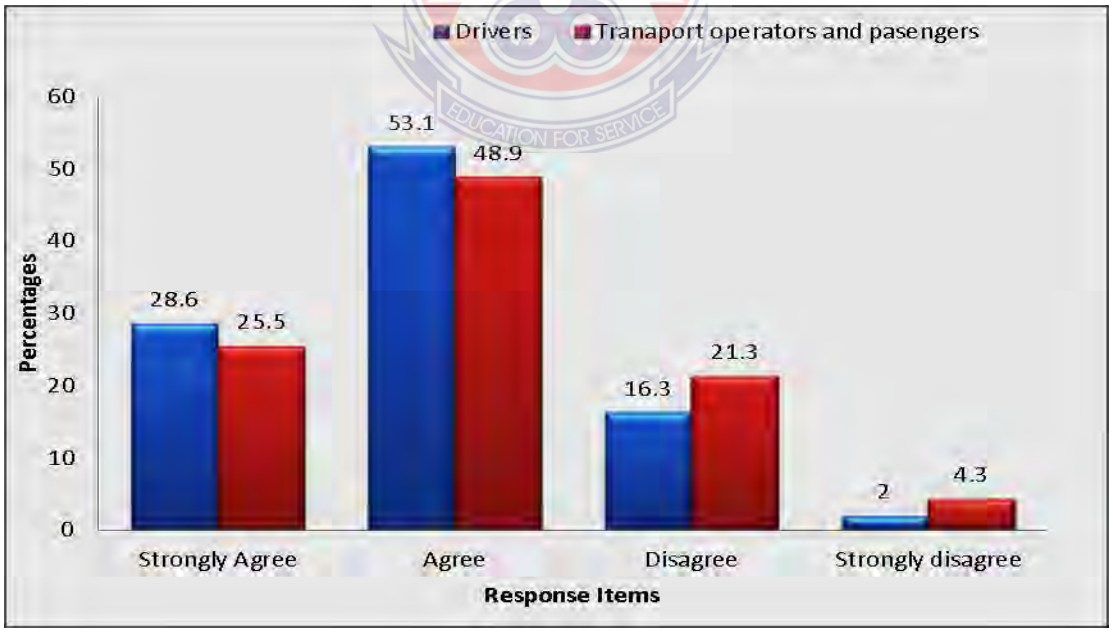

Figure 4.11: Response to the statement: "Having more police patrol could reduce trunk road violations"

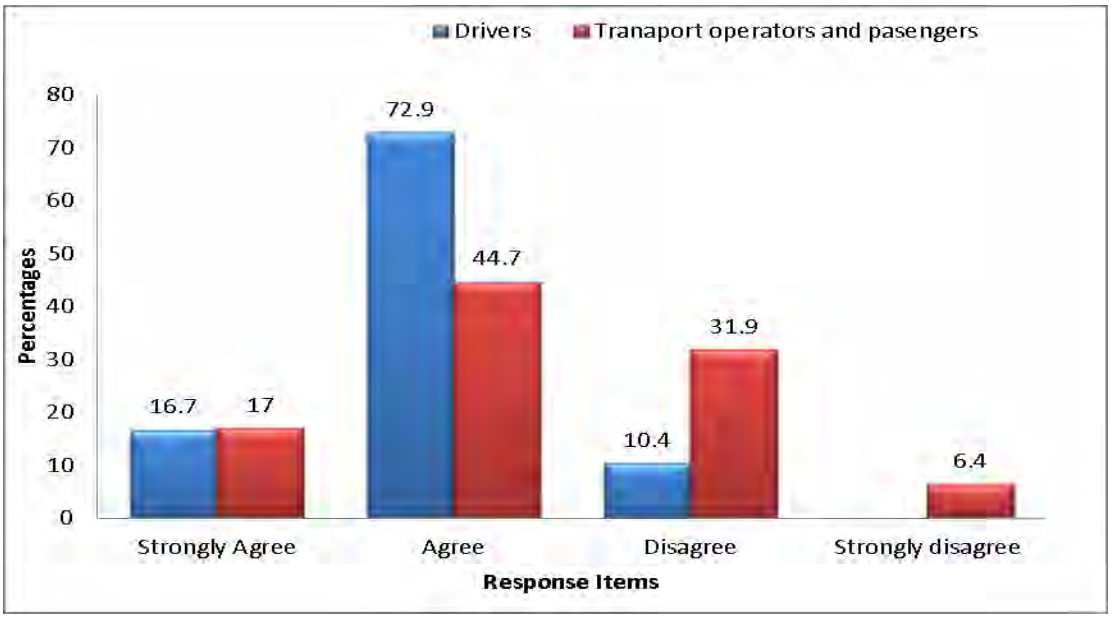

Figure 4.12: Response to the statement: "Existing Road Safety Campaign Strategies Are Better Enforced As a Means of Controlling Fatalities"

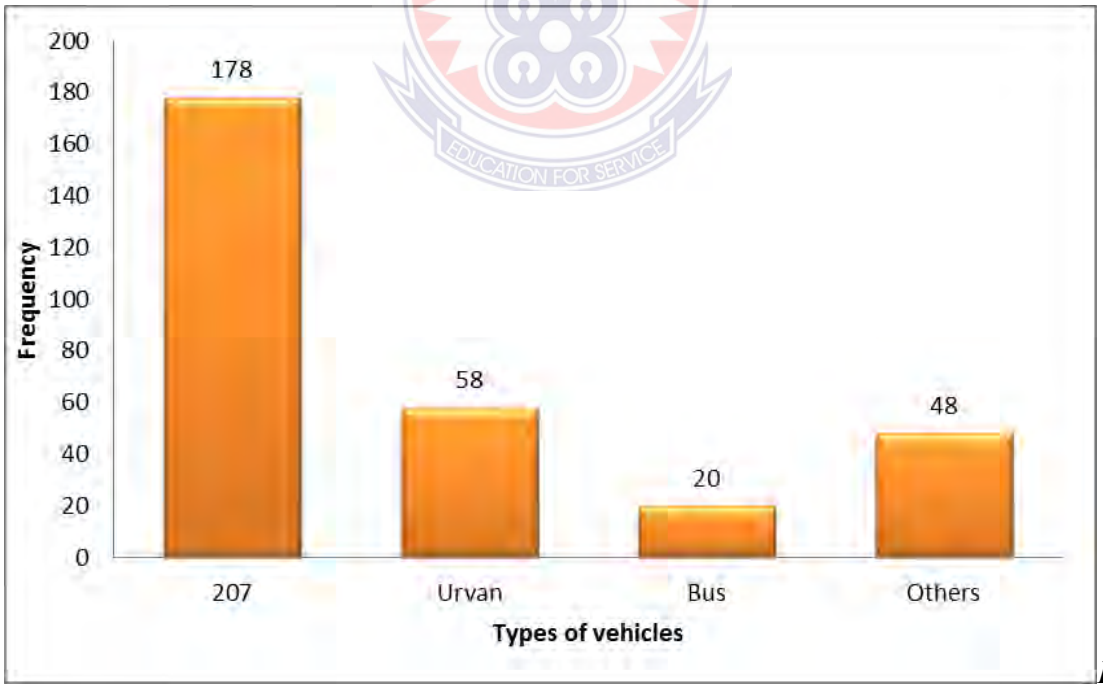

Figure 4.13: Accident Prone Vehicles in the Region

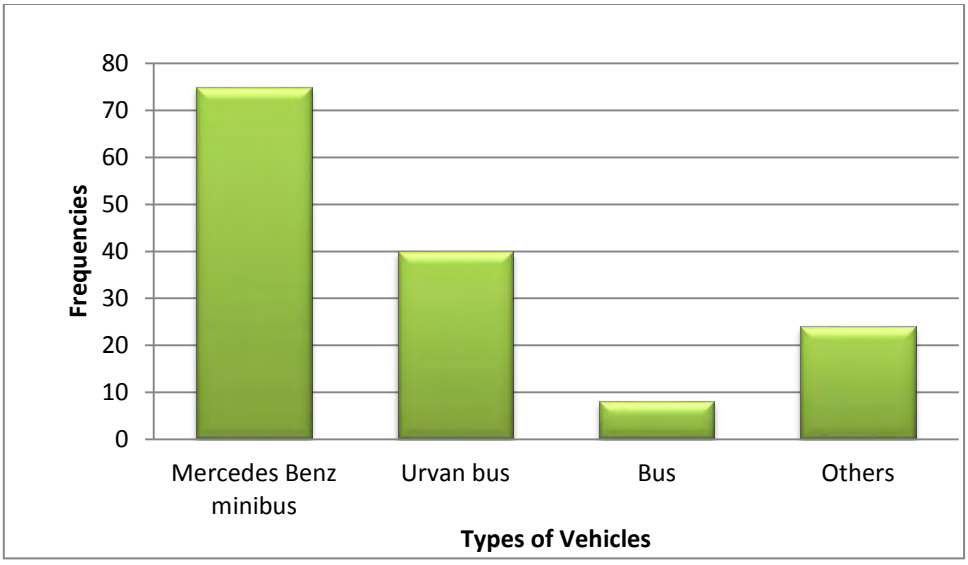

Figure 4.14: The Most Plied Vehicles on Kumasi-Dunkwa Road

CHAPTER FIVE

DISCUSSIONS OF RESULTS

5.1. Introduction

This chapter presents the overall discussions on the results of the study that were analysed in the previous chapter. The outcome of the survey suggests that Mercedes Benz 207 bus is the most accident prone vehicle type in the Ashanti Region especially on the Kumasi-Dunkwa road. About 95% of the respondents who were asked to mention 3 types of vehicles that often cause accidents on our roads made mention of Mercedes Benz 207 buses, among others such as Urvan (30%), other; which includes private cars, heavy goods vehicles and trucks (25%), with Bus scoring only (10%). It was also observed that 207 buses is the most plied vehicle on the Kumasi-Dunkwa road. Since 75 out of the 147 drivers who responded to the questionnaires indicated 207 as the vehicle they used.

5.2. Characteristics of Vehicles that Cause Road Accidents

As shown in Figure 4.6 the predominant characteristics cited by respondents were poor tyres used, disconnected brakes over-age and structural weakness due to overloading. The opinion of the respondents, who were mechanics when they were asked whether they would recommend the use of home-used tyres and other parts, 70% said no with the view that second hand tyres and parts are not good for our public commercial transport with only 30% responded yes, (refer to Figure 4.3). It is imperative that the condition of the vehicle plays a vital role in controlling the vehicle and the chances for staying out of an accident are better with a vehicle in tip-top condition than it is with one that has operational defects.

5.2.1 Maintenance culture

One hundred and forty four (144) commercial vehicle drivers were given the opportunity to indicate the frequency at which they maintained their vehicles, 60 of them said always whereas 75 said sometimes only 9 rarely do maintain their vehicle (Appendix A, Q.23). When the drivers‟ age was cross tabulated against the frequencies, it was realized that the middle aged group drivers do maintenance more than others (Table 4.2).

The view of transport owners was in support to that of the drivers; where about 73% indicated that they have positive attitude towards maintenance of their property as they do check their vehicle monthly or better than that (Figure 4.1). The outcome from the survey proves contrary to the researcher‟s view that poor maintenance culture accounted for road traffic accidents .in the region.

5.2.2 Design Modifications and Second-Hand Parts

With regards to modifications and second-hand parts, respondents in the survey consisting of both drivers and mechanics were giving the opportunity to share their views. With all perceptions of the people on how modified vehicles behave, the data provided by the respondents on item 6 of mechanics questionnaire showed that a comparative majority of 91% of the mechanics admitted they have made alteration on home used vehicle before and 9% said no to the question. Quite surprisingly, when they were asked further to mention some vehicle characteristics that make modified vehicle accident-prone, the majority of the respondents cited overloading, over-age and structural weakness.

Concerning drivers‟ majority of the respondents indicated that they have not driven modified vehicles before (Refer to Table 4.3). When they were asked further to give reason, most of them simply said modified vehicles are dangerous since they can fail at any time.

In an interview with the MTTU, as well as DVLA officials‟, the response confirmed that most vehicles used commercially for passengers were brought to the country as vans and cargo (haulage) with both front and rear braking systems working, but have been modified to suit different purpose for which they were not made (passenger vehicle). According to them, there is a dangerous act on these vehicles with respect to overloading and the removal of the rear brakes, which a task force team have been put to check and deal with offenders.

In support for this, a recent study by the National Road Safety Commission of Ghana found that "A significant proportion of the commercial vehicles in the country are old. Closely related with increasing old cars in Ghana is the increasing number of accidents. The age profile of vehicles is mostly above five (5) years. Only 13% are below 5 years, about 34% are up to ten (10) years with those up to (15) years and above constituting over 50%" (NRSC, 2009).

This confirms the fact that there are a lot of structurally weak vehicles on our roads endangering road users‟ life since the age of the tyre matter most even if they are not being used, they can fail regardless of the tread wear (MRT/NRSC, 2006).

5.2.3 Mechanical Failure

During the interview with the accident unit of the Ghana Police MTTU, the frequently reported causation of accident in the region is mechanical failure which to them is vague statement. The drivers in response to causes of road traffic accident in the region cited defective brake and tyres, as mechanical failure. According to them, the brakes of a vehicle have been designed to stop the vehicle safely under all conditions and they are the main mechanical road safety feature. The brakes are designed in a way that they should not be modified in any way whatsoever (MRT, 2006). It is therefore extremely important that the

brakes are always maintained in a first class condition. If so done properly, brakes will not fail suddenly.

From the other perspective, it is seen that most Ghanaians do purchase imported tyres that have been used and rejected elsewhere in Europe or USA. However, the age of the tyre matter most even if they are not being used, they can fail regardless of the tread wear (MRT/NRSC, 2006). Now it is evidently clear from Table 4.8 that, those in favour of defective brake were 24 respondents and 18 respondents in favour of defective tyres. It is obvious that these mechanical failures are due to alterations made and the use of second hand tyres.

In conclusion however, there is a confirmation to the fact that the most cited types of mechanical failure are loss of brakes, tyre burst or blowouts or tread separation and steering or suspension failure as reported by Hill, (2010).

5.3. Driver Attitudes that Cause Road Traffic Accident

In the recent survey, several questions were posed that were related to errors and violations aimed at exposing certain attitudes and behaviour caused by drivers on trunk roads. A number of driving attitudes were closely related to accident involvements were investigated and the results as summarized in Chapter 4 were as discussed below:

5.3.1. Driver Education

From Table 4.1, in Chapter 4, there is a clear indication that education levels of public commercial vehicle drivers were low. It was shown that majority of our drivers; about 44% had no education at all with about the same having JHS or MSLC as their highest formal education. This was confirmed during an interview at the DVLA in Kumasi that about 80% of

the applicants who applied for driving license had no formal education or has only basic education.

In another development the data presented by the researcher in order to find out how drivers learned driving indicated that majority of the respondents comprising 28.60% learned driving through their friends, 26.5% through relatives and 16.3% learned driving through a driving school instructor. From the data, the majority of respondents got into driving through friends and relatives (refer to Figure 4.4 in Chapter 4). However, most of these drivers said they had road safety education during their training.

5.3.2. Distance Travelled by Drivers per Day

With regards to the length of kilometres a driver cover in a day, the results indicates that most drivers cover more distances and therefore might become tired As may be seen in Table 4.6, the questionnaire asked the respondents how far they usually drive in a day? The cross tabulation shows that the greater number of 96 respondents representing 65.3% of the total respondents does drive above 401km a day, which is statistically significant as indicated with a p-value of 0.001. A critical look at the table shows that the proportion of drivers who cover more distances come from the middle aged group where 81 out of the 147 drivers were in the age group of 36-45years with 30 drivers also coming from 26-35 years age group.

The next factor that the researcher found as contributing to the long distance covered by the drivers was due to the fact that most of them drive their own cars or else cars owned by a relative. This is supported by the fact that 17.39% of respondents agree that fatigue is one of the major causes of road accidents in the region. Considering the nature of the road network in the region driving at such a distance may look tiresome by the old age drivers but the younger ones may not see it so.

5.3.3. Speeding

Speeding on trunk roads was found to be an important factor leading to road traffic accidents by the researcher. The result from the sampled population shows that there are other parameters such as age, gender and educational level that account for the speeding on trunk roads. These variables were analysed along with speed, and from Table 4.8, it could be observed that 33 drivers representing 22.9% attributed major cause of accident to speeding which comprised 12 respondents who had no formal education, 15 JHS/MSLC respondents and 3 SHS/GCE and 3 HND respondents respectively

In support of this, Table 4.6 clearly shows that middle aged group of drivers tend to speed more than both young and old drivers. According to the results, the proportion of drivers who cover long distances a day drive hurriedly to reach their destination, where 81 drivers out of the 147 respondents were in the age group of 36-45 years with 30 drivers also coming from 26-35 years age group.

Additionally Table 4.5 where the researcher wanted to know from the mechanics about drivers attitudes that contributes to road accidents. Out of the 46 respondents, 34 respondents representing 73.91% said over speeding is the major driver attitude as against 17.39% being fatigue and 4.35% each for incompetency and drunk driving.

This confirms the World Bank report that fully 90% of all licensed drivers speed at some point in their driving career; and 75% admit to committing this offense regularly. (World Bank, 2009).

5.3.4. Aggressive Driving Behaviours

The driver attitude section of the driver‟s questionnaire seeks to find out certain behaviours of drivers that accounted for aggressive driving behaviours. Table 4.9 presents the detailed analysis of the responses obtained from the survey. It can be seen that when one way ANOVA table was used, with the behaviours paired against levels of driver education, it was observed that over speeding and overtaking were most significant behaviours each giving a p-value of 0.001. Distractions and drunk-driving were found to be the next committed behaviours by the respondents with p-value of 0.081 and 0.068 respectively. While driving and at the same time using the mobile phone attracted the least.

In support of this fact, Table 4.10 which present data analysis of the 188 respondents of transport owners and passengers seeking to know whether there are bad drivers on Kumasi-Dunkwa road confirms that most commercial vehicle drivers drive badly. When 124 respondents representing 66% said yes with only 64 respondents representing 34.0% of the total respondents said no to the question. The researcher‟s observation is that aggressive driving behaviours are the most frequent roadway offenses but since there are no serious enforcement that deals with offenders, people see them as normal. There is therefore the confirmation that these behaviours are probably under-reported, since most people are not willing to admit to the more serious actions, even if no penalty exists. Hence, it can be concluded generally that driver perceptions on aggressive driving behaviours were consistent with passengers.

5.4: Road Safety Interventions and Remedial Measures

Effective remedial measures are the main concerns for both road safety advocates and the public. Information gained from the responses from the public regarding attitudes towards

remedial measures can be an important factor in helping politicians and decision makers. In the survey, part C and part D of the passengers and drivers questionnaires respectively sort to address the issues on remedial measures. This part of the questionnaire comprising 8 questions which respondents in the survey consisting of both drivers and passengers who acknowledged the receipt of the questionnaire were asked to respond.

5.4.1. Periodic Road Safety Course for Drivers

The results from the survey showed that periodic training on road safety is very important to public commercial vehicle drivers in the region as well as the country. From Table 4.10, it is obviously clear that almost all the respondents agreed to the statement. The drivers themselves attest to the fact that road safety education is an important tool in reducing road traffic accident, since 46.9% strongly agreed, 49% agreed and only 4.1% disagreed (Figure 4.7).

With regards to transport owners/passengers 142 out of 188 respondents representing 76.6% strongly agreed, while 46 respondents representing 23.4% disagreed. In the same view, when the one way ANOVA table was cross tabulated, there were an indication that a p-value of 0.003 and 0.001 for drivers and passengers respectively which was statistically significant (refer to Tables 4.11& 4.12).

5.4.2. Enforcement Agencies

The analysis on whether the enforcement agencies help in reducing road accidents, a substantial majority of both drivers and passengers agreed when about 27.1% of drivers and 23.4% of passengers strongly agreed, 62.5% of drivers and 55.3% of passengers agreed. Only 10.4% and 17% of drivers and passengers respectively disagreed to the statement (Figure 4.8)

When the one way ANOVA table was generated, there was greater consistency in drivers‟ response as compared to that of the transport owners/passengers confirming that enforcement agencies help in reducing road accidents.

5.4.3. Theoretical Training by Drivers

Driver education and training tend to be an important factor to curtail road traffic accidents in every country. The results here showed that both drivers as well as passengers agreed that both theoretical and practical training are important requirement every driver needs before driver‟s license is issued by the DVLA. The manifestation of this is seen in Figure 4.10 where 53.1% of drivers and 57.4% of passengers strongly agreed while 30.6% and 34% of drivers and passengers respectively agreed. Therefore, theoretical test is of vital importance since about 90% of the respondents concurrently share the same view of agreement. Similarly, Table 4.12 which give the summary of the mean averages for the remedial measures given by the transport owners and passengers proves that considering the factors, the option of having every driver have both theoretical and practical training before issuing license tended to receive the least mid-point mean average total of 1.53 as compared to other factors shows a strong agreement in the view of respondents.

In an interview with an official of the DVLA, it was evident that a written test is taken as pre-requisite to issuance of driving license in the country. However, such written tests are generally ineffective because the questions do repeat and that applicants can easily learn by rote without understanding. Yet it is important because it concentrate on eliminating the errors and bad behaviours most commonly found in drivers.

5.4.4. Road Safety Awareness

In response to this by the drivers as indicated in Figure 4.10, 41.8% believed that road safety awareness programmes are enough for them whereas 59.2% did not believe so. The passengers shared the same view with the drivers when 34% agreed and 66% disagreed to the fact that there is enough road safety awareness for public commercial vehicle drivers (Figure 4.9).

Thus, in the researcher‟s opinion, adequate campaign supported by enforcement can improve driver‟s attitude towards better driving as recommended by many researchers. Hence there is an urgent need for improved road safety awareness programme nationwide.

5.4.5. Enforcement Strategies

With regards to enforcement strategies, the researcher wanted to know whether the existing interventions are properly enforced, with the view that having more Police patrols on the road the results as shown in Figure 13 indicates that both drivers and passengers attest to the fact that police patrols could reduce trunk road violations. The overall mean scored by both drivers and passengers when the one way ANOVA table was cross tabulated also indicated a strong agreement with a mean aggregate of 2.0 (refer to Table 4.11 & 4.12). In furtherance of this the respondents who were mechanics when they were asked to specify some enforcement strategies to deal with road safety ranked education/awareness first, followed by intensified road checks with stiffer punishment rated least. Thus there is a correlation between enforcement and education as a way of changing driver behaviour positively towards reducing road accidents. To support this, Hutabarat and Lam (2005) indicated that “enforcement efforts were very effective in changing driver behaviour and improving safety, especially, when combined with education and media campaigns”.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

The main aim of the thesis was to identify the characteristics of vehicle and driver attitudes and behaviours that contribute to road traffic accidents, so as to be able to suggest appropriate remedial measures to curtail the situation. The foregoing discussion has confirmed the assertion that some attitudes of drivers contribute to road accidents as well as some vehicle characteristics.

6.1.1. Vehicle Characteristics Contributing to Road Traffic Accidents in the Region

The findings of the study reveal that the common vehicle characteristics that contribute to road accidents in the region are the alterations made on second hand vehicles which lead to poor braking and weak structures. In addition to this overloading and over aged vehicles frequently used on trunk roads contribute significantly to road accidents. There was also a confirmation that frequent tyre burst or tyre failure on road is due the second hand tyre predominantly used for our public commercial vehicles.

Even though the findings showed positive attitudes to maintenance, there is the evidence that some vehicles are not worthy to be on road especially the most plied vehicle the Mercedes Benz 207 buses for their uncomfortable seating.

6.1.2. Driver Attitudes and Behaviours

The study established that the top three driver attitudes contributing significantly to road traffic accidents are over speeding, fatigue, and careless driving which this research captured as aggressive driving behaviours. Both drivers and passengers are in total agreement

that over speeding is rampant on trunk roads. Based on the survey questionnaire, most drivers always or sometimes are in a hurry to reach their destination which result in over speeding.

Again the long distance covered by drivers on the average in a day was established as a fact that most drivers plying Kumasi-Dunkwa road become tired contributing to road traffic accidents on the road. Finally aggressive driving behaviours which combines overtaking, swivelling, distractions and receiving phone calls while driving were confirmed as contributory factors of driver attitude towards road traffic accidents.

6.1.3. Remedial Measures

From the findings it was established that a comprehensive driver awareness programmes need to be intensified as the respondents agreed that road safety awareness is inadequate in the region. Also there should be serious enforcement by the enforcement agencies to prevent those who try to violate road traffic regulations. There was evidence from the survey that road safety enforcement efforts were very effective in changing driver behaviour and improving safety when combined with education and media campaign [Hutabarat and Lam (2005)].

Though engineering measures were not a focus of this study, issues such as better roadway design and proper road maintenance were mentioned by respondents as measures to improve road safety situation which the researcher saw as very useful.

6.2. Recommendations

Based on the findings of the research, the following recommendations were made that:

- Improving road safety in the region should be a matter of all inclusive involving road users, policy makers and the mass media. The mass media should be used for publicity to raise the awareness in support of road safety campaigns.
- The Ghana Education Service should design appropriate curriculum for all levels of education to conscientise the students from the beginning so that they become aware of the consequences of road safety which would result in improved driver attitudes.
- The theory test for applicants seeking driver license should be comprehensive to include basic knowledge in vehicle systems.
- Over aged vehicles should be banned in the country. That is any second hand vehicle which is more than 10 years of age.
- There should be effective regulations to deal with importation of second hand parts and tyres if they cannot be banned.
- The modifications made by the local artisans especially at the Suame Magazine should be regulated by an accredited professional body such as SMIDO.
- More in-depth investigation is required to identify the actual driving behaviour by monitoring drivers on trunk roads remotely.
- There should be a road safety fund set aside purposely for road safety awareness and education campaigns.
- The National Road Safety Commission (NRSC) should be serious on the 3E‟s (i.e. Engineering, Education, and Enforcement) as a means of improving road safety in the region.

- The government should provide necessary logistics to the enforcement agencies such as Ghana police MTTU and other coordinating bodies to enhance their work.

6.3. Future Work

It is recommended that future research is carried out to provide more insight into road users attitudes and perceptions towards road traffic accidents. Again there is the need for concerted effort and coordinated programmes from the various stakeholders to fight the road safety challenges in the Ashanti Region. Finally, methods for acquiring driver license in the country needs to be investigated in order to have a more reliable and efficient driver data that can enable policy makers to be proactive in curbing road traffic accidents.

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APPENDIX A

University of Education, Winneba

College of Technology Education -Kumasi

Department of Design & Technology Education

Post Graduate Degree Programme Master of Technology Education (Mechanical)

Dear Sir/madam,

The object of this questionnaire is to Investigate on Driver Attitudes and Behaviours as well as their Vehicles in order to propose measures for improving safety on our roads especially Kumasi – Dunkwa trunk road.

Please read the questions carefully and answer them as truthfully as you can. This information will be treated confidentially and will be used for research purposes only.

INSTRUCTION

Please tick [√] appropriately in a box which best describe your opinion and fill in the space where needed.

QUESTIONNAIRE FOR PUBLIC COMMERCIAL VEHICLE DRIVERS

PART A: BACKGROUND INFORMATION

1. Gender: ☐ M ☐ F
2. Age: ☐ 16-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ Above 65
3. Educational Level ☐ None ☐ JHS/MSLC ☐ SHS/GCE ☐ HND ☐ Degree ☐ Other (specify)……

PART B: CAR USAGE

4. What type of vehicle do you usually use? ……
5. Who owns the vehicle that you usually use? ☐ Yourself ☐ Parents ☐ Employer ☐ Relative ☐ Friend ☐ Other, Specify. ……
6. How long do you normally drive in a day? Please give estimate. ☐ Less than 100 Km ☐ 100 – 200 km ☐ 200 – 300 Km ☐ 300 – 400 Km ☐ above 400 Km
7. Have you ever driven a vehicle that has been modified before? ☐ Yes ☐ No
8. If Yes, state the kind of modification ……
……..

PART C: DRIVER EDUCATION

9. How did you learn driving? I was taught by: ☐ myself ☐ a parent ☐ a friend ☐ a relative ☐ a driving school instruct
10. For how long did you learn? ……
11. Did you have any road safety education during training? ☐ Yes ☐ No
12. The following are some driver attitudes and vehicle behaviours that cause road accidents. Tick as many as possible using ranking scale 1-5 ☐ Speeding ☐ lack of attention ☐ reckless driving ☐ defective brake ☐ defective tyre ☐ drunk driving ☐ pedestrian error

PART D: DRIVER ATTITUDES AND BEHAVIOURS

NO.	STATEMENT	ALWAYS	SOMETIMES	RARELY	NEVER
14	How often are you in hurry to get somewhere when you are driving?				
15	How often do you drive above the speed limit?				
16	If you drive above speed limit, how much over? ☐ 10-20 ☐ 20-30 ☐ 30-40 ☐ above 40				
17	How often do you overtake another vehicle?				
18	How often do you use fast acceleration or apply heavy braking as part of your driving?				
19	How often do you drive under the influence of alcohol?				
20	How often do you drive without your seat belt?				
21	How often do you drive and at the same time use mobile phone?				
22	How often do you become distracted by music, passengers or pedestrians?				
23	How often do you maintain your vehicle?				

PART E: REMEDIAL MEASURES

NO.	STATEMENT	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
24	It is important to have road safety course periodically for public commercial vehicle drivers.				
25	The enforcement agencies help us a lot in reducing road accidents.				
26	Having more police patrol could reduce trunk road violations.				
27	There is enough road safety awareness the public and drivers.				
28	The National Road Safety Campaign system is very effective in the Ashanti region.				
29	It is important that every driver have both theoretical and practical training before issued a driver‟s license by the Driver and Driver and Vehicle Licensing Authority (DVLA).				
30	Award scheme instituted by the National Road Safety Commission can help reduce road accidents.				
31	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities				

32. Suggestions and comments: ……

……...

……...

Thank You for You Cooperation.

APPENDIX B

University of Education, Winneba

College of Technology Education, Kumasi

Department of Design & Technology Education

Post Graduate Degree Programme Master of Technology Education (Mechanical)

Dear Sir/madam,

The object of this questionnaire is to Investigate on Driver Attitudes and Behaviours as well as their Vehicles in order to propose measures for improving safety on our roads especially Kumasi – Dunkwa trunk road.

Please read the questions carefully and answer them as truthfully as you can. This information will be treated confidentially and will be used for research purposes only.

INSTRUCTION

Please tick [√] appropriately in a box which best describe your opinion and fill in the space where needed.

QUESTIONNAIRE FOR TRANSPORT OWNERS AND PASSENGERS

PART A: BACKGROUND INFORMATION

1. Gender: ☐ M ☐ F
2. Age: ☐ 16-25 ☐ 26-35 ☐ 36-4 ☐ 46-55 ☐ 56-65 ☐ Above 65
3. Occupation ☐ Driver ☐ Mechanic ☐ Trader ☐ Conductor
   ☐ Nurse ☐ Teacher ☐ Other (specify) ……
4. Educational Level: ☐ None ☐ JHS/MSLC ☐ SHS/GCE ☐ HND
   ☐ Degree ☐ Other (specify)……..

PART B: VEHICLE USE AND MAINTENANCE (for transport owners only)

5. How long have you been in transport business?
   ☐ >5yrs ☐ 6-10yrs ☐ 11-15yrs ☐ <15yrs
6. How often do you maintain or check your vehicle? ☐ Weekly ☐ monthly
   ☐ Every 2 Months ☐ Every 3 Months ☐ Randomly

7. Have you ever had an accident? ☐ Yes ☐ No
8. If Yes what was the cause(s) ☐ Mechanical failure ☐ Loss of control
   ☐ Inexperience ☐ fatigue/tiredness ☐ Over speeding
9. Were there some casualties? ☐ Yes ☐ No if Yes, state number……..
10. Do we have bad drivers on Kumasi-Dunkwa road? ☐ Yes ☐ No
11. If Yes, who is a bad driver?

    …….....

    .....
12. Mention at least 3 types of vehicles that are accident prone …….

    ……

PART C: REMEDIAL MEASURES

NO.	STATEMENTS	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
13	It is important to have road safety course periodically for public commercial vehicle drivers.				
14	The enforcement agencies help us a lot in reducing road accidents.				
15	Having more police patrol could reduce trunk road violations.				
16	There is enough road safety awareness for the public and drivers.				
17	The National Road Safety Campaign system is very effective in the Ashanti region.				
18	It is important that every driver have both theoretical and practical training before issuing a driver"s license by the Driver and Vehicle Licensing Authority DVLA.				
19	Award scheme instituted by the National Road Safety Commission can help reduce road accidents.				
20	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities				

APPENDIX C

University of Education, Winneba

College of Technology Education, Kumasi

Department of Design & Technology Education

Post Graduate Degree Programme Master of Technology Education (Mechanical)

Dear Sir/madam,

The object of this questionnaire is to Investigate on Driver Attitudes and Behaviours as well as their Vehicles in order to propose measures for improving safety on our roads especially Kumasi – Dunkwa trunk road.

Please read the questions carefully and answer them as truthfully as you can. This information will be treated confidentially and will be used for research purposes only.

INSTRUCTION

Please tick [√] appropriately in a box which best describe your opinion and fill in the space where needed.

QUESTIONNAIRE FOR MECHANICS AT SUAME MAGAZINE (SMIDO)

PART A: BACKGROUND INFORMATION

1. Gender: ☐ M ☐ F
2. Age: ☐ 16-25 ☐ 26-35 ☐ 36-4 ☐ 46-55 ☐ 56-65 ☐ Above 65
3. Educational Level ☐ None ☐ JHS/MSLC ☐ SHS/GCE ☐ HND ☐ Degree ☐ Other (specify)……
4. How long have you been working? ☐ >5yrs ☐ 6-10yrs ☐ 11-15yrs ☐ <15yrs

PART B: MODIFICATIONS ON VEHICLES

5. What vehicle factors cause road traffic accidents? Tick as applicable using 1,2,3, ranking
   ☐ Brake failure ☐ Tyre burst ☐ Ceased fan
   ☐ Steering lock ☐ Fan belt failure ☐ Ceased Piston
   ☐ Bend crankshaft
6. Have you ever made alteration on home used vehicle before? ☐ Yes ☐ No
7. What kind of alteration did you make? ☐ Rear brake disconnection ☐ Changing steering wheel position ☐ Lengthening the Chassis frame ☐ Other, Specify ……

8. What kind of vehicle did you modify? ☐ Nissan urvan ☐ Mercedes Benz „207“
   ☐ Saloon Car ☐ Other, Specify ……
9. What brought about the modification you made and why? .....
   ……
10. What is your view about second-hand vehicles?
    .....
    .....
11. State any 2 characteristics of modified vehicle that make it prone to accident.
    ……
    ……
12. Would you recommend the use of second hand tyres and other parts
    ☐ Yes ☐ No
13. Give reasons to your answer to question 12.
    ……
    ……
14. What attitudes of drivers contribute to fatal road accidents in the region?
    ☐ Over speeding ☐ Incompetency ☐ Fatigue ☐ Drunk driving
15. What do you think could be done about the situation? Rank using 1, 2, 3 etc.
    ☐ Stiffer punishment ☐ Education/Awareness creation
    ☐ Intensified Road checks ☐ Annual Award Scheme
    ☐ (Other Specify)……

Thank You for You Cooperation.

APPENDIX D

University of Education, Winneba

College of Technology Education, Kumasi

Department of Design & Technology Education

Post Graduate Degree Programme Master of Technology Education (Mechanical)

Dear Sir/madam,

The object of this questionnaire is to Investigate on Driver Attitudes and Behaviours as well as their Vehicles in order to propose measures for improving safety on our roads especially Kumasi –Dunkwa trunk road.

Interview Questions for Officials of the National Road Safety Commission, Driver and Vehicle Licensing Authority and Local Transport Managers Popularly called Station Masters

13. **Do we have bad drivers on Kumasi-Dunkwa road?**

    If Yes, who is a bad driver? .....

    ……

14. **In your opinion state 5 driver attitudes that can lead to road accidents.**

    1.……

    2.……..

    3.……

    4.……

    5.……

15. List 5 mechanical faults that contribute to road traffic accidents

1. ……

2. ……

3. ……

4. ……

5.……

5. What can we do about accident situation on Kumasi-Dunkwa road?

……

……

……

6. What is your view about second-hand vehicles?

……

……

7. State any 2 characteristics of modified vehicle that make it prone to accident

……

……

……

8. Would you recommend the use of second hand tyres and other parts

9. Why? Give reasons to your answer ……..

……

10. Is your work effective in the region? How do you know?

Thank You for You Cooperation.

Data analysis

Collectively, the researcher surveyed 381 respondents, in which 12.1%, 49.3% and 38.6% were mechanics, transport owners/travelers and drivers respectively.

Characteristics of respondents

Characteristics	Drivers (%)	Mechanics (%)	Transport owners/Travelers (%)
Gender			
Males	98.0	91.3	74.5
Females	2.0	8.7	25.5
Age			
16 – 25	4.1	4.3	19.1
26 – 35	20.4	21.7	23.4
36 – 45	55.1	26.1	51.1
46 – 55	14.3	30.4	6.4
56 - 65	6.1	17.4	19.1
Above 65	0	0	0
Level of education			
None	4.2	21.7	0
JHS/MSLC	43.8	39.1	2.1
SHS/GCE	43.8	4.3	25.5
HND	8.3	13.0	19.1
Degree	0	13.0	51.1
Others	0	8.7	2.1

From the 381 respondents gathered by the researcher on Drivers, Mechanics and Transport owners/Travellers for gender the data showed that drivers had 98.0% for males and 2.0% for females, mechanics showed 91.3% for males and 8.7% for females and transport owners/travellers indicated 74.5% and 25.5% for males and females respectively. Majority of the respondents felled between the ages 36-45 comprising of 55.1% for drivers, 26.1% for mechanics and 51.15 for transport owners/travellers. From the data few respondents were between the ages of 16-25 and none of the respondents were above the age of 65. The educational level of the respondents as shown by the data above for the three groups indicated that majority of the respondents were from JHS/MSLC which the drivers had

43.8%, 39.1% for mechanics and 2.1% for transport owners/travellers. SHS/GCE showed 43.8% for drivers, 4.3% for mechanics and 25.5% for transport owners/travellers. Few respondents representing 0%, 8.7% and 2.1% for drivers, mechanics and transport owners respectively.

RESEACH QUESTION 1

Table 2

How often Drivers maintain their vehicle by the ages of drivers $\chi^2=31.206$; df=8, p-value<0.001

Ages of drivers	How often drivers maintain their vehicles			Total
	Always	Sometimes	Rarely	
16-25 years	3	0	3	6
	5.0%	.0%	33.3%	4.2%
26-35years	15	12	3	30
	25.0%	16.0%	33.3%	20.8%
36-45 year	30	45	3	78
	50.0%	60.0%	33.3%	54.2%
46-55 years	6	15	0	21
	10.0%	20.0%	.0%	14.6%
56-65 years	6	3	0	9
	10.0%	4.0%	.0%	6.2%
Total	60	75	9	144
	100.0%	100.0%	100.0%	100.0%

The researcher wanted the respondents to indicate how often they do maintain their vehicle. From the data above the respondents between the ages of 16-25 hardly maintain their vehicle which 3 out of the total respondents maintain their vehicle always and 3 rarely maintain their vehicle comprising of 5.0% and 33.3% respectively. From the ages between 26-35, 15

respondents maintain their vehicle always constituting 25.0%, 12 respondents constituting 16.0% maintain their vehicle sometimes and 3 respondents constituting 33.3% do maintain their vehicle rarely. The majority of the respondents that do maintain their vehicle felled between the ages of 36-45 which 30 respondents comprising 50.0% do maintain their vehicle always, 45 constituting 60 % do maintain their vehicle sometimes and 3 respondents constituting 33.3% rarely maintain their vehicle totalling 78 constituting 54.2% respondents out of the total population.

Table 4

Have you ever driven a vehicle that has been modified before by drivers $\chi^2=18.500;df=4$, *p-value*<0.001

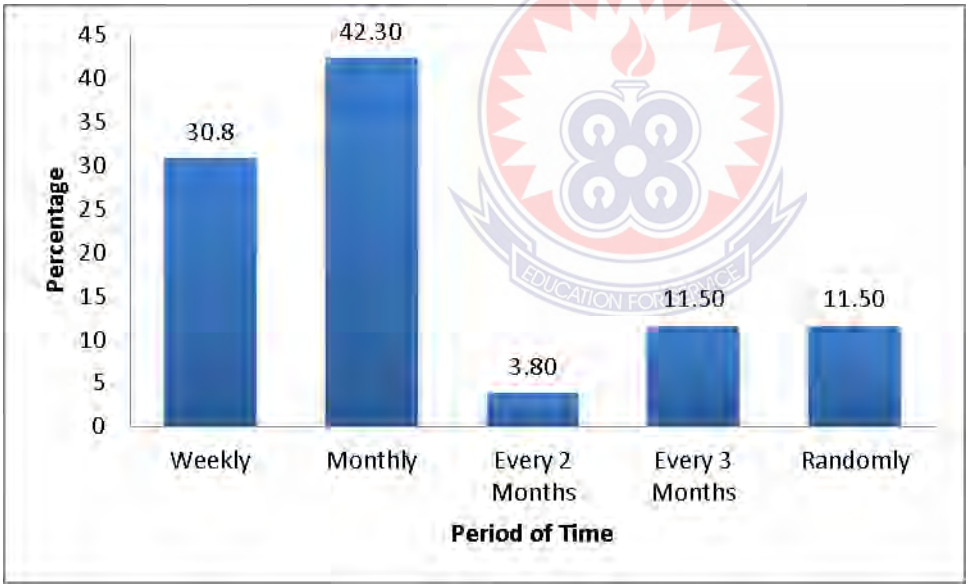
Driving of modified vehicles	Response Items		Total
	Yes	No	
16-25 years	0	6	6
	.0%	6.9%	4.1%
26-25years	12	18	30
	20.0%	20.7%	20.4%
36-45 year	33	48	81
	55.0%	55.2%	55.1%
46-55 years	6	15	21
	10.0%	17.2%	14.3%
56-65 years	9	0	9
	15.0%	.0%	6.1%
Total	60	87	147
	100.0%	100.0%	100.0%

From the data above the respondents provided their view if they have ever used a vehicle that was modified before. From the data 33 respondents said yes and 48 respondents said no to the questionnaire item above, the respondents were between the ages of 36-45 representing

the majority of respondents. The respondents constituted a total of 55.1% of which 55.0% said yes and 55.2% said no. In view of the respondents between the ages of 56-65, 9 respondents said yes to the question comprising 15.0% and 0% said no indicating that the few respondents were found in between these ages. From the ages between 46-55 respondents 6 representing 10% said yes and 15 respondents representing 17.2% said no to the question. Few respondents of 6 betweenthe ages of 16-25 said no constituting 6.9% and no respondent said yes.

Figure 1

How often do you maintain or check your vehicle?



In order to ascertain the reliability of vehicles on our roads the respondents were asked how often do they maintain or check their vehicle. From the data gathered it was then disclosed that greater number of respondents representing 42.3% do maintain or check their vehicles monthly, 30.8% respondents do maintain or check their vehicle weekly. From the above data

few respondents representing 3.8% do maintain their vehicle in every two months and 11.5 respondents do maintain their vehicle randomly.

Table 3

If Yes, what caused the accident by Transport owners/Travellers

Cause of Accident	Educational level		Total
	Degree	Other specify	
Mechanical failure	8 40.0%	0 .0%	8 33.3%
Loss of control	8 40.0%	4 100.0%	12 50.0%
Over speeding	4 20.0%	0 .0%	4 16.7%
Total	20 100.0%	4 100.0%	24 100.0%

The analysis of the data that influenced the respondents from the Transport owners/Travellers to state the major cause of accident, the respondents with the educational level as Degree and other were left to indicate whether mechanical failure, loss of control and over speeding are what causes accidents. It is in this direction, the respondents with the Degree level of education indicated that 40.0% of the accidents are caused by mechanical failure and 0% in favour of others which represented 33.3% of the total percentage. On the other hand 8 respondents representing 40.0% of the degree level were in favour with the view that accidents are caused by loss of control and 4 respondents representing 100.0% for their counterparts. Few respondents were in favour to the view that accidents are caused by over speeding from both the degree and others level of education,4 respondents from the degree level of education agreed to over speeding as the cause of accident representing 20.0% as

against 0% to their other counter parts. These respondents were from the view of the transport owners/travellers.

RESEARCH QUESTION 3

Table 4

How long drivers normally drive in a day $\chi^2=60.142$; *df=16, p-value<0.001*

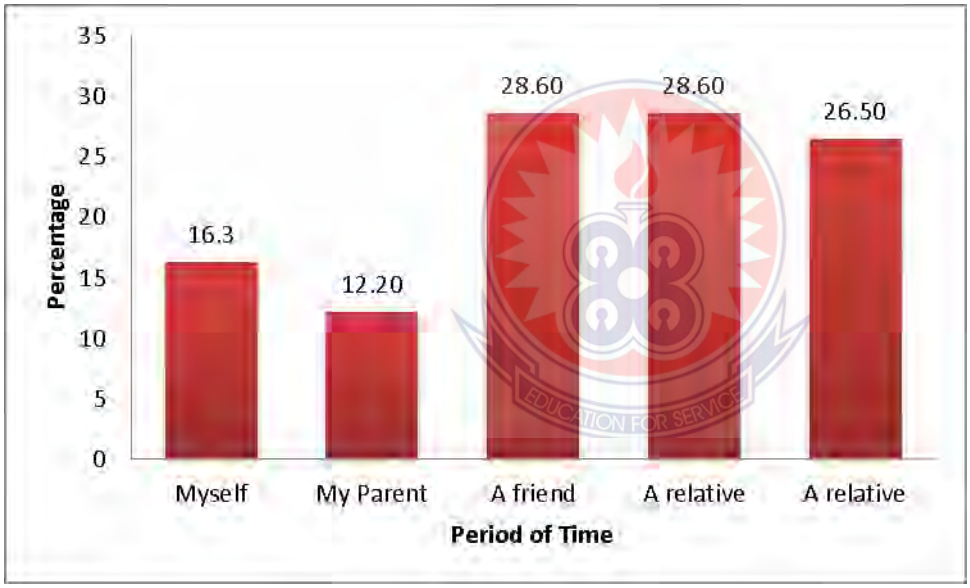
Ages of drivers	How long drivers normally drive in a day					Total
	< than 100 km	101 - 200 km	201 - 300 km	301 - 400 km	> 400 km	
16-25 years	0	3	0	3	0	6
	.0%	14.3%	.0%	16.7%	.0%	4.1%
26-25years	0	6	3	0	21	30
	.0%	28.6%	50.0%	.0%	21.9%	20.4%
36-45 year	6	12	3	6	54	81
	100.0%	57.1%	50.0%	33.3%	56.2%	55.1%
46-55 years	0	0	0	3	18	21
	.0%	.0%	.0%	16.7%	18.8%	14.3%
56-65 years	0	0	0	6	3	9
	.0%	.0%	.0%	33.3%	3.1%	6.1%
Total	6	21	6	18	96	147
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The respondents were requested to indicate how long they do drive in a day. With few respondents between the ages of 56-65 who were in favour that they do drive 6.1% daily. However majority of the respondents from the ages of 36-45 had a total of 81 respondents representing 51.1% which comprises of 6 respondents drive less than 100 km, 12 respondents do drive an average of 101-200km, 3 of the respondents indicated that they do drive at 201-300 km per day, 6 respondents do drive at 301-400 km per day and the greater number of 54 respondents representing 56.2% of the total respondents do drive above 401km

a day, on the other hand a total of 4.1% of the respondents which received the lowest score were from the ages of 16-25.

Figure 2

How the driver respondents learned driving



From the cross section of the data above the respondents were asked the means through which they learned driving. Out of the respondents 16.3% indicated they learn driving by themselves, 12.20% learned driving through the help of their parents, the majority of the respondents comprising 28.60% learned through their friends, 26.5% through relative and 16.3% learned driving through a driving school instructor. From the data the majority of respondents got into driving through friends.

Table 5

Road safety education for drivers during their training by respondents level of education

Response (Yes/No)	Educational level				Total
	None	JHS/MSLC	SHS/GCE	HND	
Yes	0	54	45	6	105
	.0%	85.7%	75.0%	50.0%	74.5%
No	6	9	15	6	36
	100.0%	14.3%	25.0%	50.0%	25.5%
Total	6	63	60	12	141
	100.0%	100.0%	100.0%	100.0%	100.0%

Similar trend was observed when the respondents were requested to indicate whether road safety education should be provided to drivers during their training. Majority of the respondents of 105 representing 74.5% were in favour to this view, the JHS/MSLC level of education however were the more respondents of 85.7% supporting the view that road safety education should be provided to drivers during training, few respondents of 36 representing 25.5% said no to the provision of road safety education during training in view to this greater respondents of 6 representing 50.0% from the HND were not in favour. It was evident that most respondent are in support to the assertion.

Table 6

Causes of the accidents by the driver respondents were involved χ2=27.526;df=12, p-value=0.006

What caused the accidents	Educational level				Total
	None	JHS/MSLC	SHS/GCE	HND	
Speeding	3	15	12	3	33
	50.0%	23.8%	19.0%	25.0%	22.9%
Lack of attention	0	21	18	0	39
	.0%	33.3%	28.6%	.0%	27.1%
Reckless driving	3	12	15	0	30
	50.0%	19.0%	23.8%	.0%	20.8%
Defective brake	0	6	12	6	24
	.0%	9.5%	19.0%	50.0%	16.7%
Defective tyre	0	9	6	3	18
	.0%	14.3%	9.5%	25.0%	12.5%
Total	6	63	63	12	144
	100.0%	100.0%	100.0%	100.0%	100.0%

From the table above, it could be observed that 33 drivers representing 22.9% attributed it speeding which comprised of 3 respondents who had no formal education, 15 JHS/MSLC respondents and 12 and 3 SHS/GCE and HND respondents respectively. Also 39 attributed the causes of accidents to the lack of attention of drivers which also constituted 21

respondents with JHS/MSLC background, 18 SHS/GCE backgrounds and none for those without formal education and HND education. For reckless driving 30 of the respondents were in favour with a constituent of 3 for those without formal education, 12 being JHS/MSLC graduates and 15 SHS/GCE graduates but none for those with HND background. For those in favour of defective brake and defective tyres they were 24 and 18 respectively.

Table 7

Driver attitudes and Behaviour

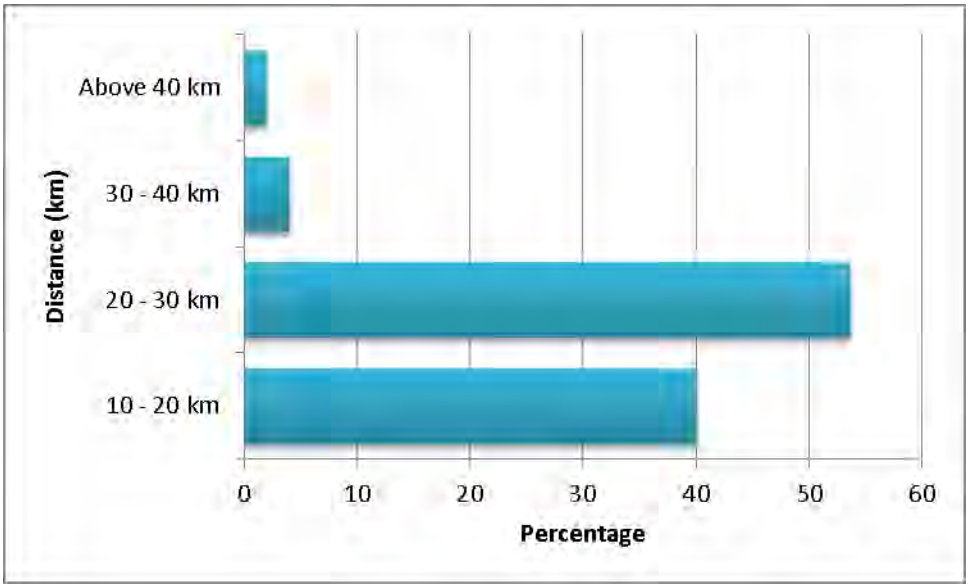
	Item	None	JHS/MSLC	SHS/GCE	HND	Total	P-value
1	How often are you in a hurry to get somewhere when you are driving	1.50	2.00	1.62	2.00	1.81	0.001
2	How often do you drive above the speed limit	2.00	2.30	2.25	2.25	2.26	0.837
3	How often do you overtake another vehicle	1.50	2.24	2.10	2.00	2.13	0.001
4	How often do you use fast acceleration or apply heavy braking as part of your driving	2.50	2.67	2.33	2.50	2.50	0.134
5	How often do you drive under the influence of alcohol	3.00	3.29	3.62	3.50	3.44	0.068
6	How often do you drive without seat belt	3.00	2.67	2.67	2.50	2.67	0.674
7	How often do you drive and at the same time use your mobile phone	3.00	2.80	2.71	3.00	2.79	0.589
8	How often do you become distracted by music, passengers or pedestrians	2.00	2.10	2.48	2.50	2.29	0.081
9	How often do you maintain your vehicle	2.00	1.62	1.65	1.75	1.66	0.471

1=Always, 2= Sometimes, 3=Rarely, 4=Never

The respondents from JHS, SHS; HND and NONE were requested to indicate the behaviours and attitudes of drivers in terms of their driving. The respondents from the JHS/MSLC and their counterparts from HND had the higher average score of 2 respondents when it comes to how hurry are drivers when they want to get to somewhere when driving. This then suggested that respondents from such sectors do not take their time in driving to their destination. The respondents were likely to hurry in driving to their destination as compared to others. The respondents with a p-value of 0.471 indicated how often they do maintain their vehicle. The respondents were asked how often do they drive above the speed limit, the respondents from the HND and SHS scored the average of 2.25 respectively as against their counter parts from the JHS who scored an average of 2.30 in terms of driving above the speed limit. The data above the researcher wanted to find out how often do drivers drive without wearing seat belt. A p- value of 6.74 was scored for all the levels on seat belt. As usual with respondents from the JHS and SHS an average of 2.67 was scored by both educational levels.

Figure 3

Length of Kilometres drivers drive above the speed limit



The respondents from the above data were requested to indicate the length of kilometres drivers drive above the speed limit. With the exception of respondents who drive above 40 km who had 3% as represented above had the lowest score. The majority of respondents do drive above the speed limit of 20-30 km which represented 53% of the total percentage. 40% was indicated by respondents who drive above the speed limit of 10-20 km. The distance in km as driven by the respondents above 30-40 km had an aggregate percentage of 6.

Table 8

Bad drivers on the Kumasi – Dunkwa road by educational level of transport owner and travellers $\chi 2 = 34.350; df = 4$, *p-value*<0.001

	Educational level					Total
	JHS/MSLC	SHS/GCE	HND	Degree	Other specify	
Yes	4	16	24	76	4	124
	100.0%	33.3%	66.7%	79.2%	100.0%	66.0%
No	0	32	12	20	0	64

	.0%	66.7%	33.3%	20.8%	.0%	34.0%
Total	4	48	36	96	4	188
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

From the statistical data above the respondents were requested to indicate if there are bad drivers on the Kumasi-Dunkwa road. The respondents from all the various educational level provided their view to the research question. Majority of the respondents of 124 representing 66.0% were in favour that there are bad drivers on the Kumasi-Dunkwa road. These respondents were suggested by transport owners and travellers with the degree level holding the majority of 79.2% of the total percentage. On the other hand 64 respondents said no to the question representing 34.0% of the total percentage. It is worthy of note that 66.7% who were in not support to the question were from SHS/GCE level of education. Out of the number of respondents of 188 the majority of 96 respondents were from the degree level of education.

RESEACH QUESTION 4

Table 9

Remedial measure by drivers

		None	JHS/MSLC	SHS/GCE	HND	Total	P-V
1	It is important to have road safety course periodically for public commercial vehicle drivers	2.00	1.43	1.57	2.00	1.56	.003

2	The enforcement agencies help in reducing road accidents	1.50	1.85	1.86	1.75	1.83	.527
3	Having more police patrol could reduce trunk road violations	1.5	2.14	1.81	1.75	1.94	.016
4	There is enough road safety awareness for the public and drivers	2.5	2.71	2.67	2.5	2.67	.721
5	The NRSC system is very effective in the Ashanti region	1.5	2.29	2.33	2.75	2.31	.088
6	It is important that every driver have both theoretical and practical training b4 issuing license	2	1.57	1.52	2.5	1.65	.001
7	Award scheme instituted by the NRSC can help reduce road accidents	1.5	1.86	2.00	1.75	1.9	.205
8	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities.	2	1.85	1.95	2	1.91	.601

1=Always, 2= Sometimes, 3=Rarely, 4=Never

Analysis of the table indicates that considering remedial measures by the various educational levels of the respondents depicted that those with HND and those with no educational background (2.00, 2.00 for each) tended to consider organizing periodic training programs for drivers so as to update their knowledge on current trends in driving. It can be found out that the factor of enforcement agencies helping in reducing road accidents had the lowest ratings as compared to the other factors with a mid-point of 1.83. However, in having more police patrol on the road to reduce accidents was highly favoured by those with Junior High School and Middle School leaving certificate background with 2.14 as against a mid-point of 1.94. A further comparison of averages for the factors revealed that the factor of creating enough road safety awareness among the public had the highest of ratings when to compared to all the factors. It is also worthy of note that among these high rankings yet again those with Junior High School and Middle School Leaving certificate background were found to have considered this factor higher than the other with a mean average of 2.71as against a mid-point of 2.67. It could be implied that more respondent considered creating enough road

safety awareness for the public to be more important than the other factors. Refer to table 9 for further details.

Table 10

Remedial Measures by Transport owners/Travellers

	Item	JHS/ MSLC	SHS/ GCE	HND	Degree	Others specify	Total	P-Value
1	Periodic road safety programs for Drivers	1.00	1.17	1.11	1.29	2.00	1.23	0.001
2	The enforcement agencies help in reducing road accidents	2.00	2.08	1.78	2.12	1.00	2.02	0.010
3	Having more police patrol could reduce trunk road violations	2.00	1.67	2.44	2.04	3.00	2.04	0.001
4	There is enough road safety awareness for the public and drivers	3.00	2.67	2.89	2.71	3.00	2.74	0.441
5	The NRSC system is very effective in the Ashanti region	4.00	2.58	2.56	2.75	2.00	2.68	0.001
6	It is important that every driver have both theoretical and practical training b4 issuing license	2.00	1.58	1.44	1.54	1.00	1.53	0.313
7	Award scheme instituted by the NRSC can help reduce road accidents	2.00	1.83	1.67	1.79	3.00	1.81	0.002
8	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities	3.00	1.83	2.22	2.54	1.00	2.28	0.001

1=Always, 2= Sometimes, 3=Rarely, 4=Never

Table 10 gives the summary of the mean averages for the remedial measures given by the transport owners and travellers. From the table it could be observed that considering the factors the option of having every driver have both theoretical and practical training before issuing licence tended to receive the least mid-point mean average total of 1.53 compared to the other factors. On the other hand creating enough road safety awareness for the public and drivers had the highest ratings than the others with a mean average mid-point total of 2.74 which is higher than for all the other factors.

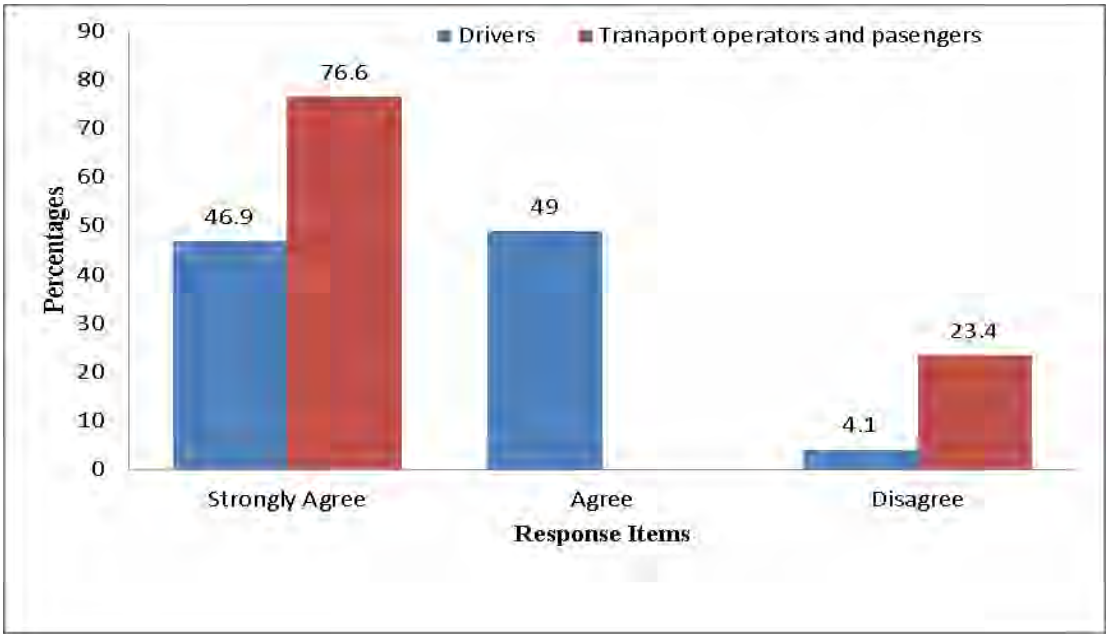


Figure 9: It is important to have road safety course periodically for public commercial vehicle drivers

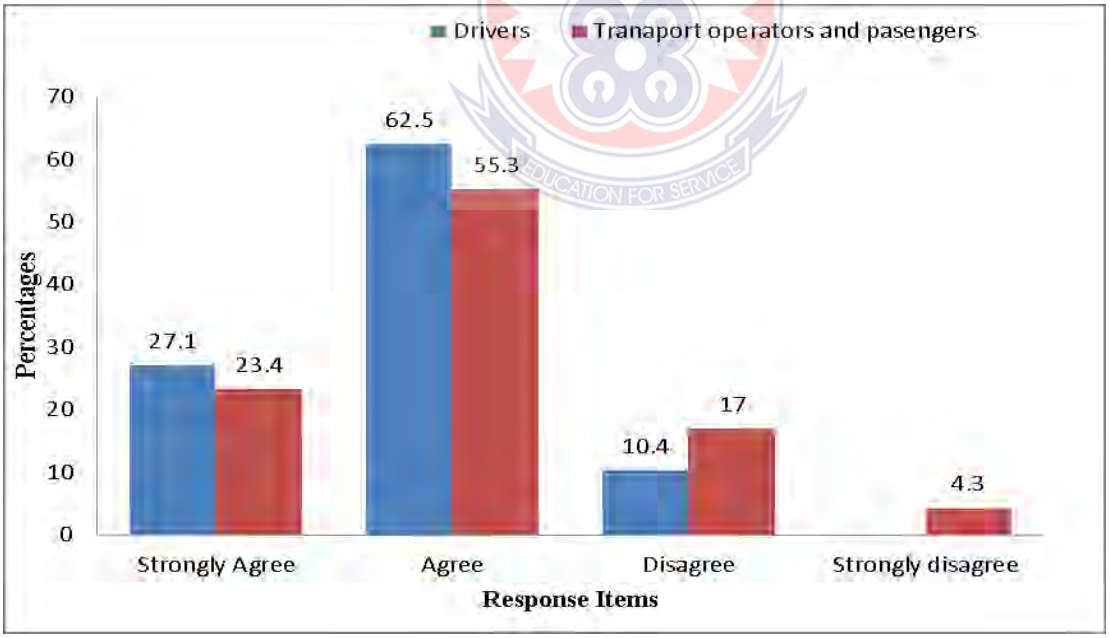


Figure 10: The enforcement agencies help in reducing road accidents

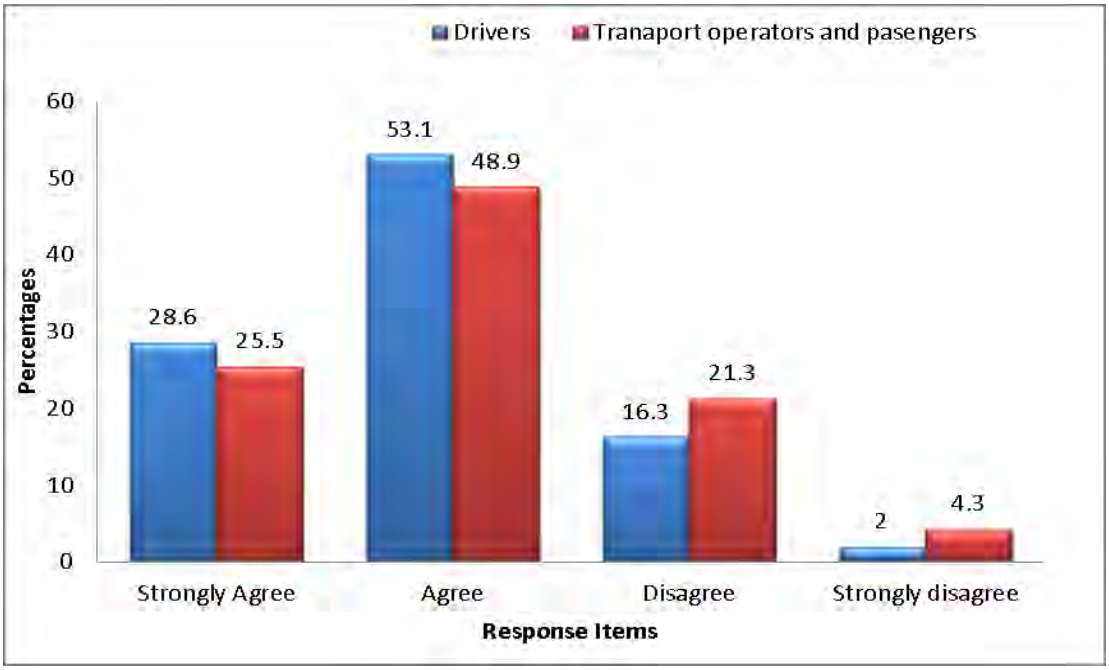


Figure 11: Having more police patrol could reduce trunk road violations

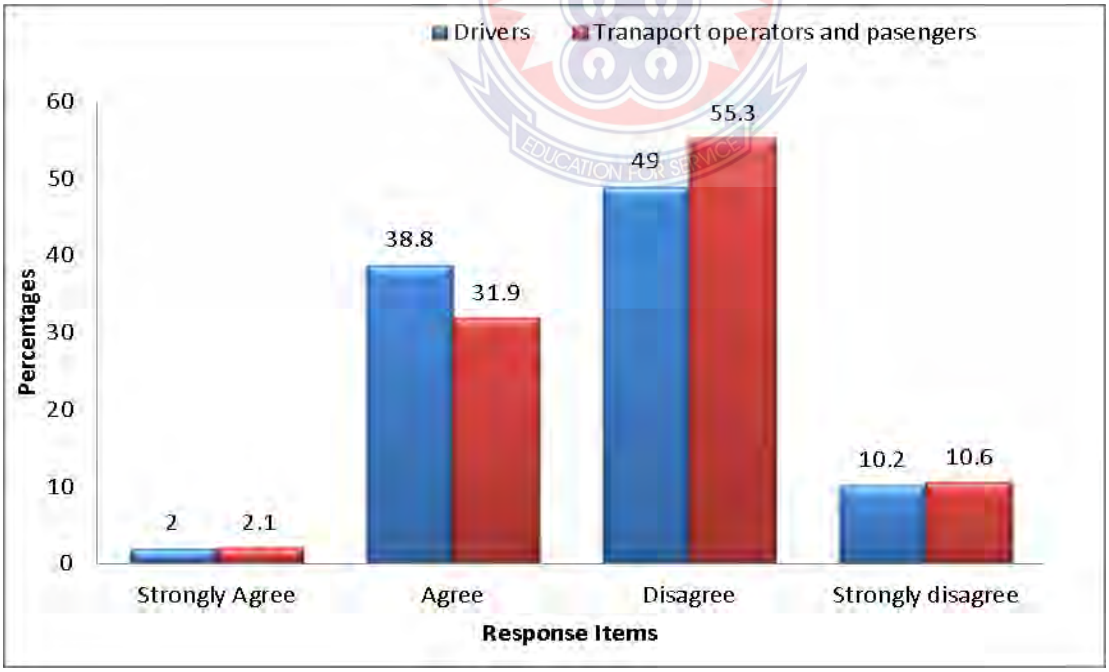


Figure 12: There is enough road safety awareness for the public and drivers

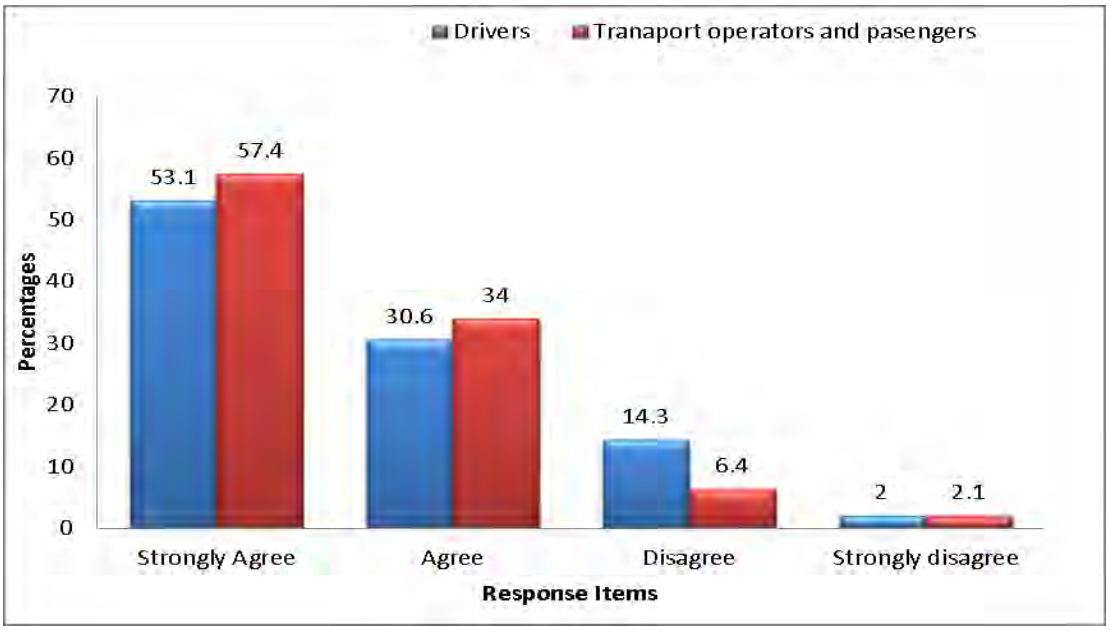


Figure 13: It is important that every driver have both theoretical and practical training b4 issuing license

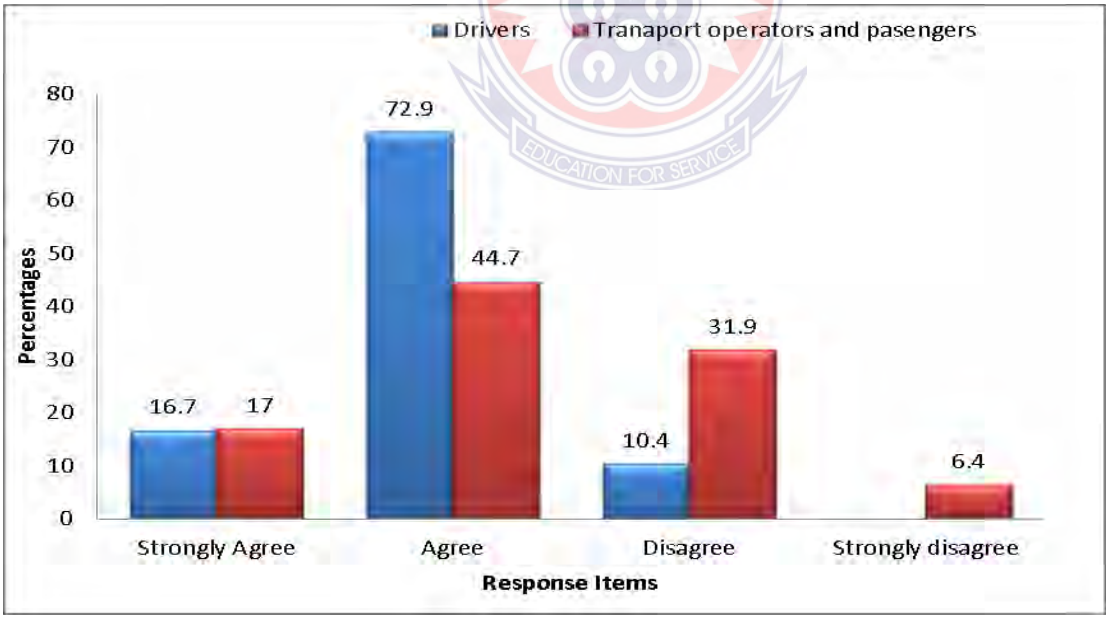


Figure 14: Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities

Data analysis

Collectively, the researcher surveyed 381 respondents, in which 12.1%, 49.3% and 38.6% were mechanics, transport owners/travelers and drivers respectively.

Characteristics of respondents

Characteristics	Drivers (%)	Mechanics (%)	Transport owners/Travelers (%)
Gender			
Males	98.0	91.3	74.5
Females	2.0	8.7	25.5
Age			
16 – 25	4.1	4.3	19.1
26 – 35	20.4	21.7	23.4
36 – 45	55.1	26.1	51.1
46 – 55	14.3	30.4	6.4
56 - 65	6.1	17.4	19.1
Above 65	0	0	0
Level of education			
None	4.2	21.7	0
JHS/MSLC	43.8	39.1	2.1
SHS/GCE	43.8	4.3	25.5
HND	8.3	13.0	19.1
Degree	0	13.0	51.1
Others	0	8.7	2.1

From the 381 respondents gathered by the researcher on Drivers, Mechanics and Transport owners/Travellers for gender the data showed that drivers had 98.0% for males and 2.0% for females, mechanics showed 91.3% for males and 8.7% for females and transport owners/travellers indicated 74.5% and 25.5% for males and females respectively. Majority of the respondents felled between the ages 36-45 comprising of 55.1% for drivers, 26.1% for mechanics and 51.15 for transport owners/travellers. From the data few respondents were between the ages of 16-25 and none of the respondents were above the age of 65. The educational level of the respondents as shown by the data above for the three groups indicated that majority of the respondents were from JHS/MSLC which the drivers had

43.8%, 39.1% for mechanics and 2.1% for transport owners/travellers. SHS/GCE showed 43.8% for drivers, 4.3% for mechanics and 25.5% for transport owners/travellers. Few respondents representing 0%, 8.7% and 2.1% for drivers, mechanics and transport owners respectively.

RESEACH QUESTION 1

Table 2

How often Drivers maintain their vehicle by the ages of drivers $\chi^2=31.206$; df=8, p-value<0.001

Ages of drivers	How often drivers maintain their vehicles			Total
	Always	Sometimes	Rarely	
16-25 years	3	0	3	6
	5.0%	.0%	33.3%	4.2%
26-35years	15	12	3	30
	25.0%	16.0%	33.3%	20.8%
36-45 year	30	45	3	78
	50.0%	60.0%	33.3%	54.2%
46-55 years	6	15	0	21
	10.0%	20.0%	.0%	14.6%
56-65 years	6	3	0	9
	10.0%	4.0%	.0%	6.2%
Total	60	75	9	144
	100.0%	100.0%	100.0%	100.0%

The researcher wanted the respondents to indicate how often they do maintain their vehicle. From the data above the respondents between the ages of 16-25 hardly maintain their vehicle which 3 out of the total respondents maintain their vehicle always and 3 rarely maintain their vehicle comprising of 5.0% and 33.3% respectively. From the ages between 26-35, 15

respondents maintain their vehicle always constituting 25.0%, 12 respondents constituting 16.0% maintain their vehicle sometimes and 3 respondents constituting 33.3% do maintain their vehicle rarely. The majority of the respondents that do maintain their vehicle felled between the ages of 36-45 which 30 respondents comprising 50.0% do maintain their vehicle always, 45 constituting 60 % do maintain their vehicle sometimes and 3 respondents constituting 33.3% rarely maintain their vehicle totalling 78 constituting 54.2% respondents out of the total population.

Table 4

Have you ever driven a vehicle that has been modified before by drivers $\chi^2=18.500;df=4$, *p-value*<0.001

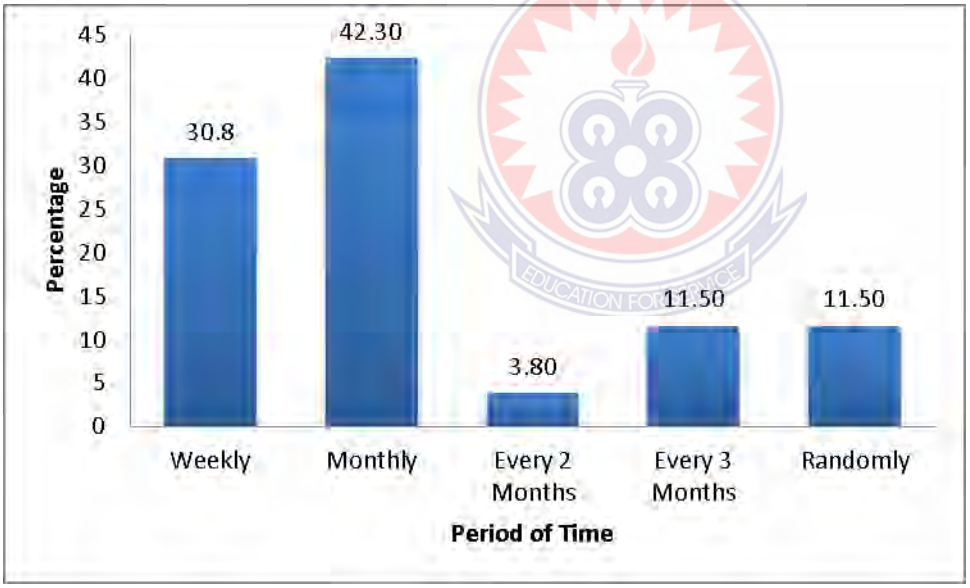
Driving of modified vehicles	Response Items		Total
	Yes	No	
16-25 years	0	6	6
	.0%	6.9%	4.1%
26-25years	12	18	30
	20.0%	20.7%	20.4%
36-45 year	33	48	81
	55.0%	55.2%	55.1%
46-55 years	6	15	21
	10.0%	17.2%	14.3%
56-65 years	9	0	9
	15.0%	.0%	6.1%
Total	60	87	147
	100.0%	100.0%	100.0%

From the data above the respondents provided their view if they have ever used a vehicle that was modified before. From the data 33 respondents said yes and 48 respondents said no to the questionnaire item above, the respondents were between the ages of 36-45 representing

the majority of respondents. The respondents constituted a total of 55.1% of which 55.0% said yes and 55.2% said no. In view of the respondents between the ages of 56-65, 9 respondents said yes to the question comprising 15.0% and 0% said no indicating that the few respondents were found in between these ages. From the ages between 46-55 respondents 6 representing 10% said yes and 15 respondents representing 17.2% said no to the question. Few respondents of 6 betweenthe ages of 16-25 said no constituting 6.9% and no respondent said yes.

Figure 1

How often do you maintain or check your vehicle?



In order to ascertain the reliability of vehicles on our roads the respondents were asked how often do they maintain or check their vehicle. From the data gathered it was then disclosed that greater number of respondents representing 42.3% do maintain or check their vehicles monthly, 30.8% respondents do maintain or check their vehicle weekly. From the above data

few respondents representing 3.8% do maintain their vehicle in every two months and 11.5 respondents do maintain their vehicle randomly.

Table 3

If Yes, what caused the accident by Transport owners/Travellers

Cause of Accident	Educational level		Total
	Degree	Other specify	
Mechanical failure	8 40.0%	0 .0%	8 33.3%
Loss of control	8 40.0%	4 100.0%	12 50.0%
Over speeding	4 20.0%	0 .0%	4 16.7%
Total	20 100.0%	4 100.0%	24 100.0%

The analysis of the data that influenced the respondents from the Transport owners/Travellers to state the major cause of accident, the respondents with the educational level as Degree and other were left to indicate whether mechanical failure, loss of control and over speeding are what causes accidents. It is in this direction, the respondents with the Degree level of education indicated that 40.0% of the accidents are caused by mechanical failure and 0% in favour of others which represented 33.3% of the total percentage. On the other hand 8 respondents representing 40.0% of the degree level were in favour with the view that accidents are caused by loss of control and 4 respondents representing 100.0% for their counterparts. Few respondents were in favour to the view that accidents are caused by over speeding from both the degree and others level of education,4 respondents from the degree level of education agreed to over speeding as the cause of accident representing 20.0% as

against 0% to their other counter parts. These respondents were from the view of the transport owners/travellers.

RESEARCH QUESTION 3

Table 4

How long drivers normally drive in a day $\chi^2=60.142$; *df=16, p-value<0.001*

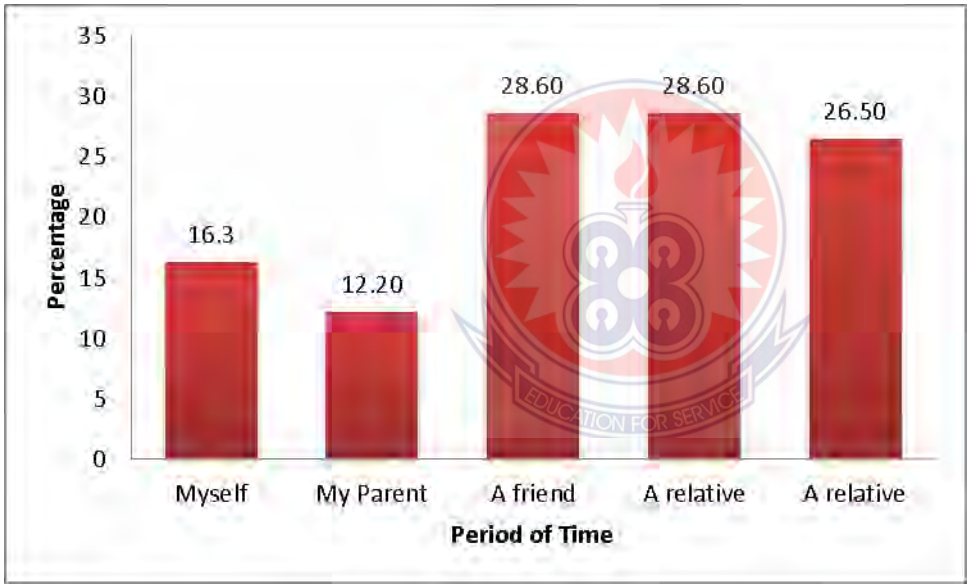
Ages of drivers	How long drivers normally drive in a day					Total
	< than 100 km	101 - 200 km	201 - 300 km	301 - 400 km	> 400 km	
16-25 years	0	3	0	3	0	6
	.0%	14.3%	.0%	16.7%	.0%	4.1%
26-25years	0	6	3	0	21	30
	.0%	28.6%	50.0%	.0%	21.9%	20.4%
36-45 year	6	12	3	6	54	81
	100.0%	57.1%	50.0%	33.3%	56.2%	55.1%
46-55 years	0	0	0	3	18	21
	.0%	.0%	.0%	16.7%	18.8%	14.3%
56-65 years	0	0	0	6	3	9
	.0%	.0%	.0%	33.3%	3.1%	6.1%
Total	6	21	6	18	96	147
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The respondents were requested to indicate how long they do drive in a day. With few respondents between the ages of 56-65 who were in favour that they do drive 6.1% daily. However majority of the respondents from the ages of 36-45 had a total of 81 respondents representing 51.1% which comprises of 6 respondents drive less than 100 km, 12 respondents do drive an average of 101-200km, 3 of the respondents indicated that they do drive at 201-300 km per day, 6 respondents do drive at 301-400 km per day and the greater number of 54 respondents representing 56.2% of the total respondents do drive above 401km

a day, on the other hand a total of 4.1% of the respondents which received the lowest score were from the ages of 16-25.

Figure 2

How the driver respondents learned driving



From the cross section of the data above the respondents were asked the means through which they learned driving. Out of the respondents 16.3% indicated they learn driving by themselves, 12.20% learned driving through the help of their parents, the majority of the respondents comprising 28.60% learned through their friends, 26.5% through relative and 16.3% learned driving through a driving school instructor. From the data the majority of respondents got into driving through friends.

Table 5

Road safety education for drivers during their training by respondents level of education

Response (Yes/No)	Educational level				Total
	None	JHS/MSLC	SHS/GCE	HND	
Yes	0	54	45	6	105
	.0%	85.7%	75.0%	50.0%	74.5%
No	6	9	15	6	36
	100.0%	14.3%	25.0%	50.0%	25.5%
Total	6	63	60	12	141
	100.0%	100.0%	100.0%	100.0%	100.0%

Similar trend was observed when the respondents were requested to indicate whether road safety education should be provided to drivers during their training. Majority of the respondents of 105 representing 74.5% were in favour to this view, the JHS/MSLC level of education however were the more respondents of 85.7% supporting the view that road safety education should be provided to drivers during training, few respondents of 36 representing 25.5% said no to the provision of road safety education during training in view to this greater respondents of 6 representing 50.0% from the HND were not in favour. It was evident that most respondent are in support to the assertion.

Table 6

Causes of the accidents by the driver respondents were involved χ2=27.526;df=12, p-value=0.006

What caused the accidents	Educational level				Total
	None	JHS/MSLC	SHS/GCE	HND	
Speeding	3	15	12	3	33
	50.0%	23.8%	19.0%	25.0%	22.9%
Lack of attention	0	21	18	0	39
	.0%	33.3%	28.6%	.0%	27.1%
Reckless driving	3	12	15	0	30
	50.0%	19.0%	23.8%	.0%	20.8%
Defective brake	0	6	12	6	24
	.0%	9.5%	19.0%	50.0%	16.7%
Defective tyre	0	9	6	3	18
	.0%	14.3%	9.5%	25.0%	12.5%
Total	6	63	63	12	144
	100.0%	100.0%	100.0%	100.0%	100.0%

From the table above, it could be observed that 33 drivers representing 22.9% attributed it speeding which comprised of 3 respondents who had no formal education, 15 JHS/MSLC respondents and 12 and 3 SHS/GCE and HND respondents respectively. Also 39 attributed the causes of accidents to the lack of attention of drivers which also constituted 21

respondents with JHS/MSLC background, 18 SHS/GCE backgrounds and none for those without formal education and HND education. For reckless driving 30 of the respondents were in favour with a constituent of 3 for those without formal education, 12 being JHS/MSLC graduates and 15 SHS/GCE graduates but none for those with HND background. For those in favour of defective brake and defective tyres they were 24 and 18 respectively.

Table 7

Driver attitudes and Behaviour

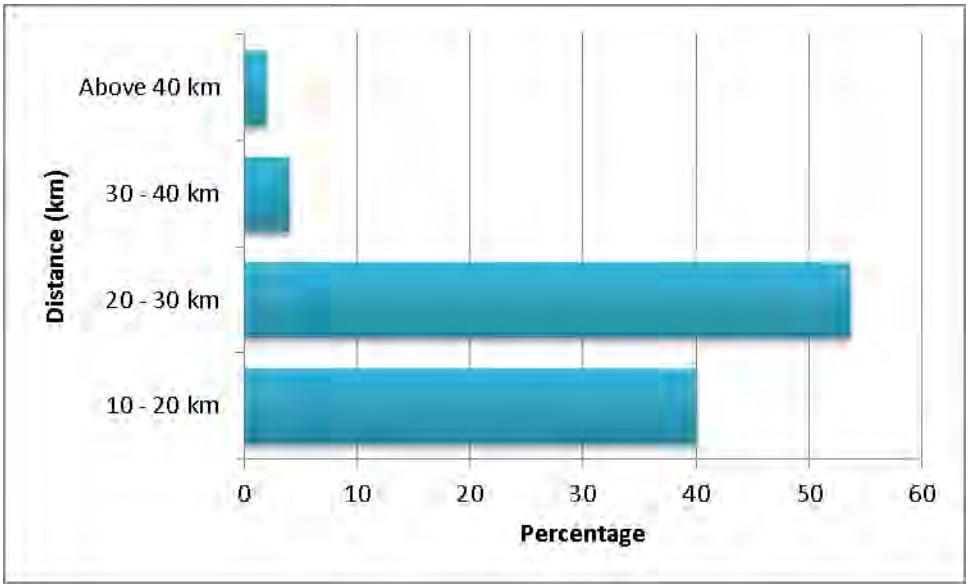
	Item	None	JHS/MSLC	SHS/GCE	HND	Total	P-value
1	How often are you in a hurry to get somewhere when you are driving	1.50	2.00	1.62	2.00	1.81	0.001
2	How often do you drive above the speed limit	2.00	2.30	2.25	2.25	2.26	0.837
3	How often do you overtake another vehicle	1.50	2.24	2.10	2.00	2.13	0.001
4	How often do you use fast acceleration or apply heavy braking as part of your driving	2.50	2.67	2.33	2.50	2.50	0.134
5	How often do you drive under the influence of alcohol	3.00	3.29	3.62	3.50	3.44	0.068
6	How often do you drive without seat belt	3.00	2.67	2.67	2.50	2.67	0.674
7	How often do you drive and at the same time use your mobile phone	3.00	2.80	2.71	3.00	2.79	0.589
8	How often do you become distracted by music, passengers or pedestrians	2.00	2.10	2.48	2.50	2.29	0.081
9	How often do you maintain your vehicle	2.00	1.62	1.65	1.75	1.66	0.471

1=Always, 2= Sometimes, 3=Rarely, 4=Never

The respondents from JHS, SHS; HND and NONE were requested to indicate the behaviours and attitudes of drivers in terms of their driving. The respondents from the JHS/MSLC and their counterparts from HND had the higher average score of 2 respondents when it comes to how hurry are drivers when they want to get to somewhere when driving. This then suggested that respondents from such sectors do not take their time in driving to their destination. The respondents were likely to hurry in driving to their destination as compared to others. The respondents with a p-value of 0.471 indicated how often they do maintain their vehicle. The respondents were asked how often do they drive above the speed limit, the respondents from the HND and SHS scored the average of 2.25 respectively as against their counter parts from the JHS who scored an average of 2.30 in terms of driving above the speed limit. The data above the researcher wanted to find out how often do drivers drive without wearing seat belt. A p- value of 6.74 was scored for all the levels on seat belt. As usual with respondents from the JHS and SHS an average of 2.67 was scored by both educational levels.

Figure 3

Length of Kilometres drivers drive above the speed limit



The respondents from the above data were requested to indicate the length of kilometres drivers drive above the speed limit. With the exception of respondents who drive above 40 km who had 3% as represented above had the lowest score. The majority of respondents do drive above the speed limit of 20-30 km which represented 53% of the total percentage. 40% was indicated by respondents who drive above the speed limit of 10-20 km. The distance in km as driven by the respondents above 30-40 km had an aggregate percentage of 6.

Table 8

Bad drivers on the Kumasi – Dunkwa road by educational level of transport owner and travellers $\chi 2 = 34.350; df = 4$, *p-value*<0.001

	Educational level					Total
	JHS/MSLC	SHS/GCE	HND	Degree	Other specify	
Yes	4	16	24	76	4	124
	100.0%	33.3%	66.7%	79.2%	100.0%	66.0%
No	0	32	12	20	0	64

	.0%	66.7%	33.3%	20.8%	.0%	34.0%
Total	4	48	36	96	4	188
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

From the statistical data above the respondents were requested to indicate if there are bad drivers on the Kumasi-Dunkwa road. The respondents from all the various educational level provided their view to the research question. Majority of the respondents of 124 representing 66.0% were in favour that there are bad drivers on the Kumasi-Dunkwa road. These respondents were suggested by transport owners and travellers with the degree level holding the majority of 79.2% of the total percentage. On the other hand 64 respondents said no to the question representing 34.0% of the total percentage. It is worthy of note that 66.7% who were in not support to the question were from SHS/GCE level of education. Out of the number of respondents of 188 the majority of 96 respondents were from the degree level of education.

RESEACH QUESTION 4

Table 9

Remedial measure by drivers

		None	JHS/MSLC	SHS/GCE	HND	Total	P-V
1	It is important to have road safety course periodically for public commercial vehicle drivers	2.00	1.43	1.57	2.00	1.56	.003

2	The enforcement agencies help in reducing road accidents	1.50	1.85	1.86	1.75	1.83	.527
3	Having more police patrol could reduce trunk road violations	1.5	2.14	1.81	1.75	1.94	.016
4	There is enough road safety awareness for the public and drivers	2.5	2.71	2.67	2.5	2.67	.721
5	The NRSC system is very effective in the Ashanti region	1.5	2.29	2.33	2.75	2.31	.088
6	It is important that every driver have both theoretical and practical training b4 issuing license	2	1.57	1.52	2.5	1.65	.001
7	Award scheme instituted by the NRSC can help reduce road accidents	1.5	1.86	2.00	1.75	1.9	.205
8	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities.	2	1.85	1.95	2	1.91	.601

1=Always, 2= Sometimes, 3=Rarely, 4=Never

Analysis of the table indicates that considering remedial measures by the various educational levels of the respondents depicted that those with HND and those with no educational background (2.00, 2.00 for each) tended to consider organizing periodic training programs for drivers so as to update their knowledge on current trends in driving. It can be found out that the factor of enforcement agencies helping in reducing road accidents had the lowest ratings as compared to the other factors with a mid-point of 1.83. However, in having more police patrol on the road to reduce accidents was highly favoured by those with Junior High School and Middle School leaving certificate background with 2.14 as against a mid-point of 1.94. A further comparison of averages for the factors revealed that the factor of creating enough road safety awareness among the public had the highest of ratings when to compared to all the factors. It is also worthy of note that among these high rankings yet again those with Junior High School and Middle School Leaving certificate background were found to have considered this factor higher than the other with a mean average of 2.71as against a mid-point of 2.67. It could be implied that more respondent considered creating enough road

safety awareness for the public to be more important than the other factors. Refer to table 9 for further details.

Table 10

Remedial Measures by Transport owners/Travellers

	Item	JHS/ MSLC	SHS/ GCE	HND	Degree	Others specify	Total	P-Value
1	Periodic road safety programs for Drivers	1.00	1.17	1.11	1.29	2.00	1.23	0.001
2	The enforcement agencies help in reducing road accidents	2.00	2.08	1.78	2.12	1.00	2.02	0.010
3	Having more police patrol could reduce trunk road violations	2.00	1.67	2.44	2.04	3.00	2.04	0.001
4	There is enough road safety awareness for the public and drivers	3.00	2.67	2.89	2.71	3.00	2.74	0.441
5	The NRSC system is very effective in the Ashanti region	4.00	2.58	2.56	2.75	2.00	2.68	0.001
6	It is important that every driver have both theoretical and practical training b4 issuing license	2.00	1.58	1.44	1.54	1.00	1.53	0.313
7	Award scheme instituted by the NRSC can help reduce road accidents	2.00	1.83	1.67	1.79	3.00	1.81	0.002
8	Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities	3.00	1.83	2.22	2.54	1.00	2.28	0.001

1=Always, 2= Sometimes, 3=Rarely, 4=Never

Table 10 gives the summary of the mean averages for the remedial measures given by the transport owners and travellers. From the table it could be observed that considering the factors the option of having every driver have both theoretical and practical training before issuing licence tended to receive the least mid-point mean average total of 1.53 compared to the other factors. On the other hand creating enough road safety awareness for the public and drivers had the highest ratings than the others with a mean average mid-point total of 2.74 which is higher than for all the other factors.

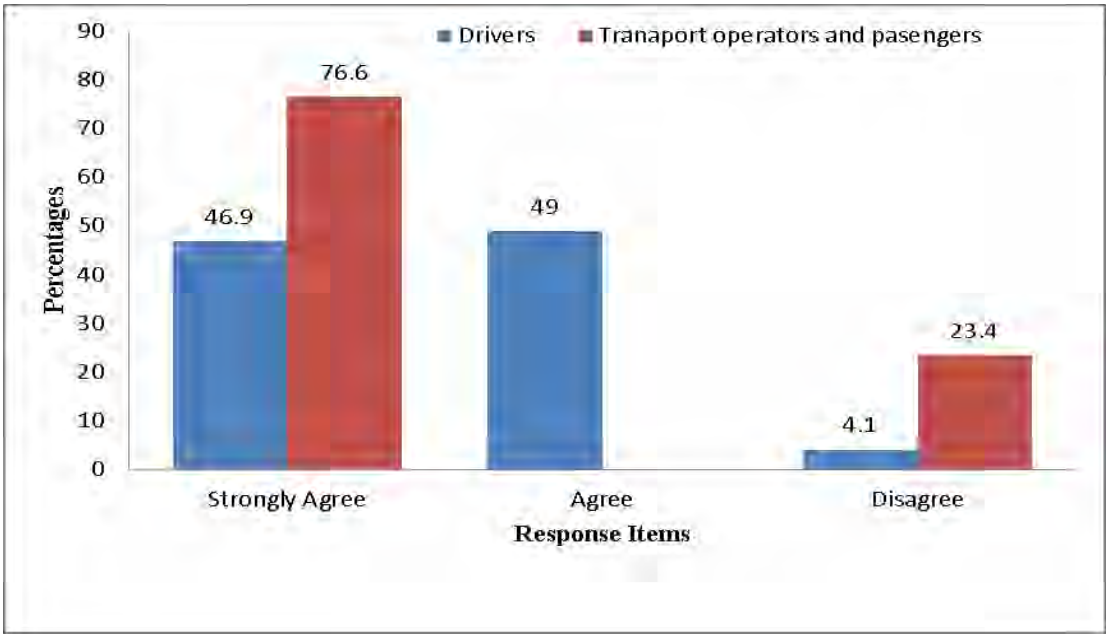


Figure 9: It is important to have road safety course periodically for public commercial vehicle drivers

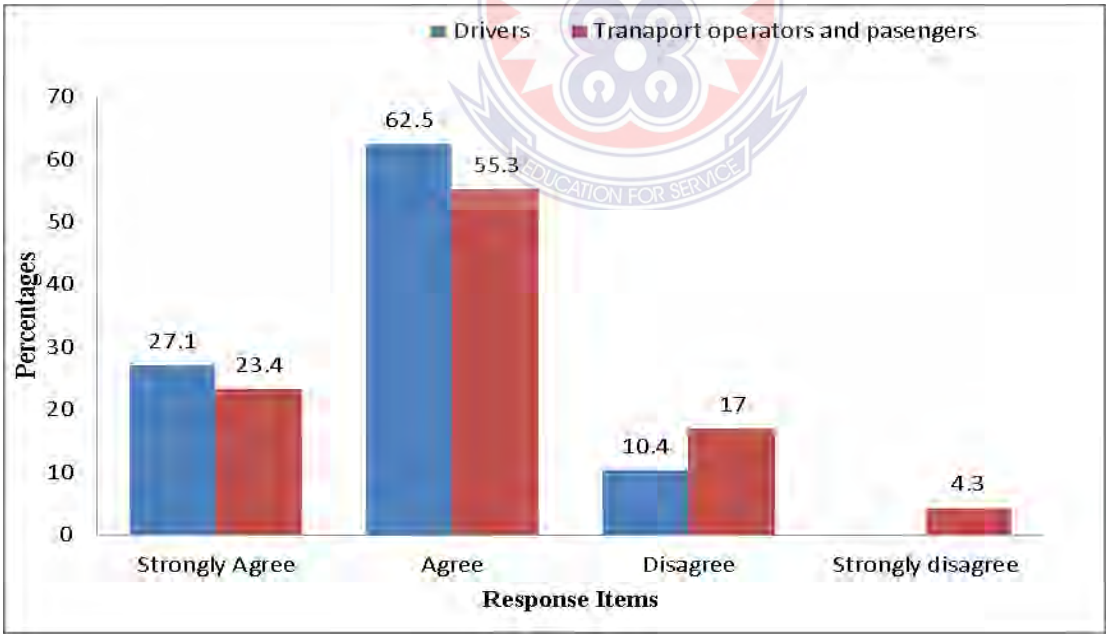


Figure 10: The enforcement agencies help in reducing road accidents

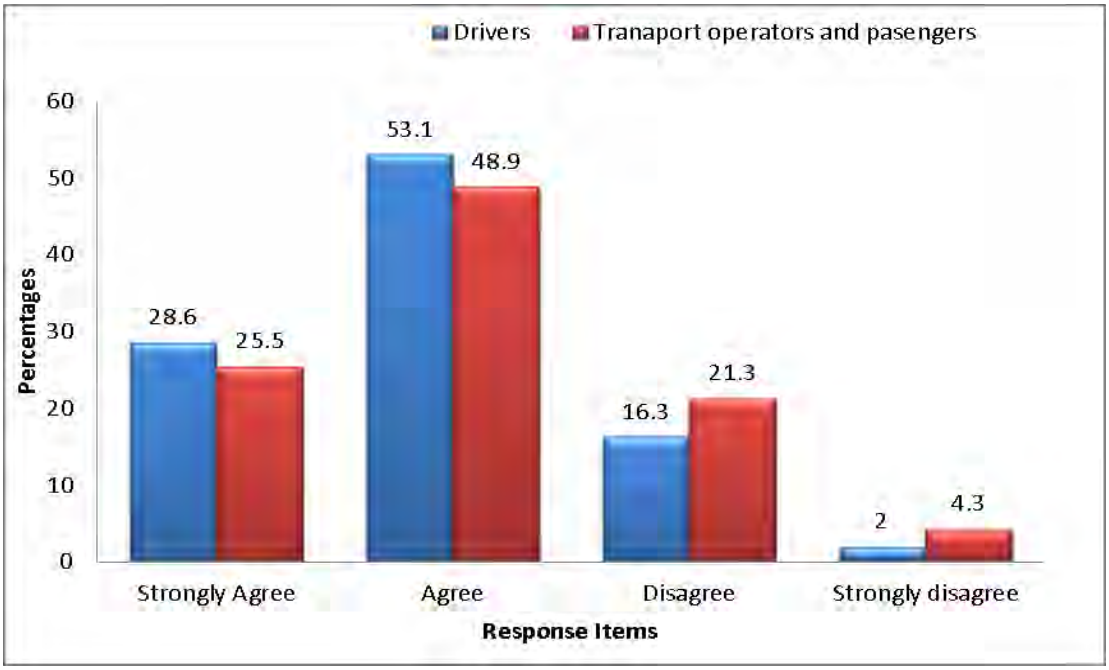


Figure 11: Having more police patrol could reduce trunk road violations

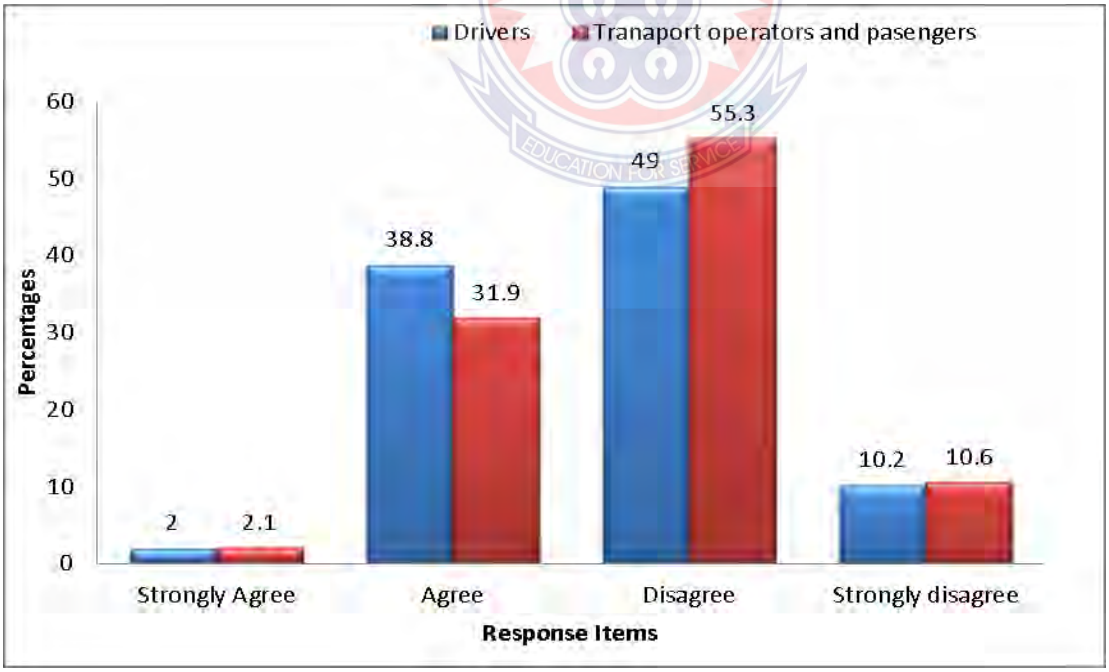


Figure 12: There is enough road safety awareness for the public and drivers

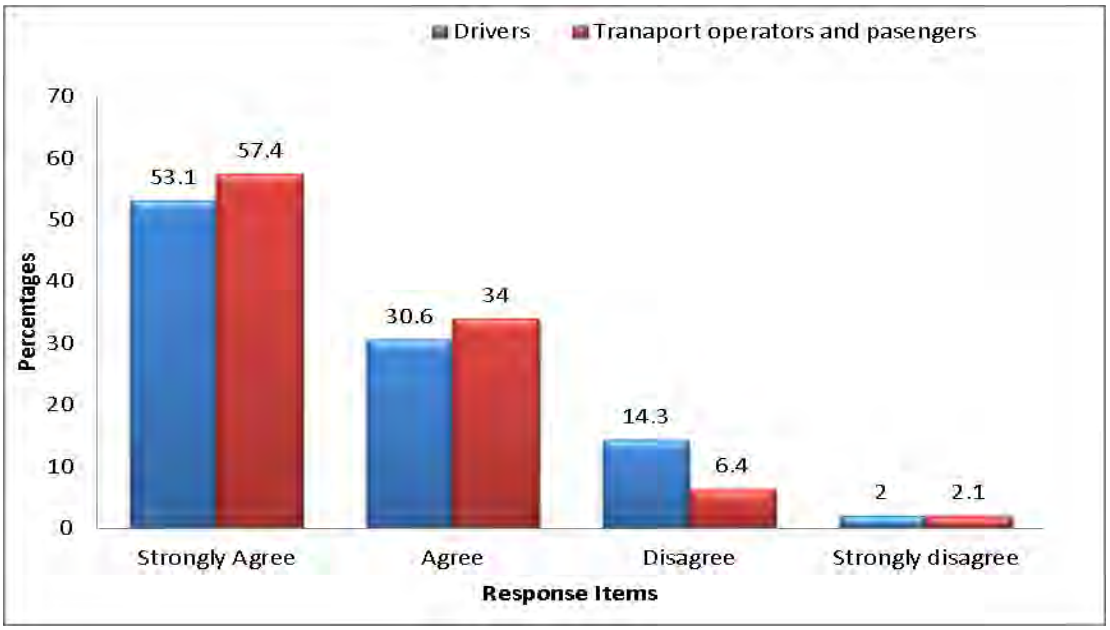


Figure 13: It is important that every driver have both theoretical and practical training b4 issuing license

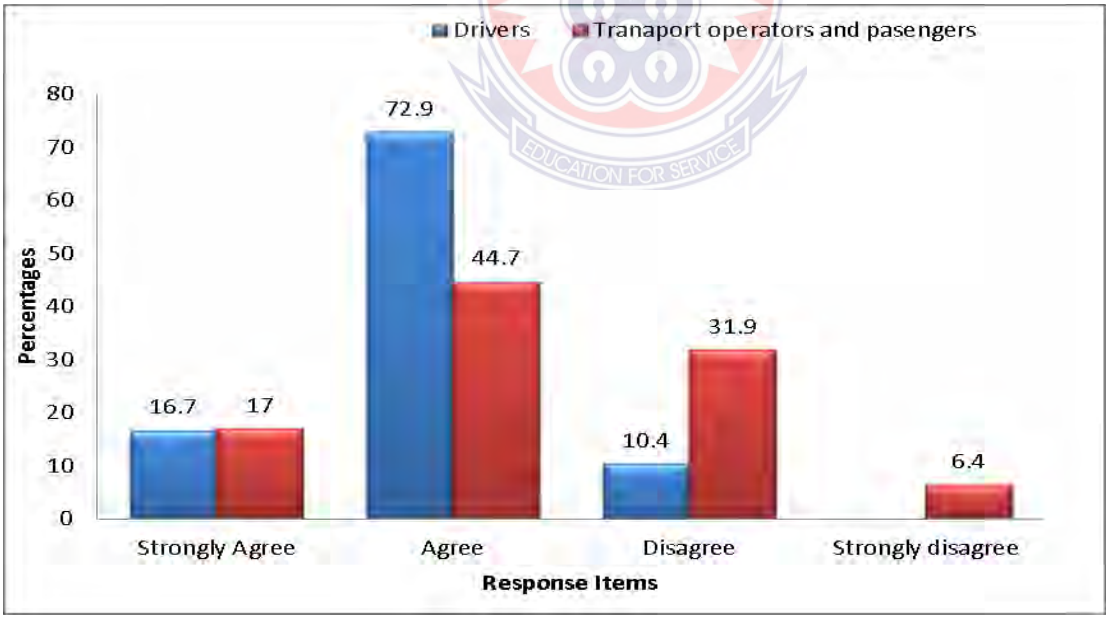
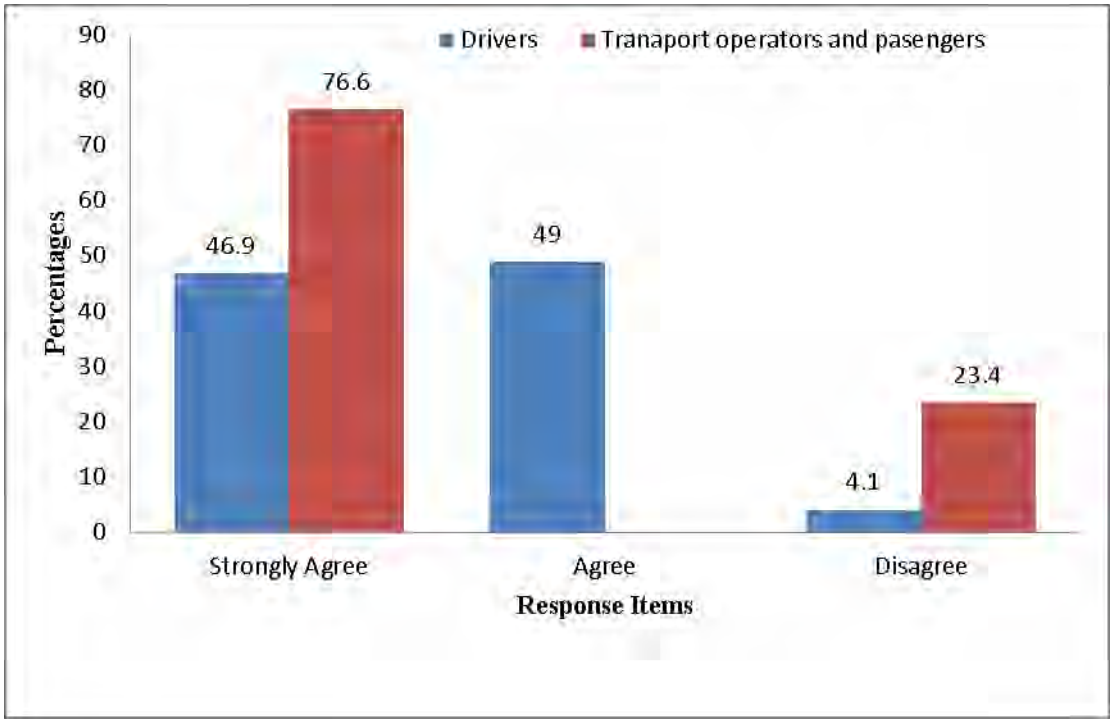


Figure 14: Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities



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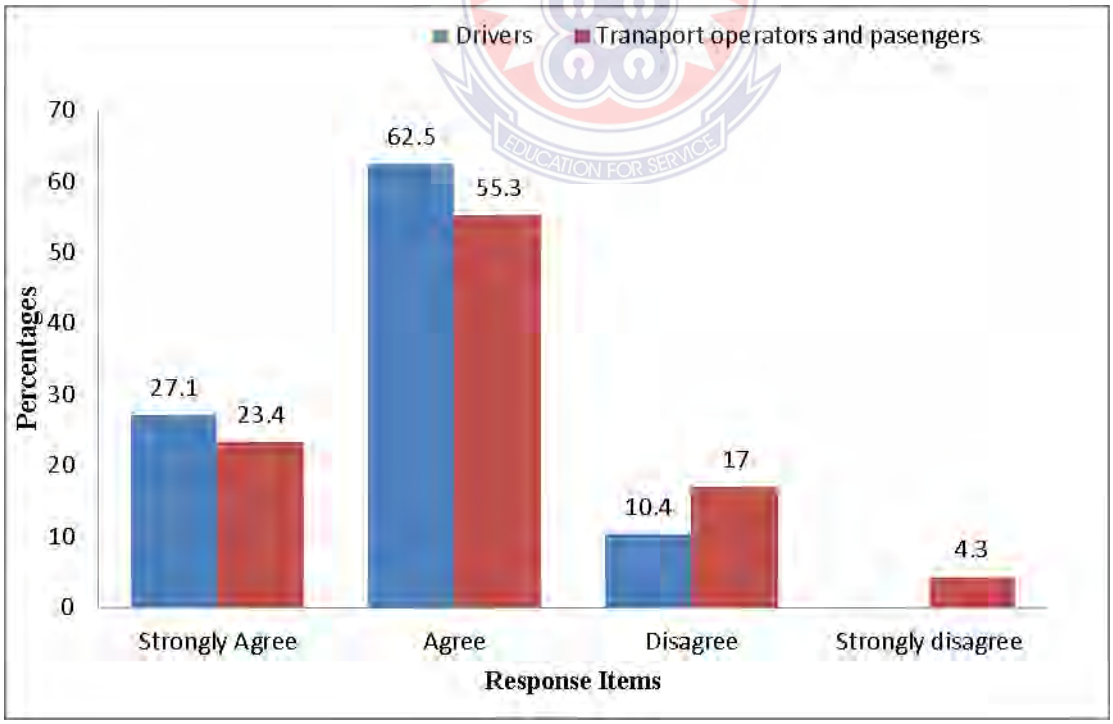

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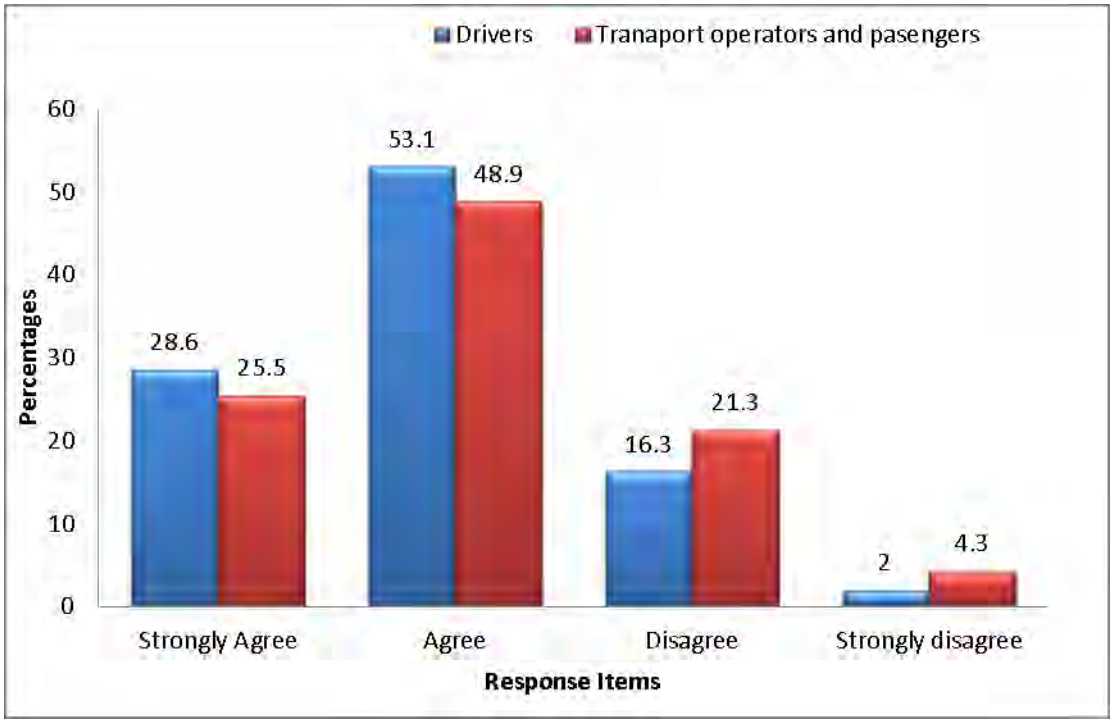
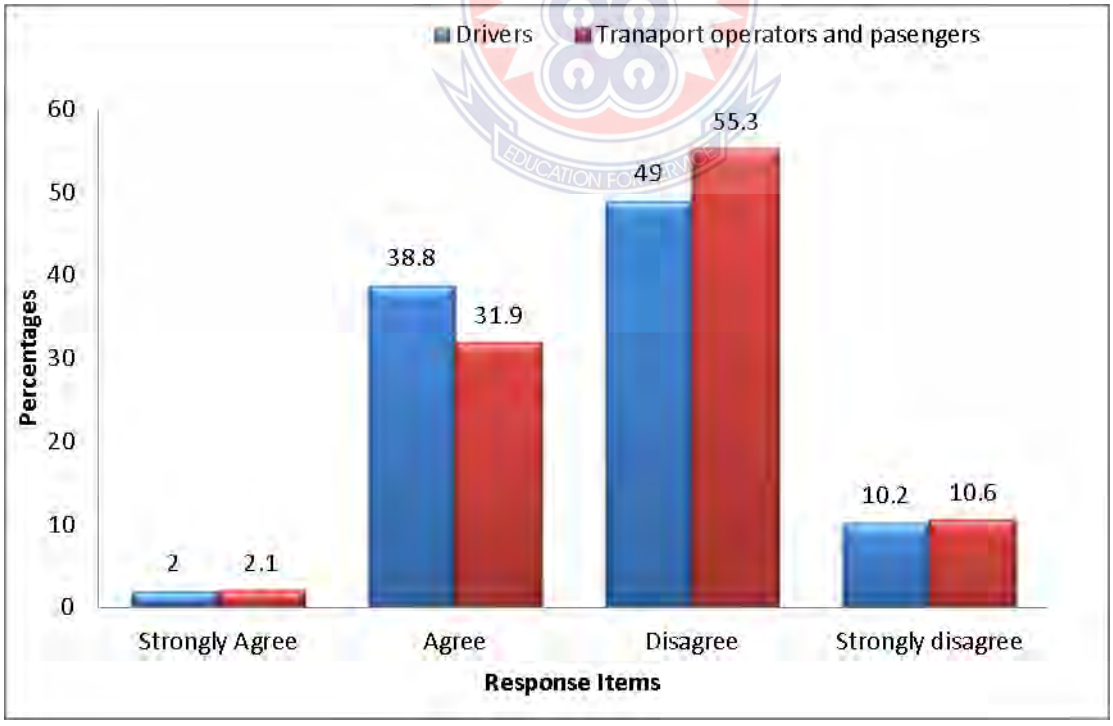


Figure 11: Having more police patrol could reduce trunk road violations



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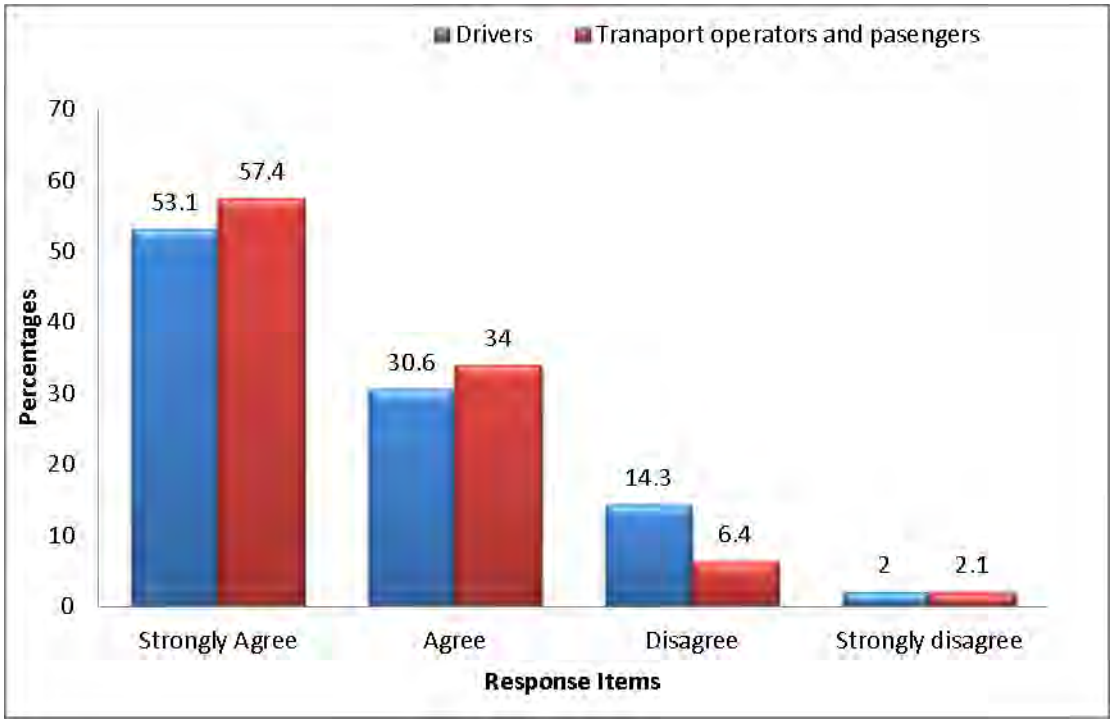

Figure 13: It is important that every driver have both theoretical and practical training b4 issuing license

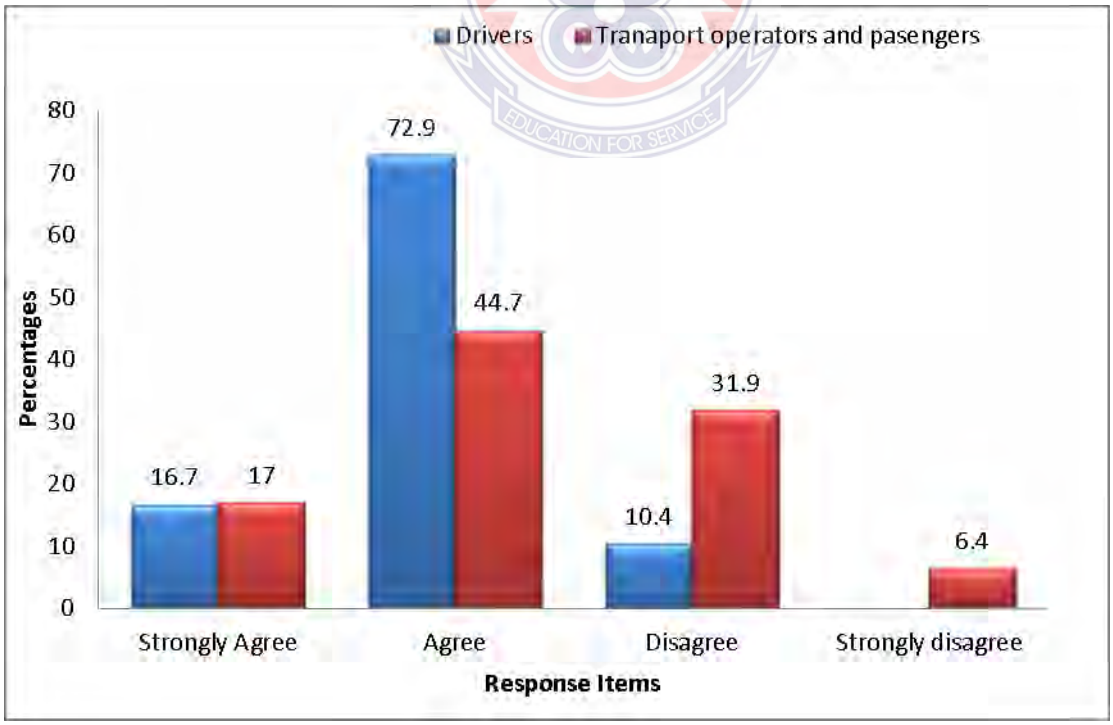

Figure 14: Existing Road Safety Campaign Strategies are better enforced as a means of controlling fatalities