



ADDIS ABABA UNIVERSITY

College of Business and Economics

Department of Public Administration and Development Management

**Causes, Consequences and Policy Directions of Addis Ababa Road Traffic
Accidents**

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Accidents**

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DECLARATION

I certify that this research work titled “(Causes, Consequences and Policy Directions on Addis Ababa Traffic Accident)” is my own work. The work has not been presented elsewhere for assessment and award of any degree or diploma. Where material has been used from other sources it has been properly acknowledged/ referred.

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List of Acronyms

- **AU-** African Union
- **GRSF-** Global Road Safety Facility
- **ITC** – International Technical Conference
- **LMIC-** Low and Middle income countries
- **HIC-** High income countries
- **RTA-** Road traffic accidents
- **UN-** United Nations
- **WHO-** World Health Organization
- **WB** – World Bank
- **UNECA-** United Nation Economic Commission for Africa
- **GDP-** Growth domestic product

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Abstract

This study examines the cause and consequences of RTA in Addis Ababa from 2013/14 - 2017/18 and aimed at recommending policy directions. The methodology used is descriptive research design. Based on the study the main cause for the accidents is found to be human factor particularly related with over speeding of drivers. Other factors like infrastructure, environment and vehicular factor contributed less than 10% of the accidents. The main victims of the accidents are pedestrians that are youth working groups of the society aged 18-30. To reduce the problem the government has set different institutions and legislations. However, the number of accidents has shown no sign of decrease over the past five years. The lack of proper knowledge on traffic safety, research based legislation, poor enforcement of the legislation, lack of coordination and inadequate emergency medical services contributed for the increasing number of accidents. By looking at the gaps of some of the legislative, institutional and policy measures of the government policy recommendations are given to reduce the extent of the problem.

Key words: RTA, Cause, Consequences, Road Safety, Policy Directions

Chapter One

Introduction

1.1 Background of the study

Road transportation is the most widely used and the most dangerous transportation in the world. Road Traffic Accident (henceforth RTA) is defined as an accident that occurs on a way or street open to public traffic, resulting in one or more persons being killed or injured, and involving at least one moving vehicle (WHO, 2009).

According to WHO, annually traffic accidents claim the lives of 1.35 million people a year and injuring or disabling between 20–50 million people worldwide; thus making the loss of 518 billion US \$ globally. Moreover injuries from RTA are “the eighth leading cause of death globally, and the leading cause of death for young people aged 15–29 (WHO, 2013). Following this line of statistics by the time of 2030 RTA is likely to be the seventh leading cause of death in the world.

More than 90% of road traffic deaths occur in low and middle income countries although those countries have 54% of the world’s vehicles. And out of the 54% Low income countries have 1% of the world vehicles but have 13% of road traffic deaths (WHO, 2018). While the overall global fatality rate is 18 per 100,000 people middle-income countries have rate of 20.1 per 100,000 and 18.3 for low income countries (WHO, 2017).

Africa shares less than 1% of the world vehicle but has the highest road traffic fatalities in the world sharing 26.6% road traffic fatality rates per 100,000 people. According to the 2017 UN news reports on road safety at least 650 people were killed daily in road traffic accidents throughout Africa.

Ethiopia being one of those African countries is also impacted significantly by RTA. RTA with multiple fatalities has become a common occurrence in the daily News. Even though there are less than a million vehicles in the country (only 831,000 vehicles) out of which 62% are found in Addis Ababa. The fatality is very high; In 2017/18 fiscal year only 4,500 people have lost their lives due to road traffic accident. (xinhuanet.com, 2018)

In the last five years Addis Ababa 116,581 accidents occurred which took the lives of 2,392 people and making 10,108 people highly injured and causing 6,523 simple injuries. Over 90% of the accidents are caused by drivers error and most of the victims are pedestrian (A.A police

commission report, 2013/14-2017/18). According to the publication from Research Gate, 2018 only 5% of the fatalities account for drivers (Research gate.net, 2018). To reduce the accident the government has created diverse institutions with division of labor, different legislations and also formed a council on road safety however despite the measures taken the problem is still increasing so as the consequences. In addition to over speeding poor road network, lack of proper knowledge on traffic safety, poor legislation and enforcement of the legislation, poor emergency medical services and post-crash treatment are some of the causes of traffic accidents in Ethiopia and in Addis in particular.

This study particularly focuses on traffic accidents in Addis Ababa and attempted to see the major causes of the accident and the consequences the accidents caused on the socio economic life of the city within these five years (2006-2010 E.C). Also it has tried to see the perception of the public towards RTA by taking a sample from pedestrians and drivers. And finally based on its findings of both the overview of the accident over the five year period and the data collected from pedestrians and drivers policy recommendations are provided to minimize the problem of RTA.

1.2 Statement of the problem

Road traffic accident is an alarmingly increasing problem world-wide. It has become a major health problem and a serious economic drain on society. And for middle and low income countries the numbers of the accidents and deaths are higher causing many deaths and economic problems for both families of the injured/dead and as a country. Road traffic accident takes 1-3% of the country GDP every year for middle and low income countries.

In Ethiopia traffic accident is causing great loss of human and economic resource. The problem is increasing as the exposure to this risk increases with rapid motorization (without appropriate regulation), rapid population growth, and increase in the road network coupled with poor attitude and safety culture of road users (UNECA, 2009).

In 2017 over 4,500 have died due to traffic accident in Ethiopia. Addis Ababa takes huge share of the risk because as a capital city there are high population and level of motorization (which is 62% of the vehicles) in the country. On average in Addis there are at least 20 or more accidents within a day (WHO, 2009). During the last five years the accidents have increased rapidly causing consequences on the dwellers ranging from simple crash to death and impacting mainly young working group of the society whose age is 18-30. This brings economic consequences of both

families and the nation as a whole. Although there are activities towards combating the problem, the worsening situation indicates that there are still matters that needs to be addressed.

There has been study's on road traffic accident both by government agencies (both at the national and regional level) and by academicians to minimize the problem. However most of the studies are not social science researches and they are far from policy evaluation and most of them are not recent.

1.3 Research questions

- 1- What are the major causes of the accidents in Addis Ababa during these five years?
- 2- What are the impacts of the RTA both in terms of human and financial recourse?
- 3- What are the gaps of existing policy and legislations to RTA management?

1.4 Research Objective

1.4.1 General Objective

The major objective of the study is to examine the major causes of RTA and impact both in terms of human and capital resources and offer some recommendations to policy makers to reduce the extent of the problem.

1.4.2 Specific Objectives

1. To identify the causes of RTAs in Addis Ababa since in the years 2013- 2017.
2. To identify the consequences of road traffic accidents on Addis.
3. To identify what policy and legislations are there and find out why they are not effective reducing the extent of the problem. Or find out gaps on the existing legal and policy framework to road traffic management and their effect on RTA's.

1.5 Significance of the study

Addis Ababa as it is the capital city there is large number of people and high motorization which increase its risk of vulnerability to traffic accident. It is taking the lives of many and making large number of people impaired. There have been many actions taken by the government to minimize the risk and increase the road safety. However the worsening situation indicates that there are things that needs to be done which needs a careful analysis of the problem. But ensuring the minimization of traffic accidents in the city while there is rapid motorization requires an understanding of its major cause and impacts based on reliable data. That is why the research is

crucial it will try to analyze the causes and impacts of RTA on Addis Ababa city from 2013/14-2017/18.

Identifying this social problem only is not enough unless and otherwise we find the rapid mechanism that solves this high rate of growth of roads accident. Therefore studies like this are very important to help policy makers to focus more on the issue and help them in designing their policies. Since this study analyses RTA of the five year period and then have done current data analysis from the sample population is helpful to policy makers to identify not just the symptom but the real cause of the problem. Also because it provides policy directions to minimize RTA it may help policy makers to use it as an input for their policy actions. In addition since there are few number of social science research particularly policy research on this area it will help other researchers in this field to make further investigation on the issue and use it as an input for their research.

1.6 Scope and limitation of the study

The scope of the study was limited to A.A city. Also focuses on the main causes of RTA in the city from 2013/14 up to 2017/18 (2006-2010 E.C.) and its impact. In showing the trend of RTA within these five years the study pointed out what methods and policy actions are there and tried to identify their gaps and finally provide policy directions. In addition while discussing the impacts of RTA's the study covered the impacts of RTA's on both human and on property.

In terms of limitations while doing the study the researcher faced time and financial constraints. And due to these factors the legislations that were covered on the study were minimized to three besides the transport policy.

1.7 Organization of the study

The Study is comprised of six Chapters. The first chapter consists of background of the study, objectives of the Research, significance of the Study, limitation of the Study, and organization of the Study. The second chapter comprises review of related literature, mainly dealing with different citations of journal articles, books, reports, strategies, guidelines, and other publications will be used to support this research. Chapter three is the methodology part. Chapter four is about the major causes of the accidents in Addis Ababa and their consequences based on the literature. And chapter five is recommendations for future policy directions. While chapter six is conclusion and recommendation part.

Chapter Two

Literature Review

2.1 What is Road Traffic Accident (RTA)?

Traffic- is defined as the transportation of goods, coming and going of persons or goods by road, rail, air, etc. (dictionary.com).

Road traffic is the interaction between humans, vehicles and road infrastructure, subject to legislation and traffic regulations. In this process the human being is a key element, but also the weakest link (Meng Lu, 2007).

Road traffic accidents (RTAs), is an accident that occurred on a way or street open to public traffic; resulting in one or more persons being killed or injured, and at least one moving vehicle is involved. These accidents therefore include collisions between vehicles and animals, vehicles and pedestrians, or vehicles and fixed obstacles. Single vehicle accidents, in which one vehicle alone (and no other road user) is involved, are also included (ibid).

2.2 Risk factors for RTA

A risk factor is characteristic or exposure of an individual that increases the likelihood of traffic accident to happen (WHO, 2009). RTA can results from a combination of factors. Some factors contribute to the occurrence of accident other factors aggravate the effects of the accident and thus contribute to trauma severity. Identifying the risk factors is important in identifying interventions that can reduce the risks associated with those factors.

Traffic accidents are caused by many complex interrelated factors ranging from driver and pedestrian behavior, traffic rules enforcement problem and vehicle and road conditions. Generally, we can classify the risk factors in to three: Human Factor, Vehicular Factor and Environmental and Road Way Factor. Most of the time the latter two causes provide a marginal contribution nearly all traffic accidents involve human error (Haddon, 1980)

A- Human factor

Since the advent of the automobile, human factors have remained the leading cause of traffic violations and increasingly have become a routine source of danger for road users, particularly, passengers, pedestrians and sometimes the drivers themselves. The human element contributes to 90% of all RTA's. In developing countries it is estimated that Human error account for between 64 and 95% of all causes of traffic crashes. The behaviors of drivers who are particularly prone to

over-speeding, lack of attention, improper stopping and turning, violation of traffic laws, etc. have a significant role in many accidents (Mends–Brew*, Dadzie, Dadson, Amoamah, 2018). And among the five key risk factors for RTA determined by the WHO, four are related to human factor. These include speeding, drinking and driving, non-use of motorcycle helmet and non-use of seat belts: ¹

Even though the extent of the problem is not as wide as that of the drivers, the human factor also includes errors of pedestrians. From pedestrians side, not respecting traffic rules and regulations, not using zebra crossings, jumping over highways are some of the activities that cause RTA. Such dangerous pedestrian activities can be generalized as negligence of pedestrians. Therefore behavior of both drivers and pedestrians are important factors to comprehend the causes of traffic accident.

B- Infrastructural and environmental factor

RTA can be caused by infrastructural factors. Construction of roads that are of low standard and improper design can increase the exposure of the accidents. In relation to road design, in the period between a road being planned and a road being built, a number of circumstances can change, such as the volume of vehicles, the type of road users and the weather conditions. Therefore suitable action should be taken for planning and designing future roads (Wang, 2013).

In order to reduce the infrastructural factors for causing accidents proper design of roads that are good for all weather conditions must be built. Such infrastructural measures include i.e. Separation of pedestrians and vehicles roads, building fences to separate pedestrians from cars is important to reduce the exposure to the accident. Generally, if the roads and the sides of the roads are designed and maintained to reduce the risk of collisions and to reduce the severity of a collision when such occurs they encourage the correct use of the road and encourage safe behavior of road users. But if such measures are absent it increases the risk of the accidents.

¹Five key risk factors in road traffic deaths and injuries are: drinking and driving, speeding and failing to use motorcycle helmets, seat-belts and child restraints. Child restraint involves enacting and enforcing of laws that prohibits children from being in front seat, using motor cycle etc. According to WHO report this restraint can lead to 60% reductions in death.

The prevailing weather conditions on the roads can also contribute to crashes; for example, a wet road reduces friction, and flowing or standing water can cause slippage to the moving vehicle. Many severe crashes have occurred during conditions of smoke or fog, which significantly reduce visibility. There are debates on whether infrastructural factors can be considered as one of significant causes for RTA. This is because as seen in developing and low income countries even after the construction of better quality roads the number of accidents still on the rise (Afolabi, J. A. – Gbadamosi Kolawole, T., 2017). According to Fanuel (2006), RTA from road infrastructure and environment takes only 2% of the overall number of accidents. But, however low the significance may be it is undeniable that infrastructure and weather condition play a role. And that they substantially affect both the performance of drivers and vehicles.

C- Vehicular factor

The condition of vehicle also constitutes one of the major factors of RTA. In the road traffic system the reliability of a vehicle is directly related to its liability for causing accidents. Road safety, however, goes beyond periodic check or prompt repair of vehicles. It should be a daily routine of care and check of all components of a vehicle. The main vehicle factors are defects in tires, brakes and inputs all arising from poor maintenance of the vehicle (Afolabi, J. A.- Gbadamosi Kolawole, 2017).

Moreover, accidents can be caused by not having crash protection system. If all cars were fitted with crash protection systems half the number of injuries and fatalities could be avoided (European Road Safety Observatory, 2006).

In high income countries, all vehicles are required to have standard regulations for safety, such as seat belts, airbags etc. However, low income countries lack standard regulations for safety, which means that many pedestrians, motorcyclists and cyclists experience higher RTAs (WHO, 2009).

2.3 Consequences of RTA

Consequences of RTA can be explained or described in the number of fatalities, injuries or accidents costs. It is defined as the number of cases of a certain type of harm per accident, or a number of accidents, of a certain type, for a certain period and a certain geographic area (Meng Lu, 2007).

RTA causes socio economic consequences for both the victims and their families. RTA causes a loss on property since it damages both personal and public goods and most importantly it has a consequence on the health of people these consequences for RTA on health are of three types:

- a- **Fatal Injury**: is any confirmed road crash related death report (either on the spot or any time after the sustained injury).²
- b- **Serious Injury**: is defined as when one or more road user(s) (pedestrians, passengers and drivers) suffered severe cuts, bleeding, breaks, and other damages which required them to receive medical treatment as an “in-patient” in hospital.
- c- **Minor Injury**: on the other hand, is defined as when one or more road users sustain(s) minor/slight cuts, scratches, and other minor damage which require the road user(s) to be treated as an out-patient without requiring hospitalization, and not resulting in fatality/death.

2.4 Targets of Road Safety Measures

Safety measures are actions that should be taken to minimize traffic accidents or increase road safety. Safety measures are estimated mainly by using before and after studies (based on accident statistics), statistical analysis, in-depth studies and systematic behavioral studies. All of these existing approaches have substantially contributed to the knowledge concerning road traffic safety measures, but at the same time leave room for argument (Hydén, 1987). Because accidents are unexpected and unpredictable events, and accident conditions are rather complicated. It is, in general, difficult to give an unambiguous explanation for their cause or to give a reliable estimate based on historical data of the probability of a particular type of accident in the future

Generally all traffic accident measures are targeted towards one or more of the three basic safety dimensions. These are measures to reduce road traffic exposure, accident risk and accident consequence.

² According to the UN standard a fatal crash is when one or more people die as a result of the crash within 30 days. But this day can be more than 30 or sometimes up to a year depending on the country's regulations.

- a) **Exposure** – is defined as a measure for the amount of involvement in an activity to which a probability of certain types of harm is associated. It is a determination of to what extent are certain segments of the population likely to be involved in an accident? (A.S. Hakkert & L. Braimaister, 2002). To reduce the exposure different units of measure may be used, in relation to a certain period and a certain geographic area: (number of) inhabitants, registered vehicles, vehicle kilometers, and road user kilometers, vehicle hours, road user hours, traffic situations, speed limits will be set to reduce the exposure to traffic accidents (Meng Lu, 2007).
The earlier mentioned Actions that should be taken in the pre-accident phase can also be included in this. This is because pre-accident phase actions are also actions to reduce the exposure of the accident from happening.
- b) **Accident risk**- defined as a ratio expressing a number of accidents (all, or of a certain type) per unit of (a certain type of) exposure, for a certain period and a certain geographic area. This distinction between exposure and risk are in accident risk when adding to the probability the concept of expected costs. (A.S. Hakkert, 2002). Reliability engineers use the term risk to express the probability of a well-defined, hazardous event occurring.
- d- **Consequence for accidents**- as mentioned earlier consequences are measured in terms of how much fatal, serious or simple injury they caused and how much property did the accidents cause

2.5 Measures to Reduce RTA

There are many measure suggested by different literatures and global institutions like WHO and UN to improve road safety but here they are generally discussed by classifying them in to four main areas. These can be classified as: (1) legislation and traffic regulation; (2) measures directly acting on driving behavior/human behavior; (3) road infrastructure related measures; and (4) vehicle related measures. Although these measures aim at improving traffic safety by preventing or mitigating human error, their effectiveness is uncertain. This especially concerns measures that act through influencing the driver to drive adequately. Actual driver behavior as a result of a traffic safety measure may be different from what is expected. Current knowledge is still too limited to understand all aspects of human behavior in this interactive system. Traffic safety measures may sometimes also have adverse effects, despite good intentions (Meng Lu, 2007).

1. Legislation and Traffic Regulation and Enforcement

Road traffic related legislation and regulations provide a basic framework for the traffic system. The most prominent of these are the traffic regulations, which are primarily intended to reduce the number and severity of road traffic accidents and to make the traffic process in general orderly. But even drivers that have good knowledge of the traffic regulations may make mistakes. And drivers may also sometimes just ignore the regulations. Therefore in addition to the traffic regulations, other legislation and regulations are relevant for the traffic system, for instance, the legislation and regulations concerning the requirements for vehicle design (Meng Lu, 2007).

For legislative measure to have a substantial effect extensive enforcement is necessary (Hakkert, 2001), and that needs to be continuous to maintain the effect, as it is difficult to influence human behavior in a sustainable way (Evans, 2004).

Legislations can differ among countries. There can be laws on that emphasize on vehicles, legislations on human behavior and laws on infrastructural and road design. Such laws are not limited to safety on the roads but can include transport infrastructure.

Some examples of legislative measures are laws that are enacted on alcohol use, seatbelt use and child restraint and use of helmets. (WHO, 2005)

In general, legislation influences all interactions among vehicle, humans and the road. And the relations can be summarized as follows:

2. Measures Directly Acting on Human Behavior

Human error is causing 90% and above to road traffic accident. Most accidents in middle and low income countries are caused by the drivers' fault. Therefore in order to tackle the problem of RTA it is important to consider measures that focus on human behavior. Some of the measures to address human behavior are information and education (Meng Lu, 2007)

Since legislation by itself is not sufficient enough to foster a positive attitude amongst the population about the legislation through publicity and campaign and inform them about the consequences of breaking the law (ibid). The public also need to be educated about the causes and the socio economic consequences of RTA's so that they become conscious and respect the rules willingly for the sake of their own safety.

Publicity campaigns increase awareness of drivers and help to change their behavior. These are transmitted by media through promotions and other means. In Singapore in 1984 observed that

50% reduction in serious injuries and 9% reduction in fatalities because of the combined effects of enforcement and publicity (ITC, 2014).

Training and education are also a formidable means of effectively dealing with the problem of road accidents. Particularly for drivers training, opening of driving Schools and retraining of operators of vehicles is a necessity. This measure is the best means to ensure that drivers who are entering in the system are endowed with the necessary skills (ibid).

3. Road and Infrastructure Related Measures

Designing better roads and infrastructures can make a major contribution to road traffic injury prevention. The key to Safe Road Infrastructure Design is consistency of standards so that road users do not encounter unexpected situations. Although road crashes are overwhelmingly caused by human failings, the greatest untapped potential to prevent death and injury is through the roads themselves. (Mark W. Greenlee, 2013).

By providing better road infrastructures we can produce a long term solution that helps save lives and reduce injuries. Between 1980 and 2000 in Sweden, the Netherlands and the United Kingdom, this measure combined with speed management measures reduced the number of deaths of vulnerable road users by around a third. (ibid)

Some of the common road infrastructure measures are

1. **Classifying roads functionally** - Many roads have a range of functions, and are built to be used by different types of vehicles and by pedestrians with large differences in speed, mass of vehicle and degree of protection (WHO, 2005). Therefore while designing a road it is better to separate the roads based on their functionality so that RTA's can be reduced.
2. **Designing** "Self - Explaining Roads" and "Forgiving Road Side" by selecting the most desirable design standards (and NOT the minimum standards) involving: designing a speed, designing of effective road furniture vis-à-vis guard rails, using proper signage etc. (Mark W. Greenlee,2013)
3. **Standardizing road signs throughout the country** so that there are common understanding of the meaning of the symbols and signs of roads (ibid).
4. Building of speed breakers, walk sides for pedestrians etc.

By and large, it is important for to acknowledge the key elements of safe road infrastructure design while designing roads since it helps to reduce RTA and the injury level by a large amount.

4. Vehicle Related Measures

Vehicle safety is a key strategy used in addressing casualty reduction targets to achieve a safer road traffic system. It addresses the safety of all road users and currently comprises measures for crash avoidance /primary safety and reduction of injury in the event of a crash /secondary safety. (EU Commission, 2019). Some of the vehicle related measures are designing of vehicles that are based on standards, and having of protective systems.

Vehicles should be built or designed in a way that drivers are able to see all directions and all other vehicles motion. Also they should be designed to offer ample protection and to minimize the injuries of the occupants and the pedestrians in the vicinity, the use of protective devices and restraint systems such as, air bags, seat belts headrests, helmets and child restraints (ITC, 2014).

Protective devices and restraint systems include air bags, seat belts headrests, helmets and child restraints; they are one of the most effective approaches in increasing the road safety for car occupants (The WB group, 2002). Measures for improvements in vehicle design and vehicle maintenance have contributed significantly to crash reduction in developed countries (ITC, 2014).

2.6 Global challenges and measures taken to reduce road safety

About 1.35 million people globally die each year as a result of road traffic crashes that's over 3400 deaths a day. Nearly half of those who die on the world's road are vulnerable road users: pedestrians, cyclists and motorcyclists. Road traffic injuries are the leading cause of death globally among people aged 15–29 years. Men are almost three times more likely to die than women from road traffic injuries (WHO, 2018). And the extent of the problem is higher in low and middle income countries these countries have the lowest number of vehicles in the world, but 90% of the victims of traffic accidents are from these countries. The World Bank (WB) estimates that the cost of RTA's ranges from 1 percent to 2 percent of the gross national product (GNP) of developing countries, or twice the total amount of development aid received worldwide by developing countries (global status report on road safety, 2018).

To minimize the extent of the problem there are many plans and actions done at the global and regional level to reduce the extent of RTA or increase road safety. The last decade witnessed several international policy developments on road safety, raising the policy profile of road safety worldwide. In 2004 the World Health organization Reports that road RTA's are a major but

neglected public health problem causing significant mortality, morbidity and socio-economic costs which require urgent action. Following publication of the report United Nations adopted resolution entitled “Improving global road safety”, which recognized the need for the UN system to support efforts to address the global road safety crisis. In the resolution, the Assembly invited the WHO, to work cooperation with the regional commissions, to act as a coordinator on road safety issues within the United Nations system. (UN, 2011)

On 10 May 2010, the Assembly adopted resolution which proclaimed the period 2011–2020 as the Decade of Action for Road Safety, the plan to reduce the level of road traffic fatalities and save five million lives around the world by increasing activities conducted at the national, regional and global levels (UN, 2011). To achieve this, target governments were expected to be involved at a higher degree (Global status report, 2012). To assess the compliance of member states to the plan and check the road safety, ever since 2009 WHO publishes a status report on road safety of the world every two years ever since.

For the achievement of the plan the WHO recommends that national governments ensure the following key points which include

- 1- The responsible institutions for road safety actions have the necessary human and financial resources to act effectively;
- 2- They develop and endorse a national strategy with realistic targets and earmarked funding for implementation;
- 3- They promote multi-sectorial collaboration in road safety work;
- 4- They promote collaboration between the different sectors involved in collecting data on road traffic injuries.

Other than actions by UN there are also programs by organizations like the World Bank (WB) and other NGO's. The WB particularly has a program named Global Road Safety Facility (GRSF), which was established in 2006 with a mission to help address the growing crisis of road traffic deaths and injuries in LMIC. GRSF provides funding, knowledge, and technical assistance designed to scale-up the efforts of LMICs to build their scientific, technological and managerial capacities (GRSF, 2018).

There are also global road safety partnership, commission for global road safety and many other programs including regional plans and actions such as Africa Decade Plan of Action to help countries reduce traffic accidents.

However to achieve the aim of all the programs and action plans, there needs to be a good implementation by individual states in their own particular context. Thanks to these and other efforts like these ones. There has been some progress particularly in developed countries. A few low and middle income countries have also shown significant progress in enhancing efforts to reduce RTA. For example in Ghana, the availability and accessibility and availability of emergency services have increased. Malaysia also serves another encouraging instance, by separating roads for cycles and cars. However, for many in developing and low income countries, RTA is still on the rise.

2.7 Challenges and measures of RTA in Africa

In Africa particularly in sub-Saharan African countries are low income countries. In addition to the economic problems RTA has become an increasing problem to the region. According to the 2017 UN news reports on road safety at least 650 people were killed daily in road traffic accidents throughout Africa. It has been estimated that 59,000 people lost their lives in road traffic crashes since 1990 and that this figure will be 144,000 people by 2020, by 144% increase. The pedestrians and passengers of public transportation are one of the most affected by those accidents.

The severity of road traffic crashes is also likely to be much greater in Africa than anywhere else, because many vulnerable road users are involved, but also because of the poor transport conditions such as lack of seat belts, overcrowding, and hazardous vehicle environments. Death/injury ratios are, however, not easy to compare because of the differential reporting bias for fatal and non-fatal injuries (US national institute of health, 2007).

To reduce the problem countries in the region has made different efforts both unilaterally and multilaterally as a region. Regionally the AU has its own Africa Decade Plan of Action with the aim of reducing road traffic fatalities by 50% in 2020 and it is also aimed at preventing about one million severe injuries per year (WHO, 2013).

Unilaterally nations have taken some actions to reduce RTA in their countries; some countries have made progress with regard to post crash care and have passed legislation to regulate road traffic risk factors such as vehicle safety standards.

Based on the survey done by African Development Bank in 2013, about 65% of countries have road safety policy. Half of the countries have various legal instruments to implement the policy.

Furthermore, most countries have a central road safety lead agency exclusively responsible for road safety. In most countries, road safety lead agencies do not have the legal power and dedicated financial and human resources. The survey underlines the lack of strict enforcement of traffic regulations. The main reasons pointed as the cause of weak enforcement in their order of importance are lack of trained human resources, facilities and commitment and corruption.

In spite of the efforts done both at the national and regional levels the problem of road traffic accident in sub-Saharan Africa in particular has worsen from time to time. According to WHO report 2016, Africa's RTA per 100,000 populations was 26.6% which is the highest in the world.

The WHO report indicated that, there has been no progress in reducing the number of deaths from RTA in any LIC between the years 2013-2016. Even in 2018 Quartz Africa report referred the continent as the capital for road traffic death by stating "Sub-Saharan Africa is the global capital for road traffic deaths". (Quartz Africa, 2018).

The reason for the increase in RTA in the continent is because the improvements haven't keep up with the "motorization of transport" trend and rising population growth. Meanwhile, the health care shortcomings in many African countries mean that those who survive RTA have no guarantee of adequate post-crash care. As the WHO report puts it: "the proportion of patients who die before reaching a hospital in low-income countries is twice that in high income countries (ibid).

2.8 Approach on Road Safety

2.8.1 The System Approach and The Haddon matrix

In the past to deal with the problem of RTA the focus is only one factor particularly on human factor. It is either the driver or the pedestrian or other road user that is responsible for the cause of the accident. All the measures were targeted at improving the behavior of road users. But now a systemic and holistic/all-inclusive/ approach is used because it is the best way to deal with the problem and implement effective measure.

The holistic approach operationalized through action-focused plans with numerical outcome targets, broad packages of system wide measures, close monitoring and evaluation of performance, and development and application of new knowledge. This holistic approach had evolved into the 'safe system' approach that highlights the shared responsibility and accountability by all parties (world road association, 2013).

Systemic approach/safe system approach/ is an approach that provides a set of design and operating principles to guide action on the journey to reduce and eliminate RTA. It includes all the three risk factors of RTA. It envisions elimination of death and serious injuries in the long term. For this it requires strong governmental leadership, as well as the engagement of a wide range of sectors. The approach influences how interventions are designed and has basic guiding principles these are that accident cannot be prevented but reduced, the system should be designed to reduce human error and the responsibility and accountability for road safety is shared by all road users. Systemic approach is the most effective way of considering and responding to fatal and serious casualty crash risks on a network. It helped reverse the rising trend in road fatalities in high-income countries (HICs) in the 1980s and 1990s.

The Haddon matrix is the well-known holistic method that identifies injury preventions at three phases of accident. William Haddon developed a matrix that identifies risk factors in relation to the three phases of accidents i.e. before the crash, during the crash and after the crash. The Haddon matrix is an analytical tool that helps to identify all factors associated with a crash. It can also help to identify factors associated with a crash and analyze countermeasures that can be developed and prioritized for implementation over short-term and long-term periods. Here first the three phases are each explained and their relations to risk factors are explained in table form.

- a- **Pre-accident phase:** -is the period before the accident happens. It includes all preventive or precautionary measures stages aimed at controlling or abating road accidents. In other words, it implies all situations and circumstances preceding the occurrence of an accident. We can as well evaluate certain conditions that are capable of causing an accident before they are recorded. In short, this phase is concerned with accident avoidance. (Afolabi, J. A.Gbadamosi Kolawole, T., 2017)
- b- **The accident phase:** - this is where the accident cannot be averted. This phase is associated with countermeasures that prevent injury from occurring or reduce its severity if it does occur. Such actions include preventing from further explosion from happening, rescuing the trapped person, protection of the car from further damage, sending for help, etc.
Research had demonstrated that up to 80% reduction in deaths of drivers and passengers can be achieved through the use of safety belts alone. (Afolabi, J. A. – Gbadamosi Kolawole, T., 2017)

- c- **The post - accident phase:** - It is concerned with post -accident treatment of the victims. Involves all activities that reduce the adverse outcome of the crash after it has occurred. There are a series of time sensitive actions that are essential to provide effective care for the injured, beginning with activation of the emergency care system and continuing with care at the scene, transport, and hospital-based emergency care such as near hospitals or clinics (WHO, 2018).

Table 1 The Haddon Matrix

PHASE		HUMAN	VEHICLE & EQUIPMENT	ENVIRONMENT
Pre-crash	Crash Prevention	Information Attitude Impairment Police Enforcement	Road worthiness Lighting Braking Handling Speed Management	Road design and road layout Speed limits Pedestrian facilities
Crash	Injury prevention during the Crash	Use of restraints Impairment	Occupant restraints Other safety devices Crash-protective Design	Crash-protective Roadside objects.
Post-crash	Life Sustaining	First-Aid-Skill Access Medicals	Ease of access Fire to Risk	Rescue facilities Congestion

Table 1- source: Haddon. 1980, 95: pg, 411–421.

2.9 Stakeholders in Road Safety

As explained in the system approach road safety is a responsibility of all and all can have the accountability towards a road accident. Therefore to reduce road accidents and create greater levels of awareness, commitment and informed decision-making at all levels government, industry, international agencies and nongovernmental organizations so that strategies scientifically proven to be effective in preventing road injuries can be implemented. As discussed earlier it is a problem the world is facing and that is why all the global cooperative efforts have taken place.

Therefore any effective response to the challenge of reducing road traffic casualties will require all these levels to mobilize great effort” (WHO 2009). The main stakeholders include:

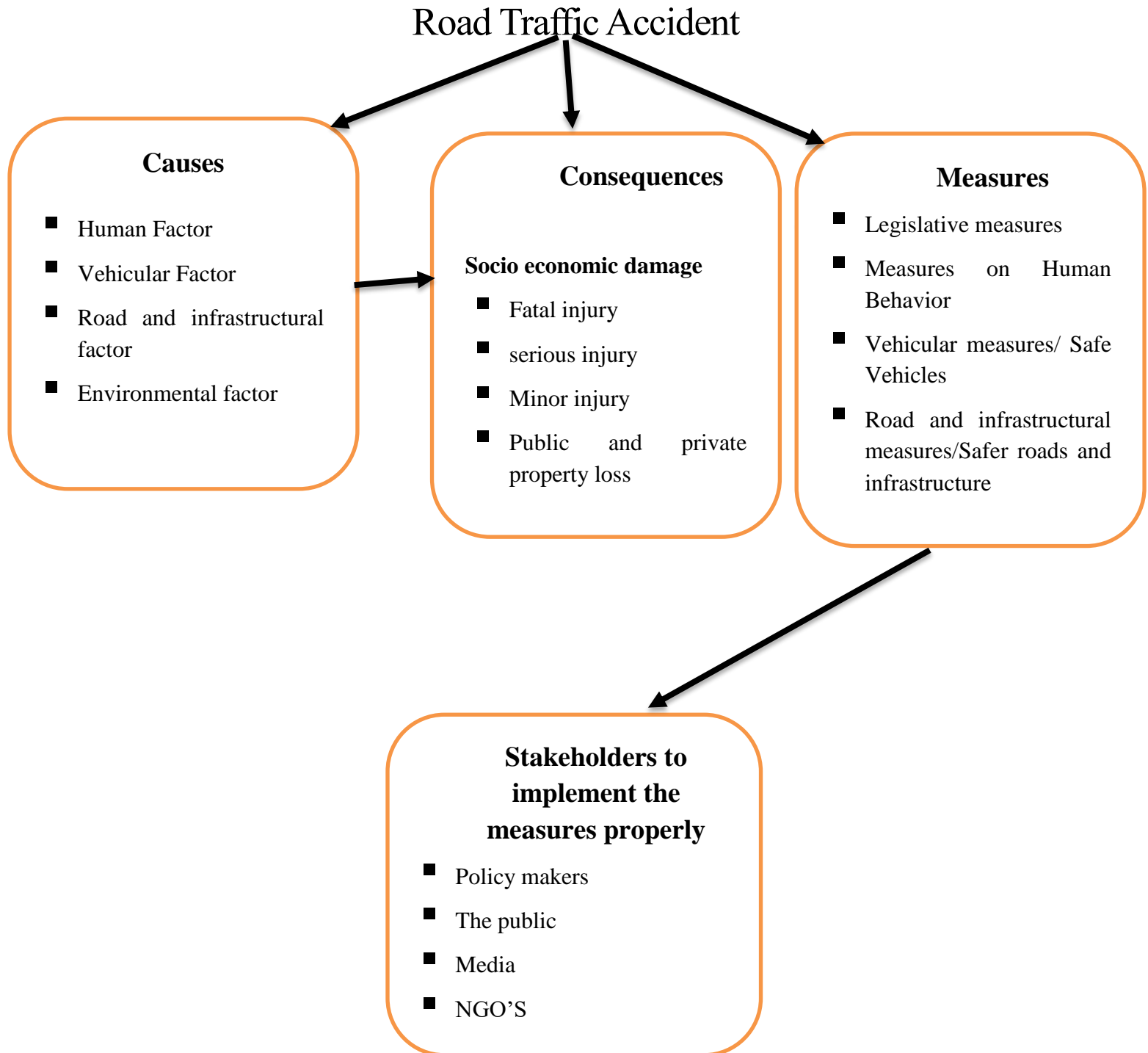
Policy-makers:-they have a responsibility to create national or local plan, enact laws or improve them, enforce or check the enforcement of the legislations and also ensuring funds to support national plan.

Non-governmental Organizations: - they have also a role in ensuring road safety. Through creating awareness raising tools, organizing public events, influencing the creation or modification of legislations and support RTA measures through finance or technical help. By doing all these NGO's can make public awareness n road safety easy and fast also they can be source of input for policy makers.

The public: - they are the major parties to road safety issue. They are affected by the accident they have a responsibility in road safety. They are major stakeholders in road safety measures by joining safety measures, respecting rules and regulations, also victims and survivors of the public can share their stories and create awareness on the consequence of RTA's.

Media:- like that of NGO's media is an important instrument to reach to the public and touch a wider part of the population at a time. They are important and contribute to road safety by reporting about RTA, creating awareness and through mass media campaign.

2.10 Conceptual frame work



CHAPTER THREE

Methodology

3.1 Study Design and setting:

The study is conducted based on the descriptive research design in Addis Ababa city. It mainly describe the nature or condition and the degree of RTA in the city from 2013/14 to 2017/18 and discuss the causes and consequences. In addition the study provides some of the existing legislatures, identify their gaps and provide policy recommendations so as to minimize the problem.

Descriptive research is selected because its main purpose is to describe the state of affair as it exists at the moment. And they help to discover causes by asking the basic questions like what, when, where, when and how without controlling the variables. Therefore, it is used in the study because this study described the factors that cause the accident and the consequences RTA brought in the city over the last five years as they existed at the moment by asking the necessary questions. Also to describe the level of perception and understanding the public has towards RTA and road safety in general will.

3.2 Population and sampling techniques

I. Study Population

The target populations of the research are of two type, from institutions that work on road safety Addis Ababa Traffic Police Commission and Addis Ababa transport Bureau are selected. And to check the level of perception of the city's dwellers drivers of taxi and automobile and pedestrians are selected as the target population of the study.

The drivers are selected because over the five years 90% of the accidents are caused by driver's errors out of which taxi and automobile drivers caused the large number of the accidents. Therefore since they are the main cause of the accident understanding their level of perception towards road safety is important to recommend a better policy direction.

Pedestrians are selected because they are the main victims of the accidents and their errors contributed for 4% of the accident therefore their perception is also important to understand more on the cause of the accident and provide better recommendations.

The city's transport bureau and traffic police commission are selected because the transport bureau is the main responsible organ for the whole transport sector including road safety it makes all the necessary major decisions regarding traffic management and road safety of the city in general while the traffic police commission is mainly responsible for enforcement, investigation and recording of the accident. Therefore the two institutions are important to get a relevant information about RTA in the city.

II. Sampling techniques

The city has over 3.5 million inhabitants and has 62% of the vehicles in the country consequently the whole target population of drivers and pedestrians in the city cannot be covered while collecting a data. Therefore purposive sampling is used to gather information from 100 pedestrian and 200 drivers of two categories taxi and automobiles. Also the since interviewing all the employees in the transport bureau and traffic police commission of the city is impossible due to time constraints only one person is selected from each institution who can give relevant information based on purposive sampling.

3.3 Instrument of data collection

I. Primary data

Primary data is collected in the form of questioners from drivers of taxi and automobile and pedestrians. Also from the cities transport bureau and traffic police commission through a purposive interview particularly in the form of semi-structured interviews. The questioner was a combination of both open and closed ended one and it was be provided for drivers and the pedestrians to fill so that their level of traffic laws and traffic safety are analyzed including their level of perception regarding Addis Ababa's road safety. From the transport bureau and traffic police commission institutions of the target population's primary data was gathered in the form of purposive semi-structured interview.

II. Secondary data

Secondary data is gathered from government bodies particularly from Addis Ababa traffic police commission. The collected data from the police commission contains information about the crash and its frequency, and the main information regarding the socio economic condition of the people involved in the crash. They also include a description of the crash itself, environmental conditions at the time of the crash and vehicular characteristics under investigation.

Also a wide-ranging literature is reviewed on the road traffic Crash data collection and management system from different manuals such as World Health Organization (WHO), thesis done on the issue or literatures relevant to the study including reports of government organs on the issue are assessed in the study.

3.4 About the Study Area

Addis Ababa is the capital of Ethiopia and home for different regional and international organizations such as African Union, the Economic Commission for Africa and others. The city has an area of 540km² and is located in the central part of the country. According to the city's administration report in 2017 the population of the city is nearly 3.5 million. The current administration of the city constitutes 10 sub-cities. Addis Ababa contributes a lot to the economic life of the country. However this importance of the city is accompanied by several problems, RTA being one of the main ones.

RTA have become a major public health concern, like many developing cities in the world Addis Ababa have made very little progress toward addressing the problems related to road traffic accident. Addis is one of the cities which scored a very high number of accidents in a yearly basis and since 2013/14 G.C. the accident rate of the city has increased by 14.4%. The government has made attempts to turn the tide through different strategies. However, the trend shows that RTA significantly been increases.

CHAPTER FOUR

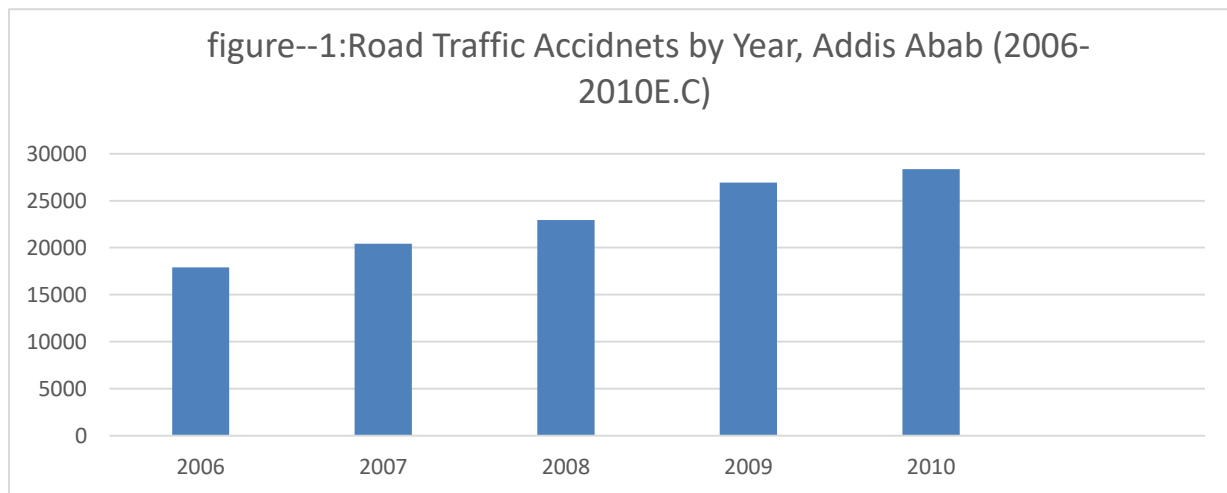
Data Presentation, Analysis and Discussion

3.1 Overview of Addis Ababa's Road Traffic Accident in the last five years

Here the collected data from both primary and secondary sources obtained from respondents will be analyzed by using tables, figures and percentages. The collected data will be interpreted based on the findings. The first part will be presentation of the five year data and its analysis.

3.1.1 Causes of RTA in relation to the three risk factors

Addis Ababa is Ethiopia's major traffic center, fastest growing city, and the heavily motorized urban area of the country with a total share of 62% of the total vehicle in the nation. Consequently thus traffic problem in the city goes hand in hand with this increasing number of vehicles and population size. The city has one of the highest accidents and causality rates in the country next to Oromia region.



Data Source: Addis Ababa Traffic Police Commission

Through the years RTA increasingly become and still is one of the city's major problems. In the last five years RTA shows an increased (figure1) through the years posing a threat to the dwellers of the city. It is taking the lives of many of its dwellers and injuring thousands. Annually due to RTA Addis Ababa experiences 400 fatalities on its dwellers (A.A road safety strategy, 2017).

Accidents are caused by several factors they have been identified in detailed way in the report. However here the causes are summarized and explained by dividing them in to three main factors i.e. vehicular, infrastructural and human factors.

3.1.1.1 Human Factor

The main identified causes of RTA in the city over the last five years were human factors. Human factor includes both the errors of the driver and pedestrians. From the two aforementioned human factors driver's error takes the lion's share 90% of the accidents despite a good weather condition and well-kept city roads. Pedestrian's error contributes only to 4% of the accident. Some of the identified pedestrian error include jay walking or standing on the middle of the road while there are pedestrian walkways.

According to the traffic accident investigation head Instant Inspector Abiye Abera most accidents are caused by driver error. At the end of the last fiscal year (2010E.C.) alone at the drivers error caused 85.9% of the accident while the error of pedestrians contributed to 2.8% of the accidents. Most of those accidents are a result of unfit driver's behavior and over speeding by drivers. In relation to the pedestrians fault the main problems include lack of knowledge, lack of precaution while using the zebra and jaywalking in the middle of crossroads is the main identified problems with the pedestrians. Below some of the major identified human factor elements in relation to the driver that because accidents will be discussed.

a. Driving Behaviors and Over speeding

Driving behaviors related to road crash reports in terms of drivers' not yielding right of way to pedestrians and other vehicles, respecting traffic lights and signs and other related traffic rules. Over the last five years the reasons that led the drivers to cause the accidents among them the three main causes are, not keeping distance, not giving priority to other vehicle and not giving priority to pedestrians which each caused 24%,21% and 12 % of the accident .

All these three main causes are related with over speed driving as stated by Instant Inspector Abiye Abera "all this above mentioned causes are caused by over speeding because if the driver was driving based on the stated speed limit he/she could have controlled the vehicle from hurting people or causing an accident. Because most drivers over speed they cannot brake before they caused an accident". And most of those accidents happen due to not respecting the stated speed limit. The stated speed limit in the city is 60km/hr for automobile, 40km/hr for taxi and 30km/hr

for heavy cars. But this limit can be adjusted by the traffic management depending on the type of road and research.

b. Driving experience

Over the last five years most traffic accidents in the city are caused by errors of drivers that has 2 and above years of driving experience. Out of all the accidents 31,787 of the accidents are caused by errors made by drivers who have 2-5 years of driving experience and 30,098 of them by drivers having 5-10 years of experience. This indicates that higher accidents are recorded by errors of drivers who have more than 2-10years of driving experience. (See also table 2).

Table 2- Driving experience of drivers who caused accident

Driving Experience							
No	Driving experience	2006	2007	2008	2009	2010	Total
1	Person with no license	133	112	126	253	327	951
2	Less than 1 year	1849	1795	1735	2071	1691	9141
3	1-2 years	3069	3961	3197	4912	5426	20565
4	2-5 years	4221	4725	6248	6771	9822	31787
5	5-10 years	4690	5860	6076	7152	6320	30098
6	More than 10 years	3630	3613	5189	4938	4349	21719
7	Unknown	312	366	368	844	429	2319

Data source: Addis Ababa Traffic Police Commission

c. Level of education

Accidents are mostly caused by drivers' error and there is a perception that if a driver is more educated there is a low tendency for her/him to cause an accident. Because the driver knows more and if educated he/she will most likely respect the traffic rules. Due to this reason in order to have more educated drivers the government has set a new regulation in 2017 that introduced that all drivers with exception of motorcycle drivers to have an education level of 10th grade or above which was formerly 8th grade.

As stated by the Takele Lulena Desse Deputy Head of Addis Ababa Transport Bureau “the main cause of accident in the city is related with lack of discipline among drivers.’ If a driver has a better

educational level his perception will also be better. Therefore the logic behind this new regulation is that the better the educational level of the driver the better he/she understanding and respect traffic rules of the city”.

However, according to the report by Addis Ababa traffic police office, 50% of the accidents are caused by drivers with secondary education and above. Out of the whole accident 34% of the accidents were caused by drivers having secondary school education and 29% by those who attended preparatory school. Only 0.9% are caused by those who have no or basic level of education. (See also table 3)

Table-3 education level of drivers who caused accident

NO.	Education level	2006	2007	2008	2009	2010	Total
1	Illiterate	25	14	15	10	7	71
2	basic education	178	340	238	126	117	999
3	primary school	2341	3213	4634	4440	3795	18423
4	secondary school	5474	6263	7157	10047	10803	39744
5	preparatory school	6096	6583	6524	7233	7923	34359
6	above preparatory school	3478	3653	4003	4681	4879	20694
7	Unknown	312	366	368	405	381	1832

Data source: Addis Ababa Traffic Police Commission

d. Age factor

Over the past five years accidents are caused by drivers found within all age groups. However, most 44.6% accidents are caused by young adult drivers aged 18-30.

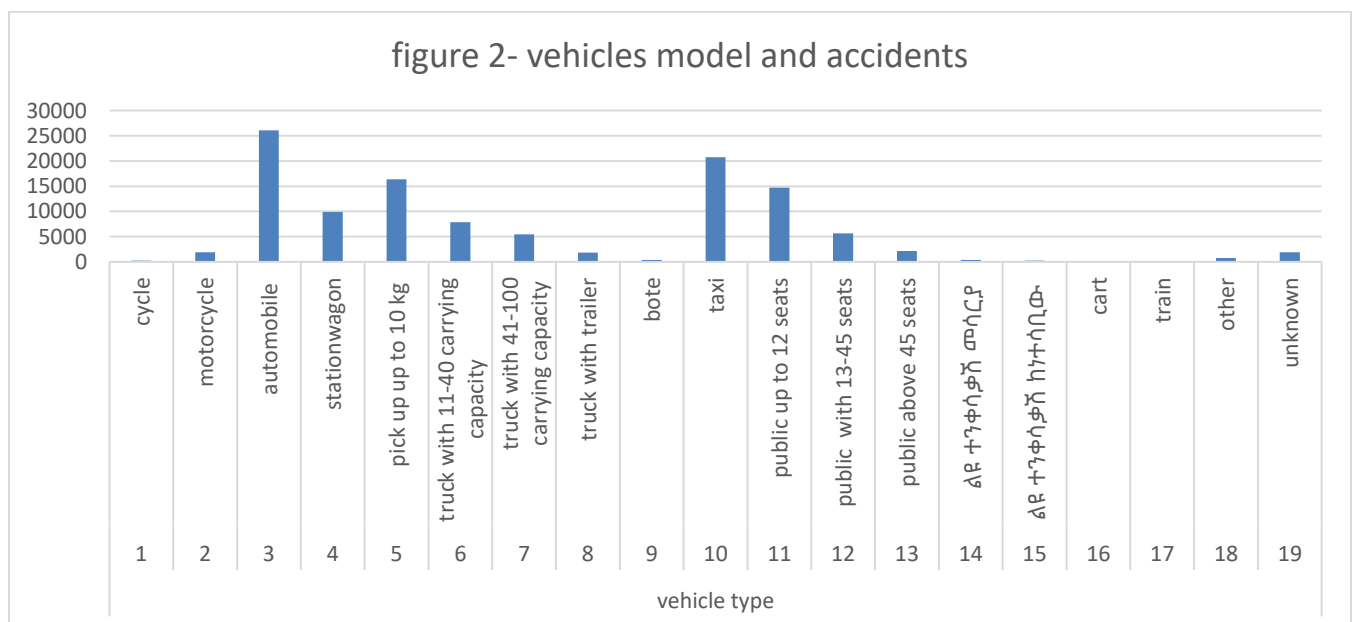
Table- 4 age of drivers

Age	2006	2007	2008	2009	2010	Total
below 18	131	495	13	67	536	1242
18-30	7818	9657	10409	12862	11248	51994
31-50	6984	7274	9190	10162	11493	45103
above 50	2659	2640	2959	3455	4658	16371
Unknown	312	366	368	396	429	1871
Total	17904	20432	22939	26942	28364	116581

Data source: Addis Ababa Traffic Police Commission

e. Model of vehicle

In the last five years accidents were exhibited by drivers of all models of vehicles. However, the two main types of vehicles that caused accidents were automobiles and taxi. These two caused over 40% of the accidents. Automobile drivers caused 23% of the accidents while taxi drivers have a share of 18% of the accidents. Even though the highest accidents are recorded by automobiles and taxi drivers there are also drivers of other vehicle types on which higher level of accident is recorded such as drivers of passenger transportation which have up to 12 seats causing 14694 (13%) of the accidents and pick up car drivers causing 16398 (14%) of the accidents. The details of the accidents is indicated here on the graph below.



Data source: Addis Ababa Police Commission

3.1.1.2 Vehicular Factors

These include different problems on the vehicle that led to the cause of the accident. As identified by the Addis Ababa traffic police commissions the vehicular factors include light problem, technical problem, damaged tire and other mechanical problems. Over the last five years vehicular factor contributed to only 4% (7221) of the accidents. And the leading vehicular factors include mechanical problem which contributed to 30% while steering wheel problem contributed to 21% of the vehicular factors. And (1.6%) 1873 number of accidents where caused by vehicles whose problems are not known.

The issue that is mostly raised with vehicular factors is that since most imported cars in the city are used how that is not going to affect the road safety of the city or contribute to RTA. Deputy Director of Addis Ababa transport bureau, Mr. Takele Lulena explains

“Of course most of the imported cars in the city are used cars however when they are imported we take a technical inspection on all cars if the car has a clear technical problem we won’t let it be used. Since we check the cars because they are used could not cause a serious threat to the road safety of the city. In relation to vehicular factors the main thing that is causing traffic accident in the city is not the fact that the imported cars are mostly used but the drivers not being familiar with the cars. Example could be the issues of Sino trucks, they are new cars that are imported in our country but when the drivers of Sino trucks cause accidents they said that they could not control the brake however the problem is not with the technical problem with the brake of the vehicle rather the drivers not being familiar with the vehicle”.

Abiye Abera’s explanation also agrees with the words of Takele “The level of contribution of vehicular factor to the traffic accident of the city is very minimal. Even looking at last year’s data, vehicular factor contributed only to 3% of the total traffic accident in the city. Of course it can be stated as one of the factors however it is not the main problem the city is facing in relation to traffic accident. The main factor is the human factor.”

3.1.1.3 Infrastructural and environmental factors

In terms of roads Addis has a better infrastructure quality compared to other parts of the country having 5,915 km length of roads out of which 2,616km are surfaced with Asphalt which is around 44% of the total network. However infrastructure is not only limited to the road coverage or its type but also the quality of the roads. It also includes the existence of other infrastructure such as traffic lights, zebra crossings, speed barkers, street lights etc. They are physical factors related to the road that cause or contribute for the accident to happen.

Environmental factors include both the weather and light conditions of the place during the time of the accident. Over the last five years the road quality and environment together have contributed to 1.5% of the accidents. More than 90% of the accidents occurred on roads that are straight and dry, at the day time and with good weather condition.

All in all the accidents are caused by three main factors, human, vehicular and infrastructural factor. Each contributing to 90%, 4% and 1.5% of the accidents respectively while the rest 0.5% are unknown problems. The majority of the accidents are caused by human factors particularly in relation to the driver. Higher numbers of accidents were caused by automobiles and second by taxi drivers who are male aged 18- 50. And by those who have an education of at least secondary level education and above with a driving experience of minimum two up to ten years. In addition, most of the accidents occurred on city roads, in day light and with cars that have no technical faults.

3.1.2 Consequence of RTA

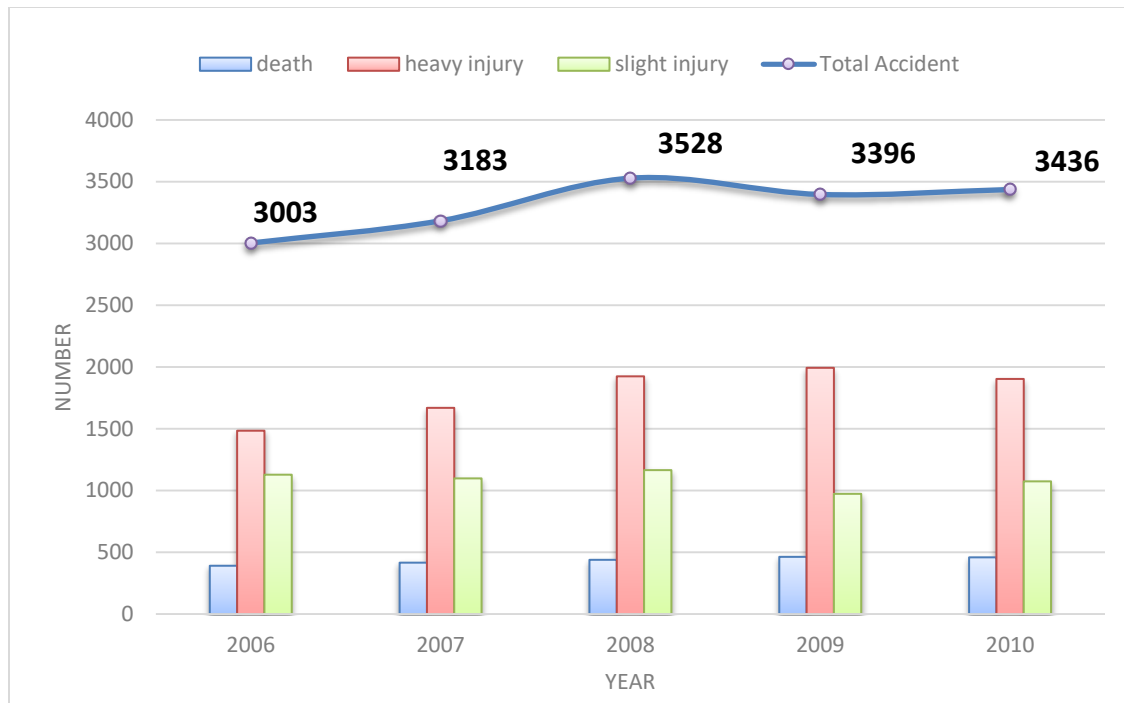
Over the last five years the accidents have caused a colossal damage to the public and private property. The consequence on the people are measured in terms of how much death/fatal injury, heavy /serious injury and how much simple injury the accident caused.

In Addis what is considered as a fatal crash is if a one or more individuals die as a result of the crash within the same reporting year. But this definition differs with UN standard which limits the date up to 30 days.

The damage on property is measured both by the damage done on the vehicle (that is in the form of high and simple damage) and it is estimated in terms of financial costs. Also on the report the term people refers to the three types of people together which are pedestrians, passengers and drivers.

From the year 2006-2010 EC a total of 116,581 accidents occurred out of which 19,023 occurred on people causing 2392 deaths/fatal injuries, 10108 major injuries and 6523 simple injuries. And (76.3%) of the victims were male while (23.6%) are female. From 2006 to 2010 the number of accident on people has increased by 433 (14.4 %) accidents. But from the five years the highest number of accident on people is recorded was in 2008 E.C. a total of 3,528 accidents (i.e. on average 9 accidents were happening each day. Compared to 2008 the number of accidents on people has decreased but in 2010 it has once again shown an increase. See also figure (4). However, the total number of accidents both on human and property have increased throughout the five years.

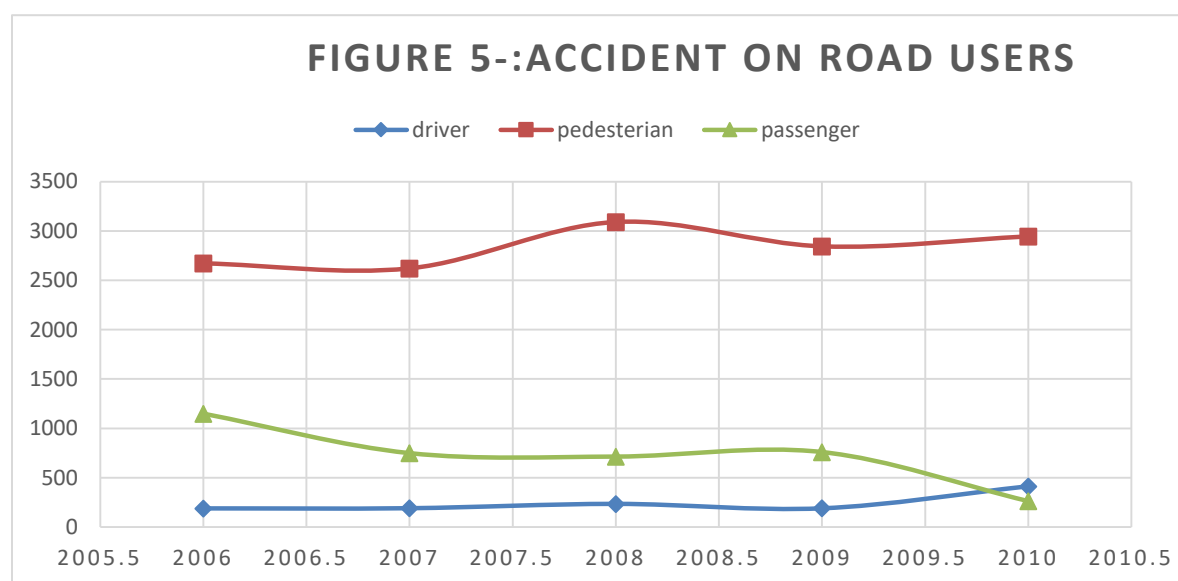
Figure 3- casualty on people



Data source: Addis Ababa Police commission

From the total number of vehicles found in the country, 62% are found in the city out of which 26% are public transports and only 4% are privately owned cars. Majority of the people in the city are pedestrians who are the main victims of road traffic accident. In the last five years from total of 19,023 accidents occurred on people 14,173 occurred on pedestrians, 3,635 on passengers while the remaining 1,215 accidents occurred on drivers. Drivers are the third victims of road traffic accident next to passengers however in 2010 the number of accident on drivers has

Increased by 150. In that year drivers become the second victims of RTA (see also figure5).



Data source: Addis Ababa Traffic Police Commission

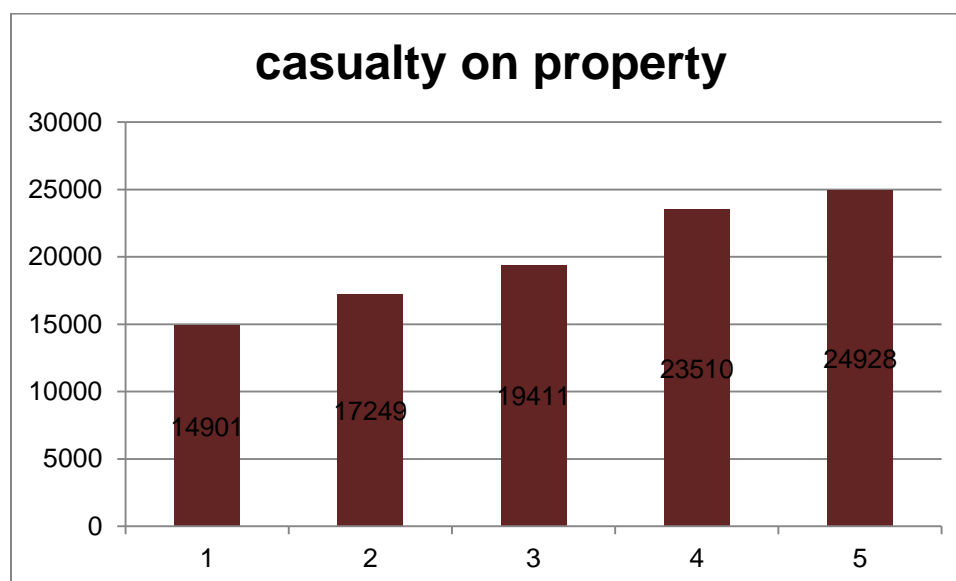
The number one victims of the accident in the city are pedestrians that are youth working group of the society that do not have any kind of previous impairment. Out of the 14,147 pedestrian victims 53.1% (7,526) of them were employees who are the working group of the society and 48.8% (6,910) of these victims were youths who are aged 18-30. 96.7% of these victims did not have any previous physical impairment.

Most of the accidents occurred while the pedestrians were crossing the road on the zebra cross. Out of the 19 actions of pedestrians mentioned by the commission the two main actions of pedestrians during the accident are when they were crossing the road on the zebra and while crossing on a road with no zebras. From the total of 14,147 of pedestrian victims on 26.4% (3,733) of the victims the accident happened while they were crossing the road on a zebra line. Also 21.4% (3,034) of the victims were crossing on a road where there were no zebras for pedestrians. (See table 1). In the last five years the overall casualty on people caused by RTA, on pedestrians 2,050 deaths, 7,614 heavy injuries and 4,483 simple injuries has been recorded, on passengers 336 deaths, 1,312 heavy injuries and 1,249 simple injuries and on drivers it has caused 100 deaths, 536 heavy injuries and 579 simple injuries has been recorded.

In addition to casualty on people there are casualty's recorded on properties. Comparatively the casualties on property are higher than that of people. Over the last five years 249,762 properties

have been damaged by RTA out of which the 149,763 are casualties of vehicles. When these casualties on property including vehicles are interpreted in terms of money they are valued as 1,006,936,085 birr. This amount of monetary asset has been lost by RTA within the last four years (2006, 2008, 2009 and 2010) and excluding the monetary value of the casualty of year 2007 because of the absence of data on the value of money lost that year. Throughout the five years the number of casualty on property has shown the largest increase in the last year (2010). (See also figure 6).

Figure-5 casualty on property



Data source: Addis Ababa Traffic Police Commission

From this it can be clearly stated that over the last five years (2006-2010E.C) road traffic accident has impacted the lives of 19,023 people and their 95,115 families³ while leaving 2,468 deaths, 9462 heavy injuries and 6311 to have simple injuries. In addition to the loss of life and causing simple and heavy injuries it has cost the city beyond 1,006,936,085 birr which is 1% of the city's 2011 budget⁴. This amount of money is without including the medical expense of injured people.

³ According to United Nations Database of Household Size and Composition 2017, there are 4-5 people within a household. Therefore multiplying 5 with the 19,023 people affected by RTA we get 95,115.

⁴ According to new business Ethiopia report on July, 6 2019 Ethiopia has a budget of 12.8 billion\$ which the capital will take around 55% which makes the budget of the city 19,008,000,000,000 birr.

As clearly stated above, it is evident that most of those victims of RTA are youth working class of the society who directly support themselves or their family. Therefore, whatever happened on the victims due to RTA regardless of whether it is death, heavy or simple injury or loss of property, directly affects their families. In a nutshell RTA is costing the city too much both in terms of the people and money. It is killing and injuring healthy working youths of the society and impacting their families as well as costing more than a billion on average annually.

3.2 Measures taken by the government

The government has taken different measures to enhance road safety in general and reduce RTA in particular. The government has taken measures which include regulatory framework, infrastructural, institutional setting and awareness creation.

3.2.1 Existing policy frame works

Addis Ababa does not have a policy that is distinctively set to reduce RTA but it is included in the transport policy as one of the basic issue. In 2011 Addis Ababa formed a transport policy that is targeted at overcoming the main challenges of urban transport which one of it is high rate of road traffic accident. The policy's main objective is "to provide safe, efficient, comfortable, affordable, reliable and accessible transport service for the urban dwellers". The term safe implies a transport system that is safe from RTA. In order to achieve this objective the policy has identified 11 key policy areas and strategies. Among these three are directly related to enhancement of road safety and reduction of RTA these are the following.

- a) **Expansion of transport infrastructure:** - includes increasing road network coverage and since large number of people are pedestrians expanding pedestrian walkways and segregation of roads.
- b) **Ensure traffic safety:** - the policy aimed at reducing the loss of life and property due to RTA through the following Strategies
 - * Organize traffic safety data base, - there are now a uniform reporting database in all traffic police offices.
 - * identifying black spots – it is not being implemented until now
 - * establishing traffic operation centers to coordinate efforts

- * prepare traffic safety directives and manuals ,
 - * launching broad awareness raising program,
 - * Strengthen traffic enforcement measures
 - * build capacity and engage in effective traffic control,
 - * taking stringent and timely vehicles' technical inspection,
 - * upgrade drivers education and training,
 - * apply strong control on drivers that use alcohol and drug,
 - * introduce pedestrian traffic signals with sound and picture on major intersections for safe crossing
 - * Introduce vehicle speed control measures and apply modern monitoring technologies
 - * Establish traffic safety council at different levels and encourage the public to contribute to traffic management
 - * Encourage traffic safety research to minimize accident
- c) **Employ integrated and modern traffic management system:** - this includes ensuring proper functioning of traffic signals, signs, road markings, roundabouts and junctions that facilitates to make more smooth traffic flow, ensure periodic maintenance and avoid the traffic signals.

The policy can be said to have covered the necessary base. However the implementation shows gaps. Although there has been a good progress in building infrastructure the segregation of roads is yet implemented properly. Off course there are pedestrian walk ways but they are not based on a standard that considers the users and weather conditions. Many walk ways are very narrow compared to the number of people who use them.

In terms of drinking and driving control the enforcement started late and is not consistently implemented due to the testing machines are imported and need hard currency for that.

The other point is that there is no black spot identification in the city. According to instant inspector Abiye Abera “there are no works related to black spot identification but we sometimes record sub cities that has the highest accident in the last three years or more but we don’t clearly sated roads as a black spot”.

In terms of public awareness there are awareness programs especially in terms of running advertisements against drinking driving and over speeding. But other than that there is barely anything. Also the strategy does not clearly state how it is going to encourage research on accidents and in what areas to cooperate with universities and other research institutions in this regard.

3.2.2 Existing institutional frameworks

There are institutions that are set to work on road safety. These are interrelated with other sectors because the issue of road safety includes interrelations between large numbers of institutions ranging from governmental to non-governmental institutions. Here only the actions of four main governmental institutions that are responsible for enhancing road safety will be discussed.

A. Addis Ababa Transport Bureau

Addis Ababa transport bureau is institution that has the highest authority that work on road safety issues of the city. It is established by 468/2005 proclamation of transport. The proclamation established a transport ministry at the national level and regional level including in Addis Ababa. The ministry in general is established to implement the transport policy and monitor its implementation nationally while the Addis Ababa transport bureau is responsible for the same task in the city.

The main aim behind the establishment of this bureau is as stated by the proclamation the following,

- * promote an ,efficient, adequate, economical and equitable transport system;
- * ensure that public transport services are safe and comfortable;
- * Develop domestic and international transport network; and
- * Promote the development of all aspects of transport.

The institution is responsible for all types of transport. In relation to road transport and its safety the bureau states to have the following responsibilities:

- * Promote the expansion of transport service
- * register vehicles, undertake annual technical inspection and follow up;

- * Organize individuals and enterprises engaged in transport services; design and implement mechanisms. on the effectiveness of traffic management; provide capacity building support;
- * issue certificate of competence to individuals and enterprises engaged in transport and garage services;
- * issue license to driving lesson institutions and trainers; issue driving license;
- * follow up and suspend the operation of vehicles that could affect the safety of the public;
- * follow up the importation, manufacture or assembling of vehicles
- * issue and follow up the implementation of directives relating to driving license,

All this registration and inspection of vehicles, giving license for qualified drivers and follow up their activities etc. directly contributes for the road safety of the city. In addition to doing all that the bureau has the responsibility to follow up other institutions and their activities related to road safety.

B. ROAD SAFETY COUNCIL

One of the main problems under the road safety of the city is lack of coordination among concerned agencies/offices like traffic police, Red Cross, Hospitals, Fire Brigade and Emergency accidents prevention and control agency etc. Due to the seriousness of the problem and in order to coordinate actions of different agencies and offices to reduce RTA Road Safety Council was established in March, 2011.

The council was established as a part of Global Plan for the Decade of Action for Road Safety 2011–2020 that has been drawn to guide efforts at national and local levels. It was planned that if the Global Plan is successfully implemented, the Decade could achieve its goal to stabilize and then reduce the level of road traffic fatalities around the world. If this ambitious target is achieved, a cumulative total of 5 million lives, 50 million serious injuries and US\$ 5 trillion could be saved over the Decade. As a result most countries adopted this council in their nation to coordinate the efforts of different institutions in fighting against RTA.

Therefore the council was also established in Ethiopia in all 9 regions including in Addis Ababa with a vision to stop fatal crashes on national roads. Its goal is to half fatal crashes by 2020. Nationally the council is accountable to ministry of transport while its Addis Ababa branch is accountable to the Addis Ababa transport authority.

The council has technical committees that are comprised of different offices of government which have direct relation with the road safety of the city. The road fund, road authority, traffic police commission, bureau of housing and construction, justice bureau, education bureau, health bureau, finance and economy bureau are member of the technical committee. The reasons for involving all these bureaus is in order to coordinate their action towards enhancing road safety and solve the problem of lack of coordination.

The council is responsible for

- * promoting plan and programs that can enhance road safety,
- * evaluate the effectiveness of existing laws,
- * in collaboration with the concerned organs, create conducive environment for the participation of the public, as well as encourage and assist the mass media to promote traffic safety;
- * Promoting road safety and evaluate and report implementations by government agencies.
- * Encourage private sector to engage in road safety related issues.

The council on the regulation state that ‘the concerned government organs and non-governmental organizations shall have the duty to cooperate with the Council in the implementation of traffic safety policy, strategy and programs’. However, it doesn’t clearly state how and on what area the council cooperates with these organs. And in reality it has not brought any significant change in enhancing road safety of the city.

C. Traffic Management Agency and Addis Ababa Road’s Authority

Because of the government’s focus on infrastructure Addis Ababa’s road network has improved over the years. This has helped to reduce the infrastructural factors that cause RTA.

Recognizing the importance of the road infrastructure, the Government has launched a Road Sector Development Program (RSDP) since 1997 which is nation-wide including the city it focused on upgrading and rehabilitating the existing road network, expanding the road network, and providing regular maintenance. Since then, the condition of roads has improved and the network has increased. Also Addis Ababa Road’s Authority is tasked with improving the roads and pedestrian walkways as well as the overall road infrastructure of the city. The authority has a vision and a responsibility to “provide safe, comfortable, reliable, and adequate road infrastructure to support the socio-economic development of the city and satisfy road users”.

Traffic Management Agency on the other hand is responsible for building of lights, speed barkers, road signs, speed limits of the road and other infrastructures that help to reduce the accidents based on studies. In addition the Agency brings stakeholders together and monitor and evaluate road safety programs and projects.

D. Addis Ababa Police Commission

The traffic police of Addis play a twofold role in traffic safety. They primarily take the responsibility of improving safety by enforcing the traffic regulations through monitoring road users. They secondly carry out accident investigation and reporting mainly for own use to document evidences required for court ruling, as well as to identify priorities and plan enforcement strategies. Moreover they send their reports to the Addis Ababa Transport Bureau and Traffic Management Agency. Since they record accidents unlike the past the recording system is better and has uniformity in all sub cities. And according to Abiye Abera “most of the accidents are recorded by our institutions except those accidents that are simple crashes that are settled between the drivers without coming to us”.

There are also other agencies that work in coordination with these institutions including

- a. A.A health bureau
- b. Non-governmental organizations like Red Cross
- c. AA education bureau
- d. Media

Normally the road safety is perceived as the responsibilities of the transport authority, the roads authority and the police commission but as it can be seen there are diverse institutions that work on the issue. All this institutional measure has a positive impact on road safety of the city since it implies that government has given a lot concern on the issue also their different responsibilities helps for division of labor will help to provide safety measures fast and easy.

However, in addition to the division of labor for and effective reduction of RTA there must be a highly cooperated work among them which is lacking among them. As explained by Instant Inspector Abiye Abera

“The existence of different institutions working on road safety is a good since it creates division of labor. However, the level of coordination among the institutions is poor. Other than reporting

relations we don't have a timely regular meeting with the institutions this has affected the way we address RTA. Never the less it is increasing recently. Particularly the traffic management now gives us training for traffic policies working on the field also different researches based on the rep but it is not constant. Other than that except the reporting relations the level of coordination is low and there are no timely set regular meetings among the institutions".

From here we can conclude that the organization of road safety is complicated matter. Not only it involves many different organizations each with their own priorities, but most importantly it requires the smooth and uninterrupted coordination between the organizations. This is not an easy matter to come up with for each organization emphasizes its own priorities: Road Authority with road maintenance, driver licensing and vehicle registration and inspection for the Transport Authority and crime prevention and investigation for the police.

3.2.3 Existing legislative framework

Legislative framework includes all the policies and rules that are enacted by the legislature. However since the transport policy is discussed above here the rules and regulations that are enacted to reduce RTA will be discussed. Most of the existing rules on road safety are put in the form of regulations.

Traffic regulation is a prescribed rule of conduct for traffic a rule intended to promote the orderly and safe flow of traffic.⁵⁵(Blacki law dictionary, 2004). Regulations have the following significance; They define the meaning of words and phrases so that they have the same meaning, establish common goals that affect the whole country, support to implement policies and strategies, use for legalizing the establishment of agencies/institutions for road safety also set penalties if not conform to the rules.

There have been many traffic regulations in the city but here the focus is on there of them that are recent and are directly related to reduction of RTA.

A. Proclamation on Vehicle Insurance Against Third Party Risks

In 2008G.C the government issued a new third party insurance policy titled "Vehicle Insurance against Third Party Risks Proclamation No 559/2008."The reason behind the setting this

⁵⁵Thomason business.Blacki law dictionary, 8th ed. West publishing Co. USA, 2004

proclamation is that the occurrence of accident by vehicles is increasing and it is causing loss of lives, bodily injuries and damages to properties or it is increasingly creating social problem; therefore it is essential to establish a system for facilitating the provision of emergency medical treatments to victims of vehicle accidents, and to require owners of vehicles to have third party insurance coverage against third party risks. And after this proclamation has been announced since January 9, 2008 all vehicles have been required to have this third party insurance coverage. In other words, no vehicle can move without having this insurance which has to be amended annually. Even if the proclamation has set out to reduce the level of fatality done on the victim and property the number of accidents as well as the number of heavy injuries are increasing in the last five years. However, perception about third party insurance coverage has changed a lot nowadays; today the drivers see it as part of their obligation.

B. Driver's qualification certification license

In august 2008 the government also set a new regulation titled Driver's Qualification Certification License Proclamation No.600/2008". "The purpose of this proclamation is to ensure that drivers operate vehicles in appropriate condition by acquiring adequate driving skill to achieve safe transport service and also to set nation-wide driving qualification standard and establish a system for the issuance of driving license qualification certification free from forgery, corruption and bureaucratic red tape" (*Driver's Qualification Certification License Proclamation No.600/2008*)

The regulation changed the way of acquiring driving license which was based on upgrading step by step. According to the regulation "a holder of a higher driver's qualification certification license within a category of licenses shall be authorized to operate any vehicle requiring a lower driving license within the same category". (ibid)

Furthermore, the regulation set out the age and education level of drivers. For driving motor and automobile a driver must acquire 4th grade and must be at least 18 years. For driving tanker, bus or taxi a driver must acquire 8th grade and must be at least 24 years of age and for driving tanker and special mobile equipment vehicle a driver must have at least 8th grade level of education and at least 20 years of age. Therefore, this proclamation in addition to setting the responsibility of both the authority and driving license giving institutions it has also set the age and education level of the drivers.

C. The new/ 2018/ Driver's qualification certification license

Since the 2008 regulation resulted young drivers to acquire license with less experience to start from any level they want to learn and because the accidents are still increasing, in which more than 80 % of the accidents are caused by drivers, fault the government set the new proclamation in 2018 aiming to address the situation in a better way. This proclamation has the same objectives like the previous proclamation which is to ensure that drivers operate vehicles in appropriate condition by acquiring adequate driving skill to achieve safe transport service.

The regulation changed the earlier system and set a requirement that in order to upgrade from the lowest to the highest in one category a driver must take training and it should be a step by step process. This is aimed at giving the drivers more experience while they upgrade from one level to another. Also includes the case of three wheel driving license where it states that “in case of three wheels’ motorcycle driver’s qualification certification license, have completed at least tenth grade education and attained the age of not less than twenty years” While for their categories of driving except motor vehicles for acquiring a driving license one must have at least 10th grade education level.

The main aim behind this change in education level of drivers is that as stated earlier more than 80% of the accidents are caused by drivers error who are young therefore in order to reduce this the government increased the grade level from 8 to 10 so that the more people are educated the more they are likely to do mistakes and follow the traffic rules.

This regulation in addition to revising the level of education of drivers it has also addressed the issue of driving license levels. In the past the level of driving license was 1st level 2nd level up to 5th. And a driver can enhance its driving experience from 1st to 2nd and above within one year. As stated by the instant inspector Abiye Abera “in the past years a driver can have 3-4 driving license in one year but after this new drivers’ license regulation has been issued it as revised the acquiring of driving license and made it to be through a step by step process i.e. auto1, auto2, public1, public2”

In spite of all the effort done the number of accident is still increasing in the city and all this measure has failed in some way to reduce the extent of the problem. And this last proclamation seemed like it is not based on a proper research also indicate lack of coordination among the

institutions since more than 50% of the accidents that are recorded in the last five years are caused by drivers whose education is above secondary level education. Therefore this indicates that the proclamation is not based on proper investigation to the problem.

Table- 5 Summary of the proclamations

Regulation number	Name of the regulation	Objective of the regulation
468/2005	Transport proclamation	To promote efficient, equitable, safe and comfortable transport system
Proclamation No 559/2008	Vehicle Insurance Against Third Party Risks	To pay in order to compensate the victim of the accident in the case of loss of life, bodily injury, damages to property and emergency medical treatment caused by the insured vehicle.
600/2008	Driver's qualification certification license	1/to ensure that drivers operate vehicle by acquiring adequate driving skill to achieve safe transport service; 2/ to set nationwide driving qualification standard and establish a system for the issuance of driving license qualification certification free from forgery, corruption and bureaucratic
Regulation 205/2011	National road traffic safety council establishment	To devise road safety strategy and coordinate concerned organs for its implementation
Proclamation No. 1074/2018	Driver's qualification certification license	Has the same goal with that of the earlier drivers qualification license

Even though the city administration has a clear policy and set a council to enhance road safety still road traffic accidents has been increasing in the city annually. Therefore due to the seriousness of the problem based on the policy the city's administration introduced a new strategy on road safety in 2017. The strategy envisages road traffic injury free Addis Ababa, and sets a goal to half fatal and serious injuries by 2023. However, even in 2019 in just the first half of the year the authority reported that RTA has increased by 6% in the city. Which indicate that a more coordinated and strategic work and an effective implementation should be pursued to turn the tide.

3.3The public perception of RTA

In order to have effective legislation and implementation or in general to reduce the problem of RTA, knowing the public perception is important. This is because their respect and implementation of all the road safety plans is what is crucial for its effectiveness. In this research randomly selected

100 pedestrians and 200 taxi and automobile drivers of Addis were given a questioner in order to understand their general perception about RTA and road safety of the city in general.

3.3.1 Pedestrian's perception of RTA

From the sample population asked 52 of them were men while 47 are females, where 51% are college graduates, 29 of them have secondary education and 19 have primary education.

➤ *How much are they aware about the problem?*

From the whole population 73.2% are aware about the existing problem of RTA in the city in which 16.8% are very much aware of it while 56.4% are well aware. The rest 24.8% are not much aware about it while only 2% don't have a clue about the problem. And 94.74% of the population thinks that it is one of the city's major concerns.

Table-6 relation of level of awareness about RTA in the city and whether it should be the city's concern

Are you aware about the road traffic accident problem in Addis Ababa * one of the city's concerns at the present

Are you aware about the road traffic accident problem in Addis Ababa	yes	no	other	TOTAL
Very much	16	0	0	16
Not Much	19	1	1	21
Well aware	55	1	0	56
Am not aware about it	0	2	0	2
TOTAL	90	4	1	95

➤ *The level of awareness about the basic traffic rules.*

Almost all respondents (98%) know about the basic traffic rules. But only 7% said to respect the rules at all the times and 50% said to respect the rules only sometimes.

Table 7- relation between familiarity of the traffic rules and the level of respect

Familiarity with traffic regulation*respect	Familiarity with basic traffic rules and regulation		
	Yes	No	TOTAL
If your answer is yes how often do you respect them?			
Sometimes	50	2	52
All the time	7	0	7
Often	38	0	38
TOTAL	95	2	97

➤ ***RTA cause and consequence***

In terms of risk factor all the three risk factors are mentioned in the response garnered from the sample however 86% of the respondents perceive that human factor related to the behavior of drivers is the main risk factors while 46% answered that it is infrastructural factors and 42% responded that human factor related to behavior of pedestrians that are the main risk factor for RTA in the city. In addition to the risk factors the main reason for the increment of the accident in the city is perceived to be lack of knowledge. 75% of the sample responded that lack of knowledge by road users about road safety is the main factor contributing to the high rising number of RTA in the city. Besides, 69% of the sample does not believe that there is adequate training of driver.

As regards the consequence of RTA on average 65% of the respondents know that it is causing more death and negative consequences on public health. The rest 35% emphasized on the economic burden and traffic jam as a major consequences of the city's RTA.

➤ ***Perception of respondents towards the existing system and the way forward***

Regarding the diverse institutions that work on RTA more than 41% agreed that it has a positive effect to reduce RTA. With respect to the legislation 43% of the respondent's state that the existing rules and regulations are enough but there is a gap in implementing them. But 29% agrees that the existing laws are not sufficient and the rest 24% of the respondents agreed that there is no consistent regulation that is consistent with the existing problem at the present. With respect to the post-crash service of the city 84% agreed that there is lack of adequate and timely post-crash service in the city. Only 7% said that the service is getting better, 3% responded that the problem is not with the service but with lack of proper infrastructure and 6% relate it with lack of man power as the reason scarcity of the service.

As a way forward the respondents suggested what the city administration should focus on /to what area priority should be given/. There are two major recommendations given by the respondents, 74% suggested that primary focus of the government must be to enhance the public awareness towards RTA and 64% suggested that there should be improvements in enforcement of laws regarding the driving schools. And 25 % of the respondents suggested that there should be more fines on those who break the rules. In this regard 58% of the respondents answered that just like drivers pedestrians should also be punished when they break the law while 41% disagrees with the latter suggestion. Also in order to enhance road safety 30% of the respondents suggested that the government should work in cooperation with Media as its main awareness outlet.

Table 8- Which institutions should the authority work with as the main stakeholders for increasing road safety in the city

Which institutions should the authority work with as the main stakeholders for increasing road safety in the city	Frequency	Percent
Other Government institutions	26	26.00%
Public	25	25.00%
Media	30	30.00%
Training institution	19	19.00%
TOTAL	100	100.00%

As a way forward the respondents also answered what their contribution towards reducing RTA and better road safety of the city as pedestrians. For better road safety of the city 6% of the respondents said their contribution is to teach others about road safety and traffic rules while 1 % said that they can't have much contribution and while the majority of the respondents 93% said that their main contribution is to respect traffic rules and regulations as well as cooperate with law enforcers.

3.3.2 Drivers Perception of RTA

Out of the 200 sample population 50 were women and 148 were men and 39% drive their own cars, 49 % of them work as drives while 12% of them are in neither of the above categories although they are drivers. The education levels of the drivers have been found to be as presented in the following table:

Table- 9- age and education level of drivers

Age and educational level				
AGE	Education level			TOTAL
	Primary	Secondary	college graduate	
18-20	0	11	4	15
20-30	1	29	40	70
30-40	0	34	44	78
above 40	6	20	10	36
TOTAL	8	93	98	199

➤ ***Awareness about the problem***

77% of the respondents are aware about the problem of traffic accident in the city and think that it is one of the city's concerns while the rest 23 % know about the problem but don't think it is one of the city's concerns at present.

➤ ***Awareness about the basic traffic rules***

Most of the drivers (92%) know about the basic traffic rules and regulations of the city. But only 40% of the driver's respect the traffic rules all the time, 46% responded that they follow the traffic rules most of the time, 13% of the drivers respect the rules sometimes.

Out of 40% who said to follow the rules all the time more than half (22%) of them are college graduate. Out if these 22% 18% are within 31-40 age range. This indicates that the more a person is educated and the more she/he is matured the more likely they will respect traffic rules and regulations.

Table- 10- familiarity with traffic rules and level of respect

Are you familiar with the basic traffic rules and regulations?	How much do you respect them			
	sometimes	all the time	usually	TOTAL
Yes	26	71	81	178
No	0	7	8	15
TOTAL	26	78	89	193

Table 11- education level and level of respect of traffic rules

Education * How much do you respect traffic rules				
Education Level	How much do you respect traffic rules?			
	sometimes	all the time	Usually	
Primary	1	5	1	7
Secondary	13	31	45	89
College graduate	11	42	43	96
TOTAL	25	78	89	192

➤ ***Perception of respondents on RTA Cause and Consequence***

Most (80%) of the drivers responded that lack of adequate knowledge of road safety by road users is the main cause of RTA in the city. 54% answered the contribution of lack of proper infrastructure is the main cause for RTA.

According to 82% of the respondents pedestrians are the main victims of in the city's RTA due to lack of adequate knowledge about road safety by the pedestrians, while 75% answered that over speeding of drivers that results most accidents on pedestrians.

Also most of them (88%) responded that after accidents happen what increases the risk or consequence is lack of sufficient emergency medical services in the city.

Table- 12- main reason for the cause of RTA

Main Reason		
Value	Frequency	Percent
lack of knowledge about road safety by road users	160	80%
lack of proper infrastructure	107	54%
Lack of adequate training of drivers	99	50%
lack of enforcement of regulations	75	38%
lack of proper regulations that guide the traffic management system	31	16%

➤ *Perception towards the existing system and the way forward*

The majority of the respondents know that RTA is one of the concerns of the city and the diverse institutions that deal with road safety. More than 62% responded that cooperation of different institutions could have a positive effect on reduction of RTA.

On the subject of the new revised regulation (2018) on driving license most of them are not aware about it since they responded from the perspective of the 2008 regulation. Since the 2008 regulation was not based on the step by step process majority (63%) of the drivers suggested that it should be a step by step process and that they prefer the older regulation. This indicates that the public is not aware about the new proclamation of 2018 which bring back the old step by step process and add other elements to it like education and new levels.

On the other hand, 21% responded that the problem is not with the regulation itself but with its implementation, 18% responded that they don't have any idea about the regulation and the rest 8% answered it is a good regulation.

With respect to the recently constructed speed brakes are perceived to be a good effort by more than 90% of the respondents but 14% of the respondents state it is good but it lacks uniformity from place to place.

As a way forward to reduce the extent of the problem the government as 89% of the respondents suggested should focus on enhancing public awareness. And 63% responded that pedestrians should be punished when they break road safety law. Most importantly in order to have more road safety in the city the authority should work with the public as suggested by 30% of the respondents while 26% suggested working in collaboration with the media. Which both are aimed at changing the knowledge of the public towards RTA. Their contribution to reduce RTA is as explained briefly by more than 90% of the respondent is to respect traffic rules and regulations while driving and to drive safe.

Conclusion

Addis Ababa has made a very little progress toward addressing the problems related to motor vehicle crashes. The city has the highest accidents and casualties in the country next to Oromia region. In the last five years the number of accidents has been steadily increasing so as the amount of destruction on both private and public property and most importantly the lives and health of the people. Pedestrians are the main victims of the accidents. The main cause of the accident is human factor mainly related with that of drivers and or speeding. Vehicular factors and infrastructural factors together contribute for only 5.5% of the accidents.

In order to reduce the extent of the problem the government has established different institutions and legislated a number of rules and regulations, yet the number of the accidents is still rising. To effectively reduce RTA and bring about road safety there needs to be a whole and inclusive change both at government and public level. In order to do that knowing the perception of the public is important. This is because unless the public accepts the plans and is willing to implement the rules any road safety plan cannot achieve its goal.

From the study conducted it is clear that there should be better enforcement of the existing rules and most importantly the government should work on public awareness so people are conscious of their action while using the roads. Because most of the respondents know the rules but they don't follow them all the time.

In addition the government should try to narrow the gap of post-crash service, provide better and well planned infrastructure, and legislate rules that are based on research, better enforcement of the regulations, better cooperation as well as enhance public awareness. How to do these basic things is going to be discussed on the next chapter.

CHAPTER FIVE

Policy Directions to Reduce RTA

5.1- INTRODUCTION

As can be seen from chapter three Addis Ababa has the highest accidents and causality rates in the country. In the last five years the numbers of accidents have increased by 14.4%. Most of the victims are youth working groups of the society while pedestrians being the first victims among road users.

The main factor for the cause of the accident is human factor particularly related to behavior of drivers. And speeding is the first identified problems of drivers. Among all drivers Taxi's and automobiles are the two types of vehicle that caused over 40% of the accidents.

Addis Ababa does not have a policy that is distinctively set for road safety but the issue of road safety is included in the transport policy as one of the basic themes. The city has set a council on road safety and institutions dividing the work area among them but there exist a huge gap of coordination among them. And the engagement with non-governmental organization and other private organizations in reducing RTA and works done on public awareness is very low. The existing regulations set for reducing RTA also lack proper enforcement.

There is also lack of proper investigation, not using available data while designing legislations. Lack of Black spot identification in the city and most importantly the limited public awareness about the regulation has significantly affected the road safety of the city.

In this chapter policy recommendations will be given in order to reduce the extent of the problem and particularly solve the above mentioned problems that are discovered in the research. Hopefully, these policies recommendations will help the policy makers to look in to situation much deeper also help them to reduce the extent of the problem.

5.2 Policy directions to reduce RTA

Policy directions are both a course of action and a framework that are aimed at improving the policy or help in achieving the objective of the policy⁶.

Road traffic deaths and serious injuries are to a great extent preventable, since the risk of incurring injury in a crash is largely predictable and many countermeasures, proven to be effective, exist. (Bolen, 1997) There are many recommendations given by different scholars, NGO's and intergovernmental organizations on how to reduce RTA. Even though the theoretical base of RTA countermeasures may have international applicability the actual physical solutions may not. Therefore we must look in our country's perspective and make our recommendations depending on the city's actual situation.

As stated in the beginning of the chapter the issue of road safety is included under the transport policy of Addis Ababa. And the policy has stated a strategy to reduce RTA and bring the road safety. But for further realization of the policy objective and solve the perceived problem while doing the research here key recommendations that are relevant to policy makers will be given that relate to the context of Addis Ababa.

I. Creating effective Coordination mechanism

To achieve road safety it requires firm political will, and an integrated approach involving close collaboration of many sectors this is because it is a shared responsibility. Indeed the city administration has set different institutions and divided tasks among them however there is no clearly set coordinating mechanism among them. If there is coordination among these sectors their collaboration will also increase which in turn brings reduction of RTA. The question then is in what ways these institutions should coordinate.

A. Through improving reporting mechanism

All the government institutions have a reporting trend for a higher authority monthly, quarterly and every six months. But here reporting is proposed as policy direction not only to the higher authority but to all sectors. At the present the trend is that the police commission reports to the traffic management while the latter reports to the transport authority. This is one directional flow

⁶ Policy directions are a course of actions that leads to the achievement of objectives of the policy strategy. ([www.business dictionary .com](http://www.businessdictionary.com))

of report. Therefore a reporting system that flows both to the higher authority and from the higher authority to the lower should be created. This helps the institutions to know what the other sector is doing and in what ways to collaborate with the other sector. Also helps to make decisions based on empirical findings at every sector.

B. Meetings of stake holders every three month.

Meeting is essential way of coordination because it helps to share experiences, ideas and controversial ideas through discussion. Also it helps to identify the major problem of RTA and coordinate the efforts of all sectors towards the solution.

Of course there are meetings that get together the sectors but it is not effective and mostly it is flow of information from one side to another. However if we make the meetings to be held at least four times a year every three month at different sector each time, it will help make the sector understand more about the other sectors. Because meetings in the form of discussion help to understand each other intern they create coordinated effort towards reducing RTA.

II- Using available data

Data collection is done especially by traffic police on the case of the accident and it is reported to the higher authorities however, the data is not been used for making decisions. And most of our regulations and policy is not based on the existing reports rather they are a copy of international policies to reduce road traffic accident. The problem of the new regulation can be explained by this context because as explained in chapter three t it is not based on the data that already exist at the police commission. If it was it would have understood that the problem is not with having better education level since most drivers who caused the accident have secondary education and above.

Data should not be collected just for the sake of collection and file organization they are a source of information that serve us for making better informed decisions to reduce RTA. The data shows us what gaps there exist and what our future action should be. In general they are stepping stone for our next action and decisions. Hence using of the already available data and making decisions on that base is important.

III- Research based planning

The government's plans and vision to reduce RTA/enhance road safety/ are not based on understanding the context of the city rather like most of developing countries they are driven from

the UN or AU's decade plan of action. In order to set a goal, formulate a policy or any measure to reduce RTA researching in to the situation is essential so that better understanding of the situation will be created which in turn result better solutions, policies and strategies that help to reduce the problem.

Therefore research on RTA should be integrated as a policy strategy and should be carried on at least once a year at government level by professionals selected from stakeholder institutions. In addition working with universities and academicians whose work is related to such areas contributes in carrying out a research. All in all research is important because it helps the city to have integrated measures, policies, enforcement capacity, etc. based on the scientific findings to reduce RTA.

IV- Better education at the Driving training institute

Most accidents in the city are caused by human factors related to behaviors of the drivers such as over speeding, not giving a way to pedestrians and other cars. Therefore in order to reduce this problem driving trainings should expand the time for psychological training at the driving training institutions. This will help drivers to behave in a desired way and feel the social responsibility they carry/or be conscious of it/ while driving.

This requires an effective regulatory framework, and a proactive educational approach. Also involves creating an understanding that drivers are the first link in the road safety chain. And whatever the technical measures in place, the effectiveness of a road safety policy depends ultimately on the users' behavior. For better behavioral change of drivers while on the training the psychological training courses should include the following

- Making them to develop an attitude towards safe driving;
- Changing their behavior in society in general;
- An effort for them to acceptance and abiding by regulations

V- Education and Engaging NGO'S and media

For the Addis Ababa where 90% of the RTA is caused by human factor educating and increasing public awareness is crucial. Education has always featured as one of the key activities of prevention. It is a useful for effective implementation of all road safety measure and reduces RTA. In addition public awareness will increase their willingness to committee themselves to their own safety and help to do their obligation for road safety.

Non- governmental organizations and media are important ways to reach in to the public easily in a better way and create awareness about RTA. Since public awareness is the key thing to reduce RTA it is through engaging with the media organizations and NGO's we will get help:

- In addressing broader public increasing awareness to them about road safety and rules of traffic.
- In getting the public opinion on how to improve the government's effort in reducing RTA. Encourage governments to make the roads safe.
- Identify local safety problems.
- Encourage enforcement of traffic safety laws and regulations,
- Campaign for firm and swift punishment for traffic offenders.
- Also in Promotion of the ideal behavior for driver

In Addis although there have been engagements with the media in doing campaign for drinking driving, over speeding and doing a report on Medias regarding the accidents of the day it is not enough, because better education and publicity requires more engagement is needed with the Media. The relation with NGO's is also very poor.

Therefore to get all the above stated advantages and helps in addition to advertisements we have to engage them through preparing events, discussions, conferences we can educate the public. Also working with the media and NGO's through organizing the platforms for public education, invite them to meetings as one of the key institutions for road safety efforts.

VI- Working towards better Enforcement

Enforcement is powerful tool for changing behavior to a desired way in the quickest way possible, as it bypasses the process of changing the attitude of the individual (Rothengatter, 1990). Penalizing of those who break the law and its effective implementation deters the drivers and make them to abide by the law.

Traffic laws are promulgated of the government which wants to protect the users of the roads. These must be enforced and shall have the desired effects on all users of the road network. Previous studies have shown that countries where enforcement has been strict and adequately provided, ramifications were significantly reduced RTAs (ICT, 2014). This includes enforcing punishments that are already in the legislation on both drivers and pedestrians when they break the law.

The enforcement should not only be limited to the traffic police and its interaction with the road users but at institution level. Enforcement of plans and making the necessary requirements to

achieve the plan must also be considered. For all the road safety plans and ideas of the government to be effective enforcement is a necessary thing. Therefore all institutions established to bring road safety should be committed in enforcing their plans to reduce RTA and held accountable and be questioned for not providing what they planned to achieve.

VII- Identification of Black spots.

Black spot is the location in a road where the traffic accidents often occur. In these black spots, accidents are not a random event, but common due to varying factors (IJIRSET, 2013).

Black spot identification is very helpful in organizing finance, planning and efforts to reduce RTA. It is very effective at addressing problems at specific sites with a concentrated accident frequency and occurrence. It is also helpful to make further studies on that area on the cause of the accident and help to direct the necessary measure based on the context of the spot.

VIII- Provide Safer roads

WHO recommended that awareness of safety in the planning of new road networks, incorporation of safety features in the design of new roads, safety improvements to existing roads, and remedial action at sites with high risk of traffic crash are essential for improving road safety (WHO, 2006). Since most of the dwellers of the city and main victims of RTA are pedestrians it is important to have a road infrastructure that is comfortable and safe for them. The present pedestrian walk ways are narrow therefore they should be broadened that can accommodate the number of pedestrians. Also constructions of speed humps are important and should be expanded since most of the accidents are caused by over speeding of drivers.

IX- Better access to Emergency Medical Services

The lack of emergency medical services such as ambulance is increasing the risk of RTA after accidents happen. This post-crash care is important to reduce the risks of the victims of the accidents. According to world health organization report, 2013, countries like Ghana can reduce the risk of the accident by improving the ambulance services and increasing their numbers. Therefore from taking the experience of Ghana and others in collaboration with health bureau the work of enhancing such post-crash ambulance services must be done. This would reduce the consequences of the accident.

Ambulances and medical personnel is important for reducing the risk of the accidents in the city which could save thousands from being permanently injured.

CHAPTER SIX

Conclusion and Recommendation

6.1- Conclusion

The objective of this thesis was to analyze the situation on road traffic accident in Addis Ababa in the last five years to make recommendations for policy makers towards reduction of the burden. A conclusion was drawn based on a review of the RTA information taken from Addis Ababa's police commission, Addis Ababa Transport bureau, and from a sample population of 100 pedestrians and 200 drivers (taxi and automobile drivers).

The analysis shows that the city has basic strategic plan, legislations and institutions set in place for reduction of RTA. However, there is a gap in enforcing those plans and regulations the policies and there is a huge cooperation gap among the institutions. And most importantly there is a huge gap in public awareness creation and collaborating with other stakeholders like media and to create the platform for awareness. There is lack of knowledge, negligence of road safety regulations by road users and poor law enforcement which all has contributed for the city to experience increasing number of accidents over the last five years.

RTA is a one of the city's concern at present causing over 400 fatalities, serious injuries for thousands and more economic distractions. From 2006 to 2010 RTA has increased by 14.4%. Over the last five years the city has experienced 116,581 accidents which caused 2,392 deaths, 10,108 major injuries and 6523 simple injuries. Pedestrians have experienced 75% of the accidents while second and third victims are passengers and drivers. The young people aged 18-30 are the most affected age groups by RTA.

Human factor related to driver's behavior is the main cause of the accidents. In relation to drivers behavior over speeding is one of the reasons that cause most of the accidents. Not giving right way pedestrians and other divers are also the main causes of RTA in the city. Next to drivers pedestrian error and not respecting of laws is another cause for RTA in the city. From the study conducted on sample population most of the respondents know the rules but do not respect them all the time. And perceive that the causes of most of the accidents are related to lack of knowledge by road users.

There have been different legislations and efforts to reduce RTA but the lack of coordination among the institutions, not using accurate data for designing those legislations and lack of effective works on public awareness has resulted the legislative frameworks and the whole effort not to be fruitful. In terms of roads there is no traffic separation such as cyclist lanes, pedestrian lanes and all these factors contribute significantly to risk of road traffic injury occurrence in the city.

There is also a challenge in accessing post-accident health care service, due to lack of adequate post trauma care. This increases the health risk for the victims and economic burdens for their families. Therefore there must improvement in accessibility to health care services. And since majority of the victims are pedestrians proper pedestrian paths needs to be established and improvement in road traffic law enforcement.

In order to have a better legislative framework that could better address the problem, reduce the extent of the problem and improve awareness about RTA among decision makers, and road users, based on my study and finding in order to reduce the RTA in Addis Ababa city I kindly recommend to work on the policy directions stated in chapter five.

Reference

Addis Ababa traffic police commission report from 20013/14- 2017/18.

Africa Development Bank Group, (2013), *Assessment of road problem and Challenges in Road Safety Management System*, International Journal of Innovative Research in Science, Engineering and Technology, Evaluation and treatment of accident black spots using Geographic Information System, Vol. 2, Issue 8, August 2013.

Afolabi, J. A, Gbadamosi Kolawole, (2017), Road traffic crashes in Nigeria: Causes and consequences. *Transport & Logistics: the International Journal*; Volume 17, Issue 42, April 2017

Awoermi Joshua Remi, (2017), Analytical study of the causal factors of road traffic crashes in southwestern Nigeria, Ladoke Akintola University of Technology.

Awol Mohammed, (2013) Identification of risk factors involved in RTA's in Ghana, a case study of techman municipality.

Bolen J et al. (1997) Overview of efforts to prevent motor vehicle-related injury, Morbidity and Mortality Weekly Report, 1985–1996, Atlanta, GA, Centers for Disease Control and Prevention.

Dr. Atubi, (2010), *Augustus determinants of road traffic accident occurrence in Lagos state: some lessons for Nigeria*, International Journal of Humanities and Social Science Vol. 2 No. 6.

Dr. Mark W. Greenlee, (2013), *Human Factors as Causes for Road Traffic Accidents in the Sultanate of Oman under Consideration of Road Construction Designs*, University of Regensburg.

Dora C, Phillips (2000), *Transport, environment and health*, Copenhagen, World Health Organization Regional Office for Europe, 2000, European Series No. 89

Edwin Mends–Brew, Joseph Dadzie, Ben ApauDadson, Martin OwusuAmoamah, (2018) *Modelling the Trend of Road Traffic Accidents in Accra, Mathematical Modelling and Applications*, Accra Technical University, Ghana,. Vol. 3, No. 1, 2018, pp. 1-8.

European Road Safety Observatory, 2006

Fanuel Samson, (2006) *Analysis of Traffic Accident in Addis Ababa*, Addis Ababa University graduate studies Faculty of Mechanical Engineering.

Global Road Safety Faculty report, 2018

Haddon, (1980), *Option for the Prevention of Motor Vehicle Crash Injury*. Israel Journal of Medical Sciences.

Haddon, 1980; AMA, 1983; Stansfield, 1992; Robertson, 1992, *Determinants of road traffic accident in Lagos city*, 2012

Hussein A.M Yahia¹, Amiruddin Ismail, Shaban Ismael Albrka¹, Mohd Azizul Ladin, and Aldukali Salem Almselati, (2014) *Implementing Specific Interventions To Reduce Road Traffic Accidents*, Sustainable Urban Transport Research Centre (SUTRA), University of Kebangsaan, Malaysia.

Hyden, (1987), *Conceptual safety pyramid*, Florida University.

International Technical Conference, 2014

Kopits E, (2005), *Traffic fatalities and economic growth*. *Accident Anal Prevention*; 37:169-178.

Mends-Brew*, Dadzie, Dadson, Amoamah, 2018, *Modelling the trends of road traffic accident in Accra*, volume 3.

Meng Lu, (2007), *Modelling and evaluation of the effects of traffic safety measures Comparative analysis of driving assistance systems and road infrastructure*, Lund University.

Quartz Africa, Yomi Kazeem, (2018), *Death rates from traffic accidents are higher in Africa than anywhere else*, Dec, 2018.

Ross A, (1991), *towards safer roads in developing countries a guide for planners and engineers*, Crowthorne, Transport Research Laboratory.

United Nations Economic Commission for Africa, (2009), *Road Safety in Ethiopia*.

United Nations news on Road Safety, 2017.

United Nations on Road Safety Collaboration, 2018

WHO, (2004), world report on traffic injury prevention, Geneva,

WHO, (2007), report on road safety, Geneva, Switzerland

WHO, (2009), report on road safety Geneva, Switzerland.

WHO, (2013), report on road safety, Geneva, Switzerland

WHO, (2017), report on road safety, Geneva, Switzerland.

WHO, (2018), Fact sheet on Road traffic accident.

World report (2015), Traffic injury prevention.

<http://www.researchgate.net/2018>, *Road traffic accidents in Ethiopia, magnitude, cause and possible intervention*. 2018

www.https://roadsafety.piarc.org

<http://www.xinhuanet.com/english/2017-18>

Appendix

I- Questioner for Pedestrians

- 1- Sex a- Male b- Female
- 2- Age a- 15-20 b- 20-30 c- 30- 40 d- 40 and above
- 3- Education level
a- primary education b- Secondary education c- College graduate
- 4- Marital status a- single b- married c- other
- 5- Occupation a- student b- government employed d- private employed e- other
- 6- Are you aware about the road traffic accident problem in Addis Ababa?
a- Very much aware b- Well aware
b- Not much d- Am not aware about it

- 7- If you are aware about the problem of road traffic accident of the city do you think it is one of the city's concern at the present?
- a- Yes b- No c- Other.....
- 8- If your answer to the above question is yes what do you think are the main reasons for the increment of RTA in Addis Ababa city?
- a- Lack of knowledge about road safety by road users
b- Lack of adequate training of drivers
c- Lack of proper regulations that guide the traffic management system
d- Lack of enforcement of the regulations that are already there
e- Lack of proper infrastructure for road users
f- Other reason
- 9- Are you familiar with the basic traffic rules and regulations of the city?
- a- Yes b- No c- Other-----
- 10- If your answer is yes how often do you respect them?
- a- Sometimes c- often
b- All the time d- Not at all
- 11- What do you think are the main risk factors for RTA in the city?
- a- They are mainly related with vehicular factors (technical problems of the vehicles, the vehicles being old etc.)
b- Road Infrastructural factors (such as improper design of roads) are the main risk factors for RTA in the city
c- Human factor related to behavior of the drivers
d- Human factor related to road users other than drivers (pedestrians, cyclists)
- 12- What are the main consequence of RTA the city dwellers are facing
- a- It is causing more traffic jam due to collusion among vehicles
b- It's causing more health problems by making people injured
c- Its causing high economic burden to the city due to both public and private property loses
d- Its causing more death
e- Other consequences-----
- 13- If your answer to the above questions is yes do you think the existing rules and regulations of the city regarding road safety are providing enough to lower the extent of RTA in the city?

- a- We have enough regulations the problem is with implementation
- b- There is lack of adequate regulation regarding road safety in the city
- c- The rules and regulations are not consistent with the present situation/problems of the city
- d- Other-----

14- Do you think the pedestrians should be punished if they do not follow the rules and regulations of traffic like that of drivers?

- a- Yes b- No c- Other-----

15- What do you think about the post - crash treatment in the city such as ambulance service, traffic police service availability? -----

16- The institutions responsible in ensuring road safety in Addis Ababa are diverse with other different responsibilities do you think this is one of the reason that affects the road safety of the city?

- a- It greatly affects it c - It has a small effect
- b- It doesn't affect it at all d- Other-----

17- What do you think should the city administration do in order to minimize the extent of the problem of RTA?

- a- There should be more rules and regulations on RTA and its management system
- b- There should be more fines on drivers and pedestrians who break the law
- c- There should be policy that clearly states main responsible organ to handle the situation in a coordinated way
- d- Better enforcement of laws related to driving training institutions
- e- The public awareness should be enhanced towards RTA
- f- Other -----

18- Which institutions should be the main stakeholders for increasing road safety in the city?

- a- Other government institutions
- b- The general public
- c- Media institutions
- d- Driving training institutions
- e- Other -----

19- What do you think is your contribution to ensure road safety in Addis Ababa?

II- Questioner for Drivers

- 1- Sex a- Male b- Female
- 2- Age a- 18-20 b- 21-30 c- 31- 40 d- 40 and above
- 3- Education level a- primary education b- Secondary education c- College graduate
- 4- Marital status a- single b- married c- other
- 5- Are you driving
a- Your car b- employed by other person or organization c- Other.....
- 6- Do you think the problem of road traffic accident of the city do you think it is one of the city's concern at the present?
a- Yes b- No c- Other.....
- 7- Are you familiar with the basic traffic rules and regulations of the city?
a- Yes b- No c-Other
- 8- If your answer is yes how often do you respect them?
a- Sometimes b- usually c- All the time d- Not at all
- 9- If your answer to the above question is yes what do you think are the main reasons for the increment of RTA in Addis Ababa city?
a- Lack of knowledge about road safety by road users
b- Lack of adequate training by training giving institutions
c- Lack of proper regulations that guide the traffic management system
d- Lack of enforcement of the regulations that are already there
e- Lack of proper road infrastructure
f- Other reason-----
- 10- Most accidents occur on pedestrians why do you think is the reason for that?
a- Over speeding by drivers
b- absence of accurate knowledge by pedestrians about road safety
c- lack of traffic lights and other signals on zebras
d- other reason-----
- 11- What do you think about the new revised regulation on driving license certification and its benefits and gaps of the regulation?
- 12- What do you think about the recent construction of speed barkers on some roads of the city?
- 13- After accidents happen what do you think increases the risk to injure?

- a- Lack of fast emergency medical service
- b- The age of roads found at the middle of the road
- c- Lack of first aid knowledge by drivers
- d- Running away of drivers
- e- Other reason-----

14- Do you think the pedestrians should be punished if they do not follow the rules and regulations of traffic like that of drivers?

- a- Yes b- No c- Other-----

15- What do you think about the post - crash treatment in the city such as ambulance service, traffic police service availability?

16- The institutions responsible in ensuring road safety in Addis Ababa are diverse with other different responsibilities do you think this is one of the reason that affects the road safety of the city?

- a- It greatly affects it b- It has a small effect
- c- It doesn't affect it at all d- Other-----

17- What do you think should the city administration do in order to minimize the extent of the problem of RTA?

- a. There should be more rules and regulations on RTA and its management system
- b. There should be more fines on both drivers and pedestrians who break the law
- c. There should be policy that clearly states main responsible organ to handle the situation in a coordinated way
- d. Better enforcement of laws related to driving training institutions
- e. The public awareness should be enhanced towards RTA
- f. Other -----

18- Which institutions should be the main stakeholders for increasing road safety in the city?

- a. Other government institutions
- b. The general public
- c. Media institutions
- d. Driving training institutions
- e. Other -----

19- What do you think is your contribution to the cities road safety?

III- Interview questions for the Addis Ababa traffic police commission

- 1- What are the main causes identified by the institution to RTA in the city?
- 2- Which are the main areas that are experiencing such accidents, is the black spots clearly identified?
- 3- Why Addis Ababa is having the highest motorization level in the country and experiencing increasing rate of accidents do not have a policy on RTA management?
- 4- According to regulation number 395/2017 any person violating a traffic rule shall be punished so why is Addis focusing the punishment only on drivers?
- 5- Do you record all the accidents and how efficient is the accident recording system?
- 6- How much is the level of coordination among different organizations dealing with the road safety in the city?
- 7- Do you have a stakeholders meeting and how often is that?
- 8- Do you think having different institutions trying to address the problem of RTA affects the city's ability to address the problem in a better way?
- 9- How much is the new regulation on driving license helping in minimizing the level of RTA in the city?
- 10- What is your institution doing to help reduce RTA in the city?
- 11- Why is the RTA still a problem that is increasing through time to the city after so many works have been done to reduce it?
- 12- What are you planning to do about it in your next step as an institution?

IV- Interview questions for Addis Ababa road and transport bureau

- 1- What are the main causes identified by the institution to RTA in the city?
- 2- Does the city have a policy on road safety?
- 3- Do your institutions coordinate with stakeholders on increasing road safety, how is the level of interactions and the identified gaps?
- 4- Do you think having different institutions trying to address the problem of RTA is affecting the city's ability to address the problem in a better way?

- 5- As already known there is now a new regulation on that strengthen the driving license which require education level above 10th grade, do you think this will in any way reduce the extent of the problem?
- 6- In the last five years most accidents are caused by those who acquired secondary level education and above so what do you think is the logic behind this regulation?
- 7- Your institution is the one responsible for registering vehicles how much is the imported cars safe and reliable? What is your institution doing related to importations of used cars and its impact on the road safety of the city?
- 8- What is the institutions plan to reduce road traffic accident in the future?