

PREFACE

This is the Final Report submitted to Surface and Marine Transport Regulatory Authority (SUMATRA) as a requirement of a consultancy contract signed on 25th April 2007 for a "Study on Road Accidents in Mainland Tanzania."

The overall objective of the consultancy assignment was to propose short, medium and long term measures which will minimize the occurrence and consequences of road traffic accidents, effective road traffic legislation and its enforcement and to develop an effective and efficient road traffic accident database accessible to all stakeholders.

We are thankful to SUMATRA for the opportunity to explore the most traumatic problem associated with road transport and to recommend mitigating measures. We acknowledge with thanks the assistance given by government officials particularly the Inspector General of Police and his staff. We thank the numerous stakeholders who contributed their experience and knowledge and more than one hundred road traffic accident victims who gave us feedback on their experiences and suffering. We thank the Surface and Marine Transport Regulatory Authority for their very constructive comments on the draft report and the cooperation of the management and staff from the beginning to the end of the project. Without the contributions of the stakeholders and the road traffic accident victims this study would not been successful.

Dar es Salaam, 28th September, 2007

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ABBREVIATIONS

BAC	-	Blood Alcohol Concentration
BoT	-	Bank of Tanzania
CT	-	Computer Tomography (CT-Scan)
CTLA	-	Central Licensing Authority
DARCOBOA	-	Dar es Salaam Commuter Bus Owners Association
DART	-	Dar Rapid Transit Agency
DCC	-	Dar es Salaam City Council
DEVILA	-	Driver Examination Vehicle Inspection and Licensing Agency
GDP	-	Gross Domestic Product
HGV	-	Heavy Goods Vehicle
HMC	-	Highly Motorized Countries
IGP	-	The Inspector General of Police
JICA	-	Japan International Cooperation Agency
LGA	-	Local Government Authorities
MOI	-	Orthopaedic Institute
MOID/MID	-	Ministry of Infrastructure Development
MOPPS	-	Ministry of Public Security and Safety
MRI	-	Magnetic Resonance Imaging
NGO	-	Non Governmental Organisation
NMT	-	Non Motorized Traffic
NRSC	-	National Road Safety Council
NRSP	-	National Road Safety Policy
NTP	-	National Transport Policy
PSV	-	Passenger Service Vehicle
PSV	-	Public Service Vehicles
PT	-	Public Transport
RDP	-	Rural Development Policy
RFB	-	Road Fund Board
RLAs	-	Regional Licensing Authorities

RTA	-	Road Traffic Accidents
RTAIS	-	Road Traffic Accident Information System
RTAVF	-	RTA Victim Fund
SADC	-	Southern African Development Community
SATCC	-	Southern Africa Transport and Communication Commission
SUMATRA	-	Surface and Marine Transport Regulatory Authority
TABOA	-	Tanzania Bus Owners Association
TANROADS	-	Tanzania Roads Agency
TBS	-	Tanzania Bureau of Standards
TCD	-	Traffic Control Devices
ToR	-	Terms of Reference
TRA	-	Tanzania Revenue Authority
URT	-	United Republic of Tanzania
UTODA	-	Uganda Taxi Operators and Drivers Association

EXECUTIVE SUMMARY

The study used available road traffic accident (RTA) and collected new data through a variety of techniques to analyze the problem of RTA, their impact on the economy and recommended specific road safety measures. It was estimated that RTA cost the economy at least 3.4 percent of the gross domestic product. We recommend improvement of the environment of road transport to make it more favourable to safety by implementing existing policies, strengthening the enforcement of existing legislation and amending the few weak points to make it more effective. The government should provide effective coordination of road safety actors by approving and implementing the Draft Road Safety Policy. It should increase resources for law enforcement and remove non-enforcement functions from the police force in order to allow the force to concentrate on their primary responsibility.

Operational and Institutional Environment of Road Transport

Our review of the operating and institutional environment of road transport suggested that the two policies governing the sector namely the National Transport Policy (2003) and the Rural Development Policy (2003) are very comprehensive and reflective of the recent government structural reforms. The Draft National Road Safety Policy (2007) will provide for the needed coordination in road safety activities and setting of national targets. The three policies are still new and the challenge now is in developing strategies for their implementation and to update the legislation to make their implementation mandatory by the public bodies.

Improvement of institutional set-up for efficiency and focus is necessary. We recommend the establishment of transport units in big urban centres (cities and municipalities) to professionally oversee transport planning, traffic management and the provision of public transport. For the very big cities establishment of an agency similar to the proposed Dar Rapid Transit (DART) may be appropriate. This will free the Traffic Police to focus on enforcement, especially the enforcement of road safety legislation. The function of vehicle inspection and driver examination should be shifted from the police to the proposed agency dealing with all motor vehicle and driver issues in order to improve efficiency and to allow the police to fully focus on enforcement. These recommendations are in line with the policy directions in the National Transport Policy and the current government policy on good governance.

Our review of the legal framework revealed that the country has a comprehensive legislation that covers every aspect of road transport. The

legislation can, to a great extent, meet the challenges of the increased rate of accidents if it was enforced to the letter and spirit. What seems to water down its effectiveness is weak enforcement. However, in spite of this positive assessment there are few notable weaknesses within the law which may render its implementation less effective. It is therefore recommended that;

- Deliberate efforts should be taken to intensify enforcement of the existing legislation on road safety
- Amend the laws which are not in conformity with the current demands. In particular it is necessary to increase the fines in the Road Traffic Act 1973 (as amended) to match the fines proposed in the Transport Licensing Act 1973 Regulations being proposed by SUMATRA. That is, introduce a minimum fine of 100,000/= for offences prosecuted in a court of law and 50,000/= for offence settled out of court (e.g. through the notification system).
- Recruit more enforcing agents at all levels i.e. central and local governments and within SUMATRA.

Road Traffic Accidents (RTA): Situation Analysis and Proposed Measures

The analysis of the RTA situation show that the situation is comparable to the neighbouring countries which are considered to have very low road safety levels globally. The report contains measures proposed for short, medium and long term implementation to reduce the occurrence and severity of RTA in the following areas:

- 1) Enforcement of existing road safety legislation and public education/campaigns focusing on pedestrian and NMT safe use of roads are essential. Closely related is improvement of driver training and licensing particularly for PSV and freight vehicles. This will take care of human factors contributing to RTA;
- 2) The roadworthiness of the vehicle fleet plying our roads needs to be improved. This requires adoption of modern vehicle inspection technology and system. Particular focus should be placed on PSV and freight vehicles;
- 3) Road Safety Engineering aspects of road design need to be emphasized. Provision for pedestrians and cyclist in urban centres and on trunk roads passing through settlements and treatment of black spots should be given priority;
- 4) Improvement of rescue and emergence medical services so that majority of RTA victims can be treated within the "golden hour." To

achieve this better coordination and more resources must be made allocated.

- 5) Improvement in RTA official statistics is absolutely necessary for future monitoring of road safety situation and for decision making. The development of RTA database which was a part of this contract is a major breakthrough if the system is implemented nation wide.

The ban of night services by PSV should be re-considered in the light of regional practice and maximum driving hours regulation. Consideration of our regional grouping membership (EAC and SADC) suggests that we should permit international PSV to offer services at night provided they demonstrate compliance with the maximum driving hours regulation. General lifting of the ban is not recommended until SUMATRA and the Police develop capacity to enforce the maximum driving hours regulation for both PSV and freight vehicles countrywide combined with the introduction of effective vehicle inspection.

Impacts of Road Traffic Accidents

The study investigated the social and economic impact that road traffic accidents have on accident victims and their families and on the health sector. The approach adopted was the use of both qualitative and quantitative methods of data collection including interviews of accident victims and dependants/relatives of deceased accident victims in four regions including Dar es Salaam, Coast, Kilimanjaro and Arusha. We analysed data from Muhimbili Orthopaedic Institute and the Tumbi Hospital. The information with the situation analysis of RTA reported to the police was used to assess economic loss the country due to loss of life and property as a result of RTA for the year 2006. Human capital approach was used to estimate the RTA costs for 2006. The total economic loss due to the reported 2,838 fatalities and more than 15,855 personal injuries and damaged motor vehicles was 508,019 million T Shillings (equivalent to 446 million US \$) or 3.4 percent of the GDP. The estimated RTA cost for the country is significant and justifies considerable investment in road safety programmes or measures to reduce the economic drain and negative social impacts on the RTA victims and their families.

Finally we recommend that each stakeholder to plan how to implement the proposed measures under their mandate by preparing action plans with budgets and to request for the necessary additional resources. It is important to lobby for political support by continuously bringing to their attention the negative impacts of RTA to human life and the associated loss to the economy.

1. INTRODUCTION

1.1 Background

The road transport system is the most important mode of transport in the country and the government and the public is concerned about the safety of the system. The number of reported RTA has been increasing in spite of the stakeholders' efforts through the National Road Safety Council (NRSC) and other government sporadic initiatives. Loss to the economy due to Road Traffic Accidents (RTA) was estimated to be 2% of the GDP in 2002. Because of these facts, the Surface and Marine Regulatory Authority (SUMATRA), as a regulatory body of the sub-sector perceived the need to have a clear assessment of the RTA problem.

The Surface and Marine Transport Regulatory Authority (SUMATRA) was established by the Act of Parliament (No. 9) of 2001 to regulate rail, road and maritime transport services. The primary function of the authority as far as road transportation is concerned is the licensing of PSV, protecting the interests of the consumers of the service, and monitoring the performance of the sub-sector. The monitoring of sub-sector includes, among other things, the availability, quality and standards of service. SUMATRA is thus responsible to monitor the safety level of the services since road traffic accidents are often a result of poor driver behaviour or vehicle condition. According to the Act SUMATRA is to "*consult with other regulatory authorities or bodies or institutions discharging functions similar to those of the Authority in Tanzania and elsewhere*". Thus, in monitoring RTA, SUMATRA has to consult and cooperate with the Police Force and other public and non-public organizations.

This caused SUMATRA to commission the Bureau of Industrial Cooperation (BICO) of the College of Engineering and Technology, University of Dar es Salaam to undertake a Study on Road Accidents in Mainland Tanzania. This report is being submitted as per Terms of Reference (ToR) of the Contract No./SMTR.TEN/06/02 for Consultancy Services for a STUDY ON ROAD ACCIDENTS IN TANZANIA MAINLAND signed on 25th April 2007.

1.2 Study Objectives and the Scope

The objectives of the study as stated in the Terms of Reference (ToR) were:

- 1) To have short, medium and long term measures which will minimize occurrences of road accidents.
- 2) To have effective and efficient rescue measures.

- 3) To have effective road traffic laws, rules, regulations and their enforcement.
- 4) To have effective and efficient road accident data collection system and a corresponding database which will be available to all agencies participating in road safety activities.

Scope and Nature of Work is defined in section 3 of the ToR as follows.

The main responsibility of a Consultant will be to conduct a study on Road Accidents in Mainland Tanzania including:

- 1) Critically examine the operational environment of road transport sector.
- 2) Examine and review the existing institutional and legal framework under which the current road transportation is being carried out.
- 3) Examine the causes, impact, extent and the pattern of road accidents.
- 4) Examine the existing rescue measures which are taken after occurrence of an accident.
- 5) Propose a national road accident data collection system and its corresponding database which will be easily accessed by different agencies participating in road safety activities.
- 6) Assess the impacts and effectiveness of the ban of night service by commercial passenger buses to road transport users and service providers in terms of accidents prevention and other criminal acts such as banditry.
- 7) Recommend measures to reduce severity and number of road accidents.
- 8) Clearly show policy implications of the findings and recommendations.
- 9) Make a presentation of study findings and proposed solutions to the Management of SUMATRA.

1.3 Organisation and Implementation of the Work

In order to meet the objectives and to thoroughly cover the scope of the project, the study was split up into seven tasks as shown below and performed as it was agreed in the inception report.

- i. Review of the environment of road transport in mainland Tanzania including operational, institutional and legal issues;
- ii. Collection and analysis of road traffic accident data;

- iii. Quantitative and qualitative analysis of the impacts of road traffic accidents;
- iv. Quantitative and qualitative analysis of the impacts and effectiveness of the ban of the night service by public passenger buses to road transport users and service providers;
- v. Measures to reduce severity and frequency of road traffic accidents;
- vi. Development of National Accident Data Collection System and the corresponding (Web Based) National Road Traffic Accident Database accessible to stakeholders; and
- vii. Reporting.

1.4 Work Methodology and Achievements

We gave a priority to consultation of the stakeholders particularly in the review of the road transportation environment including the legal and institutional framework to assess how the official policies and legislations are perceived by them and extent of their implementation. In assessing the magnitude of the RTA problem and its nature we used the official statistics and the views of the stakeholders.

In assessing the social impact of accidents we went to the accident victims and interviewed over one hundred of them in four regions using a standard questionnaire. In this way we were able to estimate the consequences of RTA on individuals and families. This is a very important outcome of this study. We recorded very low insurance compensation levels. Impact of RTA on health services was carried out by visiting relevant hospitals and talking to the staff and collecting data from their records and analysing the same. We found that actual costs of treatment were higher than those assumed in earlier studies. This is no surprise because with the current changes the real costs are becoming more apparent. The assessment of economic impact was based on data from the social impact study compared with that from hospitals. The loss of output was estimated from the accident statistics for 2006 and the economic performance reported by the BoT for 2006 compared with what was reported as loss of income in families as a result of RTA. More realistic values were therefore obtained compared to previous studies.

Apart from few un-evaluated and un-coordinated measures like the ban of night travel by the PSV in 1994, introduction of speed limiters popularly known as speed governors and regular one week annual road safety campaign by the National Road Safety Council very little road safety work

has been done in this country. Our proposed measures are therefore based on international experience and fundamental consideration of the road transport system.

1.5 Organization of the Report

The report contains usual preliminaries and the executive summary which is followed by the introduction. The body of the report is divided into seven chapters. Chapter two and three reviews the operating environment and the legal framework of road transport in Tanzania respectively. Chapter Four contains the findings concerning the causes of road accidents and the measures proposed to improve road safety. The effectiveness of the ban of the night services by PSV and the issues on rescue services for RTA victims are also discussed in this chapter. Chapter five deals with the impacts of RTA both socially and on the economy and the health sector. Chapter six discusses the development of Road Traffic Accident information system and database. The last chapter brings the findings together and summarises the recommendations and the proposed action plan towards achieving the recommendations.

2. THE OPERATIONAL AND INSTITUTIONAL ENVIRONMENT OF ROAD TRANSPORT

2.1 Introduction

The aim of this chapter is to critically examine the operational environment of road transport and to review the existing institutional framework under which the current road transportation is being carried out. This is an important task as per terms of reference as it provides background information on the causes of increasing number of road traffic accidents and the limitations of the institutions responsible for the management of the road safety problem.

Road transport is the most dominant mode of transport in Tanzania. The urban centres and the rural areas are connected by a road network of over 80,000 km. Transport of people on the roads is by public and private vehicles as well as by walking and pedal cycles. The public mode transport tends to dominate since vehicle ownership is still low. For example in the City of Dar es Salaam the majority of the inner city trips are made by public transportation or by non-motorised transportation modes¹. The trip share according to a recent survey was 43% by public transport (Daladalas), 45% by Non Motorised Transport (NMT) and only 6% of trips are by private cars. The share of NMT is higher in smaller urban centres where most destinations can be reached by cycling or walking.

As of May 2007, TRA had registered 335,984 vehicles. This excludes vehicles owned by the government. Vehicle fleet in Dar es Salaam is estimated at approximately 80,000², with 46,000 private cars with the rest being taxis and commercial vehicles.

Traffic safety is a serious challenge in Tanzania with many people being killed or maimed on roads. Contrary to developed countries the trend of road traffic accidents and especially fatalities is increasing as shown in chapter four. However, we note here that accident rates associated with buses are high. There is a public perception that this is primarily a problem, associated with racing for patronage. The cause of this problem is the combination of a very fragmented ownership of the private sector and the absence of any effective monitoring of behaviour on the road. There is also the perception among the public that corruption is compromising

¹ Source: World Bank <http://www.worldbank.org> and traffic surveys performed by DART consultant.

² DART Consultant

effective enforcement of traffic regulations. There are other problems like traffic congestion in cities particularly in Dar es Salaam city, inadequately developed road network, poor maintenance and ineffective traffic management practices all of which contribute to road traffic accidents one way or another.

Road transport and the safety of the travelling public is a responsibility of several ministries and organisations and is governed by a number of policies and legislation. The Ministry of Infrastructure Development and the institutions under it are responsible for transport policy, road development, maintenance and management and the licensing of PSV. The Local governments have responsibility for roads under their jurisdiction. The policies governing transport, institutional set-up and current situation are reviewed in this chapter while chapter three is concerned with the legal aspects. The two chapters together provide a complete background for the problem of road traffic accidents in Mainland Tanzania.

2.2 Road Transport Policy

Basically, there are three primary policy documents directly related to road safety in Tanzania. These are the National Transport Policy issued by the then Ministry of Communications and Transport in 2003, and the Draft Road Safety Policy prepared by the Ministry of Infrastructure Development in 2005. The other is the Rural Development Policy released by President's Office, Regional Administration and Local Government in December, 2003. The three Policy documents address matters of road safety as follows:

2.2.1 National Transport Policy (2003)

Government's initiative to formulate a National Transport Policy goes back to 1987 when the then Ministry of Transport and Communications prepared the First Draft of the National Transport Policy. In one of its objectives the Government committed itself to ensure that standards of safety shall be established, implemented and maintained for each mode of transport with a view to assuring the safety of life, property as well as protection of the environment.

This initiative matured in 2003 when the National Transport Policy 2003 (NTP) was passed. Being a crucial ingredient of the Policy, safety features prominently in the Vision, Mission and other parts of the Policy. To this effect, the Vision of the Policy is "to have efficient and cost-effective domestic and international transport services to all segments of the population and sectors of the national economy with *maximum safety* and minimum environmental degradation."

As for the Mission the NTP seeks “to develop safe, reliable, effective, efficient and fully integrated transport infrastructure and operations which will best meet the needs of travel and transport by improving levels of service at lower costs in a manner which supports government whilst being economically and environmentally sustainable.”

Safety issues are further emphasised in several parts of the NTP. For example, in Chapter 4 (Transport Sector Objectives and Goals) the Policy states that “The transport sector needs a comprehensive policy to ensure compliance with the national social and economic development objectives and goals, paying due emphasis to *safety and security*”.

At the level of public vehicle design standards and specifications, it is the objective of the NTP “to have appropriate and acceptable vehicle design, standards and specification to cater for the needs of various groups.” Thus, in order to have appropriate and acceptable vehicle design, the NTP provides the following policy directions:

- i. Technical specification of buses, including appropriate bodies to be drawn by the responsible ministry with advice from the safety/regulatory authorities and gazette them.
- ii. The sub-standard buses currently in operation are gradually removed and appropriate buses are licensed.
- iii. Future importation and licensing of passenger vehicles should lay emphasis on high capacity buses of 30 passengers for minibuses and up to 90 passengers for large buses.

The brief highlights above clearly demonstrate how committed the Government is, in terms of realizing a road transport sub-sector that is safe and secure but also reliable, effective, efficient and comfortable. This commitment does not stop at the level of the Government only but rather percolates downwards to all agents in their various capacities, that is, whether regulators, monitors, implementers or enforcing agents.

2.2.2 Rural Development Policy (2003)

The Rural Development Policy (RDP) was promulgated in 2003 with hindsight of the National Development Vision 2005. In this respect RDP will act as an instrument of achieving the five main attributes of the National Vision 2025 stated as follows:

- i. High quality livelihood;
- ii. Peace, stability and unity;
- iii. Good governance;
- iv. A well educated and learning society; and

- v. A competitive economy capable of producing sustainable growth and shared benefits.

Obliviously, these attributes, particularly, the first and the last cannot be achieved in the absence of safe, reliable and efficient road transport services in the rural areas. In view of this reality the RDP pertinently observes that: "Transport infrastructure in the rural areas, such as, rural roads, railways, water and air transport, are either non-existent in some areas, insufficient or in poor conditions in others. This state of affairs impedes free flow of goods and services and smooth movement of people from and to the rural areas".

To address this weakness the Policy statements direct, among others that: "Efforts will be taken by LGAs [Local Government Authorities] and other stakeholders to rehabilitate and maintain the present rural roads network and expand it in order to reduce transport costs and travel time." Rehabilitation and maintenance presupposes, among other things, putting in place safety measures or mechanism in order to ensure that the roads are safe for both passengers and goods.

2.2.3 Draft National Road Safety Policy (2007)

The Draft National Road Safety Policy 2007 (NRSP) is a product of a study, which was commissioned by the then Ministry of Works in 2003/4 to develop the National Road Safety Master Plan for Tanzania Mainland and Zanzibar with financial support from the World Bank. This study identified a series of shortcomings and opportunities to improve the situation. Consequently, the Master Plan recommended the appointment of a Road Safety Champion to follow-up on the most crucial organisational suggestions and the preparation of three crucial documents, namely, the Road Safety Policy, the Road Safety Strategy and a Draft Bill for establishment of a Road Safety Board and Road Safety Fund.

Based on the National Transport Policy, 2003 and the National Road Safety Master Plan, 2004 the National Road Safety Policy was prepared whose Vision is, "No body is killed or seriously injured as a result of a road traffic accident". The Mission of the NRSP is "to continuously reduce the severity and frequency of road accidents in an efficient and professional manner." According to the NRSP the responsibility to see to it that maximum safety is built into the road transport system is vested into the Ministry of Infrastructure Development which will create, by means of an Act of Parliament, a Road Safety Board that will be responsible for the overall management and coordination of road safety activities.

2.2.4 Critique of the Policies

All the Policies reviewed above are fairly new. They were passed in the 2000s and they are hardly five years old. In this context, they were passed within the fundamental structural and public reforms pursued by the Government since the mid 1980s, reforms which have led to substantial socio-economic development. Even in terms of their implementation one can hardly say that they have failed for one or several reasons. We need to give them more time to prove their worthy.

However, successful implementation of the said Policies will depend on the coordination among the various ministries and other key players in the road transport sub-sector.

Policy statements comprise a collection of goals and objectives which a government adopts to guide the management, development and growth of a particular sector so that it is able to efficiently and effectively achieve the national socio-economic goals. By nature, they are not binding as they lack the force of law. To be effective they have to be transformed into binding instruments, such as, statutes (legislation) or regulations which exact compliance by all stakeholders in the relevant sector. The review of the road safety legislation that follows below tries to ascertain whether the legal framework currently in force responds to the aspirations of the Policies reviewed above and whether the said framework address the various causes of road accidents mentioned earlier.

2.3 Institutional Framework/Arrangements

Different organisations are responsible for the management of the road transport sub-sector. The principal organizations and their roles are summarized below.

2.3.1 The Development, Maintenance and Management of the Infrastructure

Formerly two ministries were responsible for transport but the fourth phase government established the Ministry of Infrastructure Development with mandate for all transport matters. It is responsible for policy formulation and planning of the various modes of transport. A planning unit within the MOID deals with overall planning of trunk roads. The Road Safety Unit is responsible for road safety policy. The unit is also responsible for policy on axle load and gross vehicle weight limits. According to The Roads Act 2007, road authorities including TANROADS and Local Government

Authorities (LGA) shall be responsible for the development, maintenance and management of roads and related facilities. TANROADS is however responsible for Trunk and Regional roads while the rest are under LGA.

Urban municipal councils have confined themselves to the physical maintenance of urban roads while doing almost nothing on transport planning, public transport and traffic management. In fact, there are no professionals who are responsible for transport issues in city and municipal councils. As a result, the provision and management of transport is poor. The result is poor mobility and road safety in urban cities. Traffic Police ensures smooth running of traffic as provided for in the Road Traffic Act 1973. However, this takes away considerable human resources from the enforcement function.

Road Fund Board (RFB) under the MOID is responsible for the allocation of road funds for purpose of road maintenance. The Board also monitors expenditure on road maintenance in TANROADS and LGA.

The Ministry of Lands and Human Settlement Development is responsible for urban land use planning and regional physical development planning. Transport Planning at regional and district level is an integrated element of the physical development planning. However, in extended built-up areas transport planning need to be recognised as a separate activity. Because responsible LGA have not recognised and taken up this function transport services are poor in urban centres as mentioned before. The ministry and LGA should cooperate closely to implement the NTP policy mission in their respective roles.

2.3.2 Regulation of Road Transport

Road transport operations are controlled mainly through the Road Traffic Act 1973 and The Transport Licensing Act 1973. The MOPSS through the Police Force is responsible for the enforcement. MOID through SUMATRA is responsible for licensing of PSV and the monitoring of performance. Freight vehicles are not regulated at the time of writing. Driver training and testing is also the responsibility of the MOPSS. The relevant legislation is reviewed in Chapter Three. In this section we briefly outline the roles and challenges facing the organisations responsible for regulation.

The Role and Challenges Facing SUMATRA

The Surface and Marine Transport Regulatory Authority (SUMATRA) was established by the Act of Parliament (No. 9) of 2001 to regulate rail, road and maritime transport services. The primary function of the authority as far as road transportation is concerned is the licensing of PSV, protecting

the interests of the consumers of the service, and monitoring the performance of the sub-sector. The monitoring of sub-sector includes, among other things, the availability, quality and standards of service. SUMATRA is thus responsible to monitor the safety level of the services since road traffic accidents are often a result of poor driver behaviour or vehicle condition. According to the Act SUMATRA is to “consult with other regulatory authorities or bodies or institutions discharging functions similar to those of the Authority in Tanzania and elsewhere”. Thus, in monitoring RTA, SUMATRA has to consult and cooperate with departments and organisations within the MOID, the Police Force and other public and non-public organisations.

SUMATRA Head Office is in Dar es Salaam and there are two branch offices at Tanga and Mtwara dealing with road transport licensing. The country is organized into five zones, namely:

- (i) Eastern Zone covering Dar es Salaam, Coast, Mtwara and Lindi regions.
- (ii) Central Zone covering Dodoma, Tabora, Kigoma, Singida and Morogoro regions.
- (iii) Southern Zone covering Mbeya, Iringa, Rukwa and Ruvuma regions.
- (iv) Lake Zone covering Mwanza, Mara, Kagera and Shinyanga regions.
- (v) Northern Zone covering Kilimanjaro, Manyara, Arusha and Tanga regions.

The major challenge facing SUMATRA is sufficient resources, both human and financial, for the work of enforcing the regulations and monitoring the quality of transport services. The manual RTA database makes it extremely difficult to check operations with poor road safety record.

Role and Challenges Facing the Police Force

The Traffic Police Force, which is under the Ministry of Public Security and Safety, is responsible for road traffic accident data collection, enforcement of (road safety) regulations and vehicle inspection. The force is also responsible for driver testing and issuance of certificate of competence.

Limited resources and lack of exposure to modern enforcement strategies has resulted in inadequate enforcement of the law intended to prevent RTA. One of the outputs of the National Road Safety Master Plan (2004) is a training manual (in enforcement) for use by the Department. Effective use of the manual is one way to overcome this challenge provided that transport and other resources are made available. It is also unfortunate that traffic management in cities has been wrongly thought to be the

responsibility of the Police Force. While the Traffic Police Department has been doing some traffic management at times of crises, it should not be entrusted with such resource consuming activity. This is particularly for Dar es Salaam where high congestion levels demand more than twelve hours per day police presence in order to control traffic.

The Police Force is currently responsible for vehicle inspection. This is a very big challenge to the force since the number of vehicles is large compared with the number of vehicle inspectors. Vehicle inspection technology has advanced over the years and nothing has been done to provide the force with the state of the art vehicle inspection facilities. On the other hand experience worldwide shows that vehicle inspection is usually a responsibility of a unit of experts in the ministry responsible for transport or its agency.

Driver training (driving schools) and testing is under the MOPSS and the police force conducts the examination of drivers and issues certificate of competence for the successful ones. The Ministry of Finance through TRA Tanzania Revenue Authority (TRA) issues the driver licence upon the production of the certificate of competence.

Proposals for creating “one-stop-centre” to deal with all the functions related to drivers and motor vehicles so as to achieve better efficiency may be considered after the approval of the Draft Road Safety Policy. If the concept debated during the drafting of the policy is accepted, driver training, examination and licensing and vehicle inspection and licensing will be under one agency (Driver Examination and Vehicle Inspection and Licensing Agency – DEVILA) under the ministry responsible for transport. This will free the police to focus on enforcement function, reduce the inefficiency in the processes related with driver and motor vehicle licensing and allow the participation of private resources into the function of vehicle inspection by certifying competent garage to carry out vehicle inspection function.

2.3.3 Road Transport Associations: Suppliers and Users

There are associations of transport suppliers like the Tanzania Bus Owners Association (TABOA) and the Dar es Salaam Commuter Bus Owners Association (DARCOBOA) which provides forum for the owners to negotiate with the government on issues of common interest. There are also associations of the users of the services like Campaign for Travellers Safety Trust Fund (CTS) which educates travellers about their rights. There is also the SUMATRA Consumers Consultative Council vested with the task of protecting the interests of the consumers.

DARCOBOA and TABOA among other things represent and defend the interests of commuter bus owners in Dar es Salaam and intercity bus owners respectively. They propose fares to SUMATRA for approval. The associations also facilitate dissemination of information including regulations and rules. However, the DARCOBOA's stated role/goal "to provide good, safe and efficient passenger transport service to Dar es Salaam residents" is far from being achieved. However, the associations can positively promote safety by developing a common strategy of monitoring their driver behaviour and as a group refusing to hire drivers with records of exceeding speed limits or other unsafe behaviours.

It is interesting to note that a parallel organisation for Uganda (Uganda Taxi Operators and Drivers Association - UTODA) plays a very important role in the regulation of the minibus industry in Kampala. There is, however, always a strong risk that if the Government does not regulate the public transport market others may try to do so. It is therefore vital to make sure that the effect of any "unofficial" regulation is predominantly beneficial rather than harmful to the interests of those using public transport. Thus we should not encourage TABOA or DARCOBOA to take on roles that may have a negative impact on consumers. This is to say that we should stick with the present structure of the regulatory regime and focus on correcting any weakness.

Road transport users' organizations are relatively weak as far as protecting the rights of consumers because of limited awareness and poor networking among themselves and weak representation in the sector. Also very little is known by the public about the activities of SUMATRA Consumers Consultative Council. Dissemination of information and establishment of a "hotline" where consumers can provide feedback to SUMATRA free of charge is one way forward to address this situation. This "hotline" should be displayed in every PSV and consumers would be encouraged to call SUMATRA as well as the Police when a driver of a PSV is driving above the speed limit. SUMATRA should use such reports to warn both the driver and the owner of the respective PSV and the police could use the information as a basis for their enforcement strategy. Owners of PSV should be advised not to hire drivers who are often reported to SUMATRA for speeding. This can have a positive effect on road safety.

2.3.4 Summary and Comments on Institutional Arrangements

Table 2.1 summarises the functions of institutions involved in road transport. The table shows that at least seven organisations are responsible for one or more aspects of road safety. This excludes other ministries like Ministry of Education and Vocational Training, Health and Social Welfare, and

Constitutional Affairs and others which also have road safety functions. It is important to recognise that Road safety has many players and the key question is how to effectively coordinate the players and to encourage cooperation. The problem of weak coordination was noted in the National Transport Policy (2003) by the statement "... Major weaknesses in the regulation include poor coordination between authorities, poor governance (corruption) and poor enforcement". This is due partially to a very weak structure of the National Road Safety Council (NRSC) which has responsibility for coordination and research among others. Part of the answer to this problem may come through the Draft National Road Safety Policy (2007) which proposes the establishment of coordination body under the Ministry of Infrastructure Development i.e. Road Safety Board. Efficiency shall also be achieved if motor vehicle and driver issues are processed by one agency (DEVILA) as described above.

Table 2.1 Institutional Responsibilities for Road Transport

	MOID	MOID-Road Fund Board	MOID-TANROADS	PM - Local Govts	MOID-SUMATRA	MOPSS-Police	MOPSS – NRSC	MOF-TRA	Providers and User
Transport Policy, Road Safety Policy	Yes								
Road Financing (Development Maintenance)	Yes	Yes							
Infrastructure development maintenance	Yes		Yes	Yes					
Road Safety	Yes		Yes	Yes	Yes	Yes			
Driver Training						Yes			
Driver Licensing						Yes		Yes	
Vehicle inspection						Yes			
PSV Licensing					Yes				
Motor Vehicle Licensing								Yes	
Enforcement					Yes	Yes			
Road Safety Coordination etc							Yes ³		
Lobbying and supporting enforcement function									Yes

Other recommendations include:

³ To be replaced by the Road Safety Board if the Draft NRSP (2007) shall be approved.

- i. Ensure political support and will in implementing the NTP directions and other policies. For example on strengthening enforcement, adequate resource allocation, strengthening coordination, good governance, encouraging policy oriented approach in institutions, respect for professionalism etc.
- ii. LGA should establish a formal transport/traffic entity within City/municipal council. For bigger Cities, creation of an agency similar to DART may be considered. Responsibilities should include urban transport planning, traffic management and provision/management of public transport. Capacity building (soft/human) is very important and should be given priority.

2.4 The Status of Road Transport Operations

Transportation of people and goods on the road network is through public transport (PT) services (urban and inter-city), non-motorised transport (pedestrians and pedal cycles, tri-cycles, pushcarts), goods (freight) vehicles, and private cars. In this section we give a summary of the present situation.

2.4.1 Public Transport

Public Transport (PT) is the predominant mode of movement of people in the country. PT is provided by individuals and companies and is regulated by SUMATRA. As of February 2007 SUMATRA had issued 1,168 licences to big bus operators and 1,193 licences to small bus operators for intercity services. Within Dar es Salaam 43 percent of the trips or 1.4 million trips daily are by public transport services (daladalas). As of February 2007 SUMATRA had issued 4,530 licences to Daladala operators in Dar es Salaam.

There are noticeable weaknesses in the provision of PT and consumers are not satisfied. For Dar es Salaam the main reasons for the dissatisfaction are:

- i. PSV fleet is old with inadequate leg-room and poorly maintained. The majority (90%) of daladalas is more than 10 years old.
- ii. Domination of low capacity buses on routes that are better served by high capacity buses. Recent study (for DART) shows that the 18 seat capacity bus type is the most common daladala representing approximately 70% of the active fleet. However, SUMATRA has stopped issuing licences to low capacity bus routes serving the DSM city centre. This is a good example of implementation of NTP.
- iii. Comfort and safety levels are inadequate and services are not convenient or reliable due to low speeds as a result of congestion.

- iv. Vehicles tend to wait at the stop until they are fully loaded.
- v. Overloading, poor crew behaviour and harassment from touts.
- vi. Pollution from old vehicle exhausts is visible and constitutes a significant health risk.
- vii. Failure to pick up schoolchildren when there are full fare passengers to serve.

Except for the problem of congestion, the listed problems suggest lack of discipline. This stems partially from the fragmentation of ownership and hence the competition between vehicles on the road. The Draft Regulations 2007 and Draft Passenger Service Vehicles - Technical Safety and Quality of Service Standard Rules 2007 (to be made under Transport Licensing Act 2003) address most of the current problems. If enacted and enforced the situation will improve.

A major problem with inter-city buses involves a high number of fatal accidents. The long distances of travel, combined with poor driving and vehicles conditions exacerbate the situation. Most of the accidents are however a result of poor driving. Some of the measures such as driving during the day only and use of speed governors to control speeds do not seem to reduce the accidents. Control of speeds through check points has also not borne fruits. Despite having regulations requiring regular (annual) inspections of public service vehicles (PSV), it is clear that inspection is, at best, casual, and many vehicles are visibly in poor condition. In Uganda, all public service vehicles have to be inspected by the Transport Licensing Board inspectors annually before issue of the appropriate vehicle licence. Adoption of this practice whereby SUMATRA assumes responsibility to inspect PSV before issuance of licence has a big potential to improve the safety record of PT as well as the quality of the service. The present assumption that a PSV is licensable simply because it has been inspected in accordance to the Traffic Act 1973 should not continue. It should be recognised that the requirement of the Act is for all vehicles and SUMATRA will be discharging her duty of protecting the consumers by introducing its own inspection whereby the issues of safety and comfort are ascertained before the issue or renewal of a licence. However, If DEVILA is established the road worthiness issues may be satisfactorily handled by it leaving SUMATRA to focus on comfort issues.

2.4.2 Non-motorised Transport

The facilities provided for those using non-motorised transport (NMT) are generally very poor, with many important routes not having adequate sidewalks. There is little concern for trying to improve the safety of those walking alongside or across busy roads. The same applies to provision of

facilities for cyclists, including availability of secure parking. As reported in Chapter four, pedestrian and pedal cyclist together constituted 41.8 percent of the fatalities due to RTA between 2000 and 2005. Since a high proportion of the population cannot afford motorised transport and many make very long journeys to walk, it is important that their needs are given priority as a means to reduce RTA. Often relatively cheap improvements can do much to improve the safety and comfort of pedestrians. In addition the forgotten needs of the disabled should also be provided for.

2.4.3 Traffic Management and Urban Transport Improvement Strategy

The road system in Dar es Salaam was designed to meet the needs of a smaller urban area with less car ownership. It is now, however becoming increasingly congested and traffic flow can sometimes breakdown. There is a vital need to improve the management of the current system and to give priority to large capacity public transport vehicles. The planned introduction of the BRT system is therefore a step towards the right direction. The most important strategy in the improvement of the urban transport system is building capacity in LGA by setting up transport units manned by professionals with adequate training and exposure in the transport planning and management. For Dar es Salaam and other big cities setting up of a separate agency may be appropriate. The DART may serve as a model for our other cities if successful.

2.4.4 Freight Transport

Freight transport is currently not regulated at all. This is an anomaly that needs to be corrected as soon as possible. Some of the problems observed in relation to freight trucks include:

- i. Many trucks are not roadworthy and frequently breakdown and cause avoidable accidents.
- ii. They are usually parked alongside a road blocking sight lines and restricted carriageway which contributes to RTA.
- iii. Most of them are polluting due to poor maintenance and use of fuels.
- iv. Some overturn due to improper loading and poor driver techniques.
- v. Aggressive driving of some drivers of trucks intimidates other users and causes accidents. In Dar es Salaam, drivers of trucks carrying construction material such as sand and aggregates are particularly notorious.
- vi. Trucks leaving cities such as Dar es Salaam cause long queues while parked alongside roads waiting to be inspected by TRA officials.

Regulation of freight transport coupled with vehicle inspection by SUMATRA (or DEVILA if established) before the issuance or renewal of licence will provide opportunity to ascertain roadworthiness of trucks and monitor driver behaviour which are necessary to improve road safety.

2.4.5 Private Transport

With vehicle ownership level of about ten vehicles per 1,000 population contribution of private transport is low compared to public transport. Even in Dar es Salaam where we have the highest concentration of motor vehicles, trips by private transport mode are only a small proportion of the total. The vehicle fleet in Dar es Salaam is estimated at approximately 80,000, with 46,000 being private cars. However, the majority of the inner city trips are made by public transport or by non-motorised transport modes. Only 6% of trips are made by private cars. While Daladala carry 1.4 million passengers per day, 200,000 trips are made daily by private modes. With the national economy improving and in the absence of an acceptable public transport as an alternative, there has been an increase in private car usage thus contributing to more congestion and accidents. Absence of any priority system for public transport has also made public transport less attractive and private car usage more attractive. There should be specific efforts to improve and prioritise PT as a strategy to reduce congestion and improve road safety.

2.4.6 Recent Planning Developments

In 1995 the Japan International Cooperation Agency (JICA) prepared a transport master plan for the city of Dar es Salaam on behalf of the Government. The plan included detailed plans to improve the management of traffic in Dar es Salaam. However, the Master Plan was only partially implemented. JICA is currently carrying out transport study in the city and shall prepare transport master plan for year 2030.

The city of Dar es Salaam will soon see the construction of a Bus Rapid Transit (BRT) system along two corridors as an initial phase of its planned Dar es Salaam wide BRT system. An agency called Dar Rapid Transit Agency (DART) is to manage the day to day operations of BRT. According to the establishment order "DART is established as an Executive Agency that effectively plans, coordinates and facilitates the provision of urban transport facilities and services and ensures improved traffic management in Dar es Salaam."

The mandate of DART among others includes:

- i. Transport planning;

- ii. Traffic management and control;
- iii. Provision of Public transport facilities;
- iv. Provision of NMT facilities for pedestrians and cyclists; and
- v. Provision of high quality public transport services

The two measures are a response to congestion problems in the city. We recommended above the need to establish transport unit within LGA in major urban centres so that transport issues may be tackled professionally and continuously instead of current approach based on foreign driven crisis management. When warranted agencies similar to DART may be established in other cities.

2.5 Summary and Recommendations

Summary and General Recommendations

The operating and institutional environment of road transport does not favour road safety or high quality public transport. The road network is not adequate especially in major urban centres where the number of vehicles is increasing rapidly and limited facilities for NMT exist. However, the government has published the National Transport Policy (2003) and Rural Development Policy (2003) which together give policy direction for the transport sector and for transport issues for rural areas respectively. The government through MOID has developed Draft National Road Safety Policy (2007). This policy has the potential of solving the problem of weak coordination and cooperation in road safety matters. The recent establishment of one ministry with responsibility for all transport matters has created possibility for coordination of the transport sector which was not there before. It is now for the MOID to create the environment for cooperation among her departments and the organisations it is responsible for. The proposed establishment of Driver Examination Vehicle Inspection and Licensing Agency (DEVILA) will bring under one roof all issues dealing with motor vehicles and improve efficiency in the area. If LGA takes up their traffic management role seriously, the traffic police will be free to fully assume their role of enforcement. The potential improvement in road safety as a result of increased enforcement is high and sufficient resources should be allocated to this function.

Specific Recommendations

Specific recommendations to improve road safety and the environment of road transport include:

- i. SUMATRA (or DEVILA if established) should assume responsibility to inspect PSV before issuance/renewal of licence.

- ii. Regulation of freight transport coupled with vehicle inspection by SUMATRA before the issuance or renewal of licence is a necessary measure to improve road safety especially along the trunk roads.
- iii. LGA and TANROADS should take steps to provide and improve NMT facilities and to prioritize and improve PT as a strategy to reduce congestion and improve road safety in urban areas and at settlements along trunk roads.
- iv. The central government, LGA and SUMATRA should encourage formation of PT or cooperatives to reduce current large numbers of PT providers.
- v. Resources allocation to the Traffic Police Department and SUMATRA should be increased to increase enforcement of road traffic legislation and the monitoring of PT and freight services. Fines from offences could be dedicated to this function.
- vi. SUMATRA could use consumers and their associations in the monitoring of PT quality and safety. Information dissemination on current regulations, channels of complaints and establishment of a hotline to report offenders are some of the ways to achieve this.
- vii. LGA responsible for major urban centres should establish transport units to take care of transport planning, public transport and traffic management.

Policy Implications

Most of the recommendations do not require policy change but rather are implementations of policy directions of the NTP and others. Establishment of DEVILA depends on approval of the Draft NRSP and political will. Allocation of resources to road safety activities is also dependent on political will to prioritize the preservation of human life.

3. THE LEGAL FRAMEWORK FOR ROAD TRANSPORT

3.1 Introduction

The main objective of providing transport services is to move people and goods from one place to another. The end-product of the movement is safe and satisfactory arrival of people and goods to places of their destination. To ensure efficiency and safety of road transport operations regulation is necessary. In Tanzania, road transport is regulated by various principal and subsidiary legislations. These laws provide a regulatory regime on various matters which are crucial in the transportation industry. These include safety which is now one of the topical agenda in the management of the road transport sector. Others are licensing of public service vehicles, construction and management of safe roads, carriage of goods with due regard to the preservation of the infrastructure, establishment of regulatory authorities and enforcing agents and, finally, registration and running of driving schools. To this effect, the Legislature has enacted the following principal legislation on road transportation. The legislation reviewed is listed here in accordance with the significance to the day-to-day operations of the road sub-sector and in particular safety considerations.

- i. The Road Traffic Act, 1973 Cap 168
- ii. The Transport Licensing Authority Act, 1973 Cap 317
- iii. The Surface and Marine Transport Regulatory Authority Act, 2001 Act No. 9/2001.
- iv. The Motor Vehicles Driving Schools (Licensing) Act, 1965 Cap 163
- v. The Highways Act, 1932 Cap 167
- vi. The Roads Act, 2007
- vii. The Local Government (Urban Authorities) Act, 1982 Cap 288
- viii. The Local Government (District Authorities) Act, 1982 Cap 287
- ix. The Motor Vehicles (Third Party) Insurance Act, 1945 Cap. 169
- x. The Standards Act, 1975 Cap 130 and
- xi. The Fair Competition Act, 2003 Act No. 8/2003

The principal legislation listed above is complimented by a hoist of by-laws and regulations enacted by the respective Ministers and local government authorities, as the case may be. For example, under the Road Traffic Act 1973 the Minister responsible for road traffic is empowered to make regulations for the better carrying into effect of the provisions of the Act on more than 60 areas. In the Transport Licensing Act 1973 there are more than 20 areas on which the Minister responsible for

communications is empowered to make regulations. Therefore, road transport seems to be one of the fertile grounds endowed with an extensive net-work of legislation. The problem of safety within the road transport sector is attributed to several causes grouped as follows:

- i. Human factors
- ii. Road environment
- iii. Vehicle factors, and
- iv. Traffic management factors

The importance of each of the factors as a cause of road traffic accidents in Tanzania is elaborated in chapter four.

Since road traffic accidents are attributed to the factors listed above, the pertinent question that arises here is: does the legal framework on road transport address the problem of road accidents, *ipso facto*, road safety in Tanzania? The review that follows herein below will attempt to answer this question apart from highlighting the problems or weaknesses of the existing legal framework and recommending what should be done in order to eliminate or mitigate the said problems or weaknesses.

3.2 Review of Legislation Governing Road Transport

3.2.1 The Road Traffic Act 1973

Provisions of the Act

This is the principal legislation concerned with the safety of road transport. Thus, it deals with registration of motor vehicles, driving licences, use of motor vehicles, control of traffic, enforcement, non-motorised transport and the National Road Safety Council. More important, section 114 (2) of the Act empowers the Minister for the time being responsible for road traffic to make regulations on a myriad of traffic matters as specified in sub-section 2(a) to (ah). Similarly, section 114(3) empowers the Minister responsible for finance to make further regulations particularly on fees and charges payable under the Act.

The provisions of the Act, as originally enacted provide for the following matters, amongst others:

- i. Every person propelling or riding any carriage or animal upon a road must observe all the provisions of the Act.
- ii. Every person using the road must exercise due care and attention and should be alert and cautious so as not to endanger other road users.

- iii. Requires the Engineer-in-Chief to erect or mark on the ground traffic signs of such kind, design, material, size and colour as may be prescribed.

The provisions covered all the factors contributing to road traffic accidents, namely, human factors, the road environment and vehicles.

Amendments to the Act

The Road Traffic Act 1973 is now more than three decades old. However, the Legislators have tried to keep it abreast with new developments by amending it whenever the need arises. So far it has been amended thirteen times.

An important amendment of the Road Traffic Act 1973, as far as road safety is concerned, was carried out in 1979 whereof the National Road Safety Council (NRSC) was established at national level. In 1986 pursuant to Government Notice No. 392 dated 15th August 1986, road safety committees were established at both regional and district levels. The functions of NRSC include, *inter alia*, the following:

- i. To promote research into causes of road accidents;
- ii. To promote statistical research as to the number, types and cost of traffic accidents;
- iii. To diagnose from research and statistical records or any other sources, causes of road accidents and to suggest counter measures to combat accidents problems;
- iv. To identify local accident hazards, devise and suggest remedies and advise authorities concerned to promote action etc.

Today the statutory functions of NRSC including those mentioned above have been distributed amongst its four committees namely, the Research and Statistical Committee; Education, Training and Publicity Committee; Road Transport and Accident's Committee and the Central Coordinating Committee.

Unfortunately the NRSC has not excelled in the discharge of its functions due to various constraints including weak financing and its structure. The non-performance of the NRSC as a coordinating body for road safety work is reported in the Study on Management of Road Safety and Vehicle Axle Load Control in Tanzania 1992, Road Safety Programme 1995, and the National Road Safety Master Plan 2004.

Another important amendment was carried out in 1996. It was partly necessitated by the government's policy to bring its traffic legislation in harmony with road safety laws existing in other member states of the SADC region. The harmonization of the traffic legislation in SADC region is guided by the SATCC Road Traffic Model Statute which was approved and adopted by the SATCC Committee of Ministers in July 1994. The amendment is referred to as the Road Traffic (Amendment) Act 1996, No. 16/1996. The issues amended include:

- i. It prohibits issuing of driving licences to persons below the age of 18 years;
- ii. It restricts issuing of driving licences in respect of a bus or heavy commercial vehicle to persons of over 21 years old with a driving experience of a period of not less than 3 years;
- iii. It empowers the court to cancel or suspend any international driving licence;
- iv. It empowers any police officer of and above the rank of Assistant Superintendent to suspend a driving licence pending the decision of a court;
- v. It prohibits any disturbance when driving through a residential area;
- vi. It prohibits the laden weight of vehicles to exceed the permissible maximum weight;
- vii. It prescribes the use of signals, turn-off from the road, slow and abrupt stopping, passing of an official motorcade, use of carriage ways and lanes, overtaking, manoeuvring on public road, movement of public service motor vehicles in built-up areas, application of brakes, approaching and driving at inter-sections, use of pavements by pedestrians;
- viii. It prohibits driving of public service vehicles unless they are fitted with a speed governor;
- ix. It enjoins every road user to comply with the instructions conveyed by traffic signs, traffic signals and road markings.
- x. It requires driving instruction to be done in driving schools or a certified driving instructor.
- xi. It separates motorised from non-motorised transport so that it is now illegal for drivers to drive on pavements or footpaths.
- xii. It provides for tightening of safety belts and compulsory wearing of helmets when riding motor cycles.
- xiii. It requires drivers to undergo breath test using lactometers if suspected to have alcohol in their bodies.

The drive towards harmonisation of traffic laws in the SADC region also witnessed the then Ministry of Works commissioning studies to prepare the

new Highway Code, Learner Drivers' Manual, Road Traffic Sign Manual and related Regulations.

Regulations

Section 114(2) (b) of the Act empowers the Minister to prescribe regulations. The Minister is thus empowered to prescribe maximum weight and maximum dimensions of any motor vehicle, trailer or carriage, and any load thereon, that may be used on any road and the maximum weight that may be transmitted on the road surface by the wheel or wheels on any one axle of a motor vehicle, trailer or carriage. Regulations made under this provision are intended to protect the road infrastructure which if allowed to deteriorate is bound to increase vehicle operating costs. The current regulations on maximum weight of vehicles are contained in the Road Traffic (Maximum Weight of Vehicles) Regulations 2001, GN. No. 30/2001 published on 9th February 2001. The Ministry of Infrastructure Development is now in the process of reviewing them so that they match with the recent developments in the motor vehicle manufacturing. They provide for the maximum gross vehicle mass for the various categories of vehicles, the maximum load on axle/group of axles, and the schedule of overloading fees. The Ministry of Infrastructure Development is currently fine-tuning the draft Road Signs Regulations to replace the 1965 regulations.

Furthermore, the Government has taken several measures to see to it that the Act is enforced accordingly. For example, since 1991 a notification system was introduced vide GN No. 159 of 1991, which empowers police officers to serve notices on drivers contravening traffic regulations. The notification system elicits about 38 offences for drivers, 5 for cyclists and none for predestination. A special court (traffic court) was also introduced in Dar es Salaam.

Weaknesses of the Act

Generally, the Road Traffic Act 1973 together with the Regulations made there-under is a comprehensive legislation capable of containing the alarming rate of accidents if, at all, it was enforced to the letter and spirit. However, there are few areas which can be considered as weaknesses, namely:

- i. Some of the regulations made under the Act are too old e.g. the Traffic Regulations on Vehicle Dimensions and Usage of 1960 (GN No. 270 of 1960) and the Traffic (Traffic Sign) Rules, 1965, GN No. 524

- of 1965. There is urgent need to repeal and replace these Regulations.
- ii. The fines imposed by the Act have outlived their worthiness. Current offences covered by the notification is 20,000/= . These should be revised upward to 50,000/= through the notification system or 100,000/= if settled in court.
 - iii. The National Road Safety Council has not lived up to its expectation and the current debate on the creation of the Road Safety Board means that stakeholders are now thinking of its abolishment. The Bill for the Road Safety Board is probably more than overdue.
 - iv. The responsibility to erect traffic signs, signals and markings is centralised to the Engineer-in-chief only. There is urgent need to bring the Roads Act 2007 in force because it decentralises this function to road authorities like TANROADS.
 - v. The list of traffic signs prescribed in the Government Notice No. 524 of 1965 is incomplete and out of date. There are about 56 signs only against more than 122 as found in other SADC countries like Botswana. The Ministry of Infrastructure Development should bring into force the Draft Regulations on Traffic Signs and Markings which are comprehensive. This should be done hand in hand with road user education on safer use of roads, traffic signals, signs and markings.

3.2.2 The Transport Licensing Act 1973

Provisions of the Act

This is a vital and more specialised legislation catering for operators of vehicles engaged in the business of carrying passengers. Prior to its amendment in 2001 the Act used to establish three regulatory authorities, the Central Licensing Authority (CTLA), the Regional Licensing Authorities (RLAs) and Urban Local Government Authorities. The latter regulated all commuter buses plying within the jurisdiction of an urban local authority. It should be noted that when this Act was enacted in 1973, basically, it sought to regulate intercity and inter-regional transport of passengers. Urban transport seems to have been left out. It is in consideration of this gap that the Act was subsequently amended in 1999 by Act No. 12/1999 to allow urban local government authorities to act as licensing authorities and, as such, issue road service licences to operators of commuter buses in urban areas. As a result of this amendment the Act became applicable in the transportation of passengers in both urban and non-urban areas.

By virtue of the provisions of section 11(5) of this Act, local government authorities are empowered to engage in the business of passenger carriage. Section 11(5) says - "It is hereby declared that, for the purposes of this Act, the performance by a local authority of its functions shall be deemed to be carrying on of a business." And, in accordance with section 11(1) of the Act the local authority must in such cases obtain a road service licence. However, the use of vehicles for ambulance purposes by a local authority is not deemed to be carrying on business. For that reason, no licence is required.

Although local government authorities are allowed to engage in the business of carriage of passenger the Transport Licensing Act 1973 as amended by the Surface and Marine Transport Regulatory Act, 2001 do not seem to empower the said authorities to grant road service licences today. As pointed out below this mandate now lies with SUMATRA only.

The Role of SUMATRA under the Transport Licensing Act 1973

Following the passage of the Surface and Marine Transport Regulatory Authority Act, 2001 the Transport Licensing Act, 1973 was amended so that powers and functions which the Minister responsible for communications and the licensing authorities (that is, CTLA, RLAs and Urban Local Government Authorities) used to enjoy under the 1973 Act were transferred and vested in the Surface and Marine Transport Regulatory Authority (SUMATRA). This amendment does not seem to save

the powers of urban local government authorities as far as licensing is concerned. So, today the task of granting road service licences even for commuter buses in urban areas and the imposition of discretionary conditions on the said licences lies with SUMATRA. In fact, as far as urban areas are concerned, SUMATRA can issue what is known as exclusive licence under section 26 of the Act. This provision says that a licensing authority (SUMATRA) may, subject to such conditions as it may impose, grant to any person an exclusive licence authorizing such person to operate vehicles for the carriage of passengers in any urban area or part thereof over such routes or between such places therein as it may decide. Indeed, prior to 1984 UDA used to operate in Dar es Salaam city under an exclusive licence. In short, SUMATRA's powers to issue road service licences are not shared with any other institution.

The law requires that every operator of a public service vehicle to obtain a road service licence from SUMATRA before he engages in the business of carriage of passengers. And every licence issued under the Act is subject to mandatory conditions which are intended to secure safety and comfort of the passengers carried. For that reason, section 31(1) of the Act provides that it shall be a condition of every licence:-

- i. That all authorised vehicles (i.e. vehicles covered by that licence) shall be maintained in a fit and serviceable condition;
- ii. That the provisions of any law for the time being in force relating to limits of speed and weight, the number of passengers to be carried are complied with in relation to the authorised vehicles;
- iii. That the provisions of any law with respect to the time for which drivers may remain continuously on duty and the time for resting are observed.

SUMATRA is further empowered to attach to a road service licence such other conditions as it may think fit. One such condition is that "vehicles shall be operated in accordance with time tables approved by SUMATRA and that copies of the time tables and fare tables shall be carried and be available for inspection in every vehicle used on the service. Timetable can be an effective tool in confronting fast driving drivers who do not care about the safety of the passengers they carry.

The question on who determines the fare payable by passengers is addressed by several provisions of the Transport Licensing Act 1973. First, section 24 says that every person applying for a road service licence must submit to the licensing authority, among others, such particulars as the fares to be charged. Secondly, section 28(1) provides that a person applying for a licence shall, in addition to the particulars which he is

required to furnish under Part IV of the Act, submit to a licensing authority such particulars of the rates charged or proposed to be charged. Thirdly, section 31 (3) says that a licensing authority (SUMATRA) may attach to a road service licence such conditions as it may think fit and, in particular, for securing that the fares shall not be *unreasonable*; and where desirable in the public interest, the fares *shall be so fixed* as to prevent wasteful competition with alternative forms of transport. The implication of all these provisions is that SUMATRA, as a licensing authority, enjoys the mandate to set and determine the fares based on the tests of “*unreasonable*” and ‘*wasteful competition*’.² The right to determine and fix fares is further buttressed by the provisions of the SUMATRA Act discussed below.

The enforcement of the Act, as far as road safety is concerned, is entrusted with the police, SUMATRA and any administrative officer who, in any case, is not defined in the Act. However, the police have an edge over the other enforcing agents. For example, all prosecutions of offenders under the Act must be undertaken by the police. SUMATRA alone cannot mount such prosecutions because this Act does not delegate the powers to prosecute to SUMATRA as a licensing authority. If SUMATRA strongly feels that prosecutions should also be conducted by its officials these feelings should be taken up with the Ministry of Infrastructure so that this law is amended accordingly.

Meanwhile, there is one but very broad provision which SUMATRA can enforce without the assistance of the police. This is section 33 (1) of the Act. It provides; “A licence may be revoked or suspended by the licensing authority on the ground that any of the conditions of the licence has not been complied with.” These conditions include both mandatory and discretionary. One of the mandatory conditions is on roadworthiness of a Public Service Vehicle (PSV). So, in the final analysis, SUMATRA has extensive powers, in terms of enforcement, by way of revocation or suspension of licenses, under this provision. But if SUMATRA wants to take additional action over and above the suspension or revocation of the licence, (e.g. wants to mount a prosecution), the involvement of the police would be inevitable.

Similarly, section 46(1) confers SUMATRA with extensive powers, in that, it can search any vehicle and stop it, if in motion, with a view to ascertain whether or not the provisions of the Act or regulations made there-under are complied with. Any person who obstructs SUMATRA from exercising this power commits an offence. But the prosecution of such person requires the intervention of the police.

Problems related to road safety co-ordination are pertinently addressed by the draft National Road Safety Policy. As pointed out before, this Policy directs the establishment by an Act of Parliament, a Road Safety Board which will be charged with the overall management and co-ordination of road safety activities. A Road Safety Board Bill shall be drafted after the approval of the policy.

In conclusion, SUMATRA has an indispensable role to play in the enforcement of road safety for PSV. It can invoke the provisions of section 33(1) and 46(1) to question the road worthiness of a PSV plying on the roads and, on the basis of those provisions and, if satisfied that the vehicle is not road worthy, may suspend or revoke the road service licence in respect of that vehicle. In addition, SUMATRA can seek the assistance of the police to have the culprit prosecuted in a court of law. If SUMATRA finds the procedure for prosecution cumbersome the earlier recommendation to have the law amended so that it personally handles the prosecution should be pursued with immediate effect.

Regulations

Section 44 of the Act confers the Minister with general power of making regulations. Pursuant to this provision the Minister has on various occasions made regulations including the following:

- i. The Transport Licensing (Delegation of Powers) Notice, GN No. 136/1957 as subsequently amended.
- ii. The Transport Licensing (Road Service Vehicles) (Conditions as to Fares) Order GN NO. 92/1970.
- iii. The Transport Licensing (Road Service Vehicles) (Prescribed Conditions) Regulations GN. No. 89/1970 as amended.
- iv. The Transport Licensing (Appeals) Regulations GN No. 74/1996 as amended.
- v. The Transport Licensing (Fees) Regulations GN. No. 206/2001.

It is evident from this list of Regulations that except for the last Regulations the others are very old, some having been enacted in the 1950s. They may not, for one reason or another, be able to meet passengers' safety in view of the modern technological developments. SUMATRA, as a regulator has taken note of this gap and has formulated new regulations to take care of the realities of today. The new set of regulations earmarked by SUMATRA for enactment includes:

- i. The (Draft) Transport (Road Passenger Vehicle) Licensing Regulations 2007. According to SUMATRA these regulations are intended to "provide a new and improved procedure of applying

- and granting of road service licences and set new conditions of licensing of passenger vehicles including conditions to operate in urban areas. The new Regulations also impose obligations to licence holders to provide passenger services which guarantee safe, reliable and affordable transport services to all categories of passengers. The Regulations provide a mechanism for SUMATRA to oversee, monitor and enforce compliance with terms and conditions of services and check any abuse of licence", These Regulations will repeal the regulations listed above.
- ii. The Passenger Vehicles (Technical Safety and Quality of Service Standards) Rules, 2007. The Rules are meant to set standards for technical safety and quality in road passenger vehicles. Therefore, they will introduce appropriate and acceptable passenger vehicle design, safety and comfort to users including disadvantaged groups such as elders, people with disability and children.

Our Comments on the Draft Regulations

The Draft Transport (Road Passenger Vehicle) Licensing Regulations 2007 are commendable in several ways. For example, the adopted fines are reasonable and likely to be deterrent in the present circumstances. Since it is much easier to revise regulations compared to the principal legislation it is hoped that the Minister will revise them upwards to march increased income. However, the Regulations related to hours of work for drivers, the use of seat belts and radio calls may benefit from refinements listed below.

Regulation 18 needs to be refined to take account of the labour law. The Employment and Labour Relations Act 2004 says that no person shall work for more than 12 hours including over time in a day. It also says that an employee who works continuously for more than 5 hours is entitled to at least 60 minutes of break. In the circumstances we recommend the redrafting of the Regulations as follows;

18.-(2) (g) a driver of a licensed passenger vehicle who drives for more than 5 consecutive hours in a day should rest for a period of not less than 60 minutes. A driver of a PSV shall not be on duty for more than 12 hours including overtime. A driver who has completed his duty for a day shall not resume driving before resting for at least 12 hours.

18.-(2) (h) a licensed motor vehicles operating for more than twelve hours shall have a co-driver who shall take over driving of the vehicle in order to comply with the sub-regulation 18.-(g) above or due to any other reason.

18.-(2) (i) A licensed motor vehicle which provides inter-urban transport services shall be fitted with approved communication facility and seat belts on all seats. Passengers shall wear their seat belts before the motor vehicle starts the journey. It shall be the duty of the crew to remind passengers to put on their seat belts.

19.-(1) (h) driving a vehicle while attending a mobile phone, a radio call or any other communication facility.

Weaknesses

SUMATRA is in the process of addressing the weaknesses of the Act through the Draft Regulations discussed above. The fine-tuning of the Draft Regulations shall overcome the weaknesses noted in the course of this review.

3.2.3 Surface and Marine Transport Regulatory Authority Act, 2001

The primary objective of this Act is to establish a regulatory authority in relation to the surface and marine transport sub-sectors and to provide for its operations in place of former authorities. It has been noted that in the road sector, SUMATRA as a regulatory authority, took over the powers and functions of the Minister and the licensing authorities.

Section six of the Act establishing SUMATRA states the functions of the organization which include:

- 6-(1) The functions of the Authority shall be
- (a) to perform the functions conferred on the Authority sector legislation
 - (b) subject to sector legislation-
 - (i) to issue, renew and cancel licences;
 - (ii) to establish standards for regulated goods and regulated services;
 - (iii) to establish standards for the terms and conditions of supply of the regulated goods and sources;
 - (iv) to regulate rates and charges;
 - (v) to make rules.
 - (c) To monitor the performance of the regulated sectors, including in relation to-
 - (i) Levels of investment;
 - (ii) Availability, quality and standards of services;
 - (iii) the cost of services;
 - (iv) the efficiency of production and distribution of services, and
 - (v) other matters relevant to the Authority

In carrying out its functions SUMATRA is enjoined to enhance the welfare of Tanzania society by, inter alia, protecting the interests of consumers as stated in section 5 of the Act – “Duty of the Authority”. The basic interests of the consumers – the users of public transport - include safety, reasonable fares, comfort and convenience of services. SUMATRA is thus duty bound to protect the users of public transport from road traffic accidents and its consequences. In carrying out its functions listed in section 6 of the Act, SUMATRA is duty bound to ensure that the licensed operators provide their services while taking all necessary precautions to prevent road traffic accidents. This includes the behaviour of the drivers and their working hours and conditions as well as the roadworthiness of the licensed PSV. These concerns are addressed in the Draft Transport (Road Passenger Vehicle) Licensing Regulations 2007 and The Passenger Vehicles (Technical Safety and Quality of Service Standards) Rules, 2007.

In regulating the rates and charges and in monitoring the performance of the road sector and, especially, the cost of the services in this section SUMATRA eventually, finds itself setting fares to be charged on passengers. The set fares should be economic and ensure financial viability as required by the Act. In setting these fares SUMATRA involves the service providers, other enforcing agents e.g. police and the stakeholders generally e.g. consumers of the said services.

The provisions of section 6 when read together with sections 24, 28(1) and 31(3) of the Transport Licensing Act 1973 clearly demonstrate that SUMATRA alone is responsible for setting fares and tariffs in the road transport sector. Neither the Fair Competition Commission nor local government authorities have the mandate to discharge this function.

3.2.4 The Motor Vehicle Driving School (Licensing) Act 1965, Cap 163:

This Act provides for the licensing of proprietors of motor vehicle driving schools. It also lays down the qualifications for those who act as instructors in driving schools. Apart from holding the prescribed qualifications, they are also supposed to be registered. Meanwhile, the Minister is empowered to make regulations prescribing:

- i. A uniform code of driving instructions to be observed by driving schools.
- ii. The vehicles and equipment to be used by driving schools for the purpose of driving instructions.

It is, therefore, an important legislation that determines the training of drivers who have an important stake in controlling and reducing road accidents.

Weaknesses and Proposed Solutions

This Act is administered by the Ministry of Public Safety, and Security which also administers drivers' testing before they are issued with driving licences. The public institutions responsible for driver training do not fall under this Ministry. VETA is under the Ministry of Labour and Youths while the National Institute of Transport is under the Ministry of Infrastructure Development. Considering the current debate generated during the formulation of National Road Safety Policy we recommend that the government consider assigning the Act to the Ministry of Infrastructure Development. Driver Training and Testing will be the responsibility of MoID while the Police are left to concentrate on enforcement role.

Stakeholders were of the view that the following should be taken as short term measures:

- i. Computerise the driver licensing system in the police force. This is at advanced stage and new driver licences may be issued soon.
- ii. Procedures for driver testing should be improved. Testing should be done by a panel of not less than 3 but not more than 5 people from different professions including the police. This is cumbersome and expensive to implement. The important point is to make sure that only adequately trained drivers are licensed.
- iii. Procedures for registering driving schools should be streamlined, transparent and based on competence.
- iv. Approved curricular for driving schools should be used in all schools.
- v. The qualifications of driver instructors should be reviewed and applicants should be thoroughly tested before they are registered.

3.2.5 The Highways Act, 1932 Cap. 167:

This law regulates the technical part as far as road construction is concerned. As a result section 52 of the Act vests the Minister with powers to make rules on various matters listed below which, in their totality, are intended to have roads and highways which are safe and secure. So, the Minister may legislate on:

- i. The general control, use, management, survey, construction and repair of public highways and bridges.
- ii. The lighting of public highways.

- iii. The fixing of mileposts or stones, signposts and traffic signs,
- iv. The width of any highway or bridge.
- v. Classification of highways etc.

The crucial provisions of the Act in terms of road safety are found in Part VI of the Act, which is titled "The Use of Highways" This Part creates offences for any person who:

- i. Causes damage to public highways
- ii. Obstructs highways
- iii. Causes nuisance on public highways etc.

3.2.6 The Roads Act 2007

This law was enacted in April 2007 but it is yet to come into force. It will repeal the Highways Act 1932 described above. In the new Act Part V is entirely devoted to road safety and requires the following:

- i. A road authority shall ensure that the necessary road signs are erected on the public roads under its jurisdiction.
- ii. A road authority shall prescribe speed limits in respect of all roads or sections as the Minister may approve.
- iii. A road authority shall ensure safety of road users during design, construction, maintenance and operation of a public road. Road safety audits may be conducted at any one of these stages.
- iv. Driving and use of motorised or non-motorised vehicle on a public road shall be as prescribed in regulations.

The Road Act 2007 has retained all the provisions of the Highways Act mentioned above with some additions that provides for the current needs.

3.2.7 The Local Government (Urban Authorities) Act 1982/Local Government (District Authorities) Act 1982

Section 89 of the Local Government (urban Authorities) Act, 1982 (a similar provision exists in the other law on District Authorities) empowers urban authorities, such as, city, municipal and town councils to make by-laws for purposes of carrying into effect the functions of the urban and district authorities. These by-laws must be consented to by the Minister responsible for local governments.

Acting on these powers local governments have enacted a series of by-laws intended to regulate road safety which fall under their jurisdiction. For example, the Dodoma Municipal Council enacted in 2003 the Dodoma Municipal Council (Traffic) By-law 2003 empowering it to erect or paint on

or upon any road such traffic signs as it may consider necessary. Other authorities have enacted By-laws regulating the carriage of passengers within the urban areas.

For example, in 1991 the Dar es Salaam City Council enacted the Dar es Salaam City Council (Bus Stations) By-Laws 1991 (GN No. 459/1991) which regulate the embarkation and disembarkation of passengers only at bus stations or places indicated by traffic signs as motor omnibus stopping place. All this is done to safeguard safety of passengers.

On the other hand, local government authorities are empowered to engage themselves in the business of carriage of passengers by sections 118(4) and 55(2) of the Local Government (district Authorities) Act, 1982 and the Local Government (Urban Authorities) Act, 1982 respectively. In particular, Clauses 75 and 76 of the First Schedule to both Acts empower district council and urban authorities to establish acquire and maintain omnibus or transport services; and to establish, acquire and maintain ferry or boating services. The local authorities can provide these services whether alone or in co-operation with any other person or body of persons. But should they decide to carry out this function, they will obviously need to secure road service licences from the licensing authority which is now SUMATRA.

3.2.8 *The Motor Vehicles (Third party) Insurance Act 1946, Cap. 169*

This is another old law passed during the colonial period. Its major objective is to provide for the compulsory insurance by motor vehicle owners against third party risks, that is, against claims which may be filed in courts by claimants (persons) injured through the carelessness of motor drivers or owners and which vehicle owners/drivers may not be able to pay. Where the motor vehicle owner/driver is unable to pay the claimant or victim then the insurance company for which the owner is insured with steps in to pay the claimant.

Weakness of the Act and Proposed Solution

The Act a major weakness namely that the Act has set up what is technically called "liability insurance" instead of "accident insurance." This means that for a claimant or victim of an accident to succeed to recover money from the driver or owner of the vehicle which causes an accident, he must prove that the driver or owner was negligent in driving the vehicle which caused the accident. If he fails to prove negligence, which is always the case, the claimant or victim gets nothing. Indeed, it is extremely difficult for a passenger in a PSV involved in

an accident to explain the negligent circumstances or factors on the part of the driver which led to the occurrence of the accident. Unlike liability insurance, in "accident insurance" the claimant or victim is only required to prove that an accident occurred and that the said accident caused him to suffer the injury for which he should be paid by the insurance company.

It is therefore recommended that this Act should be amended to pave way for accident insurance instead of the existing liability insurance. This will make it easier for injured passengers or their dependants to claim compensation from insurance companies that insured the owner of the fateful vehicles.

3.2.9 The Standards Act 1975

This Act was enacted in 1975 resulting in the establishment of the Tanzania Bureau for Standards (TBS). According to section 4(1) of the Act, the functions of TBS are, among others:-

- i. To prepare, frame, modify or amend standards
- ii. To assist the Government or any other person in the preparation and framing of standards
- iii. To provide for co-operation with the Government or the representatives of any industry or with any statutory corporation or other person, with a view to securing the adoption and practical application of standards.

But section 4(2) is very important in as far as the carrying out of the above functions by TBS is concerned. It says, in the performance of its functions, TBS shall maintain, as far as may be practicable, a system of consultation and co-operation with any body established by or under any written law and having functions similar to those specified in subsection (1) or having functions which relate to industrial or commercial standards generally.

SUMATRA is a body corporate established under a written law having functions similar to those of TBS mentioned above. It follows, therefore, that TBS cannot proceed to make standards on bus bodies without consulting SUMATRA. That is the spirit of section 4 of this Act. The spirit of co-operation and consultation is further echoed by the National Transport Policy, which as mentioned before, stipulates that technical specification of buses, including appropriate bodies will be drawn by the responsible ministry (Ministry of Trade and Industries) with advice from the safety/regulatory authorities which includes SUMATRA.

Once the standards are formulated and gazetted SUMATRA can equally enforce them as they will form part of the roadworthiness of the vehicle.

3.2.10 The Fair Competition Act, 2003

This Act was enacted in 2003 to replace the Fair Competition Act, 1994. The latter was found to be inadequate in many aspects particularly after the passage of laws establishing regulatory authorities such as, SUMATRA and EWURA. The 2003 Act is intended to promote and protect effective competition in trade and commerce and to protect consumers from unfair and misleading market conduct. The Fair Competition, 2003 is a general law as it is not confined to any specific sector. The protection it offers extends to all sectors provided there is competition in the form of trade and commerce and provided consumers are likely to be prejudiced by unfair and misleading market conduct. Part II of the Act prohibits certain trade practices. For example, Section 9 of the Act prohibits agreements, if the object, effect or likely effect of such agreements is; price fixing between competitors or a collective boycott by competitors. Similarly, a merger is prohibited by section II, if it creates or strengthens a position of dominance in a market. In all such cases the Fair Competition Commission established by section 62 of the Act must intervene to protect consumers from such unfair market conduct.

The Commission's primary function is to administer the Act and develop and promote policies for enhancing competition and consumer welfare. The specific functions of the Commission include, inter alia;

- i. To make available to consumers information and guidelines relating to the obligations of persons under the Act and the rights and remedies available to consumers under the Act;
- ii. To carry out inquiries, studies and research into matters relating to competition and the protection of the interests of consumers;
- iii. To investigate policies, procedures and programmes of regulatory authorities so as to assess their effects on competition and consumer welfare and publicise the results of such studies.

At no stage do the provisions of the Act confer the Commission with powers or functions to determine fares or tariffs to be charged on consumers in any particular sector.

Besides, the Act establishes the National Consumer Advocacy Council. In carrying out its functions the Council is required to "represent the interests of consumers by making submissions to, providing views and information to and consulting with the Commission, regulatory authorities and

government ministries. Like the Commission, this Council does not have any mandate on fare or tariff determination. It seems that matters relating to fare and tariff setting have been left to the respective regulatory authorities, such as, SUMATRA.

The Fair Competition Act, 2003 has not been fully publicized and, as a result, the majority of the public is not aware of the existence of the institutions established under this Act. Consequently, public complaints on certain trade practices, such as, attempts by daladala operators to form mergers or threats to stage collective boycotts on grounds of fare increase are wrongly attributed to SUMATRA instead of forwarding them to the Fair Competition Commission. This is the major weakness on the part of the Commission that calls for immediate attention, that is, the dissemination of information concerning its presence and functions.

3.3 The Legal Duty of SUMATRA in Road Traffic Accident Prevention and Monitoring

The purpose of this section is to summarise the role of SUMATRA in RTA prevention and monitoring according to the present legislation. According to the Act establishing SUMATRA, the authority is duty bound to protect the interest of the consumers – i.e. the users of the road transport and in particular those using public transport. The following can therefore be done by SUMATRA under the current legislation.

- i. Initiate amendment of the Transport Licensing Act 1973 so that it also acquires the powers to prosecute.
- ii. Require PSV to displays time tables (both for date and time) in the buses.
- iii. Strictly implement the provisions of sections 33(1) and 46(1) on PSV found to be non-compliant with licensing conditions and vehicle road worthiness.
- iv. Cooperate with the police in mounting prosecutions against offenders.
- v. Review the proposed regulations to accommodate the comments mode above.
- vi. Expand its establishment to regional/district level to facilitate enforcement.
- vii. Cooperate with TBS on issue of PSV standards and the fair competition commission on issues of setting/monitoring PSV fares.

3.4 Summary and Recommendations

3.4.1 Summary

This review has amply demonstrated that road safety in Tanzania is heavily regulated by laws covering almost every conduct of service providers, regulators and consumers of the said services. Apart from the few weaknesses noted in some of these laws, in principle, they are fairly adequate and comprehensive to meet the challenges of the increasing frequency of road traffic accidents on the Mainland. What seems to water-down their effectiveness is enforcement of the respective legislation. The magic of any law, whether bad or good, lies in its enforcement. The Legislature's efforts to churn out safety legislation and or amend it will remain a useless exercise if the said laws will continue to decorate book shelves and tables in the offices of the enforcing agents. In this context the following recommendations are proffered;

3.4.2 Recommendations/ Proposed Amendments to Respective Legislation

Road Traffic Act 1973

The ministries of Public Safety and Security and that of Infrastructure Development individually or jointly should take the necessary steps to:

- i. Amend the fines upwards. Notification fines should be 50,000/= instead of the present 20,000/=. Any fines imposed by any court of law should be not less than 100,000/=.
- ii. Once the Draft Road Safety Policy is approved the Bill for the Road Safety Board should repeal the whole of part VII which establishes the National Road Safety Council.
- iii. Prohibit registration of PSV that is more than 5 years old.
- iv. Repeal and replace the regulations on vehicle dimensions and usage made in 1960.
- v. Harmonise the experience and age for driving PSV to be the same as prescribed in the Draft Transport (Road Passenger Vehicle) Licensing Regulations 2007.
- vi. Repeal and replace the traffic signs rules made in 1965.
- vii. Owners and operators of PSV should be required to undergo training in transport laws.
- viii. Repeal and replace the regulations on maximum weight of vehicles made in 2001
- ix. Amend the provisions on driver testing so that a driver is tested by several persons of different professions.

The Transport Licensing Act 1973

The Ministry of Infrastructure Development should take the necessary steps to:

- i. Repeal and replace the various regulations made under the Act by the Draft Transport (Road Passenger Vehicle) Licensing Regulations 2007 and The Passenger Vehicles (Technical Safety and Quality of Service Standards) Rules, 2007.
- ii. Amend it by identifying new enforcement agents to compliment SUMATRA's efforts.
- iii. Harmonise the proposed Regulations with the employment law as indicated above.

The Surface and Marine Transport Regulatory Authority Act, 2001

No amendment is recommended but efforts should be directed at implementing the functions in collaboration with other public institutions/authorities carrying out related functions especially TBS and the Fair Competition Commission. Also the establishment of SUMATRA offices/contact points at district level, especially where there high concentration of PSV to facilitate enforcement of the law.

The Motor Vehicle Driving Schools (Licensing) Act 1965

The ministries of Public Safety and Security and that of Infrastructure Development should initiate the actions to secure institutional re-assignment of responsibilities and possible re-writing/amendment of the legislation:

- i. Enact the regulations on the uniform code of driving instructions for driving schools.
- ii. Provisions on registration of driving schools should be streamlined to reflect transparency.
- iii. Tighten provisions on registration of instructors in driving schools.

The Motor Vehicle (Third Party) Insurance Act 1946

Amend the Act so that it provides for accident insurance instead of liability insurance.

We recommend that SUMATRA cooperate with and encourage the respective public bodies to initiate the amendment of the respective legislation.

4. ROAD TRAFFIC ACCIDENTS: CAUSES AND PROPOSED MEASURES

4.1 Introduction

The objective of this chapter is to present the Road Traffic Accidents (RTA) situation of in Tanzania Mainland. The available RTA data is analysed to establish their extent, distribution of casualties according to age and road user groups, pattern of accident occurrence and the contributing factors. International literature is used to provide a framework for understanding our data and for comparison. The evaluation of the effectiveness of the ban of the night services by public service vehicles is presented and measures to improve the road safety situation are proposed.

4.2 The Road Traffic System and the Causes of Road Traffic Accidents

To understand road traffic accident occurrence and to analyse the contributing factors it is useful to visualise road traffic as a system in which the components are constantly interacting with each other. The system comprise of the following components:

- i. The human as road users i.e. drivers, pedestrians, cyclists etc.
- ii. The vehicle.
- iii. The road environment including the operating rules and Traffic Control Devices (TCD).

When there is a breakdown in the interaction of the components a “system failure” or a road traffic accident is the result. Indeed, a road traffic accident has been defined as a *“rare, random, multifactor event always preceded by a situation in which one or more persons have failed to cope with their environment”*

A systematic approach to the identification of RTA contributory factors and development of safety measures need to clearly recognise that road traffic is a system and hence accident occurrence is necessarily an event with multi-factor causes as captured in the definition above. In 1980, William Haddon combined the system components with the three accident phases – namely pre-crash, in-crash and post-crash - to form what is now known as the “Haddon Matrix.” A recent version of the matrix can be found in the PIARC Road Safety Manual published in the year 2003. The contribution of the traffic system components to road traffic accident occurrence is discussed below with illustration from international studies.

The Human Aspect

The limitations of the road user are an important consideration in roadway and vehicle design. Many accidents have been attributed to “human

error" while, in fact the accident occurred as a result of information overload i.e. the road user could not process – and make correct decision in the time available. This is why road improvements that reduce the information processing demand on the road user achieve reduction in accidents. The training, condition (fatigue, health, age) and blood alcohol concentration of the driver contribute to the performance of the driver and may be a RTA contributing factor.

The Vehicle

The design and condition of vehicles contribute to RTA occurrence and the severity. Modern vehicle technology offers vehicles that are easy to drive. The protective features to occupants and pedestrian friendly bumpers to limit injury in case an accident occurs. Older vehicles have components that are likely to fail and do not offer as much protection to occupants or pedestrians. However, high acceleration capability and the cruising speeds attainable by modern vehicles can be abused. Old vehicle fleet in this country and other developing countries that import used vehicles calls for serious vehicle inspection practice to reduce number of defective vehicles on our roads.

The Road Environment

The design and condition of the road affect the occurrence and consequences of RTA. Safer roads have lower accident risk. One-way multilane freeway roads are among the safest roads when we consider the high volume of traffic they carry. The probability of human error is low as there are very few decision points and the use of traffic control devices including real time advice is standard. On the other end of the spectrum, urban networks, consisting of many two-lane two-way streets providing for both mobility and access functions offer a great challenge to road users and the frequency of RTA accidents is rather high.

International Studies on RTA Contributing Factors

A summary of in depth accident investigation studies carried out in the UK and USA to investigate RTA contributory factors is presented in this section. The studies were done by a multidisciplinary team which helped to reduce bias in the determination of relative contribution of human, vehicle and road factors to the occurrence of RTA. The results of the two studies are shown in Table 4.1. Figure 4.1 presents the results of the USA study.

Table 4.1 Factors contributing to road accidents

Contribution	UK Study	USA Study
Road environment only	2	3
Road user only	65	57
Vehicle only	2	2
Road and road user	24	27
Road user and vehicle	4	6
Road and vehicle	1	1
All three factors	1	3

(Source: Ogden 1996, Safer Roads – A Guide to Road Safety Engineering)

From the results it is apparent that over 95% of RTAs involve some degree of driver behaviour combined with one of the other two factors. However, drivers always try to blame road conditions, vehicle failure, or other drivers for those accidents. The police on the other hand try to who was to blame in order to prepare for prosecution. Drivers involved in RTA tend to believe that the other driver could have done something to prevent the accident. This is an attitude problem. Inappropriate speed is the commonest driver behaviour problem. Read Text Box 4.1 for illustration of this problem. Defective vehicle is a factor in seven percent of the RTA. The most cited types of vehicle failure are loss of brakes, tyre blowouts or tread separation, and steering/suspension failure. Road environment was a factor in 27 percent of the RTA studied. However, with improvement in design, increased travel on multilane highways and correction of poorly designed locations, the contribution of poor design is progressively being eliminated in countries that are serious about road safety. The elimination of road side objects and appropriate use of Traffic Control Devices (TCD) including traffic light signals, speed limit signs, yield and stop signs, school & pedestrian crossings, turning lanes, and roundabouts has improved road safety. Traffic management or calming measures that control driver behaviour including speed humps, pedestrian islands, raised medians, high kerbstones and, guard rails have contributed to reduction in RTA in built-up areas. Poor maintenance and construction activities to some extent contribute to the occurrence of RTA.

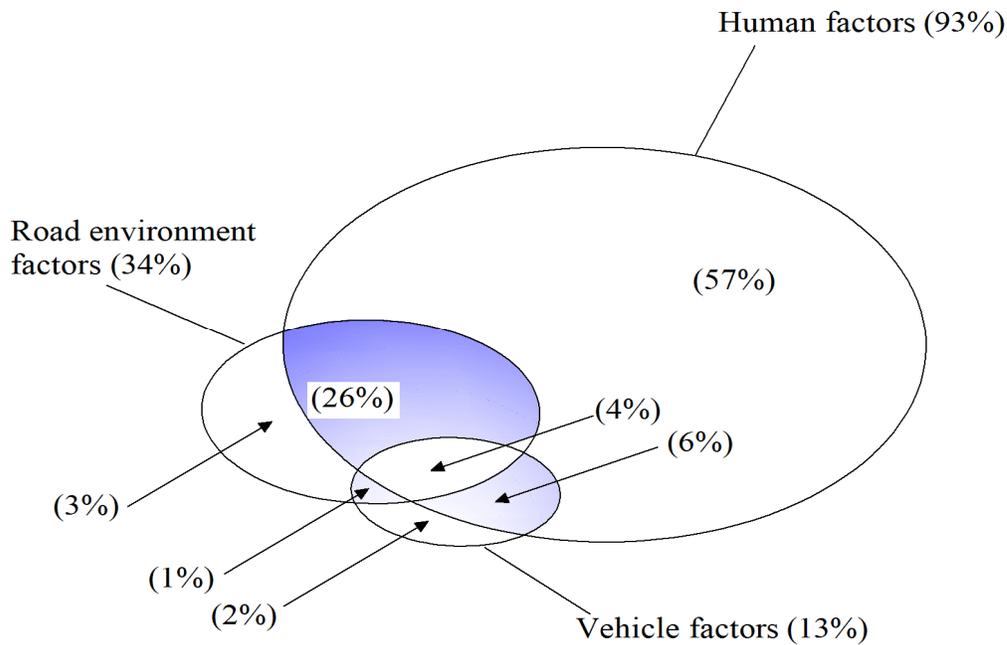


Figure 4.1 Relative contribution of human, vehicle and road factors to the occurrence of RTA (Source: PIARC 2003, Road Safety Manual)

Text Box 4.1: Speed Kills

The faster the speed of a vehicle the greater the risk of accident occurrence. The forces experienced by the human body in a collision increase exponentially as the speed increases. Most people agree that going 160 kph is foolhardy and will lead to disaster. The problem is that exceeding the speed limit by only 10 kph in the wrong place can be just as dangerous. Consider this example: a pedestrian walks out in front of a car. If the car is travelling at just 50 kph, and the driver brakes when the pedestrian is 15 m away, there will be enough space in which to stop without hitting the pedestrian. Increase the vehicle speed by just 10 kph and the situation changes dramatically. At 60 kph, with the pedestrian 15 m away and the driver braking at the same point, the car will be travelling at 30 kph when it hits the pedestrian. An impact at 30 kph can seriously injure or even kill the pedestrian.

4.3 Causes of RTA in Tanzania Mainland

4.3.1 Causes of RTA According to Official Statistics

The causes of RTA in Tanzania Mainland are established by the Traffic Police according to the definitions in the Road Traffic Act 1973. Table 4.2 and Figure 4.2 summarise the data for the years 2000 to 2005. According to the official statistics reckless or dangerous driving (which we prefer to call inappropriate speed for a given road and traffic conditions) is the leading cause of road traffic accidents. In total behavioural (human) factors, the human factor accounts for almost 77 percent of the RTA over the six year period. The summary presented in Table 4.2 is very similar to the causes of RTA reported between 1990 and 1999 suggesting that the causes for RTA has remained stable during the period.

Table 4.2 Major causes of road traffic accidents (2000 to 2005)

Causes of Road Traffic Accidents	2000	2001	2002	2003	2004	2005	subtotal	(%)
Reckless / Dangerous Driving (Inappropriate speed)	7041	6743	8179	10916	9366	4318	46563	54.5
Defective Motor Vehicles	2797	2440	2641	2503	2403	1164	13948	16.3
Careless Pedestrians	850	1056	1096	1463	1337	566	6368	7.5
Excessive Speed	426	350	340	376	1409	263	3164	3.7
Careless Motor Cyclists	924	827	827	483	757	286	4104	4.8
Careless Pedal Cyclists	1276	891	891	367	607	359	4391	5.1
Intoxication	170	98	99	68	171	92	698	0.8
Others ie Bad road, Slippery	1064	1472	1417	488	989	768	6198	7.3
Total	14548	13877	15490	16664	17039	7816	85434	100

Source: Traffic Police Statistics

Combining the causes into the three major factors contributing to RTA we have:

Human Factors	76.4%
Vehicle Factors	16.3%
Road Factors	7.3 %
Total	100.0%

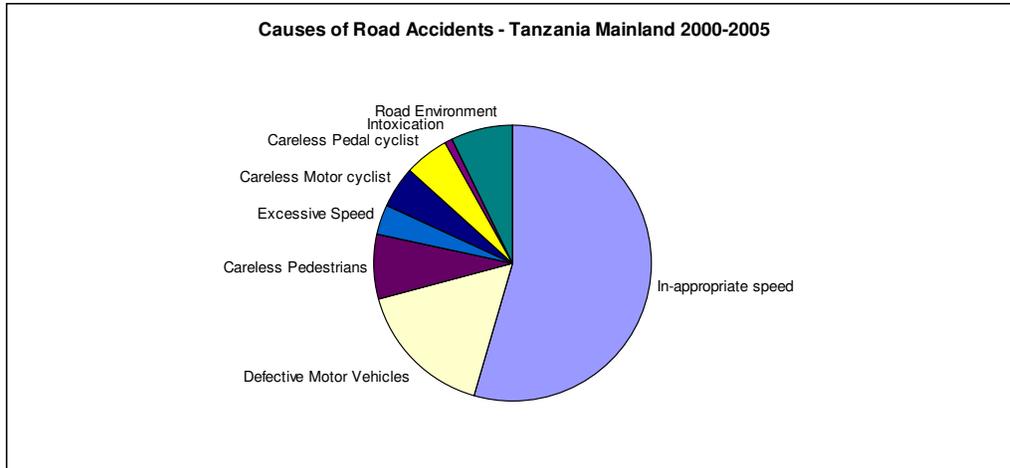


Figure 4.2 Causes of RTA in Mainland Tanzania 2000-2005 (Source: Traffic Police Statistics)

It is important to note that the causes of RTA in Tanzania were established for the purposes of prosecution according to the Traffic Act 1973. The focus of the offences in the Act is on human and vehicle factors and not the road environment. In fact in the police records the road environment factor is classified under other factors. The contribution of vehicle and road factors is likely to be more than what is reported in the statistics and measures to improve safety should give due weight to the road and vehicle factors. This is critical consideration especially when you take into account that to change human behaviour permanently is a long term measure whereas changing road design and vehicle roadworthiness of vehicle can give results in the short and medium term. We recommend strongly that the reporting of road traffic accidents be based on Police Form PF 212 C. This will help with the identification of causes of road traffic accidents and determination of remedial measures. Accordingly the development of Road Traffic Accident Information System and Database described in Chapter 6 is based on PF 212 C.

Table 4.3 and Figure 4.3 summarise the different environmental conditions associated with RTA occurrence in 2006. We note that most accidents are associated with dry weather. The number of accidents and casualties during the night is high compared with the low traffic intensity.

Table 4.3: Environmental conditions associated with RTA for 2006

	By Day*			By Night*		
	Accidents	Killed	Injured	Accidents	Killed	Injured
Wet	414	243	332	259	207	312
Rain	1054	367	1010	583	265	646

Dry	5939	1292	6631	1921	690	2548
Fog	383	217	247	273	180	270
Slippery	365	217	287	236	187	258

Source: Traffic Police Statistics

*The RTA reported may be associated with more than one condition, e.g. rain and wet and therefore column totals are meaningless.

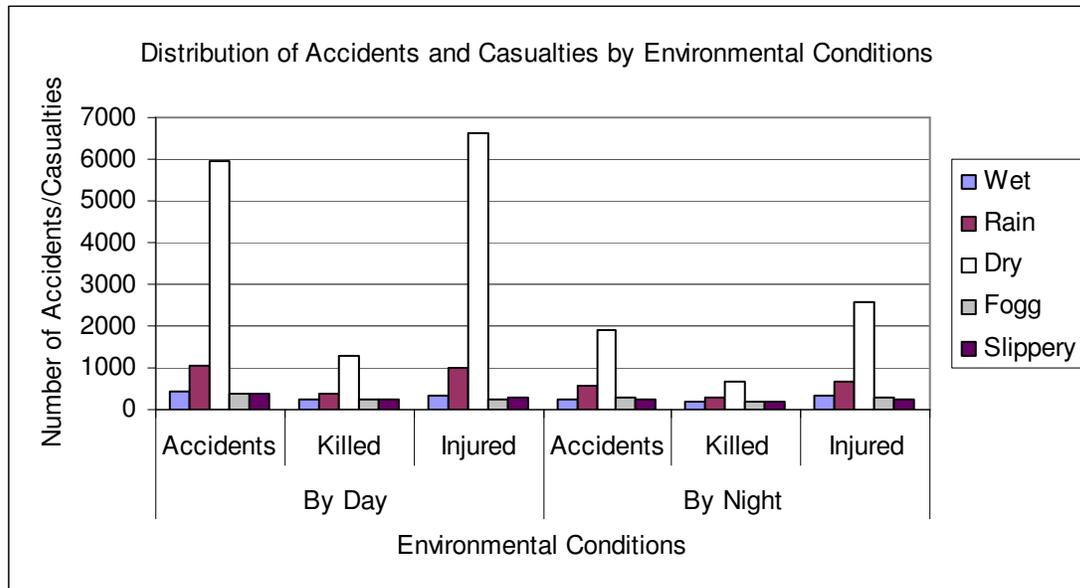


Figure 4.3: Distribution of accidents and casualties by environmental conditions, 2006 (Source Traffic Police Statistics)

4.3.2 Causes of RTA According to Stakeholders

We had discussions with road users and stakeholders and asked them to rank the official causes of RTA. The summary of their ranking of causes of RTA are presented in Table 4.4. The groups are reported in the table by a letter A to G according to the following list:

- A: Daladala & Taxi drivers
- B: Buses Drivers
- C: Truck Drivers
- D: Road Safety Professionals
- F: Traffic Police
- G: Users of Public Transport Services, pedestrians and other road users
- H: According to official statistics

Table 4. 4 Ranking of the causes of road traffic accidents by stakeholders

	Causes of RTA	A	B	C	D	F	G	H
I	Reckless/Dangerous Driving e.g. Hazardous overtaking, drivers fatigue	1	1	1	1	1	1	1
li	Defective Motor Vehicles e.g. vehicle body, vehicle tires	3	3	3	2	2	5	2
lii	Careless Pedestrians	2	5	7	6	4	3	3
lv	Excessive Speed	5	2	2	3	5	2	6
v	Careless Motor Cyclists	7	8	8	8	8	4	5
vi	Careless Pedal Cyclists	4	7	6	7	3	7	4
vii	Driving under the influence of alcohol and/or drugs	6	6	5	5	7	6	7
viii	Others i.e. Bad road, Slippery	8	4	4	4	6	8	8

Additional information / observations or opinions were as follows.

Daladala and Taxi Drivers

This group pointed out that drivers do not report known needs for maintenance of the vehicle they are driving because they will have no income while vehicles are being maintained. This results in accidents due to brake failure, tyre bursts, steering and suspension failure. They observe that driving under influence of alcohol is a serious problem especially at night and during weekends. On driver behaviour during the peak hour they noted that drivers fail to respect other road users when roads are congested. They agree that the leading cause of accidents is driver and other road users' behaviour followed by defective vehicles.

Long Distance Bus Drivers

This group points out that drivers of heavy goods vehicle are not taking sufficient safety precautions when driving and parking especially when their vehicles break down. They observed that the pay of drivers is low and this has impact on their job performance. Instead of thinking of the safety of the passengers and vehicle entrusted to them their minds are wondering on how to tackle their family problems.

They noted that bus bodies are not built to standard (most are converted trucks). This results in high accident severity when accidents occur. Tyres available on the local market are susceptible to bursting – even when

they are new. Owners of buses are not concerned about the roadworthiness of their vehicles. They observed that slippery pavements also contribute to RTA occurrence. The cause of the slippery road surfaces were attributed to high temperature during the afternoon or rain.

Drivers of Heavy Goods Vehicle (HGV)

This group supported the observations by bus drivers and in addition point out the following:

- i. There is a serious overloading problem which leads to loss of control.
- ii. Young drivers who are often not qualified to drive HGV often drive recklessly.
- iii. Over speeding especially of HGV carrying perishable goods.
- iv. Driver fatigue due to driving long hours.

Road Safety Professionals

This group is concerned that while Highly Motorised Countries (HMC) countries are experiencing reduction in RTA in spite of increasing traffic, the country is experiencing worsening Road Safety situation. The group supported the views of bus drivers regarding the sub-standard bus bodies (accident severity is higher especially with those inadequate leg-room seats). They note that the pressure on daladala drivers to deliver daily targets contribute to their poor behaviour in traffic. The professionals also noted that the young and inexperienced drivers driving big buses and HGV are contributing to increased RTA and severity. Competition (who is the fastest) among long distance bus drivers leads to high accident severity.

The Traffic Police

This group agreed with observations gives by the stakeholders and in addition recommends stronger quality control system for assuring tyre quality on our market. They asserted that the quality of the tyres being sold in the country is questionable. They are very concerned that the roads signs especially speed limit signs are not adequate (small size and their frequency is low) and that improper behaviour (speeding) is rewarded by the public. Their working facilities (transport, speed guns, breath analyses, etc) are not adequate. They also work for long hours hence poor performance.

Public Transport Users and Other Road Users

This group noted the following problems:

- i. Drivers are not caring of the other road users such as pedestrians, motor cyclists, pedal cyclists etc.

- ii. Over speeding is a common problem.
- iii. Drivers do not adhere with the road signs and markings i.e. zebra crossing etc.
- iv. Defective motor vehicles (poor brakes, worn out tyres) are allowed on our roads.
- v. Driving under the influence of alcohol is also a problem especially weekend days and at night.
- vi. Traffic Police control at signalised intersections (e.g. traffic signals not switched off).
- vii. Carelessness of the road users especially pedestrians and pedal cyclists whereby they are not aware at what time they have to cross the road.
- viii. There has been an increase of vehicle in Dar es Salaam which has lead to congestion and poor driver behaviour which may cause RTA.

From the interview of the stakeholders we noted that road users, especially drivers are aware of the causes of RTA. Unfortunately other motives like income and minimising operational costs cause drivers and owners of motor vehicles to compromise on road safety. This suggests that it will not be enough to educate or campaign for road safety alone but it is necessary to enforce rigorously the existing legislation hand-in-hand with road safety campaigns. The control of the training and licensing of bus and HGV drivers, monitoring of the safety of bus body building, the quality of tyres for heavy vehicles and drink and driving behaviour are particularly important. Road safety campaign aiming at creating awareness on safe road use for pedestrians is likely to be productive.

4.4 Extent, Trend and Nature of Road Traffic Accidents

4.4.1 Extent and Trend of RTA

The magnitude of the road safety problem may be indicated by the annual number of accidents and casualties. There were 17,677 reported road traffic accidents in the year 2006. Considering under reporting the number of RTA could be between 22,000 and 27,000. However, the number of fatalities is a more reliable measure as a large percentage is reported compared to the number of all accidents. There were 2,838 fatalities and 15,855 persons injured as a result of RTA that were reported for the year 2006. There is no adequate follow up to make sure that all accident victims who die within 30 days are captured in the official statistics.

The number of fatalities per 10,000 vehicles is used as a comparative indicator of the risk in the road transport system while the number of

fatalities per 100,000 inhabitants is an indicator of RTA as health problem. In Mainland Tanzania there were 84 fatalities per 10,000 vehicles and 8 fatalities per 100,000 inhabitants. Comparing with other countries the risk of travel is considered high or in other words the transport system is very unsafe. As a health problem the rate is considered to be low which may be attributed to the fact that most of the inhabitants are not frequently exposed to the road system due to the low road density and very low vehicle ownership levels.

The trend of road accident casualties since 1980 is shown in Figure 4.4(a and b). The trend is basically increasing with some fluctuations. Between 1995 and 2005 the number of reported accidents increased by 19 percent while fatalities and injured persons increased by 46 and 29 respectively. There are a number of reasons that can be attributed to the continuous increase in RTA casualties including but not limited to the following:

- 1) Increase in travel and exposure to traffic,
- 2) Lack of systematic and sustainable road safety programme. (The road safety policy on the basis of which sustainable programmes may be developed is in draft stage.)
- 3) Condition of the fleet of vehicles, poor training and examination of drivers and unsafe road network.
- 4) Poor attitude toward road safety by the majority of road users.

As stated above, the number of fatalities per 10,000 registered was 84. In highly motorised countries the number of fatalities per 10,000 registered vehicles is less than 10. Such countries have a history of sustained application of road safety measures since 1970's and 80's when they stopped seeking to find a person to blame for the occurrence of a RTA and started to diagnose RTA contributing factors and applying corrective measures.

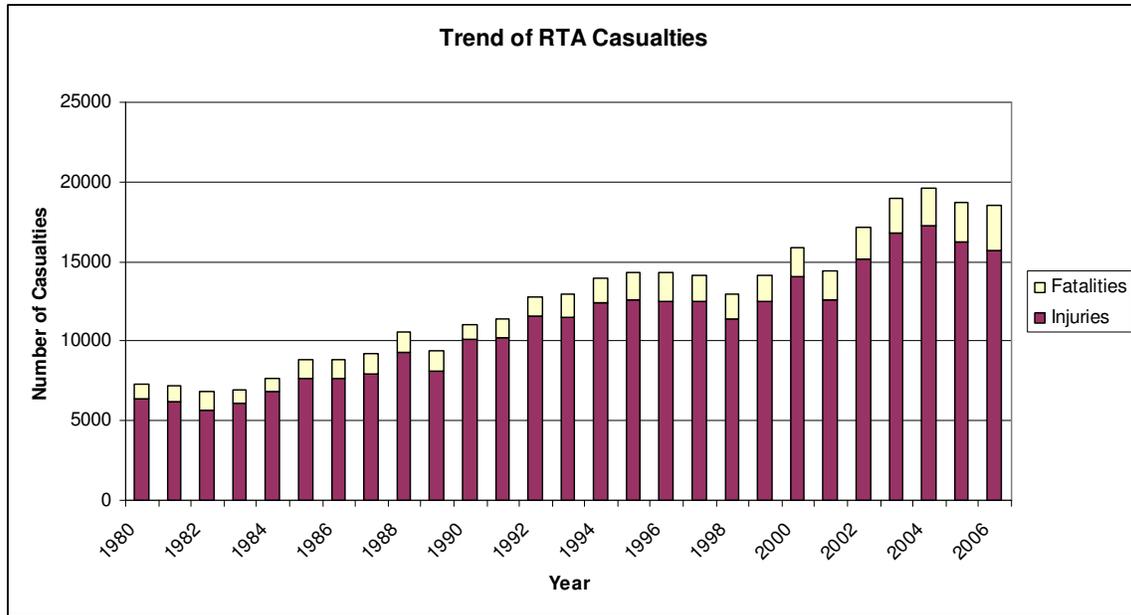


Figure 4.4(a) RTA Casualty Trends 1980 to 2006

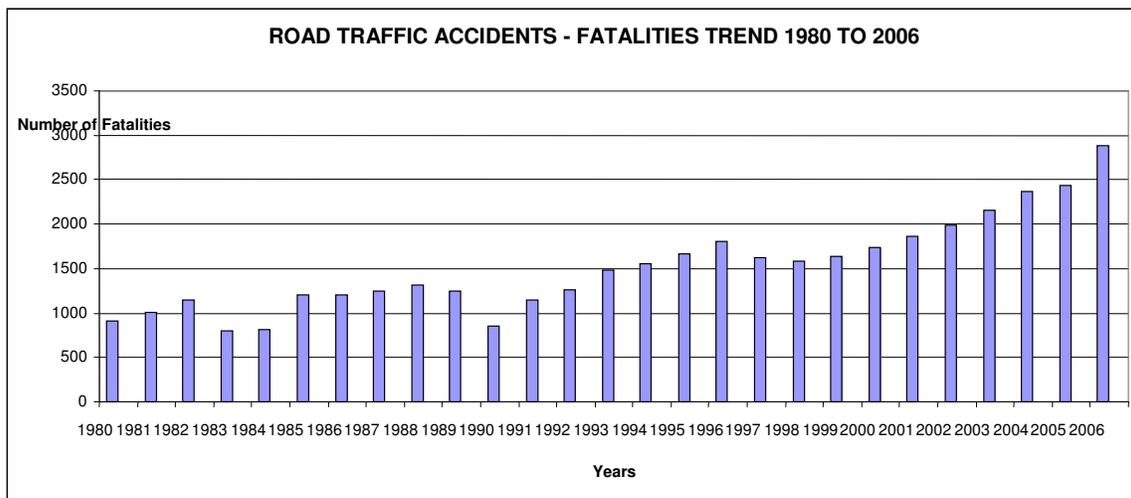


Figure 4.4(b) RTA Fatality Trends 1980 to 2006

4.4.2 The Nature of Road Traffic Accidents

The study of the nature of RTA may help identify potentially successful measure and targets for road safety work. Table 4.5(a) and Figure 4.5(b) present the distribution of persons injured by road user group. Clearly passengers and pedestrians need more attention.

Table 4.5(a): Distribution of fatalities by road user groups 2000 to 2005

Road User Group	2000	2001	2002	2003	2004	2005	Total	(%)
Drivers	127	237	249	260	283	294	1450	11.6
Passengers	658	781	875	971	1024	1053	5362	42.8
Motor- Cyclists	91	75	65	68	93	97	489	3.9
Pedal Cyclists	231	143	152	174	206	212	1118	8.9
Pedestrians	630	630	653	682	756	768	4119	32.9
Total	1737	1866	1994	2155	2362	2424	12538	100.0

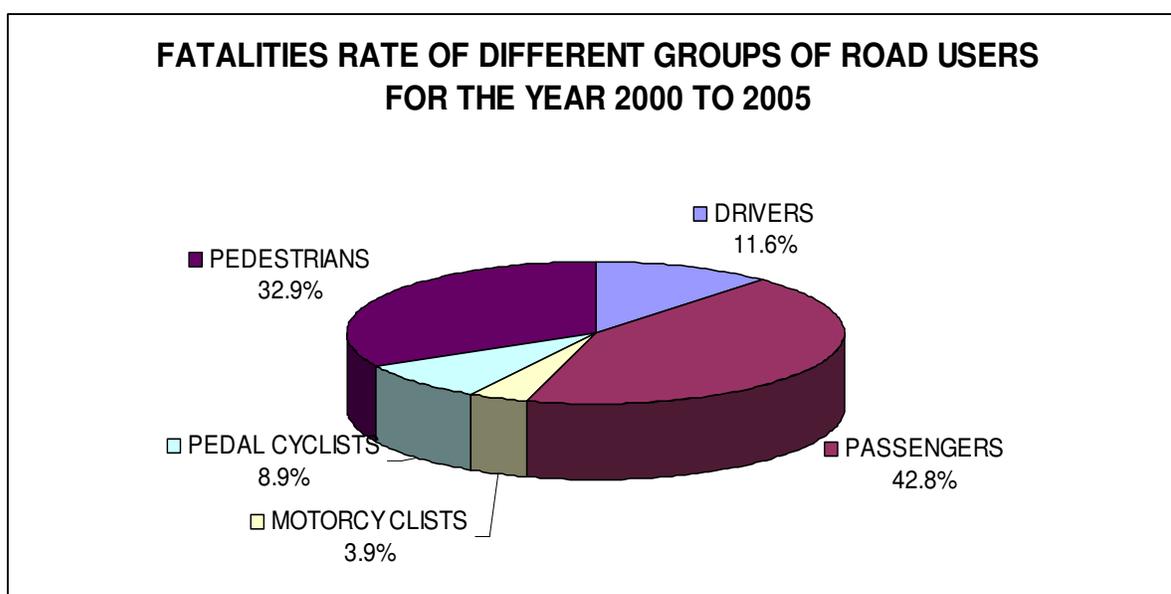


Figure 4.5 Distribution of fatalities by road user group

Table 4.5(b) Distribution of personal injuries by road user groups 2000 to 2005

Groups Of Road Users	2000	2001	2002	2003	2004	2005	Sub Total	(%)
Drivers	942	189	205	894	1279	1261	4770	5.2
Passengers	6298	7349	8475	9418	9482	9117	50139	54.4
Motor cyclists	649	149	142	628	542	493	2603	2.8
Pedal Cyclists	2719	248	345	1064	1037	994	6407	7.0
Pedestrians	3486	4632	5983	4821	4873	4409	28204	30.6
Total	14094	12567	15150	16825	17213	7109	92123	100

Figure 4.6 shows the age and gender distribution of the 415 fatalities in Dar es Salaam for the year 2006. Out of the 415 fatalities only 66 or 16 percent were female. Obviously road safety campaigns must target the male in the age group 20 to 45 years. The distribution of injured persons by age and gender is very similar. However, the proportion of female injured persons is 26 percent. Nationally (Mainland) the distribution is shown in Table 4.5 and Figure 4.7. The proportion of female fatalities and injuries were 26 and 28 percent respectively. The most productive age from 20 years to 55 years makes 78% of the fatalities and 84 percent of the injured persons. This is a big drain to the economy.

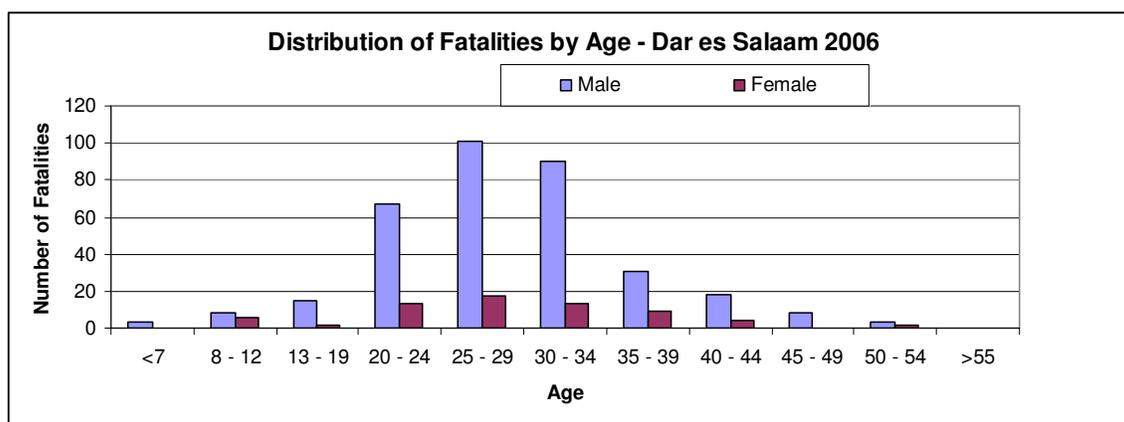


Figure 4.6 Distribution of fatalities by age and gender for Dar es Salaam 2006.

Table 4.5 National distribution of casualties by age 2006

Fatalities			Injuries		
Age	Totals	Percent Fatalities	Age	Totals	Percent Injuries
<7	106	3.7	<7	277	1.7
7 - 12	150	5.3	7 - 12	486	3.1
13 - 19	214	7.5	13 - 19	1448	9.1
20 - 24	333	11.7	20 - 24	2665	16.8
25 - 29	527	18.6	25 - 29	3222	20.3
30 - 34	514	18.1	30 - 34	2911	18.4
35 - 39	342	12.1	35 - 39	1964	12.4
40 - 44	205	7.2	40 - 44	1413	8.9
45 - 49	151	5.3	45 - 49	821	5.2
50 - 54	139	4.9	50 - 54	382	2.4
>55	157	5.5	>55	266	1.7

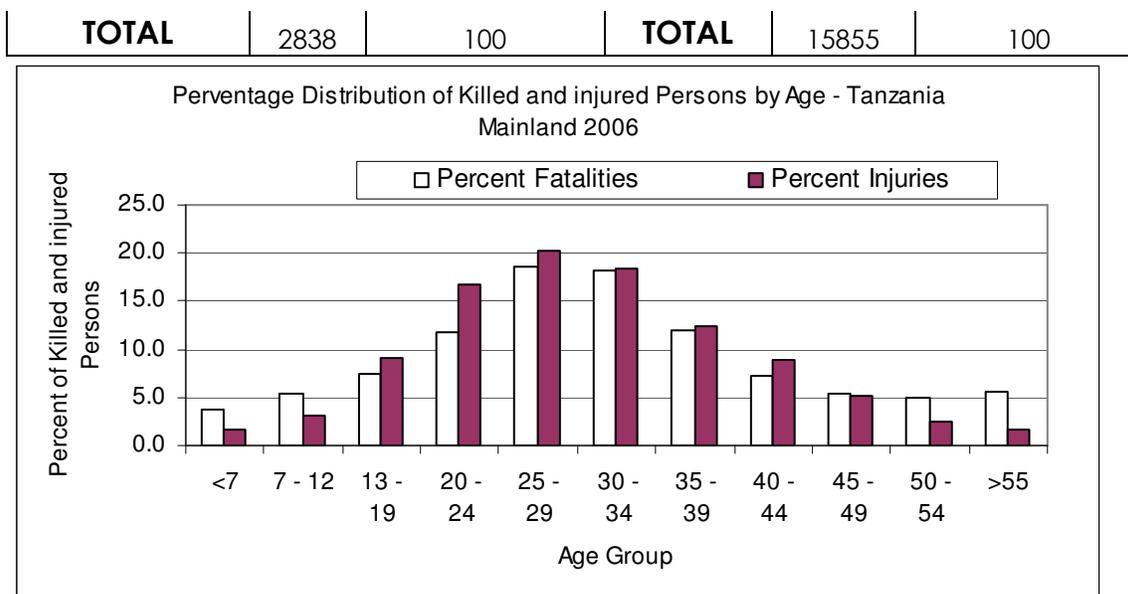


Figure 4.7 National distributions of casualties for year 2006

Types of vehicles involved by total number of accidents, killed and injured persons in Dar es Salaam City for the year 2006 is presented in Table 4.6 and Figure 4.8. The high contribution from private cars is associated with their high numbers compared to the other vehicle types. Many of the vehicles are driven by un-professional inexperienced drivers. However, the large number of accidents and casualties associated with daladala (commuters) suggests a need for specific safety strategies to address the problem.

Table 4.6 Distribution of accidents and casualties by vehicle class involved

Type of vehicles	No. of vehicles involved	Fatalities	Injured Persons
Private cars	5761	152	1553
P.S.V. (Buses)	78	6	50
P.S.V. (Daladala)	2071	87	1621
P.S.V. (Taxi cabs)	115	7	54
P.S.V (private hire)	84	0	30
H.D.V/Trailer	1036	54	259
Motor cycle	335	17	322
Pedal cycles	314	23	306
Pickups	1171	68	487
Mikokoteni	40	1	39
Total	11005	395	4713

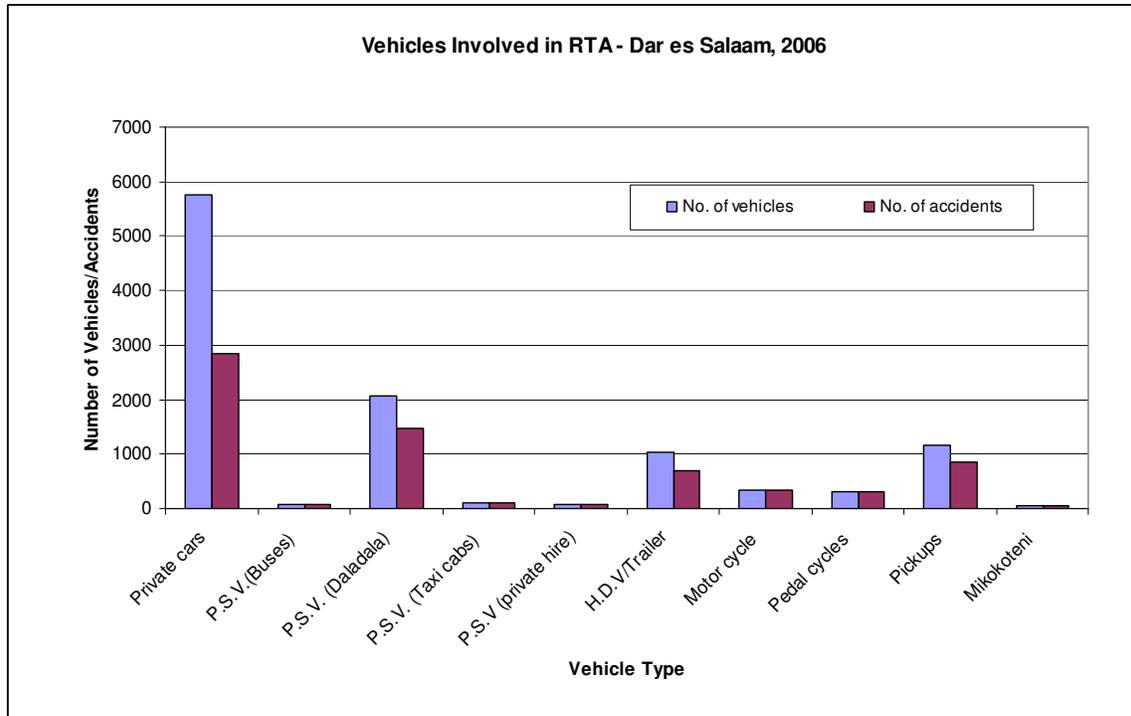


Figure 4.8 Distribution of accidents by vehicle class – Dar es Salaam, 2006

Figure 4.9 to 4.11 and Table 4.7 presents the national distribution of accidents and casualties by vehicle class. The contribution of PSV (37 percent of all casualties) is high relative to the small fleet of buses. The standards of safety for public safety in this country is extremely poor compared to industrialised countries and specific policies and strategies are necessary to change the status. The rules proposed by SUMATRA, The (Draft) Passenger Vehicles (Technical Safety and Quality of Service Standards) Rules, 2007 and The (Draft) Transport (Road Passenger) Licensing Regulations 2007, if approved and effectively enforced will solve part of the problem.

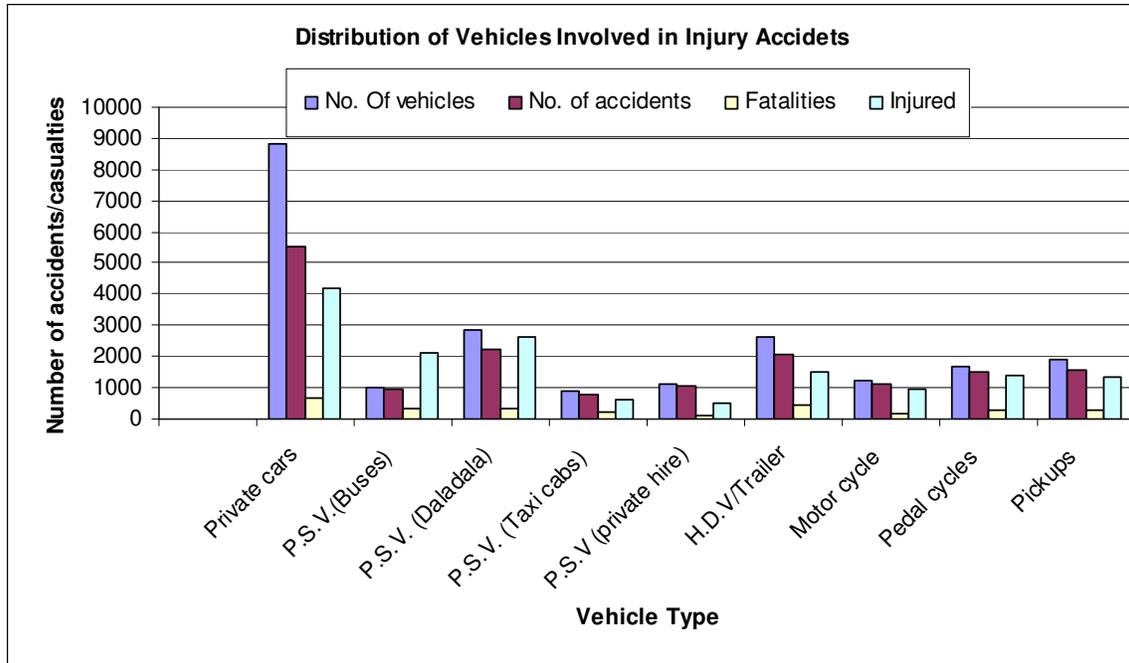


Figure 4.9 National distribution of accident frequency and casualties by vehicle class 2006

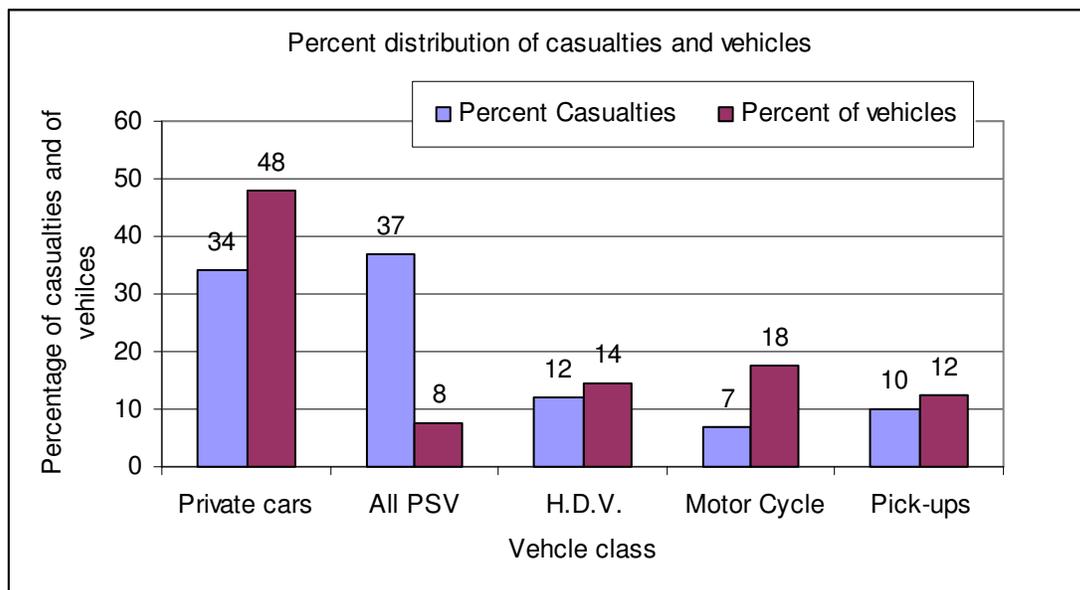


Figure 4.10 National percentage distribution of casualties and motor vehicles by vehicle class

Table 4.7 National distribution of casualties and accidents by vehicle types, 2006

Vehicle class	No. of vehicles involved	Fatalities	Injured	Casualties	Percentage
Private cars	8833	688	4203	4891	27
P.S.V.(Buses)	1010	353	2115	2468	14
P.S.V. (Daladala)	2862	328	2641	2969	16
P.S.V. (Taxi cabs)	872	199	608	807	4
P.S.V (private hire)	1100	133	523	656	4
H.D.V/Trailer	2643	438	1530	1968	11
Motor cycle	1256	163	975	1138	6
Pedal cycles	1653	255	1422	1677	9
Pickups	1927	270	1325	1595	9
Total	22156	2827	15342	18169	100

4.5 Regional and International Comparison

It is interesting to compare RTA in the different regions of the country and with the neighbouring countries. Regional distribution of RTA helps us to prioritise regions or routes when developing road safety action plan. Dar es Salaam has the highest number of accidents and fatalities in the country with 408 fatalities and 4,897 persons injured due to RTA in 2006. Figure 4.11 shows the regional distribution of casualties due to RTA for the rest of the regions. From the figure it is apparent that the regions traversed by the Tanzania Zambia highway including Coast, Morogoro, Iringa and Mbeya each had more than 600 casualties. The Northern corridor traverses Tanga, Kilimanjaro and Arusha regions and they each had more than 600 casualties. Mtwara, Mwanza, Shinyanga and Dodoma regions each approach or surpass 600 casualties. Enforcement and other road safety activities should therefore focus on the major transport corridors and the leading urban centres.

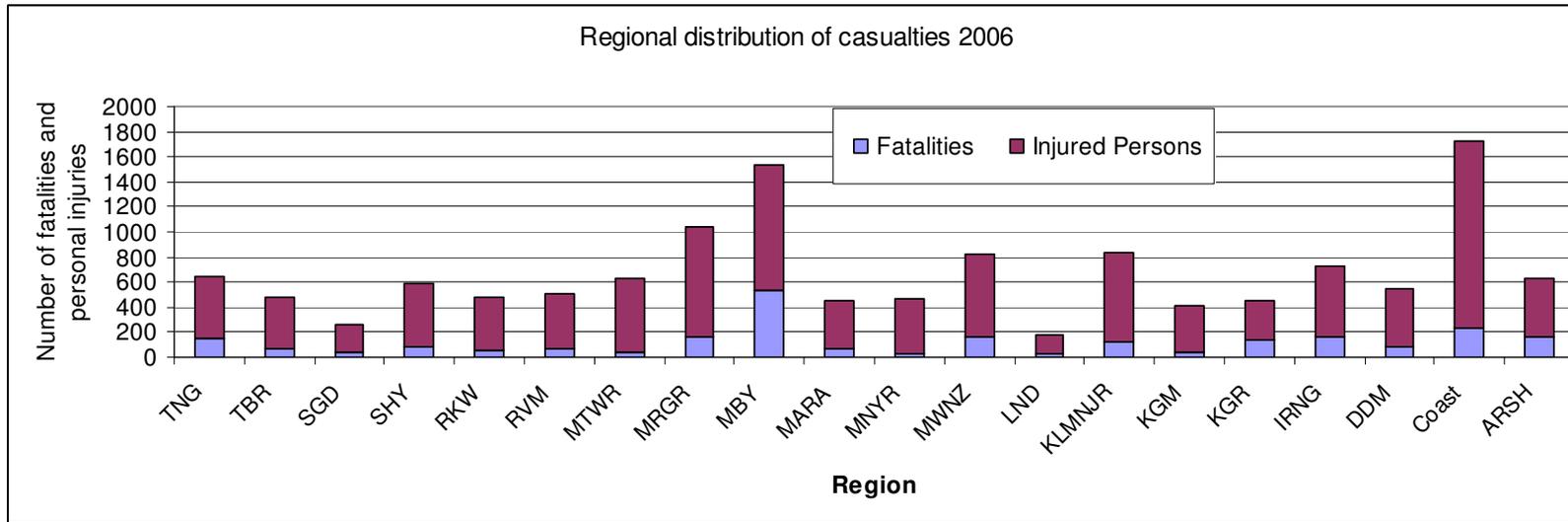


Figure 4.11 Regional distribution of casualties, 2006

We may have something to learn from our neighbours so international comparison is interesting. Kenya had 2,251 fatalities due to RTA in 2004 while Uganda had 2,142 and Tanzania had 2,366 fatalities in the same year. However, for comparison we have to take account of motorisation level as well as population. Figures 4.12(a and b) show the system risk and motorisation levels in Eastern and Southern Africa countries for the last decade using information from Africa Road Safety Review available from the source indicated. It is apparent from the two figures that the system risk correlates with levels of motorisation (i.e. number of motor vehicles per 1000 population). The average for Kenya, Uganda and Tanzania was 103 fatalities per 10,000 vehicles. Thus the system risk for Tanzania was quite close to the average for East Africa. The motorisation level of Tanzania was 5 as compared to 7 and 14 for Uganda and Kenya respectively. Malawi had the same motorisation level as Tanzania but had more than twice the system risk as shown in Figure 4.12(a). However, due to serious road safety campaigns their situation is improving⁴. Considering personal risk during the same period, Tanzania had 5 fatalities per 100,000 inhabitants which was below that of Uganda (8), Kenya (10), Malawi (12), Zambia (9) South Africa (19) and just above Mozambique (4). The situation for Tanzania was thus very close to the average of the three East African countries in terms of system risk and was safest in terms of personal risk. The system risk for Tanzania for 2006 was 84 fatalities per 10,000 vehicles. This is lower than 114 reported in the review for last decade and the improvement is probably due to the increased level of motorisation which was about 10 vehicles per 1,000 population. We can therefore conclude that the overall road safety situation in Tanzania considering the level of motorisation, the system and personal risk indicators is not much different from other African countries at the same level of motorisation. The figures suggest that it was definitely safer than Uganda and Malawi for both indicators and safer than most neighbouring countries in terms of personal risk. Regardless of this favourable comparison there is need for serious efforts to improve road safety since road transport in Africa is very unsafe compared to the countries that have invested heavily in road safety.

⁴ The positive effects of the road safety campaigns in Malawi were reported at the Annual Road Convention in Dar es Salaam, November 2006.

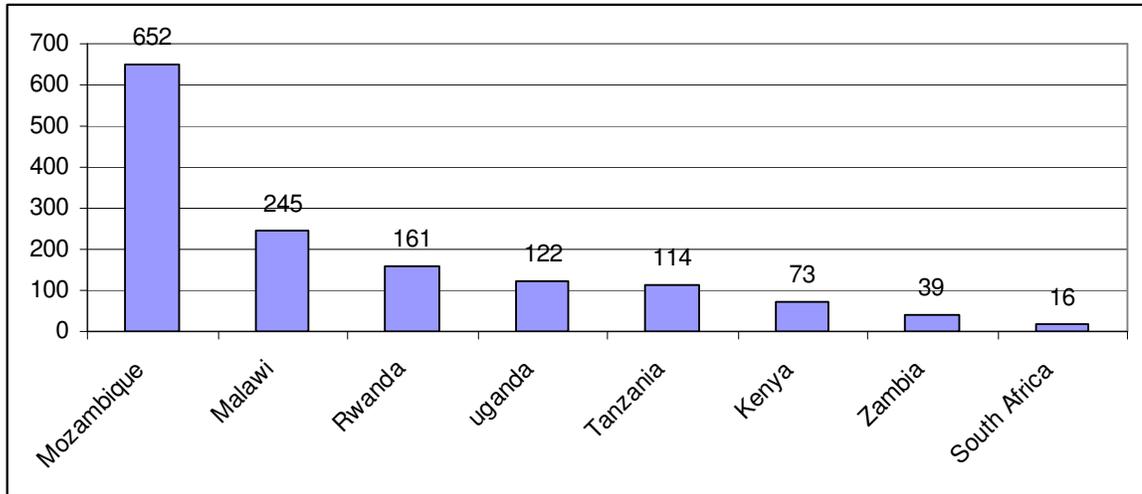


Figure 4.12(a) International (East and Southern Africa) System Risk Comparison

(The figure shows number of fatalities per 10,000 registered motor vehicles; Source <http://safety.fhwa.dot.gov/about/international/africa/>)

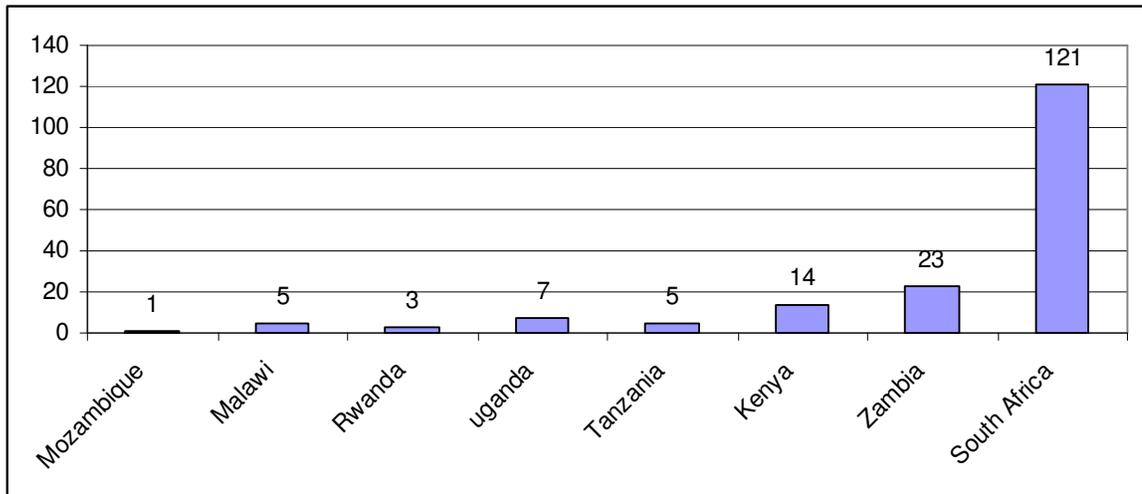


Figure 4. 12(b) International (East and Southern Africa) Levels of Motorisation Comparison

(The figure shows number of vehicles per 1,000; Source <http://safety.fhwa.dot.gov/about/international/africa/>)

4.6 The Quality, Validity and Accessibility of Accident Data Used

The road traffic accident data in Mainland Tanzania is kept in manual files at the Traffic Police Department headquarters in Dar es Salaam. Needless to say to access the data is a big problem despite the fact that Police Officers are eager to provide the data as needed by the stakeholders.

Digging into files and assembling the data manually is a problem. The police also are understaffed and under-resourced and therefore their availability for custom data processing is limited.

The details needed are not always available. We have addressed this issue further in Chapter Six where we describe the proposed Road Traffic Accident Information System (RTAIS) and corresponding Road Traffic Accident Database (RTAD) in accordance to the Terms of Reference for this assignment. However, the available data establishes the fact that we have a serious problem on our roads. From the data we are able to identify the issues that need to be addressed. The issues are confirmed by the opinions of limited number of stakeholders interviewed. Successful implementation of the proposed database and allocation of adequate resources to the activity will provide more reliable and accessible data for future analysis.

4.7 Interim Summary and Recommendations

The problem of RTA is a serious one especially in terms of system risk as indicated by the number of fatalities per 10,000 vehicles. The causes of road traffic accidents have been attributed to the three system components the major factor being human behaviour. However, the high system risk compared to other countries and the improvements normally achieved when road and vehicle factors are improved suggest the need to address all the components. Appropriate measures are described in section 4.9. It is sufficient to point out the following issues by way of summarizing our findings:

- 1) Enforcement of existing road safety legislation and public education/campaigns focusing on pedestrian and NMT safe use of roads are essential. This will take care of human factors contributing to RTA.
- 2) The roadworthiness of the vehicle fleet plying our roads needs to be improved – vehicle inspection and the control of the quality of tyres (especially for PSV and HGV) is an appropriate starting point.
- 3) For the PSV and HGV:
 - a. Body building standards for bus bodies: rules proposed by SUMATRA (The Passenger Vehicles (Technical Safety and Quality of Service Standards) Rules, 2007) should be adopted and enforced rigorously. Further technical details may be published in collaboration with other public bodies like TBS.
 - b. Much emphasis should be placed on the drivers of PSV and HGV. The proposed Regulations for PSV age in “The (Draft) Transport (Road Passenger Vehicle) Licensing Regulations 2007” should be adopted and rigorously enforced. Similar regulations should be developed, approved and enforced for the freight vehicles.
- 4) Road Safety Engineering aspects of road design need to be emphasised. Specific measures are given below.

- 5) Road safety campaigns should target road users in the age group 13 years to 55 years.
- 6) The resources allocated to RTA data collection and management should be increased in order to improve the data quality.

4.8 Evaluation of Effectiveness of the Ban of Night Services by Public Passenger Buses

4.8.1 Background

The underlying reasons for banning passenger buses from travelling at night in the year 1994 were to improve safety of public buses. The accidents with high number of fatalities at that time were occurring at night. No studies were carried out to isolate the factors involved in accidents but the feeling was that it was much safer to travel during the day.

4.8.3 Night Driving and the Risk of Accidents

Many road safety organisations analyse and compute the relative risk of being injured or killed in a traffic accident at different times of the day. Overall the conclusion is that, the 30% of road accidents that happen at night involve 50% of all fatalities on the road. This is in spite of the fact that the veh-km travelled at night are only 28% of the total veh-km travelled. The following are the accepted causes of night-time accidents:

- Reduced visibility
- Tiredness and sleepiness
- Drowsiness
- Drunk Driving
- Glare Blinding

Reduced visibility

Ninety per cent of the driver's reaction depends on vision which is severely limited at night. Depth of perception and colour recognition are also compromised after sunset and in general the field of vision is greatly reduced at night.

Tiredness and Sleepiness

Information from various countries indicates that drivers' sleepiness plays an important role in road accident mainly due to:

- Chronic sleep deprivation
- Irregular schedule changes
- Sleep disorders due to drivers working conditions

Drowsiness

The main cause of drowsiness is sleep deprivation; this condition is prevalent among commercial vehicle drivers due to the fact that their sleep during the day is usually less than what is required.

Drunk Driving

It has been documented that incidents of drunk driving increase during the night and their contribution to accidents increases also.

Glare Blinding

A lot of drivers during the night on unlit streets fail to dip their lights thus making it difficult for the on coming drivers and this result in accidents.

4.8.3 Analysis of Existing Accident Data

It is difficult to evaluate the impact of the night driving ban from the current accident data since the available data is not of high quality. The compiled data summary available from the Traffic Police Department has some valuable parameters missing that are relevant for this exercise namely:

- Time of Accident
- Exact Location
- Weather Conditions

However, the accident summary data 1990 – 2000 show the number of bus accidents, their injuries and fatalities. Based on these records the following observations were made:

- The number of passenger fatalities per fatal accident prior to the 1994 night driving ban was 0.45 and the average figure for the period 1995-2000 was 0.51. These data do not distinguish between bus passengers and passengers from the other vehicles.
- The ratio of passenger injuries per accident was 0.58 in the pre ban period (1990-1994) and this ratio was 0.50 for the period 1995-2000.

It can be concluded based on summary statistics that the passenger fatalities per fatal accident did not change much, but since the data is not disaggregated it is possible that some of these accident are due to an increase in passenger car accidents given the overall increase in passenger car travel over this period. The decrease in injuries per accident is probably the most effective indicator of the effectiveness of the ban since buses are the vehicles that tend to produce a higher number of injuries per accident.

Figure 4.13 shows that there were 939 PSV accidents involving 1010 buses which resulted in 353 fatalities and 2115 personal injuries. This shows that the current ratio of fatalities per PSV accident is 0.38. This figure can easily

go up if PSV travel by night is allowed because significant number of injured persons will die for lack of immediate medical help.

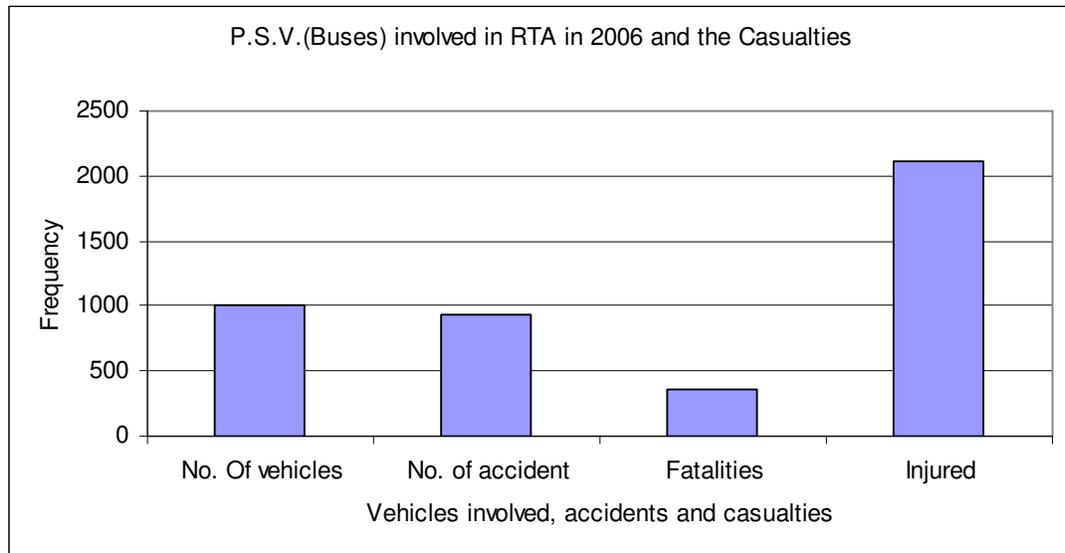


Figure 4.13 Distribution of RTA and Casualties Involving PSV in the Mainland, 2006

4.8.4 Acts of Banditry

The ambushing of PSV by robbers in remote areas has become a cause of concern. In some parts of the country vehicles travelling at night must form a convoy escorted by a police officer to safeguard security of travellers. The magnitude of this problem could escalate if PSV were to offer services at night. A larger number of police officers would have to be deployed and if buses keep to their schedule robbers can make specific ambush plans. We consider that the banning of night services by PSV a reasonable security measure even if specific before and after data were not compiled.

4.8.5 **Should Night Service Ban by PSV be Lifted on Economic Grounds or Because of Regional Grouping Considerations?**

If the night service by PSV ban is lifted some providers of intercity PSV services would have the opportunity to utilise their vehicles more intensively and thus reduce the time it takes to recover their investment. This will depend on demand and may be economically productive on some routes. It is likely that the roadworthiness of some of the PSV will be reduced due to less time available for maintenance. It is also likely that drivers and owners will violate the maximum driving hours per day. In both cases the result is increase in road accidents. It is therefore reasonable to consider if SUMATRA and the police can put in place measures to ensure

safety of the vehicles and the compliance of drivers and owners to the maximum hours of driving regulation before recommending the lifting of the ban.

On the issue of regional integration particularly the membership of Tanzania in EAC and SADC it is important to consider the practice in the countries belonging to both groups. Passengers on long distance journeys certainly prefer to continue with their journey until they reach their destination. The ban of night services by PSV on such journeys should be re-considered in the light of regional practice and the maximum driving hours regulation. It assumed that if drivers had adequate sleep they are able to keep driving at night with reasonable safety if they maintain speed consistent with night time conditions.

- Consideration of our regional grouping membership (EAC and SADC) suggests that we should permit international PSV to offer services at night provided they demonstrate (to SUMATRA and the Police) compliance with the driving hours regulation at border points and at other check points. However, the operators should continue to observe local night driving restrictions imposed by the Police Force in designated banditry prone areas;
- Lifting of night service by PSV for journeys within the country that requires driving beyond current limits should only be considered when SUMATRA and the Police have enough resources to enforce driving hours regulation;
- Lifting of the ban should not be considered for journeys within the country that can be accomplished before 10.00 pm

4.8.6 Conclusion

The available data is not very useful in assessing the effectiveness of the night driving ban for buses because it does not contain all the necessary parameters. However the reduction in passenger injuries per accident is a good indicator that the number of large accidents has been reduced. Given the prevailing operational environment it is correct to say that there is a high probability that overall passenger injuries and fatalities would increase if the night driving ban is lifted due to the following reasons:

- a) All rural highways and most arterial roads in Tanzania are unlighted. This creates a situation where the visibility for drivers becomes very poor thus increasing the chances for an accident.
- b) The design of rural roads in Tanzania is substandard as far as night operations are concerned. Most of the trunk road network has lanes that are less than 3.6 meters wide. This makes it difficult for

vehicle to pass each other safely at night thus increasing the probability for an accident.

- c) From their average driving behaviour it seems like most drivers in Tanzania think they can maintain the same speed at night while driving over a similar road segment as they do during the day. This is a wrong assumption as the visibility conditions at night dictate that night speed should be much less than daytime speed. This erroneous assumption may be a cause of some accidents.
- d) Rescue and First Aid Services in Tanzania are not well organised and do not work properly at night due to the following reasons:
 - In most areas, accident victims are usually ferried from accident sites to nearby hospitals by private vehicles of Good Samaritans who happen to be travelling on the same road. At night the number of such drivers is extremely low. This can lead to death or permanent injuries due to late evacuation from accident sites.
 - Bus accidents usually generate a large number of injuries more than can be handled by the staff of an average emergency department at our local hospitals. As such there is usually a need to mobilise staff from other departments of the hospitals. But most hospital staff do not live near the hospital and do not have reliable transport. The exercise of mobilising additional staff for emergencies at night may lead to delay in attending to the injured which may in turn lead to death or permanent injuries.
- e) Lack of Security: A number of incidents have occurred whereby some unsavoury characters converge on the scene of an accident to further attack and rob the accident victims. This kind of behaviour which has been occurring in broad daylight would probably be worse at night and may lead to premature death or additional injuries to accident victims.
- f) Banditry and General Insecurity: Of late a number of buses travelling on upcountry roads have been ambushed and passengers robbed of their belongings. This has happened sometimes during the day and it is more risky during the night.
- g) Lifting of night ban of services by PSV should only be considered for the cases cited above and for the conditions indicated.

4.9 Measures to Reduce Frequency and Severity of Road Traffic Accidents

4.9.1 Summary of Measures

As discussed above the causes of road accidents have been grouped under human factors, vehicle factors and road factors. We discuss below

potential road safety measures addressing the human, vehicle and road contributing factors.

Human Behaviour

Factors involved in accident causation in Tanzania are shown in the table below together with the suggested safety measures.

Accident contributing factor	Measures to be taken
Over speeding and reckless driving	Speed limit enforcement and roadside licence suspension
Poor driving skills	Drivers training
Driving under the influence of alcohol and/or drugs	Roadside breath test, introduction of lower Blood Alcohol Concentration (BAC) limit and roadside licence suspension
Overloading of passengers and/or good	Roadside inspection supervision of transport licence
Hazardous overtaking	Education to passengers on how to monitor drivers' behaviour and reporting the matter to traffic police.
Not using safety belts	Introducing seat belt laws
Drivers not caring for pedestrians and cyclists	Introducing sidewalks and walkways for pedestrians and bicycle lanes for cyclists
Careless pedestrians	Education to pedestrians on likely consequences
Insufficient knowledge about motor vehicle systems	Driver training on motor vehicle mechanics
Public low level knowledge on road safety matters	Introducing road safety education to public
Motorcyclists not wearing protective helmets and night travelling pedestrians not wearing reflecting tags	Introducing and enforcing helmet wearing laws and educating and encouraging pedestrians to wear reflecting tags

Vehicle Safety

The second group of factors that are seen to contribute to road accidents are the vehicle safety problems. The most important factors related to vehicles safety problems include:

Accident contributing factor	Measures to be taken
Vehicle overloading and uneven load distribution	Roadside inspection education
Substandard bus bodies and additional seats	Introducing and enforcing common standards of bus bodies
Poor breaking systems, head lights and rear lights	Introducing and enforcing laws for regular vehicle inspection
Worn-out tyres	Vehicle roadside inspection
Lack of seat belts	Enforcing seat belt laws. Legislate seat belts for rear passengers
Breakdown of vehicle steering system	Enforcing regular maintenance
Miscellaneous mechanical breakdowns	Enforcing regular maintenance

Road Environment

The third group of factors are related to the road environment. Most of the roads in Tanzania have been built with some safety deficiencies. Driving along these roads creates a hazardous situation. The factors related to the road environment include:

Accident contributing factor	Measures to be taken
Lack of safety concerns in physical planning	Incorporating road safety specialists in physical planning
Poor management of road reserves, e.g. encroachment and obstruction of sight distances	Proper management of road reserves
Lack of safety concerns in road design	Incorporating road safety audit team right from design to operation process
Rampant vandalism of road furniture	Carrying out national campaign on road furniture vandalism
Insufficient maintenance of pavements and road furniture	Carrying out regular and timely maintenance
Insufficient and poorly maintained road signs, markings, traffic lights and street lights	Carrying out regular maintenance
Black spots are not improved effectively	Effective improvement of black spots
Lack of facilities for pedestrians and other vulnerable road users, especially sidewalks and safe crossing points	Introducing sidewalks and walkways for pedestrians and bicycle lanes for cyclists

4.9.2 Human Factors

A: Over Speeding and Reckless Driving

At higher speeds, there is less time to identify and react to what is happening, it takes longer to stop and impacts are more severe, causing more serious injuries to vehicle occupants and others. Higher speeds also magnify other driver errors, such as close-following or driving when tired or distracted, thus multiplying the chances of causing a crash as illustrated in Text 9.1. Therefore, recommended, maximum speeds should be enforced for all kind of motor vehicles on the whole road network. In Tanzania, 80 km/h is the posted speed limit for some sections of trunk roads in rural areas. The following should be done to reduce the problem:

Box 4.2 A Recent RTA Caused by Excessive Speed

On 15th April 2007, a bus christened Buffalo was travelling from Dar es Salaam to Arusha and got involved in an accident at Kisangara in Mwangi District, Kilimanjaro Region. 24 people were killed while another 21 people were seriously injured. In that accident, the bus travelling at a speed estimated to be above 130 km/h hit the back of a lorry while trying to overtake it, at the same time the lorry that was hit was trying to overtake another lorry. Think of the number of factors involved! The official cause will probably be taken as over speeding and recklessly driving. Think also how much loss was caused!

(a) Short term measures

- Passengers should be given mandate to monitor the driving behaviour of their respective driver and report any misconduct to the police.
- There should be a facility to allow passengers to report to police and for the police to act.
- Increase enforcement by mobile police.
- Roadside fines should be increased such that all drivers who exceed the speed limit by 25% pay a fine of Tshs. 100,000 per offence
- All rural public roads should have designated speed limit signs as follows unless design speed dictates lower speeds.

Trunk roads	100 km/h
Regional roads	80 km/h
Collector/and district roads	40 km/h

(b) Medium Term Measures

Public service vehicle drivers who exceed the speed limit by over 30% should have their licences confiscated.

(c) Long Term Measures

Speed cameras should be introduced on all main highway corridors

B Driver Examination, Vehicle Inspection and Licensing

Under the current system in Tanzania, the responsibilities for vehicle control licensing and safety is divided among several institutions, namely Ministry of Public Safety for vehicle inspection, Ministry of Finance for vehicle registration and individual licences, and Ministry of Infrastructure Development (SUMATRA) for commercial licensing. All these functions could be streamlined into a one-stop centre to ensure coordination and observance of adequate driver and vehicle standards. Measures to be done in order to achieve this include:

(a) Short Term Measures

- All public service vehicles should be examined and be given a certificate of road-worthiness every six months by garages certified by SUMATRA
- All other vehicles older than three years should be examined and issued with a certificate of road-worthiness every 2 years by SUMATRA certified garages

- Police should conduct roadside vehicle inspection to check compliance with licensing and road-worthiness. During this inspection, driver licences should also be inspected. The police should take necessary action for those not in compliance
- The computerised a driving licence system and database now under development to facilitate revolution of licences should be linked to the Road Traffic Accident Database
- Develop the curriculum for driving school and registration system for driving schools and driving school inspectors
- Ministry of Public security to develop training programme for vehicle inspectors and driver examiners
- SUMATRA in collaboration with vehicle suppliers to regularly develop courses for new technology vehicles

(b) Medium Term Measures

- Creating a Driver Examination and Vehicle Inspection and Licensing Agency that can streamline all the related functions into a one-stop check driver inspection/examination centre of international standard that can be monitored easily. This agency when fully created will handle driver and vehicle licensing as well as vehicle inspection and road-worthiness certification

C: Drunken Driving

This is a much more serious problem than the official statistics show because of limited statistics. Blood Alcohol Concentration (BAC) limit for drivers/RV should be strictly enforced in order to restrict driving under the influence of alcohol. The following measures are proposed:

(a) Short Term Measures

- Procure and distribute breathalysers and other modern testing equipment to the Ministry of Public Security for random testing
- Prepare and implement public campaigns about the problem of drunken driving
- Driving Licence for repeated offenders (more than 2 times) should be suspended

D: Transport of passengers and goods

According to the available statistics (National Road Safety Master Plan 2004), 92.4% of the commercial vehicle fleet operating in the transport sector in Tanzania are one vehicle owner/operator. These are small operators and they are known to have a low level of technical and managerial expertise and limited financial capacity. These include operators of trucks, buses and minibuses who transport passengers and goods across the country.

Private transport of passengers and commercial transport of goods on roads are not safe enough. There is a general lack of driving skills, awareness, spare parts, maintenance expertise, and competent professional workshops. Moreover, the demand for transport is less than the available supply during off peak hour/session which results in uncontrolled competition for fight for customers and overloading. According to accident data for 2000 to 2004, the commercial vehicle fleet is involved in 30 - 50% of road accidents, and among these are the most serious accidents with several fatalities. This is a very high percentage in comparison to international levels. Road safety does not seem to be given much attention by most of the commercial transporters, whether for the transport of passengers or the transport of goods. In order to reduce the problem the following measures are proposed:

(a) Short Term Measures

- Intensify inspection activities for all passengers and goods vehicles (at least twice annually)
- Perform follow up of transport operators regarding their road safety records and take appropriate action

(b) Medium Term Measures

- Enforce speed governors and timetable compliance intercity on all passenger service vehicles. Introduce severe penalties to those found to temper with them
- Develop training programme for professional drivers

E: Seat Belt, Protective Helmets and Reflecting Tags

Seat belts and protective helmets can reduce severity of the injury in an accident. The number of pedestrians injured or killed at night is lower than day pedestrians but the rate is higher. To a large extent the problem is due poor visibility as the problem is reported to be worse on streets with no lights. The following measures are proposed to reduce accidents in this category:

(a) Short Term Measures

- Legislation requiring the mandatory installation of seat belts in all vehicles on all seats should be introduced
- It should be compulsory for all occupants to wear seat belts and legislation for penalising anybody found not complying should be introduced
- Wearing of safety helmets should be compulsory for both motor cycle riders and their passengers
- Pedestrians should be educated and encouraged to use reflective tags so that they can be seen easily by drivers during the night especially when travelling along dark streets

F: Public Awareness and Road Safety Education

The road and traffic environment affects people's lives in a profound way on a daily basis which ever country we live in and regardless of whether we are adults or children. Road Safety contributes tremendously to the quality of life of the people. As already pointed out before, human errors play a most important role in most road accidents. Measures to improve road safety must therefore in the first instance be directed towards increasing the road safety knowledge of the public at large and modifying the attitudes and behaviour of the road users. This should include campaigns to reduce road furniture vandalism. As the saying goes, "prevention is better than cure". Road safety knowledge and education involves teaching and informing target groups on how to be a safe road user. It has been identified that the most important target groups are passengers, pedestrians, school children and young motor vehicle drivers. Measures to be taken include:

(a) Short Term Measures

- Conducting regular National information campaigns on Road Safety issues to the public
- Performing public campaigns in consonance with intensified law enforcement
- Making road safety education compulsory and integrated in the school curriculum at all levels from primary level to university level, and in teachers training curriculum.
- Providing information to decision makers on the magnitude of the road safety problem and the efforts done to reduce it. Currently, road safety problem is not given a priority amongst the problem we have despite being relatively big. This is probably that decision makers do not know its magnitude. Letting them know the magnitude will attract their attention that will lead to the more priority to the matter.

(b) Medium Term Measures

- Reducing road furniture vandalism preferably by rewarding anybody reporting somebody being involved in such acts.

4.9.3 Vehicle Factors**A: Substandard Vehicle Bodies and Additional Seats in Buses in Order to Accommodate more Passengers**

Transportation is a business like other business that needs a careful monitoring and regulations. It is a norm that every businessperson is aiming on maximising profit. If transportation business is not well monitored and

regulated, chaos leading to accidents is the likely outcome. The following measures are proposed

- SUMATRA should set and monitor standard bodies for each type of PSV and goods vehicles
- Having set the standards, inspection should be done and vehicles found to have substandard bodies should be instructed to rectify the problem and be inspected again prior to being allowed to resume the business.
- The normal number of seats in each type of a bus should be standardised and checked. Those found not to comply should be suspended from the business until they have adhered to the required number.

4.9.4 Road Engineering

The road infrastructure in Tanzania is being improved considerably. However, there are road safety problems along the main roads in trunk, regional and rural roads. Also road safety problems in urban areas in Tanzania continue to increase as urbanisation expands. The main problems include different local authorities, different design and planning practices, non-harmonised signs and markings, lack of competence, and different objectives in the different city and town authorities. It should be noted that the traffic situation in urban areas is very complex compared to rural roads. In Tanzania road safety situation is more alarming for vulnerable road users, particularly the pedestrians, cyclists, motor cyclists, and passengers of PSV. Most of our trunk roads have been built with narrow carriageway width that is hazardous to road users. To this effect, it is necessary to review and improve the design of new roads and rehabilitated ones so as to ensure safety. Measures to be taken include:

A: Infrastructure Improvement

(a) Short Term Measures

- Improving all black spots that are already identified
- Eradicate the vandalism of road furniture. This should be tackled by educating the public with regard to the importance of road furniture. In order to attract information, a reward to anybody reporting vandalism or theft should be introduced and more severe punishment introduced.
- Introducing an environment that will restrict the driver to adhere to a speed limit for all vehicles in urban areas
- Enforce proper vehicle parking, proper and timely maintenance of road signs and marking

(b) Long Term Measures

- Improve the Safety of the existing roads. The carriageway width, road marking and traffic signs should be rectified. The success upon improving this aspect can be proven by the stretch from Chalinze to Morogoro. Recent evaluation indicates a great reduction in accidents after the carriageway has been widened
- Integrating facilities for vulnerable road users in the road planning and investment process. These facilities include lanes for cyclists and sidewalks for pedestrians.

B: Poor Management of Road Reserves

Poor management of road reserves is among the big contributory factor to the causes of accidents. A large percent of these reserves is occupied by trees that are sometimes affecting sight distances especially when they are closely spaced. The effect is severe when these trees are within the median. This creates a situation in which both pedestrians and drivers can not easily see each other as a result pedestrians are being hit frequently. As a short term measure, regular check up should be done and trees found too big to the extent that they can not absorb the energy upon being hit by a vehicle should be removed and new ones planted to keep the environment not badly affected much. Those which are still small but affecting the visibility should be pruned accordingly.

C: Lack of Safety Concerns in Road Design

In the road planning and design process planners have been generally assuming that the road design process will consider safety needs as the traditional road planning process rarely allows for explicit consideration of the impact of planning decisions on road safety. Likewise, road designers have been assuming the road safety needs to be implicitly taken care of by the design standards and therefore road safety objectives have been rarely explicitly considered. The roads are thus designed according to entrenched practice of designing infrastructures to minimum standards using a cookbook approach. This practice is largely driven by the desire or need to keep initial construction cost to a minimum.

Currently, roads are built with hazardous features that could have been eliminated at the design stage by the adoption of Road Safety Audit. This helps to ensure that issues associated with road safety are specifically addressed and are given equal importance as the other factors in a design project. Application of Road Safety Audit has already proven beneficial even in countries with routine safety assessment incorporated within the design process. This should be worked out as a medium term measure.

4.10 Rescue Services

4.10.1 Introduction

Rapid first aid, appropriate transport of injured people and adequate medical care at hospitals are essential elements in the emergency and rescue operations after a crash in road traffic. Immediate and efficient operations in the post-crash phase can save lives. Not only should professionals (rescue worker, police officers, etc.) have sufficient knowledge and training, but all drivers should have a basic knowledge of first aid, as should all the adult population in general.

When it comes to emergency services at the scene of a road accident, it is often a question of time. For road accidents, treatment of injured people during the "golden hour" has very important significance in the future outcome as people who are treated immediately and correct way have a far better chance to survive or to sustain relatively less disabilities.

4.10.2 Existing Services

The current medical and rescue system is utterly insufficient due to several factors. In Tanzania there is no specific unit responsible for accident rescue services. When an accident occurs at a particular locality, there is usually no special unit to be called in. The police often carry out the rescue services since they are the first to be informed, they therefore ferry victims to hospitals using their own vehicles. Since these vehicles are usually not sufficient, private cars are usually asked to volunteer to ferry the injured to hospital. However some drivers are not so willing and the police have to practically commandeer the vehicles and their drivers to ferry the injured. Under such circumstances, a lot of time is lost, thus increasing the likelihood of many victims dying or sustaining permanent injuries which could have been averted otherwise. On some roads when traffic flow is low there may simply be no private vehicles to assist in ferrying the injured.

The level of coordination between the police emergency number and the hospitals ambulances/emergency unit is not adequate. The accident in most cases are reported to the Police who later forward the request to the ambulance unit at the hospital, this process is not clear cut and valuable time is usually lost.

Some hospitals either do not have enough ambulances or if they do, most are usually not in a good working condition. If an accident occurs that has many victims as in the case of large buses, the task of carrying victims to the hospital takes several trips, which extends the exercise beyond the "golden hour". This results in some victims sustaining unnecessary permanent disabilities. In some incidences, if the hospital does not have any ambulance, police vehicles are used to ferry victims. These victims are

just laid on a hard and rough surface of the pick up. This action may aggravate their injuries or lead to early death for those seriously injured.

Lack of sufficient health experts, medicines and equipment is a common problem at most hospitals in Tanzania. This problem is worse for hospitals located outside the urban centres. In most of the cases, when accident victims arrive at the hospital they are not attended immediately due to lack of enough manpower available at the hospitals. This is due to the fact that most of the hospitals do not have houses for doctors within the hospital premises, as a result if accident victims are brought to hospitals during the night they have to wait for treatment in the morning of the next day and some may die while waiting.

Certain policy issues are among the factors hindering rescue services. An accident victim can not get hospital treatment unless either the accident has been witnessed by police or the victim has already acquired a PF. 3 form from the police. This means that if a victim is taken from the scene before the arrival of the police, he/she has first to be taken to the police station to process the form. This form can not be issued before the police have verified the accident. This process takes long and may result in a situation where the victim is being attended after "golden hour". Not only does this problem delay service to victims, it is also likely to influence owners of private cars to refuse giving help to victims as they are not ready waste their time during such a process.

In recent years, Tanzania has experienced a very rapid growth in criminal activities. In some cases when an accident occurs people come to the site to attack and rob the victims. In a few cases these people go further to the extent of killing survivors so that they can rob easily.

4.10.3 Measures to be taken to Improve Rescue Services

A: Improve Coordination and Cooperation

Improve and encourage coordination and cooperation between health facilities, police force and other involved emergency service organisations on strategic, tactical and operational level. All hospitals expected to participate in rescue services should be given radio calls that will be used for communication during the exercise. As the matter stands now, it is difficult for the police to communicate with hospitals.

B: Procure More Ambulances and Keep Both New and Available Ones in a Good Condition

Establish trained mobile teams with ambulances, which can promptly reach an accident site and at the same time have continuous communication mobile phones or radio - to a nearby hospital. Along the major roads, ambulances should be stationed at health centres not more than 100 km apart from each other. Ambulance staff should be trained in

first aid and in rescue operations. Part of this training should be arranged jointly by the police and the Ministry of Health and Social Welfare. Practical drills and mock exercises should be carried out regularly as a part of this training.

As an intermediate solution, pick-ups should be procured for the traffic police force and be used by the police primarily to reach the accident sites and to ferry victims to hospitals. These pick-ups should be modified in a manner that they can carry accident victims in a more comfortable way.

C: Develop/Procure an Efficient Communication System

Develop and implement an efficient communication system between health centres and hospitals, between the Police and medical staff and between the accident site, the medical facilities and the Police. Create a system of Joint Alarm Centres - with only one telephone number (For example 112) for all accident emergency calls. Hospital operators should also have own communication system like radio calls so that they can communicate with other service providers at any place. As some accidents may occur at sites with no mobile phone networks, it is proposed to make it mandatory for all buses to have radio calls so that communication can be accessed anywhere.

D: Upgrade Existing Hospitals

The existing hospital facilities should be upgraded. More doctors and nurses should be employed and be given accommodation. The accommodation should be within the hospital premises so that they can be easily reached in case of an emergency. They should be adequately motivated so as to maintain their efficiency. Upgrading, continuous maintenance and supply of up to date rescue equipments to those hospitals are important.

E: Training in First Aid

Train all motor vehicle drivers in first aid. SUMATRA in collaboration with Ministry of Health and Social Affairs and traffic police should offer and carry out first aid training to people in general. Make basic first aid compulsory for driving licence applicants. The subject should also be taught in schools and colleges.

F: Amending Policy/Legal Issues

As "golden hour" seems important and the current policy that requires one to have PF. 3 form has already proven to be an obstacle to timely treatment, it is better to amend it. Police should find other means to achieve the objectives of the current PF 3 procedure.

5. IMPACTS OF ROAD TRAFFIC ACCIDENTS

5.1 Introduction

Examining the socio-economic impacts of road traffic accidents is crucial since it is a powerful resource tool in raising the awareness among policy makers, politicians and the public on the need to reinforce road safety measures. While the national priority in Tanzania is focused on reducing poverty, road accidents appear to be making this task difficult as household resources are either drained or curtailed as a consequence of the loss of life of an income earner or property due to RTA. This chapter examines the impact of RTA on households and the health sector. The results are used to estimate the economic loss to the nation. The information is very useful to policy makers and decision makers as a basis for policy and resource allocation decisions to prevent RTA and to reduce their impacts.

5.2 Social Impacts of Road Traffic Accidents

5.2.1 Introduction

Overview

The social effects of road traffic accidents can be both direct and indirect on families, individuals and the society at large. It is unfortunate that despite the fact that only one person may be involved in a road accident, the entire household maybe affected financially, socially and emotionally. The study highlights the socio-economic burden of road accidents on accident victims and their families.

The study focused on the Dar – Chalinze – Arusha route. Respondents were recruited from Dar es Salaam, Coast, Kilimanjaro and Arusha regions. The decision to focus on this particular route was on the basis that it is among the major routes in Tanzania that experience high rates of road traffic accidents.

Two research instruments were used for data collection, a structured questionnaire and an in-depth interview guide. Prior to the commencement of data collection, the instruments were pilot tested to confirm the applicability, appropriateness of wording and consistency of the research instruments. The instruments addresses the following areas; household income and employment; quality of life; pain grief and suffering; health care and costs; disability and knowledge and insurance compensation.

A total of 102 questionnaires were administered to respondents of different categories. Accidents were categorized into 3 main groups; fatal, serious and minor injuries.

- i. Fatal accidents were defined as an accident in which a person was killed as a result of the accident.
- ii. Serious accidents were defined as accidents that accident victims sustained major injuries such as fractures, concussion, internal injuries or severe cuts.
- iii. Minor accidents were defined as accidents which there were only slight injuries. This was done to capture a wide variety of road accident experiences on victims and their families.

In addition to this categorisation, respondents were also grouped into 2 main groups, namely:

- i. Accident survivors and,
- ii. Dependants/relatives of accident victims.

In all cases oral consent was sought prior to their involvement in the study.

Data Analysis

All quantitative data was coded, cleaned and entered into a computer using SPSS software. After data entry had been completed and cross checked to ensure that all data has been correctly entered, a number of statistical analysis were carried out. Frequency tables were developed to summarise findings on a number of variables and cross tabulations were also performed to show the intersection between the dependent variables and independent variables. Qualitative data was also coded manually and subjected to content analysis, where key themes and concepts were identified and categorised in relation to the study objectives. This process was then followed by a systematic comparison of findings from interviews, documentary reviews and observations.

Profile of Respondents

Information was collected from different categories of accident victims, with victims of fatal accidents constituting 30% of the respondents, victims of serious accidents 61% and victims of minor accidents 9%. The table below gives a breakdown by region.

Table 5.1: Categories of road traffic accident victims interviewed by region

	Dar es Salaam	Coast	Arusha	Kilimanjaro	Total
Fatal	16	3	6	6	31
Serious	41	2	10	9	62
Minor	7	0	1	1	9
Total	64	5	17	16	102

The year of accident ranged from 1994 to 2007, with 17% of the accidents having happened between 1994 and 1999; 50% having happened between 2000 -2005 and 33% having happened between 2006 -2007.

Almost half of the respondents (49%) were either passengers in a bus, truck, saloon car or a motorbike, whereas 21% of them were pedestrians; 23% were drivers of either buses, trucks, saloon cars or a motorbike and 7% were either cyclists or cart drivers. The table below gives a more detailed presentation.

Table 5.2: Categories of accident victims on the basis of their position in the accident

	Surviving victims (%)	Deceased victims (%)	Total (%)
Passenger in a bus, truck, saloon car or motorbike	51	45	49
Pedestrian	18	26	21
Driver in a bus, truck, saloon car or motorbike	23	23	23
Cyclist or cart driver	8	6	7
Total	70	30	100

The study population consisted of 72% of males and 28% of females respondents. The age group of respondents ranged between 20 – 66 years, of which 48% of the total samples were aged between 20-30 years; 19% between 31-40 years; 16% between 41-50 years and 17% were above the age of 60 years. The mean age of respondents was 38 years.

Most of our respondents were either employed (30%) or were businessmen/women (31%). Other categories included 8% of students and 9% of farmers. The remaining 22% of our respondents were not working (unemployed). In terms of educational attainment 42% of our respondents had secondary education and 32% had primary education. Respondents with diplomas amounted to 16% of the total sample, 7% had university education and 3% reported zero years of formal education.

The marital status of our respondents varied across different categories, with 34% reporting being single, 11% were widowed, 50% were married and 5% were divorced. The mean household size was 4, with the household size ranging between 1 and 9.

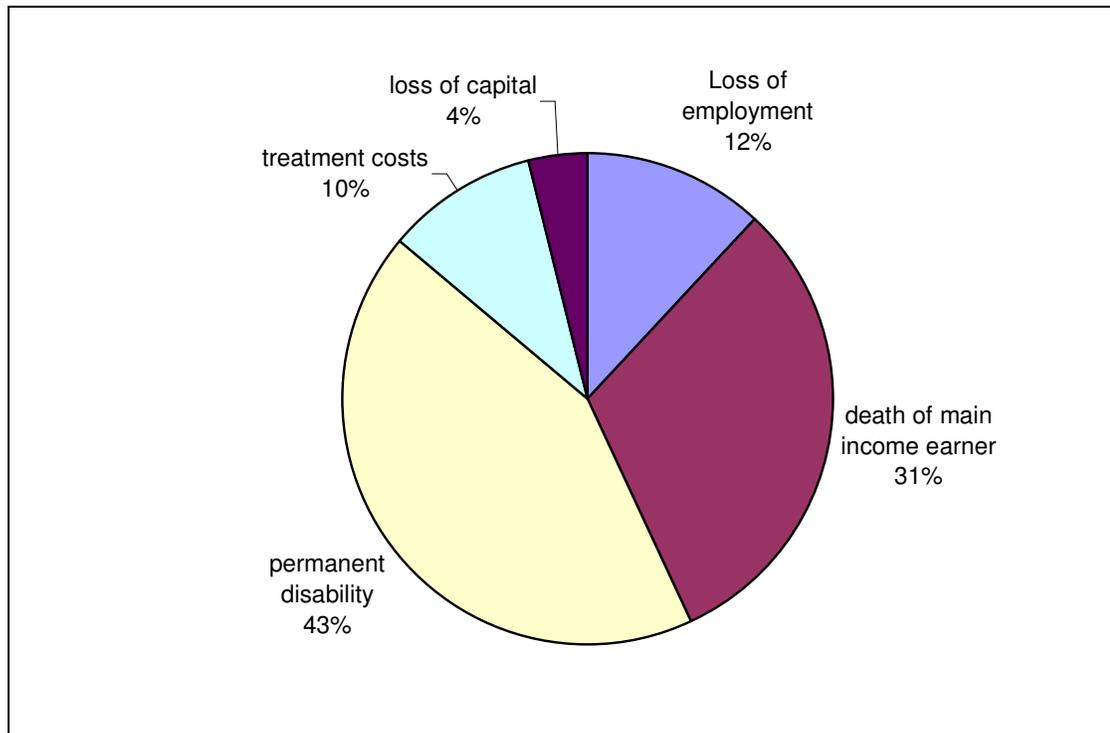
5.2.2 Impact of RTA on Family Income and Employment

While the national priority in Tanzania is focused on reducing poverty, road accidents appear to be making this task difficult as household resources are either drained or curtailed after a road accident. One of the most pertinent social impacts of road traffic accidents at the family level identified in the study is the impact on family income and employment. Overall, findings from the study show that 68% of families of accident

victims reported decrease in household income, with families of deceased victims reporting a higher percentage (71%) as compared to accident survivors (66%), although the difference was not statistically significant.

Accidents survivors who reported sustaining permanent disabilities resulting from the accident reported higher percentages with regards to decrease of family income (69%) as compared to victims who were not disabled by injuries sustained in the accident (43%). In the three regions of Dar es Salaam, Kilimanjaro and Arusha more than 50% of accident victims who had sustained permanent disabilities from the accident reported decrease of income, with Arusha reporting the highest percentages. Disability was singled out as an important contributor to the decrease of household income by the fact that victims were either unable to continue working (leg or hand amputation, back injuries, sight problems) or the fact that they had to look for alternative employments, which were less rewarding in monetary terms. Being disabled was also explained to place more strain on family income, since in a number of cases the help of an additional family member was required to cater for the victim, and in several cases as we shall observe in the sections to come a relative/dependant had to forego working. The implication on household finance is that two income earners have had to stop working.

The impact of road accidents on family income and employment can be linked to several factors namely as evident from interviews with accident victims and their families; death or permanent disability (permanent loss); time spent away from work recuperating (temporary loss); loss of property or working capital and other family members having to stop working to care for the accident victim. A number of reasons were given as reasons for the decrease of family income observed. The two most significant reasons attributed to the loss of income as explained during the interviews were death of the main income earner in the family (31%) and permanent disability caused by injuries sustained in the accident (43%). The pie chart presented below gives a more detailed analysis of other reasons explained to cause decrease of family income.

Figure 5.1: Reasons for decrease of income for accident victims

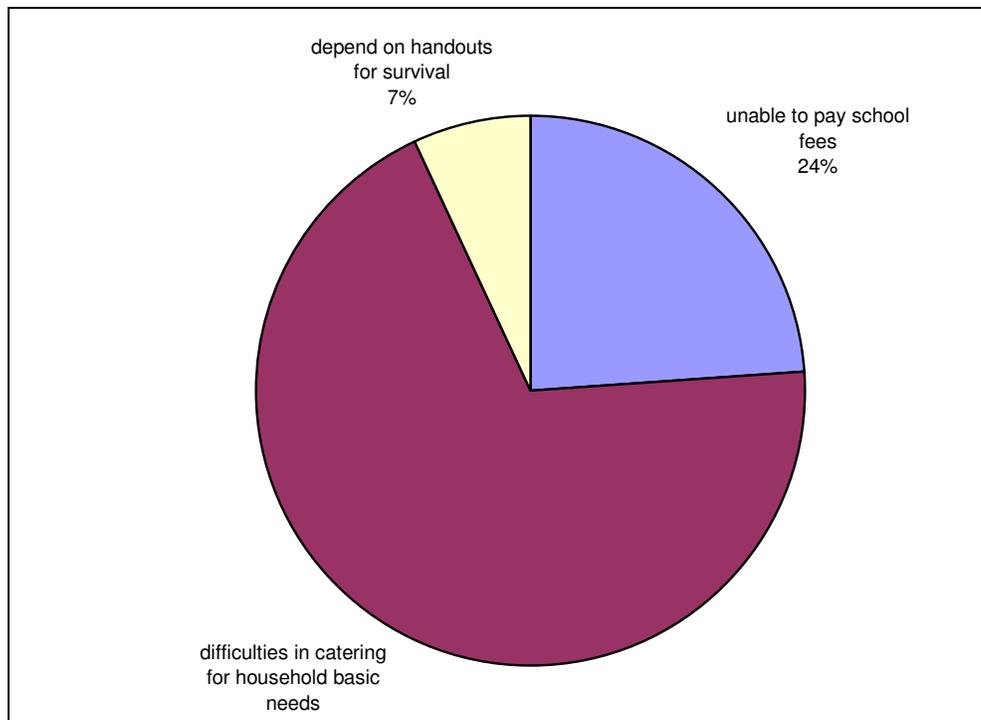
In addition to the incapacitation of the accident victim and hence inability to work, which has a direct impact on the family income, casualties of crashes also require caring, which can be either provided by a family member or hired labour. Both options have implications to the family income, since this means loss of an additional source of income to the family. Responses from the survey show that the situation is serious, where a significant amount of families are forced into losing more than one source of income. Overall statistics show that in 82% of the families, a family member had to forego working to care for the accident victim.

Analysis from the study findings show that 92% of accident victims used family savings to pay for their medical bills, whereas only 1% reported that their medical bills were either taken care by their employer or the person responsible for the accident. Others were able to get financial assistance from friends and relatives. The financial burden placed on families could be reduced if accident victims/families had some kind of insurance that would either cater for their medical expenses, schooling of children or loss/damage of property. However, data from the study shows that only 7% of the accident victims have some kind of personal insurance. The situation is even more serious when duration of seeking treatment is prolonged.

In families that reported decrease in income after an accident, 68% reported losing an average of less than Tshs. 200,000/= a month; whereas 29% lost an average of between Tshs.200,000/ - 500,000/- per month and 3% lost an average of more than Tshs.500,000/- per month.

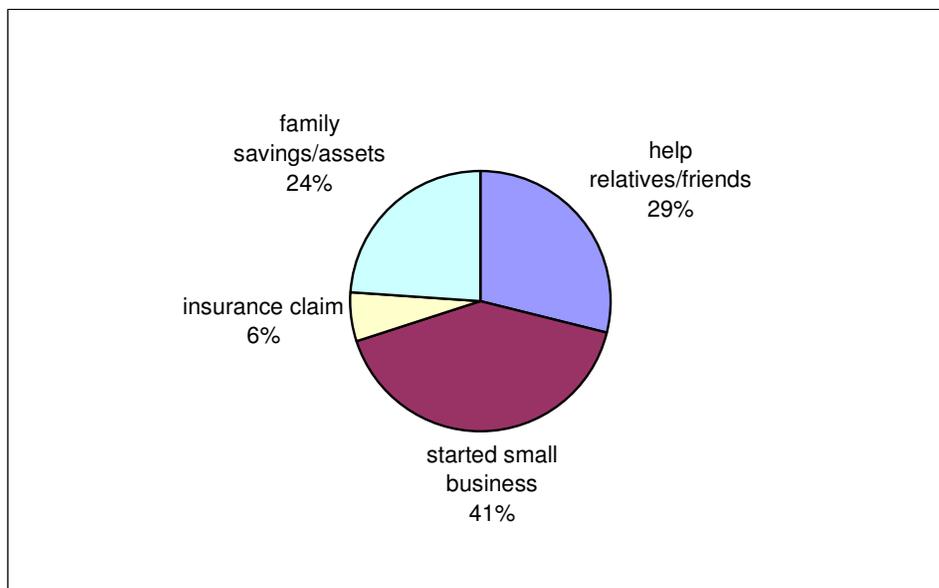
Decrease of income was noted to have several repercussions on the families' livelihood. Families reported difficulties in catering for their basic needs, inability to pay school fees for their children and the fact that in some worse cases a number of families were forced to depend on handouts from friends and relatives for survival as shown in figure 5.2. Interviews with children who had either one or both parents killed in a road accident explained how they have been forced out of school due to lack of money to pay for their school fees and other related expenses. Relatives were in most cases mentioned to provide accommodation and food but were unable to cater for education needs, especially for children in secondary school. Even when children in government secondary schools managed to get government exemption on school fees they still were having a hard time raising funds for other schooling related expenses. The effects of income decrease on quality of life that families of accident victims are forced into will be discussed in more detail in the section looking at the quality of life of accident victims.

Figure 5.2: Effect of decrease of income faced by families of accident victims



In attempts to absorb the financial shock caused by either death or disability of the main bread winner, a number of strategies were taken aboard. The most common strategies reported are shown on Figure 5.3. However, selling of household asserts has a negative implication on family finances, since it is seen as reducing household financial security. In several cases accident victims or dependants/relatives narrated of how they were forced into selling the family house to raise resources to take care of other basic needs like food, clothing, medical care and schooling related expenses. In such cases, families were either forced to move in with relatives or move into cheaper housing units.

Figure 5.3: Coping mechanisms used by families of accident victims to absorb financial shock



5.2.3 Impact of RTA on Quality of Life

Although road accidents happen in a fraction of a second, their consequences may last for days, months, years or even for the rest of the life of the accident victim. Whereas some road accident victims recover from their injuries, some however never recover fully and continue to suffer from some kind of permanent disability. The persistent pain and psychological effect they suffer may cause various difficulties for accident victims to lead a normal life.

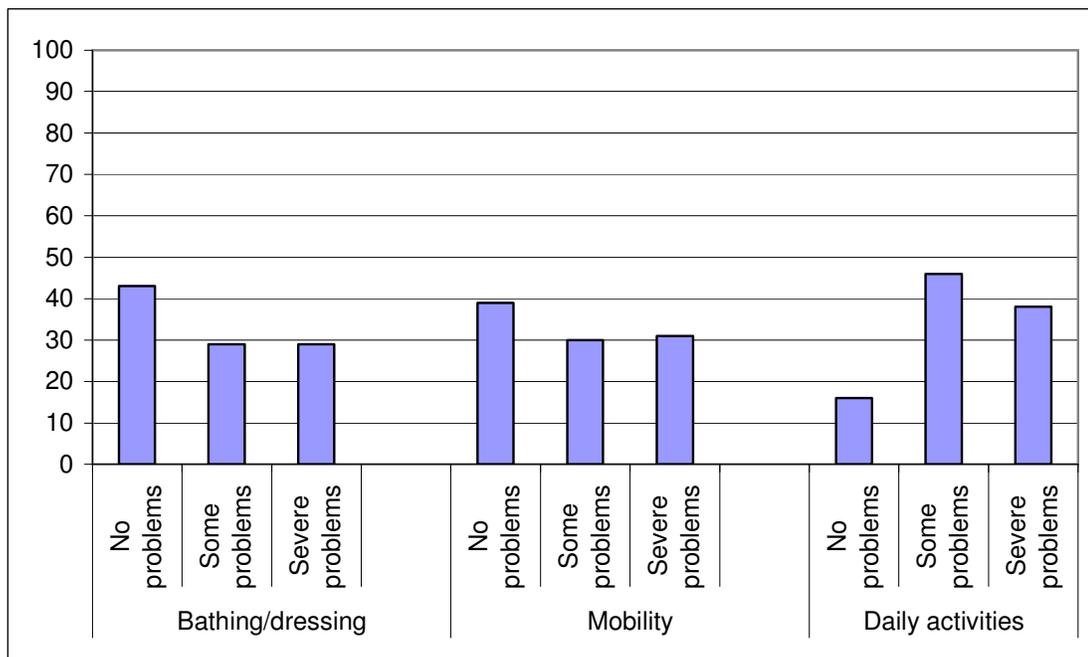
The various types of disabilities that resulted from road accident injuries were noted to affect the quality of life of respondents at different levels. At one level, quality of life was assessed on the basis of ones ability to care for his/her immediate needs like bathing, feeding oneself, mobility, persistent pain. The other level of quality of life was assessed on the basis

of a families' ability to cater for food, accommodation and other basic needs, like education, medical costs among others. Suffering from permanent disability can deprive an individual the ability to achieve even minor goals and results to dependence on others for both physical and economic support or in some cases inability to perform basic tasks can lead to depression. Hence it is important to acknowledge the fact that the emotional pain and anguish that victims incapacitated as a result of injuries of road accidents is beyond any economic compensations.

Quality of life at the individual level

The assessment of quality of life at the individual level is more focused at assessing whether the accident injuries have resulted to accident victims having problems with caring for their daily basic needs. The assessment was based on three variables, namely; ability to bath/dress, mobility and ability to undertake daily activities. The area that accident victims had more problems dealing with was undertaking daily activities, where by 46% reported experiencing some problems and 38% reported experiencing severe problems in undertaking their daily activities as in Figure 5.4.

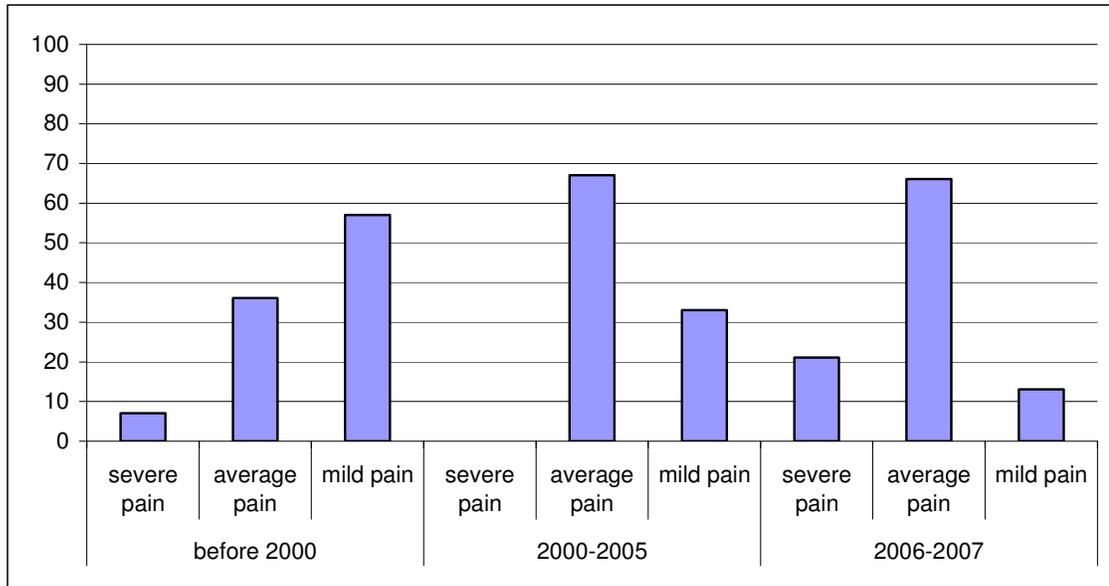
Figure 5.4: Ability of accident victims to care for their daily basic needs



In addition to the problems, accident victims experienced with taking care of themselves, mobility and undertaking their daily activities, accident victims also reported suffering from depression as a result of the accident and its aftermath. Data from the study shows that experiencing

depression is a major problem that accident victims have to deal with. 41% of the accident victims reported experiencing some problems with depression, whereas 52% reported experiencing severe problems with depression. The magnitude of experiencing depression was also noted to vary with whether or not ones employment's status has changed. Data analysis shows that for accident victims who had experienced changes in employment status as a result of the accident (being sacked from work, forced to look for alternative employment resulting from disability) the percentage of those experiencing severe problems with depression was much higher (64%) than among accident victims who had not experienced any changes in employment status (24%) as summarised in the graph below. Suffering from depression is likely to affect one's physical and social functioning leading to social isolation. It is also possible that suffering from depression can push one to substance abuse as a mechanism of relieving the pain and suffering one is going through. In the course of carrying out interviews, the study team came across accident victims who had turned to excessive alcohol consumption as a way of dealing with the suffering and pain they experience because of their disabilities.

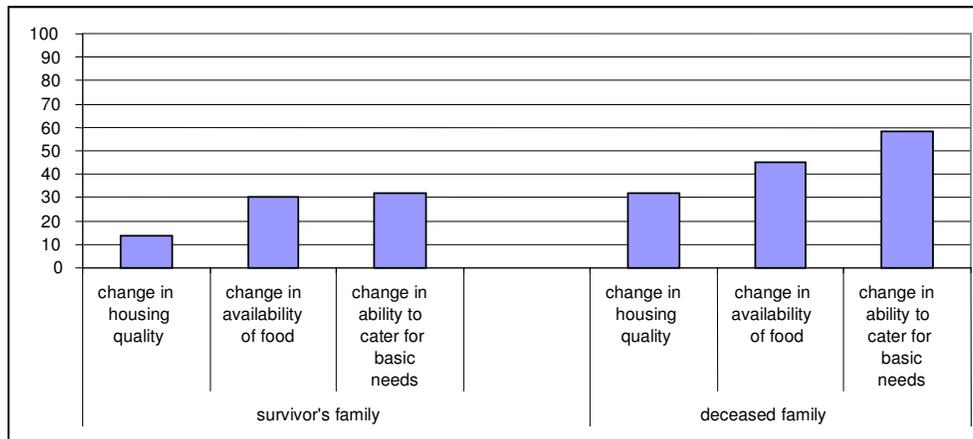
Another dimension that was also looked into was the physical pain experienced by accident victims. Experiencing pain, especially in the case of persistent pain over a long period of time is likely to impact on one's quality of life negatively. Severe and persistent experience of pain is also likely to reduce one's social and physical functioning. Overall 89% of accident victims reported experiencing some sort of physical pain. This was despite the fact that in some cases the accidents had happened more than 5 years ago. Analysis by year of accident shows that of those whose accidents happened before the year 2000, 80% reported experiencing some level of pain, of those involved in accidents between 2000 and 2005, 84% reported experiencing some level of pain and for those whose accidents happened between 2006 – 2007, 97% reported experiencing some level of pain. The level of pain experienced was categorised into 3 different categories, that is, mild pain, average pain and severe pain. On the basis of these categories, many accident victims reported experiencing some average pain (60%) as summarised in Figure 5.5.

Figure 5.5: Pain suffered by road accident victims

Quality of life at household level

Many accident victims have other dependants upon them, meaning that absence from work can have far reaching effects, well beyond the immediate costs of treatment which may be needed and other monetary costs of the accident. Analysis of data collected in the study shows that 88% of the accident victims played a significant contribution to the household income, such that inability to work or absence from work can have a damaging effect on the family's welfare. Changes in the quality of life for families of accident victims was assessed on 3 main dimensions, namely; changes in quality of housing condition, changes in food consumption and changes in the families ability to cater for its basic needs (medical costs, school fees, clothing among others). Among the 3 dimensions that were used to gauge changes in quality of life at household level, change in availability of food and family ability to cater for its basic needs were most reported by both families of surviving accident victims and deceased victims. Although changes in quality of life was experienced by both families of accident survivors and deceased accident victims, the magnitude of the problem is much more felt for families of deceased accident victims as summarised in the graph below.

Figure 5.6: Changes in quality of life for accident survivors and families of deceased accident victims

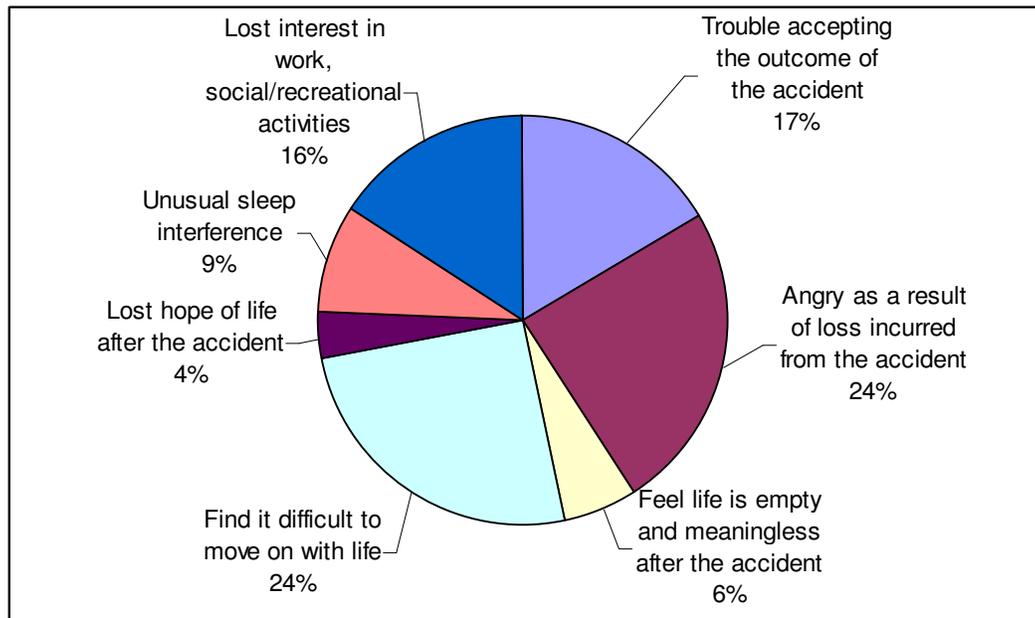


5.2.4 Pain Grief and Suffering of RTA Victims and Relatives

An analysis of medical costs and lost productivity alone do not capture the psychological losses associated with road traffic accidents, either to those injured or their families. That is, apart from the cost elements that directly or indirectly affect accident victims and their dependants/relatives, accident victims and their dependents/ relatives also experience other effects including emotional pain, grief and suffering that adversely affects their quality of life, but yet are difficult to quantify in monetary terms.

Pain and suffering experienced by accident victims

Pain and suffering experienced by accident victims was analysed by looking at the emotional pain and suffering experienced by road traffic accidents survivors as a result of the accident. A significant percentage of accident survivors reported being angry and frustrated with the outcomes of the accidents, which had brought about major changes in their lives. The survey shows that 11% of the accident victims were dismissed from work after the accident and 41% of the victims who were self employed were unable to continue working because of the injuries sustained. As a result of the pain and suffering experienced, accident victims reported that they had difficulties in moving on with life after the losses they had incurred. Figure 5.7 gives a more elaborate picture of the experiences and reactions of accident victims after the accident.

Table 5.7: Experiences and reactions of accident victims in dealing with the aftermaths of RTA

Accident victims also expressed their anger and frustrations in terms of the difficulties that they face in adjusting to the aftermaths of the accident, such as a disability resulting from the accident where victims lost either function of a body organ or loss of property. There were cases of accident victims who had lost a significant amount of property (goods) such that their business ventures have suffered enormously. They reported having difficulties in reorganising capital for reinvestment and were frustrated about the situation. The anger was directed towards the pain and suffering that they have had to endure after the accident and from the inability of being able to cater for family needs, reducing them to beggars dependant on handout from well wishes. The magnitude of disability reported was high with 90% of the accident victims reporting some kind of disability that had resulted from the injuries sustained from the accidents. Of these, 79% reported the disabilities as permanent disabilities. Figures 5.8 and 5.9 summarises the distribution and character of disabilities.

Pain and suffering were also gauged against the fact that a significant amount of family resources were used in search of medical treatment, draining the meager family resources, leaving the family with limited resources to absorb the shock of loss of employment.

Figure 5.8: Magnitude of disability among accident survivors

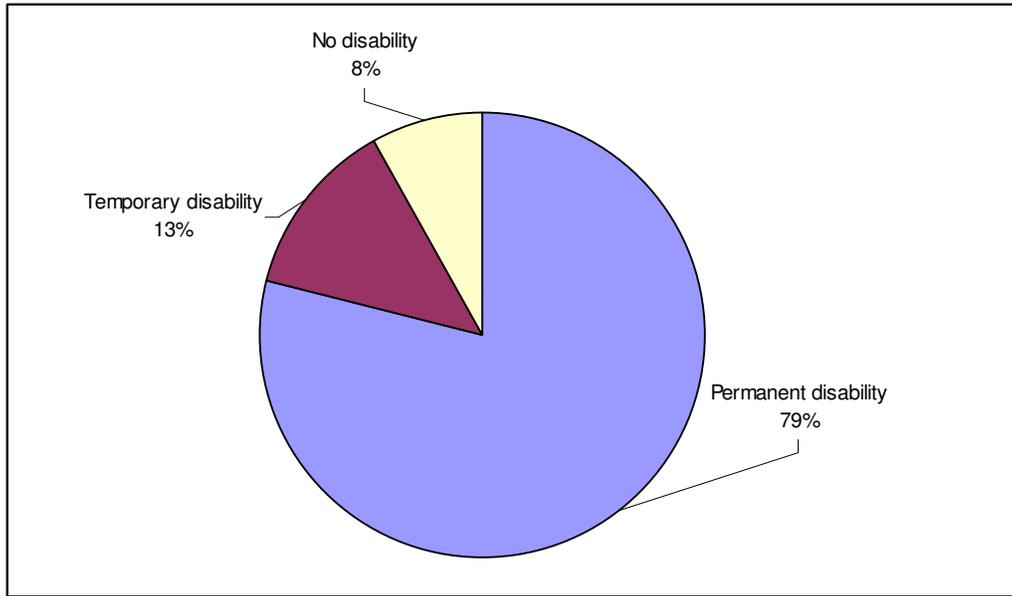
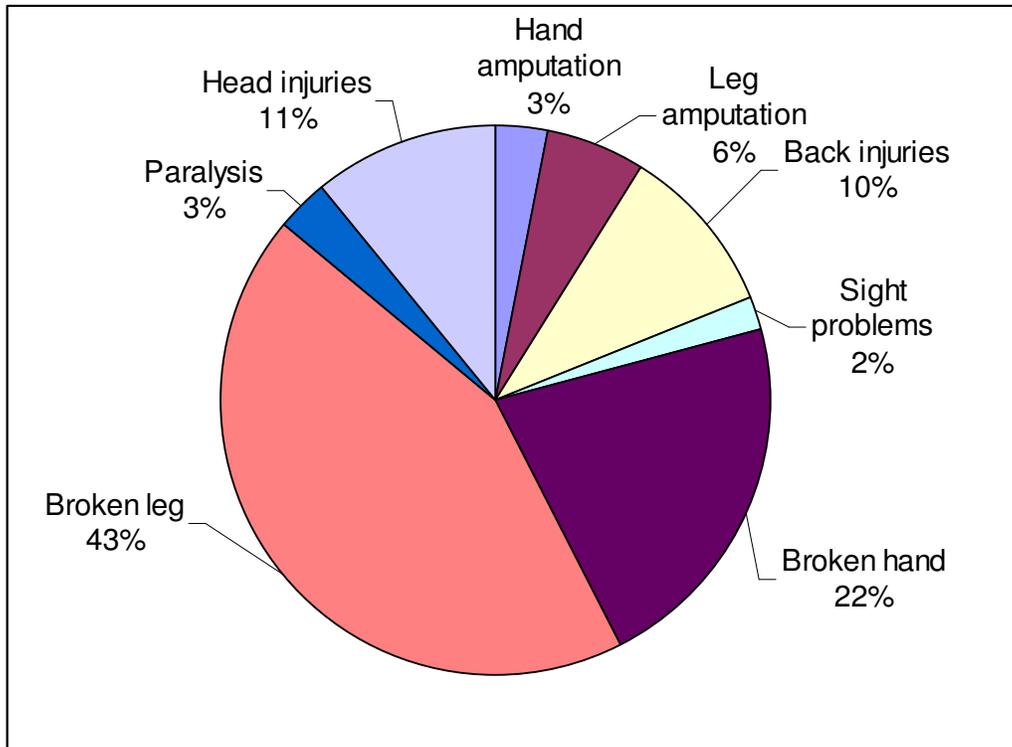


Figure 5.9: Kind of disabilities suffered by road accident survivors



Grief and suffering experienced by relatives of RTA victims

Grief following the death of a significant person is considered a very painful experience. Even though grief is a natural non-pathological phenomenon it can lead to a set of negative symptoms which involve functional impairment of the grieving person. Grief reactions can be psychological/emotional, physical or social. Psychological/emotional reactions can include anger, sadness and despair, whereas physical reactions can include sleep difficulties, somatic complaints or illness and social reactions can include desire not to see family/friends or the desire not to work. For the purpose of this particular study, grief as a result of death from road accidents was analysed within three broad areas. Aspects that were addressed include ability of dependants or relative to accept deaths of their beloved ones as real; ability to cope with emotional and social problems which are caused as a result of the loss and their ability to emancipate themselves from the bondage of the deceased. The results are summarized in Table 5.3.

Dependants/relatives of deceased accident victims reported experiencing an emotional/ psychological reaction, what can be categorised as symptoms of traumatic distress which were expressed as disbelief about the death and feeling angry and shocked from the death. Responding to the question soliciting information on one's ability to cope with accepting reality of the death of a loved one, respondents reported difficulty in accepting the deaths of their loved ones. Observations from the data collected show that more than 10 years since the deaths of their loved ones, dependants/relatives are still having a hard time accepting the deaths and experience anger towards the deaths. Disbelief of the death of a loved one was closely associated with anger towards the fact that their loved ones have had to die prematurely and the adverse difficulties that families had to go through as a result of the death. Dreams were shattered as a result of losing a parent or both parents, especially for children who had to forego schooling due to inability of the family to continue supporting their schooling. Responses from the study show that 29% of families of deceased accident victims were unable to continue supporting their children's education.

Feeling of despair and futility about the future were some of the feelings that were reported by dependants/relatives of deceased accident victims. Also reported was separation distress where dependants/ relatives were preoccupied with thoughts of the deceased person, feeling that they could not continue living without their departed loved ones, experiencing loneliness after the loss and having sleep difficulties. The deep suffering affected the readjustment of the dependant/relatives to living without the deceased. Data shows that 87% of respondents felt that it is difficult for them to continue with life with their loved ones. Table 5.3

gives a breakdown of experiences of dependants/relatives after the loss of their loved ones by region.

Table 5.3: Grief, pain and suffering of dependants/relatives of accident victims by region

Grieving process	DSM (%)	Coast (%)	Arusha (%)	Kilimanjaro (%)
Problems in accepting death of loved one	88	100	100	100
Angry about the death of their loved one	88	100	100	100
Feel life is meaningless without the deceased	31	67	100	67
Feel cannot continue living without the deceased	94	100	67	83
Lost hope in life	25	33	33	50
Experiencing sleep difficulties	50	67	50	50
Lost interest in social activities	44	68	0	0

Women experienced more difficulties in coping with loss of loved ones as shown in Table 5.4.

Table 5.4: Grief, pain and suffering of dependants/relatives of accident victims by sex

Grieving process	Females (%)	Males (%)
Problems in accepting death of loved one	100	100
Angry about the death of their loved one	100	86
Feel life is meaningless without the deceased	65	43
Feel cannot continue living without the deceased	88	86
Lost hope in life	47	14
Experiencing sleep difficulties	71	29
Lost interest in social activities	47	7

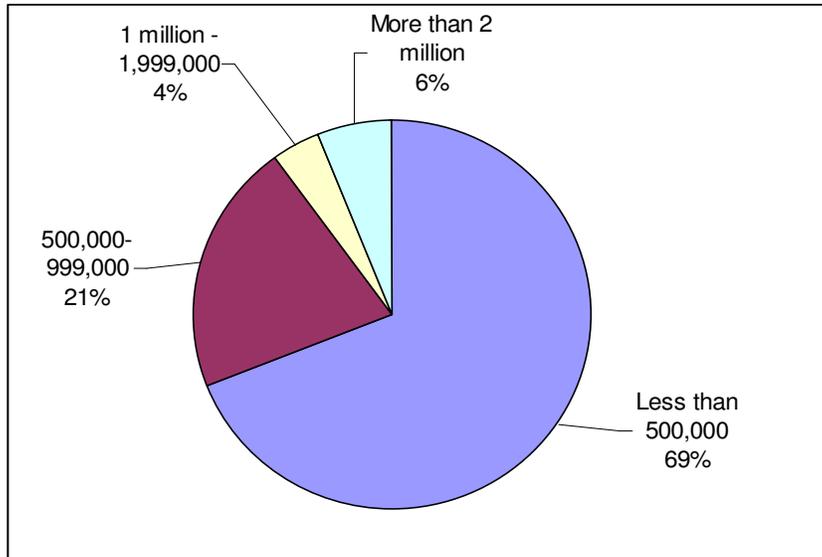
5.2.5 Health Care Costs Due to RTA

Medical costs are often the first and most tangible economic burden experienced by the families of road accident victims due to the fact that they need immediate medical attention. Findings from the study show that health care costs place a heavy burden on accident victims and their families' finances. Medical costs of those injured in crashes, range from at-scene through to recovery or death. Expenses include hospital costs (food, bed, operations, x-rays, consultation, medicine among other services) and rehabilitation costs.

The average medical cost computed from accident victims in the four study regions amounted to Tshs. 498,891/=, with distribution shown in Figure 5.10. Family savings (92% of the respondents) were used to finance medical treatment. Some reported being supported by relatives (64% of respondents). Other sources mentioned were loans (1%) and employer (1%). In addition to catering for medical expenses, families also have to

cater for transport costs when seeking for treatment. The average transport costs computed in the four study regions amounted to Tshs. 103,125/=, with costs ranging from Tshs. 5,000/= to Tshs. 1,000,000/=.

Figure 5.10: Reported costs of treatment for accident injuries (Tshs.)



The duration of treatment was also explained as an important factor in determining the costs for treatment. Treatment was explained to be a long process which required multiple visits to the health facilities, thus increasing treatment costs. On average, accident victims spent 6 months following up treatment as a result of injuries from the accident, with the duration ranging from one week to four years. The duration of treatment for 72% of the respondents was less than 6 months, 17% reported duration between 6 months and 1 year and 11% reported treatment duration of more than one year.

Depending on the type of injuries, other accident victims (61%) also required special equipments like wheel chairs, walking sticks, which meant an additional cost. The mean average costs for special equipments computed was Tshs. 73,369/=, with costs ranging from Tshs. 1000/= to Tshs. 250,000/=. Adding on to the costs of care, in some instances accident victims required special kind of food during recuperation. 36% of the accident victims in the study reported to have needed special kind of food which added up to the costs of care.

5.2.6 Compensation of RTA Victims and Dependants by Insurance Companies

The social and economic impact of road traffic accidents can be reduced to a certain magnitude if accident victims or their dependents

and relatives received insurance compensation to cater for expenses and lost income as a result of RTA. This is important since very low percentages of individuals or families reported having personal insurance coverage (7% accident victims and 25% deceased victims). Knowledge on RTA insurance compensation is an important prerequisite for either an accident victim or their relatives to claim their rights. Awareness of RTA insurance compensation was high, with 76% of the respondents reporting that they knew about road traffic accident insurance compensation. Knowledge on insurance compensation did not vary across respondents with different educational levels. However, reported compensation rates were very low. Only 12% of accident victims or families of deceased accident victims had received insurance compensation. A comparison between the percentage of surviving accident victims and those of deceased families that had received insurance compensation shows that rate of compensation are higher among families of deceased (19%) as compared to accident victims (9%). The mean amount of insurance compensation paid to surviving accident victims was Tshs. 2,083,333/=, with compensations ranging from Tshs. 600,000/= to Tshs. 4,000,000/=. The mean amount of insurance compensation paid to relatives/dependants of deceased accidents victims computed was Tshs. 7,200,000/=, with compensation ranging from Tshs. 2,000,000/= to 15,000,000/=.

When accident victims were asked on whether or not they were satisfied with the insurance compensation that they had received, 33% reported being satisfied, whereas 67% reported being unsatisfied. The satisfaction was on the basis of whether or not the compensation was able to cater for the expenses that families had to incur as a result of the accident. 17% of the accident victims reported that the compensation that they received was able to cover for their extra expenses that resulted from the accident at a score of 100%, whereas 67% of the victims felt that the compensation was only able to take care of 50% of the expenses and the remaining 16% of the accident victims felt that the insurance compensation was only able to cater for 25% of the extra expenses that were a result of the accident.

In both categories of respondents, that is, surviving accident victims and relatives/dependants of deceased accident victims, the major factor for failure to receive insurance compensation was attributed to the fact that the procedures of claiming insurance compensation are too lengthy and complicated. Accidents victims talked of how lengthy the process could be, taking up to 2 years and in the process expenses are incurred like transport and at times bribe were demanded to speed up the process. Figures 5.11 and 5.12 summarise the reasons for respective RTA categories failure to receive insurance compensation.

Another category of RTA victims is their traveling as passengers in freight vehicles as such vehicles are not allowed by the law to transport passengers. In cases when an accident occurs they can not claim for any insurance compensation. There were also cases of no documentation for either the transport of goods in freight vehicles or as passengers in a licensed PSV. When one is not issued with a valid receipt, there is no way to prove that one was genuine passenger or had goods in a vehicle involved in a RTA.

Figure 5.11: Why RTA victims did not receive insurance benefits

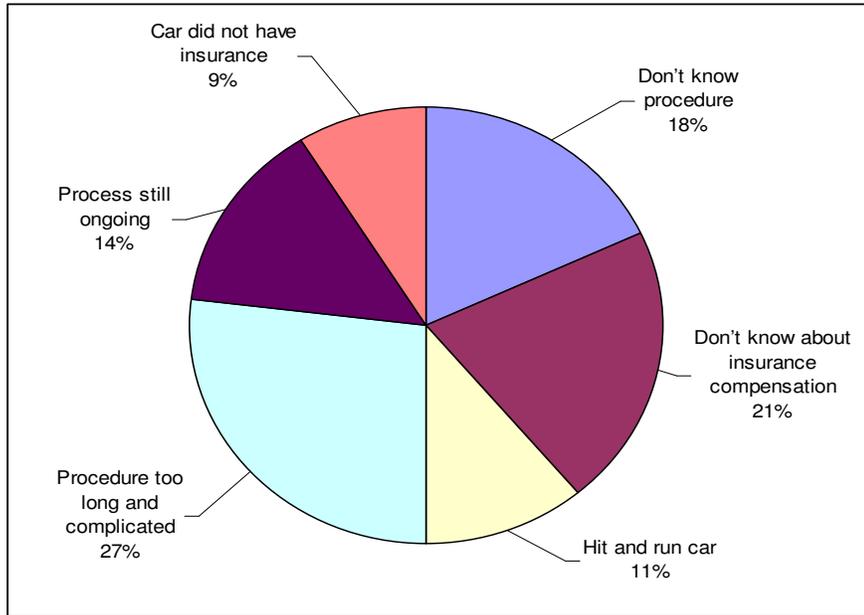
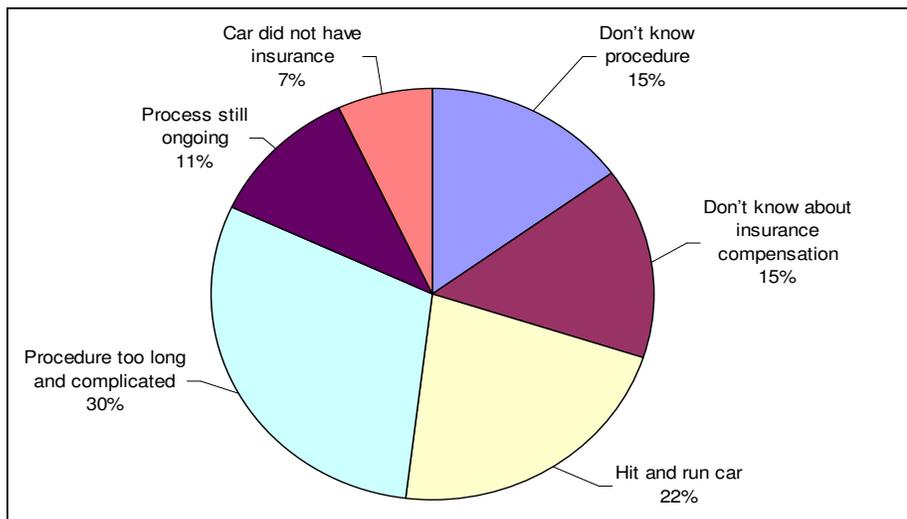


Figure 5.12: Why RTA victims dependants/relatives did not receive insurance benefits



5.2.7 Summary and Recommendations

The negative social impacts experience by RTA victims and their families are considerable. It is a serious cause of suffering through income losses and medical expenses that often increase poverty. RTA victims and their families also suffer from pain and grief, which can not be quantified, but adversely affect the quality of life of both the accident victims and their families. This suffering cannot be ignored by policy makers and the managers of the transport sector and related sectors like health and insurance as well as the entire community. The government and her organisations should take measures outlined in chapter four and any other appropriate measure to prevent RTA. The following specific actions are recommended in order to minimise social-economic impacts of RTA at household level.

Specific Recommendations:

- i. Civil societies, SUMATRA and the Commissioner of Insurance should take up the initiative of disseminating knowledge on RTA insurance requirements and procedures especially for PSV users.
- ii. SUMATRA should suspend licences of PSV that fail to issue valid tickets to passengers.
- iii. SUMATRA should assist in information dissemination on the risks of travelling in un-licensed PSV. When regulation of goods vehicles is resumed SUMATRA and Traffic Police should enforce the law against carrying passengers in such vehicles.
- iv. The Commissioner of Insurance should regulate the amounts of compensation payable to RTA victims who were involved in accident while travelling in PSV. The rates should be revised constantly to reflect actual costs.
- v. The Commissioner of Insurance should regulate the maximum time within which claims by RTA victims or their dependants/relatives should be paid.
- vi. The Commissioner for Insurance should arrange for legal provisions and funds to compensate RTA victims of hit and run accidents.
- vii. The Commissioner for Insurance in collaboration with the Ministry of Health and other medical care providers should arrange for means to provide immediate treatment of RTA victims.

Policy Implications

The recommendations which fall under the Commissioner for Insurance shall require policy change and amendment of the respective Act to accommodate the stated needs of the RTA victims. Namely to provide

- i. Timely medical treatment,
- ii. Timely compensation,
- iii. Compensation for victims of hit and run RTA, and

- iv. Adequate amount of compensation to RTA victims and their dependants/relatives.

Recommendations which fall under SUMATRA can immediately be implemented. However, aspects involving freight vehicles can most effectively be implemented after the restoration of regulation of goods vehicle.

5.3 Impact of Road Traffic Accidents on the Health Sector

5.3.1 Introduction

Assessing the impact of road traffic accidents on health services is important for several reasons. First, it is essential for raising awareness of the seriousness of road traffic accidents as a problem and burden on the healthy services. Road traffic accident victims occupy scarce hospital beds and medical attention. Often hospital staff must abandon the treatment of other patients in order to attend emergency cases so as to attempt to save the lives of accident victims. Second, it serves to make proper comparisons between road traffic accidents and other causes of death and injury. Third, it also helps to establish the social and economic cost of road traffic accidents, which in turn, reflect the social benefits of reducing road traffic accidents compared to the costs of different interventions. Thus, quantifying these impacts is important for the guidance of policy makers and managers on the priority to be given to the prevention of road traffic accidents.

This evaluation of impact of RTA on the health services is based on the analysis of data from a sample of two hospitals: the Muhimbili Orthopaedic Institute (MOI) and Tumbi Hospital in Kibaha. The two hospitals were selected for the study due to the fact that both of them are specialised hospitals established with a view to provide improved services to cases related to road traffic accidents. The proportion of hospital beds and staff time and other resources used up in the treatment of accident victims is quantified.

Data was collected from Muhimbili Orthopaedic Institute (MOI) and Tumbi Hospital. Dar es Salaam municipal hospitals do not treat RTA victims apart from first aid. The adopted procedure is to give first aid (resuscitation) such as arresting bleeding, giving intravenous fluids, anti-pains and facilitate transportation of the patients to MOI if needed for further investigation and management.

Study Population and approach

Permission to conduct this study was obtained from the Muhimbili Orthopaedic Institute and Tumbi Special hospital administration. Records of patients who attended and admitted at the Muhimbili Orthopaedic

Institute and Tumbi Special Hospital between years 1998 to 2006 were examined. The details of the study were obtained from the patients OPD register books, hospital records and interviews with the hospital administration and staffs. Pre-constructed guide was used to search for availability of such data that were meant to reveal the impact of road traffic accidents on hospital services. Most of the data were not available as anticipated. It was necessary thereafter to sample a month that could represent the general overview of the impact. However, it was difficult to collect all the data according to age and reason for attendance per patient because different tools were used to record such information. It was difficult to link between available records from OPD register book; patient files to in-patient register books and operation books. The best was to estimate using a sample month and conduct interview with the MOI administration. August 2006 was chosen due to readily availability of necessary information, which required linkages. Using available hospital data, register books and interviews the information was obtained. Data were recorded and tabulated. The results for MOI can be considered to capture the impact of the RTA problem in the country because the Institute gets referrals from all over the country.

5.3.2 Case study of impact of RTA on two hospitals

The Case of MOI

As mentioned above MOI is the leading provider of treatment to RTA victims in the country as it was established for that purpose. It deals with nearly all cases of RTA victims in DSM plus referrals from up-country as elaborated below. It can be noted from Table 5.5 that from the month of August 2006 attendance at the Institute due to RTA accounted for 66% of all the attendance cases and 52% of all admissions. Most of the RTA victims belong to the active working age as shown in chapter four. A significant proportion of the same age groups were also admitted due to road traffic accidents in the same month. In the same month of August 2006, most of the victims of road traffic accidents were males (see Table 5.6).

Table 5.5: Age distribution, outpatient department (OPD) attendance and admissions due to RTA at MOI (Sample Month, August 2006)

Age	OPD Attendance	Attended due to RTA		Admission	Admission due to RTA	
< 20	84	49	58 %	42	12	28 %
20 – 30	643	412	64 %	97	53	55 %
30 – 40	885	638	72%	139	79	57 %
> 40	344	192	55 %	106	51	48 %
Total	1956	1291	66%	384	200	52 %

Table 5.6: Gender distribution, OPD Attendance and Admission due to RTA

Gender	OPD Attendance	Attendance due to RTA		Admission	Admission due to RTA	
		Number	Percentage		Number	Percentage
Male	1243	916	71%	257	134	67%
Female	713	375	29%	127	66	33%
Total	1956	1291		384	200	

Furthermore, most of the patients were admitted for a period of between two to four weeks as shown in Table 5.7.

Table 5.7: Length of stay for in-patient admitted due to RTA

Length of stay	Number	Percentage
< 2 weeks	32	16 %
2 – 4 weeks	134	67 %
> 4 weeks	34	17 %
Total	200	100%

Outpatient Attendance

The number of outpatient seen has been rising steadily since the establishment of the Institute reaching 26,425 in 2005/06 (see Table 5.8). Private Patients seen in the year constituted 36% of the total number of patients. Most of the private outpatients are referral cases, follow-ups and other types of accidents. Victims of road traffic accidents are recorded as general patients. A least 70% of outpatient attendances are victims of road traffic accidents. It is also estimated that 40% of these patients are self-referral, 30% are referrals from Dar es Salaam municipal hospitals, 21% referrals from private hospitals (Agha Khan, Massana, TMJ, Tumbani, Regency, etc.) and the remaining 9% are referrals from upcountry districts and regions including Tumbi hospital.

Table 5.8: Outpatient attendance from July 1998 to June 2006

Period	Private	General	Total
July, 1998 – June, 1999	3,789	2,044	5,833
July, 1999 - June, 2000	3,533	3,835	7,368
July, 2000 - June, 2001	4,595	10,868	15,463
July, 2001 - June, 2002	4,751	9,905	14,656
July, 2002 - June, 2003	5,701	10,212	15,913
July, 2003 – June, 2004	7,708	10,623	18,331
July, 2004 – June, 2005	7,853	11,881	19,734
July, 2005 – June, 2006	9,588	16,837	26,425
Total	47,518	76,205	123,733
Percent	36	64	100%

In-Patient Admissions

Table 5.9 shows admission the study period. The decrease in general admission in 2005/2006 is due to decrease of number of beds in public wards from 50 to 30 due to the ongoing rehabilitation at Muhimbili National Hospital. However, the number of private in patients in 2005/2006 increased to 545 an increase of 38 % when compared to 2004/2005. This

increase is due to the opening of the second private ward with 17 beds, which was done in October 2005. On average at all time MOI private and general wards are 95% occupied. At private wards, average daily fee is \$30 - \$50 per patient per day while in general ward, patient's fee is \$10 - \$20 per day. On average, an inpatient stays a minimum of 2 weeks and a maximum of 6 weeks within the hospital.

Table 5.9: Inpatient Admissions from July 1998 to June 2006

Period	Private Ward	General	Total
July, 1998 – June, 1999	309	5,274	5,583
July, 1999 – June, 2000	338	5,773	6,111
July, 2000 – June, 2001	325	5,442	5,767
July, 2001 – June, 2002	372	5,614	5,986
July, 2002 – June, 2003	461	5,915	6,376
July, 2003 – June, 2004	359	6,328	6,687
July, 2004 – June, 2005	394	5,562	5,956
July, 2005 – June, 2006	545	3,797	4,342
Total	3,583	53,335	56,918

Operations

Table 5.6 shows surgical operations at MOI during the study period. The number of surgical operations increased by 2576 in 2005/2006 an increase of 42% when compared to 2004/2005. Private patients constituted 19% of the total operations performed. The increase in the number of surgeries was due to addition of one more operating table, which made it possible to operate emergency patient as need arise. A single operation procedure costs \$200 to \$1000 depending on the type of the operation.

At least 78 % of operations done at MOI are due to RTA. Most of patients who stays in-patient after operations, are admitted for a period of 2 to 3 weeks. Minorities of these patients (< 5%) with severe injuries are admitted for a period of 3 – 5 weeks.

Table 5.10: Operations Performed From July 1998 to July 2006

Period	Private	General	Total
July, 1998 – June, 1999	201	1,064	1265
July, 1999 – June, 2000	186	954	1140
July, 2000 – June, 2001	240	852	1092
July, 2001 – June, 2002	276	1,180	1456
July, 2002 – June, 2003	334	1,276	1610
July, 2003 – June, 2004	270	1,495	1765
July, 2004 – June, 2005	234	1,577	1811
July, 2005 – June, 2006	494	2,082	2576
Total	2543	12045	14588

Physiotherapy

As shown in Table 5.11, physiotherapy sessions have gradually increased since the establishment of the unit. In 2005/2006 a total of 15399 sessions

were performed. In 2005/2006 outpatient services for public patients were introduced. Cost for a physiotherapy session is \$3 to \$ 5 depending on duration and type of disability.

Table 5.11: Physiotherapy Patients Attended From July 1998 to June 2006

Period	No of session
July, 1998 – June, 1999	12,626
July, 1999 – June, 2000	11,578
July, 2000 – June, 2001	10,072
July, 2001 – June, 2002	11,879
July, 2002 – June, 2003	12,654
July, 2003 – June, 2004	14,961
July, 2004 – June, 2005	15,339
July, 2005 – June, 2006	14,339
Total	116,761

Investigations

Table 5.12 below shows the total number of investigation done from 1999 to 2006. Most of laboratory investigations cost \$ 10 to \$ 20 while the radiological investigations range from \$ 10 to \$ 300. Examples of laboratory investigations: Liver Function Test (LFT), Renal Function Test (RFT), Blood culture and sensitivity etc. Examples of common radiological investigations: X-Rays, Ultra sonography, Computerised tomography and Magnetic resonance imaging.

Table 5.12: Total number of investigations done from 1999 to 2006

Type of investigation	Private wards	General wards	Total	Annual Average
Laboratory	4,032	12,680	16,712	2,387
Radiological	3,656	14,899	18,555	2,651

The Case of Tumbi Hospital

As it was for the MOI case, it was difficult to collect all the data at Tumbi according to age and length of stay for in-patient admitted due to RTA. It was difficult to link between the available data from OPD register book; patient files to in-patient register books and operation books. As a result, estimation was made using a sample month and conduct interview with administration. June 2006 was chosen due to readily availability of necessary information, which required linkages.

A review of month of June, 2006 records indicate that general OPD attendance in that month was 25,120. Only 108 patients attended due to RTA. Among the 32 admitted patients due to RTA, 22 which is (69%) stayed in-patient for a period of 2 – 4 weeks.

General Attendance and Admission

Compared with MOI, Tumbi Hospital has a rather different pattern of cases related to road traffic accidents as shown in Table 5.13. At Tumbi, General

attendance due to Road traffic accidents and similarly admissions due to RTA are below 1 per cent. This might be contributed to the fact that Tumbi is more of a general hospital and also serves as both a designated district hospital for Kibaha and referral hospital for Coast region.

Table 5.13: General attendance and admission at Tumbi Special Hospital

Period	General Attended	Attended due to RTA		Admitted General	Admitted due to RTA	
July, 2000- June, 2001	320,000	1145	0.35%	82500	942	1.14%
July, 2001 - June, 2002	284,000	1046	0.36%	85500	411	0.48%
July '02 – June, 2003	288,500	1244	0.43%	70,000	632	0.9%
July, 2003 – June, 2004	335,500	1150	0.34%	94000	201	0.21%
July, 2004 – June, 2005	337,000	1142	0.34%	94500	405	0.43%
July, 2005 – June, 2006	310,000	1147	0.37%	69500	333	0.48%
Total	1,875,000	6874	0.37%	496,000	2924	0.59%
Average	312,500	1,146	0.004%	82,667	487	0.006%

Operations

Tumbi admits all patients who require all sorts of operations. However, as shown in Table 5.10, operations due to RTA are only 1% at Tumbi.

Table 5.14: Operations at Tumbi Hospital

Period	Operations	Operation due to RTA
July, 2000- June, 2001	1,726	25
July, 2001 – June, 2002	1,624	30
July, 2002 – June, 2003	1,828	23
July, 2003 – June, 2004	1,546	24
July, 2004 – June, 2005	1,766	31
July, 2005 – June, 2006	1,658	27
Total	10,148	160

Referrals and Physiotherapy sessions

At Tumbi, referrals are made to MOI for further investigations and management. Tumbi hospital does not have radiological investigations such as computer tomography (CT-Scan) and Magnetic Resonance Imaging (MRI) and hence patients requiring these investigations are being referred to MOI. The hospital uses its vehicle and related expenses and staff to facilitate such referrals.

Comment on the Data Used

As mentioned above both hospitals recorded their data manually which makes it difficult to retrieve for analysis. For future research as well as for management decisions we recommend that the data should be systematised and computerised.

5.3.3 Summary and Recommendations

Findings from this study indicate that road traffic accidents are the commonest cause of attendance, admissions and operations at MOI, which is the largest trauma institute in the country. About a third of RTA and related casualties are reported in DSM, the catchment area for the Institute. More than 75% of operations at MOI are due to RTA. Thus RTA is the largest cause of trauma victims treated at MOI. Detailed costs of treatment were available from the Institute and the data was very useful in the estimation of economic loss due to RTA in section 6.4. Compared to other health problems RTA is not a very common cause for attendance at Hospitals other than MOI. However, RTA victims need immediate attention in order to save life. This means scarce medical resources must postpone treating sick people in order to attend emergence cases due to RTA. Efforts within the transport sector to prevent RTA occurrence will minimise such demands in future and allow medical resources to attend the regular cases. Specific recommendations for the health sector include:

- i. To systematise and computerise patients and resource data for management and research use;
- ii. Cooperation with the Commissioner of Insurance to ensure immediate treatment of RTA. The Commissioner and the Health authorities should work out a way for latter payment from insurance companies or from the fund of victims of hit and run accidents;
- iii. The sector should note the potential future increase in the number of victims of RTA and prepare by equipping strategic health facilities with human resources and operating tables and ambulances to allow immediate treatment of victims.

5.4 Economic Impacts of Road Traffic Accidents

5.4.1 Introduction

Road accident costing is needed to highlight the socioeconomic burden of road accidents on families of accident victims and on the nation. Studies on the costs of RTA carried out in the 1977 concluded that for many Developing Countries between 1% and 3% of the annual gross domestic products was lost due to traffic accidents occurring on their roads. This is a very crude estimate that is used due to absence of accurate data on the costs of RTA in developing countries. For Tanzania Mainland recent estimate based on 2002 data put the cost of RTA at about 2% of the GDP of that year. This is perceived as a serious drain to any economy. The proportion of the loss due to RTA in highly motorised countries is also placed at about 2% of GDP but the estimate is on the basis of willingness to pay approach which assigns a much bigger value of a

statistical life compared to the human capital approach used in DC. Cost effective studies of road safety measures have demonstrated that huge savings can be made by modest investments. It is therefore prudent to continuously evaluate the loss to the economy due to RTA and to determine the most appropriate measures to reduce this cost.

The cost elements of RTA usually considered when using the human capital approach include:

- 1) Pain, grief and suffering imposed on the victims of road traffic accidents and their relatives,
- 2) Lost output of the victims and those who care for the survivors,
- 3) Medical costs for those injured,
- 4) Administrative costs (police, rescue services, insurance and the courts. This element may include also the delays caused to other traffic),
- 5) Loss of property - cost of vehicles repair/replacement and restoration of damaged road.

In the next section we outline the assumptions and method used to estimate each cost element for 2006.

5.4.2 The Estimation of Economic Costs for RTA for 2006

Our approach is based on the human capital approach. In this approach the tangible costs of RTA are calculated and then a sum is added to account for the intangible costs - the pain, grief and suffering which cannot be readily estimated in monetary terms. The cost of the intangible elements is usually taken as 30% or thereabout of the tangible costs.

Summary of our estimation

- 1) Pain, grief and suffering imposed on the victims of road traffic accidents and their relatives: This was taken as 25% of the tangible costs.
- 2) Lost output - of the victims and those who care for the survivors

The element is estimated from two components:

- ◆ The loss of output of the accident victim which is estimated from the productive years lost due to the death of victim or permanent disability.
- ◆ The lost output of those who care for survivors is estimated from time spent by relative or other person to care for the victim.

We have assumed productive age to be between 15 and 60 years the current retirement age for public servants. Our

estimation is based on the GDP for 2006, the age distribution of accident victims (presented in Chapter Four) and our survey of those who were involved in accident and their relatives (presented in section 5.2). It was estimated that people with disabilities (not contributing to GDP) constituted 8.6 percent of the population or about three million people in 2006. Those involved in RTA consist of the educated and business people to a large extent and the loss per person is considered to be higher than the average. Considering all the factors, we have assumed an average loss of out put per person lost in a RTA to be about 2.5 times of the per capita income.

3) *Medical costs for those injured*

Medical and the associated transport costs are a significant component of the tangible costs. In this study a sample of accident victims or relatives provided their actual costs. These were compared to cost for treatment collected from MOI. The costs reported by the RTA victims were lower than estimates based on MOI data. We consider that on average treatment costs are higher than what was actually reported because there are cost elements that are not directly captured. We used the reported values so as to get conservative results.

4) *Administrative costs (police, rescue services, insurance and the courts) and delay to other traffic*

This cost element was estimated by projection from previous studies.

5) *Loss of property - cost of vehicles repair/replacement and restoration of damaged road*

This is a major cost considering that Tanzania has no automobile industry and we rely on importation of both vehicle and parts. We have used previous study data to estimate this component. In future estimation of RTA it is advisable to carry a more extensive survey to establish the cost of loss of property. The current estimate is considered to be on the low side.

The results for all the components are summarized in Table 7.1.

Table 7.1 Cost estimate of RTA for 2006

	Cost Component	Cost (Million TSh.)	Percent of Total
1	Lost output due to death and injuries	205,623	50.6
2	Medical costs	11,774	2.9
3	Administrative costs, traffic delay and other	6,337	1.6
4	Loss of property (damaged vehicles and infrastructure)	101,398	24.9
5	Total tangible costs	325,132	
6	Intangible costs (25% of the tangible costs)	81,283	20
7	Total RTA costs in Million T Shillings	406,415	100
8	Costs of RTA adjusted using lower under reporting factor for Sub Saharan Africa recommended by PIARC (1.25)	508,019	
9	Percent of GDP	3.4 percent	

Total loss due to RTA in US \$ for 2006 is 446 million which is 3.4% of the GDP. The BoT estimated the GDP as US \$ 13.13 billion.

The distribution of the RTA costs percentage-wise is shown on Figure 7.1. The loss of output due to both death and injuries contributed the biggest share. This component includes the loss of output for the persons caring for the accident victims. The loss of property comes second followed by the intangible costs. From our findings, it may not be worthwhile to spend a lot of resources to try to get accurate estimation for administrative and other costs since their contribution to the total is small. It will suffice to estimate accurately the loss of output and property damage and then add a reasonable amount to reflect the intangible costs. Medical costs are very important although accurate estimation of this component to reflect the loss to other patients when doctors and nurses are forced to attend RTA victims are not yet ascertained.

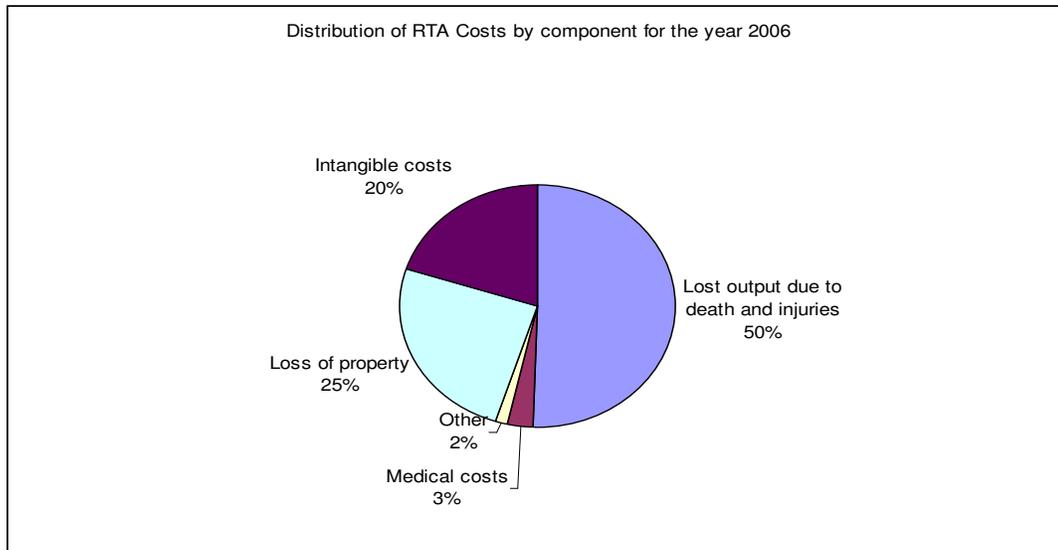


Figure 7.1 Distribution of RTA costs by component for the year 2006

For comparison we present in Table 7.2 RTA costs based on projections of the previous estimates.

Table 7.2: Updated Road Accident Costs Summary by Component in Million Tanzanian Shillings

Component	1994	2002	2003 ⁵	2004	2005	2006
Loss of Output	4924	13800	14,283	14,883	15,538	16,501,072
Medical Costs	858	10800	11,178	11,647	12,160	12,913,883
Property Damage	9313	84800	87,768	91,454	95,478	101,397,894
Administrative & Other	704	5,300	5,486	5,716	5,967	6,337,368
Total tangible Costs	17599	114700	118,715	123,701	129,143	137,150,218
Pain, Grief and Suffering	4740	57300	59,306	61,796	64,515	68,515,322
Total Road Accidents to society	38138	286700	299,735	309,197	322,802	342,815,756
In Million US \$	75	562			286	301

Source : Data for the year 2002 and 1994 are taken from the National Road Safety Master Plan 2004 (Ministry of Works, DSM) Exchange rate for 2005 and 2006 was Tshs 1129 per 1 US \$ and Tshs 1139 per 1 US \$ respectively

5.4.3 Summary, Recommendations and Policy Implications

We have used the human capital approach to assess the economic impact of RTA for the year 2006. The GDP was used as indicator of loss of productivity with adjustment to account for the fact that the educated and business people have higher exposure than the average person. We have also used values established by this study to estimate loss of income to the accident victim or his family and medical costs. The loss caused by RTA to the economy in 2006 was 508,019 million Tanzanian Shillings or 3.4 percent of the GDP.

The loss is significant and is higher percentage of the GDP compared to that estimated by previous studies. This was due to more accurate estimation of the loss to families and medical costs, increased productivity and higher number of casualties. The potential contribution of measures to reduce the economic loss due to RTA as a poverty reduction strategy needs to be considered seriously.

Since the costs of RTA constitute a major loss to the economy the government and all stakeholders should take the responsibility of implementing the National Transport Policy most seriously. The vision of the policy is the provision of transport system with maximum safety. Awareness of the problem has caused the MOID to draft the Draft National Road Safety Policy (2007) reviewed in Chapter two. In the heavy burden that RTA places on households and the economy, policy makers should give road safety initiatives the due priority starting with the approval of the draft policy.

⁵ Projections for 2003, 2004, 2005 and 2006 using inflation rates of 3.5, 4.2, 4.4 and 6.2 respectively

6. DEVELOPMENT OF ROAD TRAFFIC ACCIDENT INFORMATION SYSTEM AND DATABASE

6.1 Introduction

This chapter describes the development of RTA Information System (RTAIS) and Web-based RTA Database (RTAD). The aspect of the study was divided into 5 stages with specific deliverables up to project conclusion. The consultants used participatory method in the implementation of the project. Various stakeholders of the Accident Information System were fully involved in defining the project requirements, the kinds of reports to be produced by the program, and even the kind of information to be put into the system through a stakeholders' elicitation workshop. This enabled the main stakeholders of the Accident Information System to have the sense of ownership of the project.

Through the participatory approach, the selected representative stakeholders were the internal counterparts to this project. The representatives used their experience of in Accident Information System to lead the consulting team in fulfilling the client wishes. This approach enhanced ownership, understanding of the findings and recommendations of the consulting team on how the whole project should be.

6.2. Major Tasks Performed

In this part we describe the main tasks carried out to fulfil the Terms of Reference as outlined in our inception report. This part will explain major tasks performed in relationship to the 5 phases of the project.

Phase 1: Initialisation of the project and collection of the basic data

1. **Identification of the internal counterparts to the project.** Since the Accident Information System involves various clients, and SUMATRA is not the implementer of the RTAIS, it was first necessary to identify the "owner" of the system. Normally, the main user of a database should be responsible for data collection and maintenance, and would be the "owner" of the database – in this aspect it was agreed that the Tanzania Police Force and in particular the Traffic Police Department shall be the "owner" of this system. The traffic police will be responsible for accident information data collection, data entry, assigning the log-in permissions, system administration, and system maintenance and maintaining the necessary system hardware. The client is yet to nominate a staff who will work closely with the development team. It is expected that at the end of the project, the internal counterpart will be one of the main administrators of the system, since she/he participated fully in the

development process of the system. It is also expected that towards the end of the project, the project owner shall identify a system administrator, who shall be responsible for the installation of the applications in the main server and also in the clients' office. It is expected that, the latter staff will take over the management of the computerised Accident Information System after the consultants have handed over the project.

2. **Collection of basic data-capture forms for the Accident Information System.** The consultants were given permission to access to the Accident Information data structure used by Traffic Police. Currently the Traffic Police is using the following forms for capturing the accident information: PF 212, PF 212 C, and PF 212D. Form PF 212C is more detailed than form PF 212 and PF 212D. It was agreed that the consultants shall use form PF 212C for the development of the data entry screens. The form PF 212C was also used by the previous software that was used by the Traffic Police known as MAAP.
3. **Conduction of a brainstorming workshop for key Stakeholders of Accident Information System.** A one-day workshop was successfully conducted. The aim of the workshop was to disseminate the essential concepts, process and methods involved in computerised Accident Information System. The importance of the workshop was to identify basic data and data structure needed to be captured by the Accident Information System, and the kind of the reports the client will need from the system. The result of this workshop is attached as appendix 1: User Requirements.
4. **An in-depth study of the RTIS functional processes.** This part was fulfilled by the information obtained from the User Elicitation workshop

The outcome of the user elicitation workshop and discussions with the main stakeholders at SUMATRA, Traffic Police, MoLD and other stakeholders, enabled the identification of types of data required and the system specification as shown on appendix 1. Also the customised report structure was agreed during the workshop.

Phase 2: Determination of Software and Hardware Requirements

After clarification with the main stakeholder that this data base should be strictly web based, the consultant decided to use SQL Server for the back and, PHP and Apache Server for the front and middle tier respectively. To be able to install this program to the main web server, the client will be required to have at least SQL

Server 2000 or above, PHP and Apache Server into the client machine. SQL Server is licensed software so the clients will have to decide how many licenses will be needed for efficient running of the program. We propose for a countrywide access to have at least 25 licenses.

In addition to the software requirement the client will need to have a server whose least configuration is as shown in Appendix 2. The client who will need to access this software will need to have connectivity to the internet or direct to the server. The most common web browser such as Internet Explorer, Mozilla Firefox and others will be able to open this software. The minimum requirement for the client computer is also shown in Appendix 2.

Phase 3: Information System Design

The functional specification for the Accident Information System is as shown on Appendix 3.

Phase 4: Design and Implementation of Computerised Database for National Road Traffic Accident Database

The Design and Implementation of Computerised Database for the National Road Traffic Accident Database has been completed. The system has been implemented using SQL Server 2000, PHP and Apache Server.

Phase 5: Collection of Data, Sample Data Entry, Training of Staff and Report Writing

Training to the users will follow the commissioning. Sample data have been entered and tested.

6.3 Conclusions, Recommendations and Policy Implications

An efficient data collection system and a well maintained and accessible database are important prerequisites for the work to identify road safety problems, to categorise them and quantify them before measures are planned. Monitoring of implementation of measures is also depending on reliable data. However, since the decline use of MAAP package in Tanzania Mainland in 1999, the country is lacking a well maintained and accessible road traffic accident database. One of the main reason noted to have had contributed to the decline in the use and extension of MAAP package into other regions in Tanzania was the lack of ownership of the software and insufficient cooperation between implementing agencies.

In implementing the ongoing efforts by SUMATRA to develop National Road Traffic Accident Data Collection System and Corresponding Web based Database, the Consultant has already engaged different stakeholders of road safety in the first stage of the systems development process by obtaining user requirements. User requirements were identified for the following basic processes identified in the system:

- Recording accident information
- Analysis of accident data
- Report generation
- Database management and administration

As discussed above important issues of "Who should be responsible for data collection and maintenance of database"? "What access rights should each stakeholder have to the database?" were discussed and deliberated on by different stakeholders of road safety. On basis of the performed stakeholders workshop and workshop deliberations, the following are recommended for immediate action in order to ensure that the proposed database system will be used once its development is completed:

- SUMATRA to continue with the development and implementation of the database
- To try to convince the highest political level and the responsible Ministry to make the necessary organisational changes in Traffic Police structure so as to recognise and introduce positions of statisticians with clear career paths in Police Force
- The need to allocate fund for procuring and installing computer systems and internet points to all regional and district police headquarters
- Training of Traffic Police in application and maintenance of the proposed database system
- Require the use of PF 212 C by the police at the accident sites, which shall be compatible with the type of input data required by the database
- Introduce the use of GPS by the police in recording accident locations at accident sites

In a longer perspective, however, efforts should be made:

- To reach consensus on linking computerised databases about accidents, roads, traffic, driving licenses and vehicle registration information to each other. This will involve linking accident database to computerised databases of other Government agencies such TRA vehicle registration database, TANROADS road database, and driver's licence registration database.
- The Government to approve the National Road Safety Policy and the formation of Road Safety Board to coordinate road safety work and to encourage cooperation among stakeholders.

Appendices to Chapter 6

Appendix 1: User Requirements

Development of Road Traffic Accident Data Collection System and the Corresponding Web-Based Road Traffic Accident Database

Summary of Discussion on User Requirements (From the Workshop)

Basic System Processes

The basic processes identified in this system were as follows:

- RA1: Recording accident information
- RA2: Statistical analysis of accident data
- RA3: Report generation
- RA4: Database management and administration

Main Users of the System:

- Normally, the main user of a database should be responsible for data collection and maintenance, and would be the “owner” of the database – in this aspect it was agreed in principle that the Tanzania Police Force and in particular the traffic police shall be the “owner” of this system. The traffic police will be responsible for accident information data collection, data entry, assigning the log-in permissions, system administration, system maintenance and maintaining the necessary system hardware. However, logistic and capacity considerations suggest that during the system development (short term) and for the first five to ten years SUMATRA should consider hosting the system. This means the procurement of the hardware and the software as well as the maintenance shall be their responsibility.
- It is recommended to distinguish between the following categories of personnel: Operators, Administrators, and Senior Officers in Responsible Institutions. For this system the following user categories and their access level were identified:

1.2 Basic User Groups

User Group	Description	Access Right
USER1	Public	Read only access
USER2	Operator	Read and write access but no password change access
USER3	DB Admin	All types of access including password set-up and change
USER4	DG SUMATRA	Read and write access but no password change access
USER5	IGP and Senior Traffic Police (e.g. RTO)	Read and write access but no password change access
USER6	Other Stakeholders (TANROAD, TRA, etc.)	Read and write access but no password change access

- It was also agreed that in a longer perspective, it should be possible to link computerised databases about accidents, roads, traffic, driving licences and vehicles to each other (e.g. Link to TRA vehicle information database, TANROAD's road map database, link to Safety Unit in MOLD, etc.)

The participants were requested to do the following:

1. To identify the institution that they think will be the main user of this database
2. To write their 5 main roles in recording and analysing Road Traffic Accident
3. To write all kind of reports that they will need from this database to be used in their institutions
4. To explain the kind of information system they are currently using in recording and analysing Road Traffic Accidents (RTA)

For the Traffic Police the following were among the specific questions

1. Are you comfortable with the use of PF 212?
2. What about PF 212C is it fine for you?
 - Too many data required, become cumbersome for Traffic Police to fill
3. Whether PF 212 form is sufficient to record all the necessary accident information required by various stakeholders.
4. It is known that previously the Traffic Police has been using MAAP 5 and MAAP for windows, but then the use declined and later on stopped. Therefore the police were asked to explain the main problem of MAAP that forced them to stop using it
 - Licence fees
 - Obsolete computers

- Relationship between Ministry of Infrastructure Development and Transport
5. The police were also requested to describe main features they need to be incorporated into the new package to be developed.

The results of above discussion led to the identification of the following "User Requirement Specifications":

Basic User Requirements:

General Accident Information

1. Total number of Traffic Accident
2. Type of traffic accidents
 - i. Fatal accident
 - ii. Injured accident
 - iii. Minor accident
3. Cause of traffic accidents – dangerous driving, reckless, defective motor vehicles, intoxication, carelessness, pedestrian, excessive speed, careless motor cyclists, pedal cyclists,
4. Accident occurrence time (time in hours, day, month)
5. Nature of accident / environment
6. Weather condition during the accident
7. Visibility

Road Information

8. State of the road
9. Road classifications, at this stage point out which roads are highly affected by accidents (i.e. Show Road Accidents by Road Classification)
10. Road coverage distance – if possible specify the affected areas by showing minor or covering short distance causes higher accidents than longer distances.
11. Supply the location coordinates (It was recommended to use the GPS whenever recording the accident information)
12. Identification of hazardous locations
13. Provide digital road with other detailed information (i.e. layers) where accidents occur frequently
14. Risk Management / Road Signs
15. Sketch of the accident area

Vehicle Information

16. If possible record bus building material, vehicle ID and Names according to the company owning the vehicle, vehicle manufacturer type of tyre and their specification (allowable loading, allowable speed, etc.)
17. Reflectors systems, whether they are ok or not

18. Car registration and ownership
19. Car insurance validity including:
 - i. Date of insurance
 - ii. Date of accident
 - iii. Company insured the car / by company
 - iv. Cause of accidents
 - v. Insurance sticker number (validity)
 - vi. Qualification premium payments
 - vii. Identification of insured not insured cars
20. Type of car by ownership (government, private, military)
21. Number of motor vehicles involved in the accident
22. Type of motor vehicle
23. Registration number
24. Capacity (tons, pax)
25. Age of motor vehicle / year of manufacture
26. Purpose of motor vehicle (private, commercial)
27. Last date of mandatory inspection / service
28. Type of fuel used
29. Road service licence no. (if applicable)

Driver's Information

30. Driver's driving licence e.g. licence validity, License no. of driver
31. Driver's age
32. Use of mobile phone by driver
33. The extent of fatigue (driving hours)
34. Use of alcohol by driver
35. Use of drugs by driver

Passenger Information

36. Passengers of vehicles involved in RTA by severity, age and part of the body injured
37. Number of death by age group caused by accidents
38. People involved in the accident
39. Casualties (age, gender, degree of casualty)
40. Condition of victims (fatalities, and injuries)
41. Use of seat belts
42. Availability of passenger manifest

Pedestrian Information

43. Behaviour of the people living at a place where accident occur frequently (road crossing behaviour, concentration along the road side, high number of pedal traffic, etc)
44. Number of death by age group caused by accidents
45. People involved in the accident
46. Casualties (age, gender)

- 47. Condition of victims (fatalities, and injuries)
- 48. Gender
- 49. Use of seat belts

Reports

- 50. All reports are elaborated – Use of PF 212C will give detailed data
- 51. Reports to be produced quarterly
- 52. Number of accidents by region
- 53. Number of accidents by cause
- 54. Information on past accidents by driving license
- 55. Information on past accidents by owner
- 56. Information on past accidents Motor vehicle Registration
- 57. Number of accidents by location
- 58. Number of accidents by vehicle type
- 59. Number of accidents by capacity
- 60. Number of fatalities by road user groups
- 61. Occurrence of accidents by time of the day
- 62. Number of accidents by specified date
- 63. Number of accidents by days of the week

Appendix 2: Minimum Specifications for Servers and Desk tops

1. PROPOSED MINIMUM SPECIFICATION FOR SERVERS

- Processor Pentium IV 2.0 GHZ or higher, 400 MHZ front size Bus (FSB)
- Clock Speed 2GHZ or above
- Bus Architecture PCI
- RAM 1 GB (expandable to at least 4 GB)
- CACHE 512 KB
- HDD 120 GB Hot Plug gable Disks (Expandable to 360 GB)
- Tape Drive 20/40 GB
- CD-RW DVD-CD-WR Drive
- Video Card Integrated 1024*1024, 256 colours video, 16 MB Video Memory
- Ports 2-serial, 2USB, 1-25 Pin Parallel, 1 PS/2 keyboard port, 1 PS/2 Mouse port
- Slots 1 External SCIS port, 5 PCI, 4AGP slots
- Bays 5 Bays, 3 external, 2 internal
- Floppy Drive 3.5" 1.44 MB
- Sound System Integrated Intel On board sound blasters
- Ethernet Board Integrated Dual speed 10/100 Mbps NIC
- Fax Modem 56 Kbps Modem
- Keyboard and Mouse Keyboard and PS/2 included
- Case Convertible Mini Tower
- Monitor 17" color Monitor, same manufacturer as the CPU
- Power 220/240, 3 Pin Power Plug
- Preinstalled Windows 2000 Server, SQL Server 2000 (windows 2003 server (a.k.a .NET server) is already out)

2. PROPOSED MINIMUM SPECIFICATION FOR DESKTOPS

- Processor Pentium IV 1.8 GHZ, 400 MHZ front size Bus (FSB)
- Clock Speed 1.8 GHZ
- Bus Architecture PCI
- RAM 512 MB (expandable to at least 1 GB)
- CACHE 256 KB
- HDD 80 GB
- CD-RW DVD-CD-WR Drive
- Video Card Integrated 1024*1024, 256 colors video, 16 MB Video Memory
- Ports 1-serial, 2USB, 1-25 Pin Parallel, 1 PS/2 keyboard port, 1 PS/2 Mouse port
- Slots 4 Expansion slots (2 PCI, 2AGP)
- Bays 4 Bays, 2 external, 2 internal

- Floppy Drive 3.5" 1.44 MB
- Ethernet Board Integrated Dual speed 10/100 Mbps NIC
- Keyboard PS/2 Keyboard (Or Cordless PS/2 keyboard)
- Mouse PS/2 Mouse (Or Cordless PS/2 Mouse)
- Case Convertible Mini Tower
- Monitor 15" Colour Monitor, same manufacturer as the CPU
- Power 220/240, 3 Pin Power Plug
- Preinstalled Windows 2000 or XP, MS Office 2000 OR XP, MS Office 2003, MS Office 2007
- Web Browser Internet Explorer, Mozilla Firefox
- Adobe Acrobat Acrobat 7 or above

Appendix 3: Functional Specifications

1. Data Entry Screens

1.1. System Setup

- 1.1.1. The system shall provide an interface to maintain Traffic Police Administration System such as a stations, district, region and headquarters. Each part of the administration system shall be defined by a code and a name.
- 1.1.2. The system shall provide a user interface to maintain Traffic Police Staff, who are responsible for the Accident Information System. The staff particulars must be limited to Accident Information functionality i.e. staff identifier, full name and rank
- 1.1.3. The system should provide an end user with means of defining frequent correspondents e.g. ministries, public agencies, and companies. Correspondent particulars consist only of Correspondent Identifier and name

1.2. Administration Services

- 1.2.1. The system shall provide the application administrator with an interface to specify the server name and database full path
- 1.2.2. The system shall provide the application administrator to define application user and access rights to application services

1.3. Accident Information Services

- 1.3.1. The system shall provide an end-user with an interface to create and maintain Accident Data: Vehicle involved, vehicle damaged, drivers killed, drivers injured, passengers killed, passengers injured, pedestrian killed, pedestrian injured, date of the accident including day of the week and time, accident severity, speed limit in km/h, weather visibility, light conditions, road description, traffic movement, road separation, road surface type, road surface quality, surface condition, road width, shoulder width, shoulder, location type, junction control, collision type, accident attended, hit and run, road works, vehicle information (vehicle 1 and 2:Owner's name, owner's address, third party insurance, policy number, registration number, place issued, expiry date, vehicle inspection, make/model, region of registration, vehicle type, ownership usage, vehicle manoeuvre, vehicle damage, nose to tail, loading, lighting defects, other defects); Drivers information (both driver 1 and 2: driver's name and address, sex, age, seat belt/helmet use, nation,

driver injury, licence no., licence class, licence registration, licence expiry date, place of issue, driver's experience, drinking and driving, driver error); Passenger casualties (name and address of passengers, seat belt / helmet use, vehicle no., sex, age, severity of injury, injury type, position, liquor, action); Pedestrian casualties (name and address of passengers, seat belt / helmet use, vehicle no., sex, age, severity of injury, injury type, position, liquor, action, school); witnesses, police description of the accident, investigator's name, reviewing officer's name.

2. Customized Reports

- 2.1. The system shall provide the end user with capability to pre view and / or print the report on accidents by region
- 2.2. The system shall provide the end user with capability to pre view and / or print the report on accidents by cause
- 2.3. The system shall provide the end user with capability to pre view and / or print report on past accidents by driving license
- 2.4. The system shall provide the end user with capability to pre view and / or print the report on past accidents by owner
- 2.5. The system shall provide the end user with capability to pre view and / or print the report on past accidents Motor vehicle Registration
- 2.6. The system shall provide the end user with capability to pre view and / or print the report on number of accidents by location
- 2.7. The system shall provide the end user with capability to pre view and / or print the report on number of accidents by vehicle type
- 2.8. The system shall provide the end user with capability to pre view and / or print the report on number of accidents by capacity
- 2.9. The system shall provide the end user with capability to pre view and / or print the report on number of fatalities by road user groups
- 2.10. The system shall provide the end user with capability to pre view and / or print the report on occurrence of accidents by time of the day
- 2.11. The system shall provide the end user with capability to pre view and / or print the report on number of accidents by specified date
- 2.12. The system shall provide the end user with capability to pre view and / or print the report on number of accidents by days of the week.

7. THE WAY FORWARD

7.1 General

The social-economic consequences of RTA and the negative impacts on the health sector were highlighted in Chapter 5. The loss of life and property documented can no longer be ignored and policy makers and every public body with responsibility for road safety must do what is within their mandate to manage the problem. It is expected that the government will approve the Draft National Road Safety Policy which will provide for strong coordination of road safety stakeholders through the proposed Road Safety Board. Meanwhile stakeholders should continue to cooperate in implementation of measures aimed at RTA prevention and minimization of loss of life and property. Examples of areas that require cooperation among stakeholders include:

- i. The development and implementation of RTA database;
- ii. The linking of RTA database with vehicle database, driver (licence) database, roads and traffic database;
- iii. The amendment of outdated legislation – specific recommendations are listed in Chapter Three;
- iv. The establishment of one-stop-centre (agency) to handle motor vehicle and driver issues (Vehicle inspection, Driver Examination and licensing,);
- v. National road safety campaigns; and
- vi. The setting of national road safety targets and coordinating the actions and resources required for their achievement.

The establishment of strong coordination through proposed Road Safety Board shall facilitate the implementation of road safety actions listed above and the coordination of all actions necessary to achieve national targets.

However, most of the proposed measures described in Chapter Four fall under the mandate of one or more public actors and can be implemented by the respective actor. Each actor should prepare plan of action consistent with the available resources. Each public and non-public actor should aim at raising political attention to the RTA problem and the contributing factors with the objective of raising the priority to the problem and thus securing approval of requested resource allocation.

7.2 Recommendations and Policy Implications

Our review of the operating and institutional environment of road transport suggested that the two policies governing the sector namely the National Transport Policy (2003) and the Rural Development Policy (2003) are very comprehensive and reflective of the recent government structural reforms. The Draft National Road Safety Policy (2007) will provide for the needed coordination in road safety activities and setting of national targets. The three policies are still new and the challenge now is in developing strategies for their implementation or to amend the legislation to make their implementation mandatory by the public bodies.

Improvement of institutional set-up to improve efficiency and focus is necessary. We recommend the establishment of transport units in big urban centres (cities and municipalities) to professionally oversee transport planning, traffic management and the provision of public transport. For the very big cities establishment of an agency similar to the proposed DART may be appropriate. This will free the Traffic Police to focus on enforcement, especially that of road safety legislation. The function of vehicle inspection and driver examination should be shifted from the police to the proposed DEVILA to allow the police to fully focus on enforcement. These recommendations are in line with the policy directions in the National Transport Policy and the current government policy on good governance.

Our review of the legal framework revealed that the country has a comprehensive legislation that covers every aspect of road transport. However, some of the principal legislation is fairly old given current developments it is desirable to re-write or amend it to match current economic situation and technology. In particular it is necessary to increase the fines in the Road Traffic Act 1973 (as amended) to match the fines proposed in the Transport Licensing Act 1973 Regulations being proposed by SUMATRA. That is, minimum fine of 100,000/= for offence prosecuted in a court of law and 50,000/= for offence settled out of court (e.g. by notification). In Chapter Three we have listed specific sections of the law that need amendment.

The analysis of the RTA situation led us to recommend a number of measures required to reduce the occurrence and severity of accidents in the following areas:

- 1) Enforcement of existing road safety legislation and public education/ campaigns focusing on pedestrian and NMT safe use of roads are essential. Closely related is improvement of driver training and licensing particularly for PSV and freight vehicles. This will take care of human factors contributing to RTA;

- 2) The roadworthiness of the vehicle fleet plying our roads needs to be improved. This requires adoption of modern vehicle inspection technology and system. Particular focus should be placed on PSV and freight vehicles;
- 3) Road Safety Engineering aspects of road design need to be emphasized. Provision for pedestrians and cyclist in urban centres and on trunk roads passing through settlements and treatment of black spots should be given priority;
- 4) The ban of night services by PSV should be re-considered in the light of regional practice and driving hours regulation. Consideration of our regional grouping membership (EAC and SADC) suggests that we should permit international PSV to offer services at night provided they demonstrate compliance with the driving hours regulation.
- 5) Improvement of rescue and emergence medical services so that majority of RTA victims can be treated within the "golden hour."
- 6) Improvement in RTA official statistics is absolutely necessary for future monitoring of road safety situation and for decision making. The development of RTA database which was a part of this contract is a major breakthrough if the system is implemented nation wide.

7.3 Action Plan for SUMATRA

It will be necessary for each public actor to consider the proposed measures and other recommendations and come out with a priority action plan for the coming three to five years. We have compiled some of the actions recommended for SUMATRA below with indicative timing. Some of the actions are to be done continuously at varying intensity depending on the actual need and budget.

Table 7.1 SUMATRA Action Plan

Activity / Year	2008				2009				2010				2011				2012			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
A Improving the Operational, Legal and Institutional Environment																				
1 Introduce effective PSV inspection before issuance of licence.																				
2 Lobby for restoration of freight vehicle licensing.																				
3 Encourage formation of companies or cooperatives of PT providers by information dissemination.																				
4 Increase resources allocated to monitoring and enforcement of regulation and open offices where demand is high.																				
5 Establish "hotlines" for reporting offenders and follow-up procedures.																				
6 Information dissemination - current/new regulations and way of reporting offenders.																				
7 Strengthen cooperation with the Police Force by formulating joint enforcement strategies.																				
8 Revise Draft Transport (Road Passenger Vehicle) Licensing Regulations 2007 as recommended in the report.																				
9 Collaborate with MOPSS for the amendment of the Traffic Act 1973 and The Motor Vehicle Driving School (Licensing) Act 1965																				

Table 7.1 SUMATRA Action Plan (Continued)

Activity /Year	2008				2009				2010				2011				2012			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
B Prevention and Minimization of Consequences of RTA																				
1 Disseminate study recommendations with public bodies and encourage their implementation																				
2 Lobby for the approval of the Draft National Road Safety Policy																				
3 Encourage better driver training system and driver licensing and monitoring by cooperating with MOPSS																				
4 Encourage/ lobby for the improvement of rescue of service and emergence services for RTA victims.																				
5 Strengthen enforcement of roadworthiness and driver regulations for PSV																				
C Development of Road Traffic Accident Information System and the Corresponding Database																				
1 SUMATRA to continue the development and implementation of the Traffic Accident Database																				
2 Encourage and Support training of the initial batch of Traffic Police in the use of the Computerized Database																				
3 Hand over the responsibility of the RTA Database to Traffic Police																				
4 Continue collaborating with Traffic Police in order to make sure the RTA required by SUMATRA is available and accessible within reasonable time.																				

7.4 Follow-up and Evaluation

The effectiveness of actions to improve road safety need to be monitored and evaluated to ensure that intended results are being achieved and to modify plans if necessary. A prerequisite to monitoring and evaluation is availability of reliable and readily accessible RTA database. Priority should therefore be given to the implementation of the computerized RTIS and Database. Individual public actors should plan and implement follow-up actions as part of their plans. The knowledge gained about the effectiveness of the actions should be used in future road safety projects and programmes.

Surface and Marine Transport Regulatory Authority (SUMATRA)

TERMS OF REFERENCE (ToR)

1.0. Background

- 1.1. The government and the public at large is very much concerned with an increasing number of road accidents. These accidents drain scarce resources by claiming human lives, causing injuries and sometimes permanent disabilities. They also cause family and social problems. The amount of property loss and compensation in terms of insurance due to accidents is also enormous. In general accidents aggravate poverty in the society. In 1994, it was estimated that accidents costs amounted to Tshs. 230 billion.
- 1.2. Several measures have been taken by the government and other agencies to reverse the increasing trend of road accidents. For instance, in 1996 the government introduced speed limiters to all public passenger buses. It also banned night service by public passenger buses in 1994. Furthermore, on an annual basis, the government through National Road Safety Council has been promoting road safety by conducting national road safety week. In spite of these measures, records still show that from 1998 to 2005, the number of reported accidents increased by 34%. It is evident that a clear assessment of the road accidents problem is needed.

2.0. Objective of the Consultancy

- 2.1. To have short, medium and long term measures which will minimize occurrence of road accidents.
- 2.2. To have effective and efficient rescue measures.
- 2.3. To have effective road traffic laws, rules, regulations and their enforcement.
- 2.4. To have effective and efficient road accident data collection system and a corresponding database which will be available to all agencies participating in road safety activities.

3.0. Scope and Nature of Work

- 3.1. The main responsibility of a Consultant will be to conduct a study on **Road Accidents in Mainland Tanzania**

Consultants' responsibilities will include the following:

- 3.1.1. Critically examine the operational environment of road transport sector.
- 3.1.2. Examine and review the existing institutional and legal framework under which the current road transportation is being carried out.
- 3.1.3. Examine the causes, impact, extent and the pattern of road accidents.
- 3.1.4. Examine the existing rescue measures which are taken after occurrence of an accident.
- 3.1.5. Propose a national road accident data collection system and its corresponding database which will be easily accessed by different agencies participating in road safety activities.
- 3.1.6. Assess the impact and effectiveness of the ban of night service by commercial passenger buses to road transport users and service providers in terms of accidents prevention and other criminal acts such as banditry.
- 3.1.7. Recommended measures to reduce severity and number of road accidents.
- 3.1.8. Clearly show policy implications of the findings and recommendations.
- 3.1.9. Make a presentation of study findings and proposed solutions to the Management of SUMATRA.

In executing these tasks, the Consultant will have to work closely with SUMATRA but based in his premises. The Consultant shall involve a focal person from SUMATRA in the course of the study. It will be the responsibility of a Consultant to design and execute the assignment in a timely manner.

4.0. **Duration of the Consultancy**

The duration of the consultancy shall be 45 days, starting from the date of signing the contract.

5.0. **Organization of the Consulting Firm**

The consulting firm should present a team that will be able to undertake the study so that the intended objectives are met. The team should be formed with experts who can demonstrate competence and experience in:

- (a) Road transport management.
- (b) Road safety projects.
- (c) Law.
- (d) Designing effective and efficient data collection systems.
- (e) Designing effective and efficient databases.
- (f) Similar studies.

6.0. **Reporting**

The study will be coordinated by the Director of Road Transport Regulation with whom they shall be reporting to during the period of the consultancy contract.

Reports to be submitted will include the following:

6.1. Inception Report

Ten copies to be submitted within seven days of the commencement of the consultancy services. The report shall comprise of the tasks to be performed, a detailed work plan, including the implementation methodology and key milestones for the remaining contract period with indicative dates of achievement. Comments from SUMATRA will be available within 7 days after submission.

6.2. Progress Report

The Consultant shall submit interim reports for review and discussion by SUMATRA as may be directed during the consultation period.

6.3. Draft Final Report

The Consultant shall prepare and submit ten copies of draft final report to SUMATRA not less than 10 days before the completion of the consultancy service. A Consultant will also make an oral presentation of the draft final report to the management. Comments from SUMATRA will be available within 7 days after submission.

6.4. Final Report

The Consultant shall prepare and submit fifteen copies of Final Report to the SUMATRA at the end of the consultancy services. The report shall incorporate comments received on the draft report. The Consultant will also be required to submit an electronic copy of the report and a cleaned study dataset.

7.0. Duties and Responsibilities of SUMATRA

The Authority shall ensure that the Consultant implements the planned activities as agreed upon between the parties and ensure prompt payments in accordance to the signed contract.

8.0. Location of Work

During the consultancy period the Consultant shall preferably be based in Dar es Salaam.