

OCTOBER 2016  
SUMATRA

# IMPROVEMENT OF ROAD SAFETY IN TANZANIA MAINLAND

FINAL REPORT



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## List of Abbreviations

Abbreviation	Explanation
ABS	Anti-skid braking system
ADB	Asian Development Bank
AFCAP	Africa Community Access Programme
AfDB	African Development Bank
BICO	The Bureau for Industrial Cooperation
BoS	Bureau of Statistics
BoT	Bank of Tanzania
Danida	Danish International Development Assistance
DRSC	District Road Safety Committees
EAC	East African Community
EMAT	Emergency Medical Association of Tanzania
EMS	Emergency Medical Services
ESA	Eastern and Southern Africa
EU	European Union
EuroNCAP	European New Car Assessment Programme
FIA	Federation Internationale de l'Automobile
GDP	Gross domestic product
GIS	Geographic Information System
GNI	Gross national income
GRSP	Global Road Safety Partnership
HGV	Heavy Goods Vehicles
HQ	Headquarters
iRAP	International Road Assessment Programme
IRAT	Improving Rural Access in Tanzania
Km/h	Kilometre per hour
MoFP	Ministry of Finance and Planning
MoHA	Ministry of Home Affairs
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MoWTC	Ministry of Works, Transport and Communication
NGO	Non-Government Organisation
NIT	National Institute of Transport
NMT	Non-Motorised Transport
NRSC	National Road Safety Council
NRSP	National Road Safety Policy

Abbreviation	Explanation
OECD	The Organisation for Economic Co-operation and Development
PO-RALG	President's Office – Regional Administration and Local Government
PSV	Passenger Service Vehicles
R&D	Research and Development
RAIS	Road Accident Information System
RRSC	Regional Road Safety Committees
RSA	Road Safety Audit
RSI	Road Safety Inspection
RSU	Road Safety Unit
RTA	Road Traffic Act
RTO	Regional Traffic Officer – Tanzania Police Force
SADC	Southern African Development Community
SARSAI	School Area Road Safety Assessment and Improvement
SNRA	Swedish National Road Administration
SUMATRA	Surface and Maritime Regulatory Authority
SweRoad	Swedish Road Administration
TABOA	Tanzania Bus Operators Association
TanRoads	Tanzania National Roads Authority
TanZam Highway	Tanzania Zambia Highway
TARA	Tanzania Road Association
TATOA	Tanzania Truck Owners Association
TBS	Tanzania Bureau of Standards
TransAid	An international development charity
TSh	Tanzania Shilling
UK	United Kingdom
UN	United Nations
UNECE	United Nations Economic Commission for Europe
USA	United States of America
USD	United States Dollar
Veh-km	Vehicle-kilometre
VETA	Vocational Educational and Training Authority
VTI	Swedish National Road and Transport Institute
WHO	World Health Organisation

## Executive summary

The findings on the review of the existing situation regarding road safety in Tanzania includes identification of gaps compared to international best practice on road safety. The findings were used to suggest interventions at short, medium and long term.

No precise definition of "best international practice" exists. However, best performing countries such as Netherlands and Sweden have presented the "safe system approach" and the World Bank's Global Road Safety Facility has presented a "road safety management capacity methodology". Both approaches provide useful background for defining essential topics in the effort to reach best international practice.

### Road safety risk and trends

In Tanzania, there has been an increase in fatalities until 2013 and then a surprising reduction in 2014 and 2015, especially in some regions. Statistics show that Tanzania is at level with neighbouring countries but significantly above EU countries. Especially motorcycle accidents have increased while pedestrians still account for a large share.

More than 50% of fatalities are registered on trunk roads. The causes are very often related to speeding, either over speeding or high speed compared to the condition, and overtaking. Fatality accidents involve pedestrians in 34% of cases, single vehicle accidents in 26% and head on collisions in 20% based on Road Accident Information System (RAIS) data for ten regions.

### Road safety management

The road safety assessment and gap analysis of road safety management included assessment of institutional framework and organisation of road safety, road safety strategy and policy, accident data and data collection, funding legislation and regulation of commercial transport, monitoring and evaluation and research. The main gaps identified in these areas include:

- > National Road Safety Council (NRSC) have never been provided with any government funding



- > Limited coordination between stakeholders to deliver road safety interventions
- > Stakeholders not held responsible for performance
- > No single legislation covering road safety but separate legislative actions
- > There is no dedicated funding for road safety and in general inadequate financial resources allocated to support an effective road safety programme
- > The National Road Safety Policy suggesting road safety activities is not implemented. The policy has a vision and targets but does not specify casualty, intermediate or process performance indicators
- > Still outstanding issues in new crash data system and need for quality audit
- > Lack of regulation on driving and resting hours for commercial transport
- > There seems to be a limited system or mechanism in place for regular surveys of key parameters for monitoring changes in road user behaviour or safety performance
- > Road safety research in Tanzania is very limited.

The suggested interventions to strengthen road safety management in Tanzania include:

- > Strengthening the institutional framework and organisation of road safety including the role and capability of the NRSC
- > Improve road safety strategy and policy
- > Improve accident data and data collection, and access to data
- > Improve regulation of road freight and passenger transport
- > Improve funding
- > Improve monitoring and evaluation
- > Improve research in road safety.

### Safer roads

The main gaps identified on safer roads include:

- > No technical guidance and capacity building for urban authority engineers
- > Road safety audits are rarely done or done late
- > Formal road safety inspections are not being done
- > No systematic black-spot efforts are taking place.

Interventions to obtain safer roads include to improve road safety audit (RSA) practices and to improve identifying and treating crash sites on existing roads. It is also suggested to improve designs standards and practices and road safety inspection practice.

### Safer road users

The main gaps identified regarding safer road users on traffic and law enforcement, driver training and testing, road safety awareness and education include:

- > Gaps in the present traffic law on speed limits in rural areas, seatbelts for passengers, helmet use by passengers and use of mobile phones

- > Police are underequipped and underfunded, so law enforcement is not as effective as it could be
- > Driver training and testing not up to best practice standards
- > There is a lack of curriculum and focus on road safety education at schools
- > There have been no national campaigns in recent years
- > No system for compensating hit and run victims, and no official guidelines for determining personal injury compensation, and no immediate compensation of crash victims.

Interventions to make road users safer include both more intensified enforcement and interventions to influence behaviour. This includes intensified police and SUMATRA enforcement of traffic rules and regulations, improvements to the traffic law, and more enforcement on safety relevant infringements such as speed, alcohol and seatbelts. Interventions include to improve road safety campaigning, improve education in schools and to improve community road safety education. Interventions to improve control of driver training and testing is provided and to improve the insurance system. The EAC curriculum should be adapted and implemented.

#### Safer road vehicles

The assessment on safer vehicles identified gaps in regulation on annual roadworthiness test and on vehicle standards. There no regulation or no clear regulation on vehicle legislation. Generally, at best, a brief visual inspection is carried out.

Interventions to get safer vehicles through better vehicle construction and roadworthiness regulations are suggested as well as devolvement of a standard system for new vehicles in Tanzania.

#### Post-crash response

The assessment on handling of crash victims identified that EMS facilities in Tanzania is unable to provide the most basic post trauma care.

Interventions to further enhance handling of crash victims are suggested including to implement the pilot project on Emergency Medical Services (EMS) services and until it grows nationwide to e.g. enhance training programme for police to higher standard first aid and develop advanced first aid training to HGV and PSV drivers and make it mandatory before issuing of operation licence. Additionally fire stations could be placed together with EMS services, a system for breakdown services identified and implemented.

#### Priority interventions

The interventions suggested for highest priority based on expected impact on road safety and needs are identified to be within the areas of strengthening road safety management, providing safer roads, improving enforcement and improve handling of crash victims. Especially intensifying enforcement of traffic rules and regulations by Police and Sumatra should be given high priority.

# 1 Introduction and background

This draft final report is presenting the consultant's findings and recommendations on Improvement of Road Safety in Tanzania Mainland.

The present draft final report has been prepared by COWI A/S (hereinafter called COWI) in response to the Terms of Reference included to the contract no SUMATRA/CS/05/2014/2015 between Surface and Marine Transport Regulation Authority (hereinafter-called SUMATRA) and COWI. The project commenced contractually June 01, 2016.

## 1.1 Road safety in Tanzania

The dominant mode of transport in Tanzania is road transport. However, it is characterised by a low level of safety compared to the better performing countries.

With up to 4,000 people killed in road accidents annually as registered by the Traffic Police, road safety is a serious problem in Tanzania. In terms of cost for the Tanzanian society over 2,400-2,500 billion TSh (1.2-1.5 million USD) maybe being lost every year – see Appendix C.

On top of this is the pain, grief and suffering of both the victims and their relatives and social network. In many cases, the family will be driven into poverty due to lack of breadwinner.

Experience of poor communities in coping with medical catastrophes is very different from normally experienced by more economically developed communities. The special problems faced by poor families can include the following<sup>1</sup>:

- Inappropriate or absence of treatment leading to complications and longer treatment time

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<sup>1</sup> Social Cost of Road Traffic Crashes in India, Dinesh Mohan, Henry Ford Professor for Biomechanics and Transportation Safety, Transportation Research and Injury Prevention Programme, Indian Institute of Technology, New Delhi

- > Reallocation of labour of family members and reduced productivity of whole family – e.g. children may not be able to go to school, and older family members may spend less time in the care of children and infants
- > Permanent loss of job for the victim even if he/she survives - since a large number of poor households depend on daily wages and temporary jobs, and often do not have health insurance, or the assistance of social welfare schemes, a serious injury can result in permanent reduction of income
- > Loss of land, personal savings, household goods – e.g. the family may end up selling most of their assets and land and getting trapped into long-term indebtedness
- > Poor health and educational attainment of surviving members - the household has to cope with the time and financial demands of the situation and this can have a permanent effect on the health of children and infants in the family with consequences of loss of income, less attention, worsening hygiene at home, etc.
- > Dissolution or reconstitution of household.

The above issues are normally not factored in the standard iRAP economic estimates of the costs of road accidents in poor societies. There is very little work done to understand these issues and the calculation of losses in purely monetary terms may underestimate the actual cost of road accidents<sup>1</sup>. For poor communities, methods do not even capture the economic losses in all their complexity. The effect of injury and death on the family structure, crushing of hopes and aspirations of future generations, and the psychology of the community are just not considered.

Road crashes are also a big burden for the emergency medical services diverting resources away from other urgent and important health concerns in Tanzania. In the main hospital dealing with road traffic crash victims (the Muhimbili Orthopaedic Institute) over 50% of all admissions and more than 75% of all operations are due to road traffic crashes<sup>2</sup>. Road crashes are therefore a huge drain upon the resources of the emergency medical services diverting resources away from other urgent and important health concerns in Tanzania.

In the perspective of a relative low number of registered vehicles (512,000 cars and 4-wheeled light vehicles, 86,000 trucks and 49,000 busses in 2014<sup>3</sup>), the death rate in traffic accidents is high in Tanzania. In addition, there are 809,000 motorised 2- and 3-wheelers and 55,000 other vehicles.

Despite initiatives by different stakeholders to improve road safety in Tanzania the trend in fatalities and injuries has been increasing up to 2013. There has since the SUMATRA initiated road safety study in 2007 been significant changes in the operational environment e.g. with the introduction of motorcycles in public transport in 2009 which have changed the road safety picture in Tanzania.

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<sup>2</sup> The North South Corridor Road Safety Review - Road Safety Capacity Management Review, April 2013

<sup>3</sup> Road Safety in the African Region 2015, WHO

Therefor SUMATRA has asked for an assessment of the present road safety situation in Tanzania including assessing the operating environment and causes of road crashes as well as effectiveness of initiatives taken by different stakeholders.

## 1.2 Objectives

To help improving the road safety situation in Tanzania the study has undertaken to:

- > Critically review the state of the road safety in mainland Tanzania
- > Recommend specific and achievable short, medium and long-term interventions towards enhancing road safety in Tanzania.

The conclusions and recommendations presented in the report are those of the consultant, and all analyses are solely the responsibility of the consultant. The conclusions and opinions presented do not necessarily coincide with those of the stakeholders, i.e. the Government of Tanzania and SUMATRA.

## 1.3 Project Team

The project team consisted of:

- > Jesper Mertner, Team Leader
- > Michael Fell, Transport/Law Expert
- > Peter Mallow, Economist/Statistics Expert
- > Elhanan Lema, Road Safety Engineer
- > Allan Jones, Road Safety Engineering and Sparring.

Several missions were undertaken by the international based experts during June, August and September while Elhanan and Allan Jones are based in Tanzania.

## 1.4 Co-operation

In the course of the study, the consultant received good assistance and support from SUMATRA and the key authorities.

## 1.5 Structure of report

The report is structured according to the five pillars recommended by the UN<sup>4</sup>:

- > Road safety management
- > Safer roads and mobility
- > Safer vehicles
- > Safer road users

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<sup>4</sup> UN Global Plan for the Decade of Action for Road Safety, 2011-2020

- > Post-crash response.

Thus, the report has the following structure:

- > Chapter 2 presents the methodology of the study
- > Chapter 3 presents the road safety risks and trends in Tanzania
- > Chapter 4 presents the assessment of road safety management in Tanzania
- > Chapter 5 presents the assessment on safer roads
- > Chapter 6 presents the assessment on safer road users
- > Chapter 7 presents assessments on safer vehicles
- > Chapter 8 presents better handling of crash victims
- > Chapter 9 presents a suggestion for a monitoring and evaluation system
- > Chapter 10 summarises the interventions
- > Chapter 11 presents suggestions for priority interventions.

In Appendix A, the people met during the visits are presented, while Appendix B presents documents used during the study. Appendix C presents an estimation of economic costs of accidents and Appendix D present the result of the surveys on seatbelt and helmet wearing rates.

## 2 Methodology

This section presents the methodology and activities carried out during the study.

### 2.1 Approach and activities

The analysis in the study has used the following approach:

- > **Desk studies:** Review of existing relevant road safety data, previous and ongoing road safety studies and laws and regulations
- > **Consultations:** Meetings and interviews with relevant stakeholders
- > **Field visits.**

Thus, the study has collected and analysed quantitative data to suggest causes and development of accidents supplemented with qualitative information from stakeholders and site visit and surveys to help explain the causes for accidents in Tanzania.

The study includes an assessment of the status in Tanzania today with regard to road safety compared to a description of how things 'should be' according to international best practice. The differences between these two situations are used to define "what is missing", i.e. 'the gap'.

In our approach, we have also used our vast experience from working with road safety in one of the best performing regions with regard to road safety including some of the best performing countries such as UK, Denmark and Sweden.

#### 2.1.1 "Should be" situation

To describe the "should be" situation principles from the "safe system approach" and the "road safety management capacity methodology" are used. They are both described below.

### Safe system approach

The overall understanding in the assessment is based on the sustainable safe system approach already used in many EU member states, in Australia and New Zealand with great success.

The key to a sustainable safe traffic system is the consistent and systematic application of safety principles. The starting point must be the road user – in particular his/hers limitations and capabilities.

This is called the 'safe system' approach and it is illustrated in Figure 2-1. The OECD report *Towards Zero: Ambitious Road Safety Targets and the Safe System Approach*<sup>5</sup> describes the 'safe system' approach as the only way to achieve the vision of zero road fatalities and serious injuries and requires that the road system is designed to expect and accommodate human error.

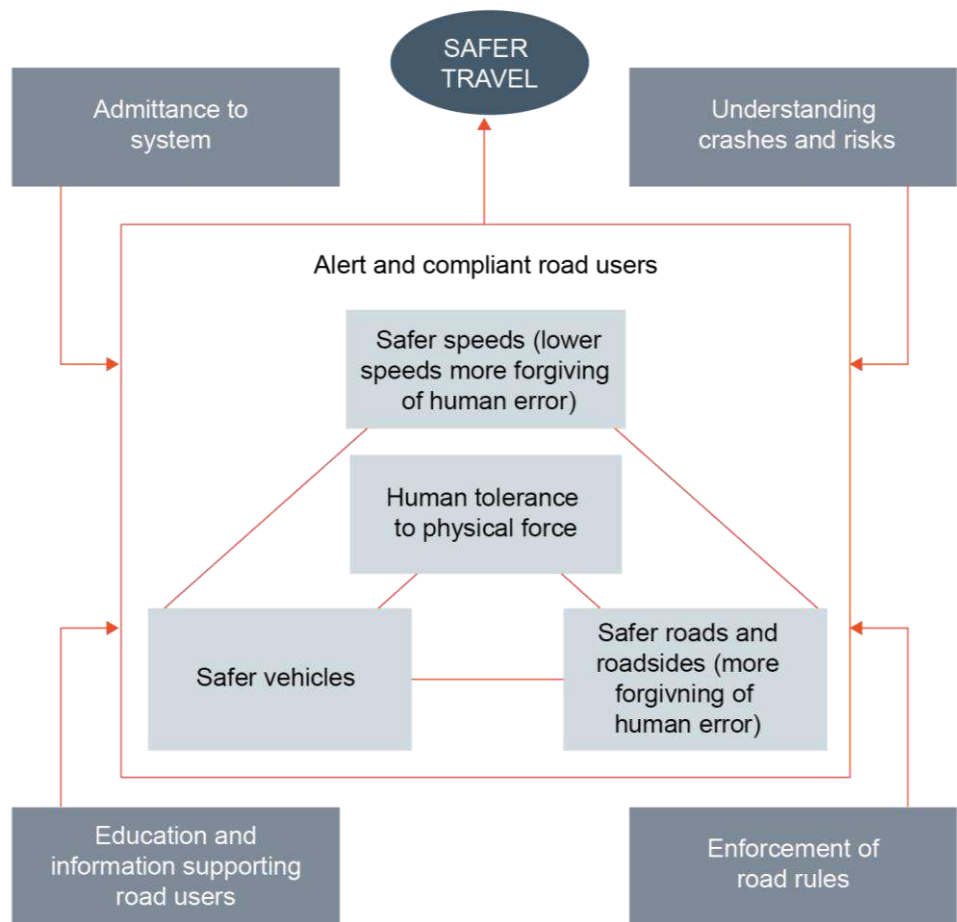


Figure 2-1 The safe system approach<sup>5</sup>.

A Safe System approach has the following characteristics<sup>5</sup>:

<sup>5</sup> Towards Zero: Ambitious Road Safety Targets And The Safe System Approach - OECD/ITF, 2008



- > It recognises that prevention efforts notwithstanding, road users will remain fallible and crashes will occur
- > It stresses that those involved in the design of the road transport system need to accept and share responsibility for the safety of the system, and those that use the system need to accept responsibility for complying with the rules and constraints of the system
- > It aligns safety management decisions with broader transport and planning decisions that meet wider economic, human and environmental goals
- > It shapes interventions to meet the long-term goal, rather than relying on "traditional" interventions to set the limits of any long-term targets.



Figure 2-2 The safe road system approach: Safe road user, safe roads and roadsides, safe speeds and safe vehicles<sup>6</sup>.

### Road safety management capacity

In the specific assessment of the gaps compared to a "Should be" situation, parts of the methodology and checklist developed by the Global Road Safety Facility<sup>7</sup> to assess the road safety management capacity of a country has been used. The approach assesses a country at different levels:

- > Results:
  - > Social costs available
  - > Fatal and injury data available
  - > Risk identified
  - > Vision identified
  - > National and regional targets exist on performance
  - > Etc.

<sup>6</sup> [http://www.kiwirap.org.nz/safe\\_road\\_system.html](http://www.kiwirap.org.nz/safe_road_system.html) and

<http://www.roadwise.asn.au/safe-system-approach-to-road-safety.aspx>

<sup>7</sup> Implementing the Recommendations of the World Report on Road Traffic Injury Prevention - Country Guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects, Tony Bliss and Jeanne Breen, Global Road Safety Facility, June 2009

- > Interventions:
  - > Planning, design and use of road network (including road safety audits)
  - > Entry and exit of vehicles and drivers
  - > Recovery and rehabilitation of crash victims
- > Institutional management functions
  - > Coordination
  - > Legislation
  - > Funding and resource allocation
  - > Promotion
  - > Monitoring and evaluation
  - > Research, development, and knowledge transfer.

## 2.2 Accident data

The trend in road crashes since 2007 has been reviewed through available data collected including both the more generic accident data from the traffic police supplemented with the more detailed accident data collected through the RAIS pilot project covering 8 regions.

The accident data suggests the level of the problem, the causes and the trends in road crashes. It suggests who is involved by e.g. road user type (pedestrian, cyclist, car, etc.), gender, age groups etc. and causes identified by the police.

For areas covered by RAIS, some more details explaining causes has been obtained.

This provides input to the qualitative assessment of the road safety situation in Tanzania.

## 2.3 Review previous studies, reports and recommendations

We have reviewed available studies and reports and their recommendations which have previously been carried out.

The documents were reviewed with the purpose to assess the findings on the road safety situation in Tanzania and the type of recommendations that have been suggested previously with the purpose to provide input to the activity assessment of effectiveness and appropriateness of safety measures implemented.

## 2.4 Stakeholder consultations and site visit

The stakeholder consultations has helped in a qualitative way to assess and explain why the problem on road safety is as it is and help to support or dismiss the causes identified through the assessment of the accident data. This e.g. includes:

- > Is driver training and testing in accordance with best practice and can it help to explain the causes for accidents
- > Is vehicle testing in accordance with best practice and can it help to explain the causes for accidents
- > Is accident data collected sufficient and up to best practice to describe the causes
- > Are injured treated according to best practice by emergency services or does it cause more fatalities than necessary
- > Is commercial transport handled, licenced and operated according to best practice or could there be a supporting cause for accidents
- > Etc.

The combination of quantitative data and qualitative information helps to assess the causes of road accidents in Tanzania. Furthermore, site visits and surveys have helped to complete the picture.

### Review operating environment and legal framework

We have done a critical review of the operating environment of the transport sector and the legal framework. Apart from consulting representatives from the road sector, the relevant rules were reviewed.

The review provided information on the legislative framework in Tanzania and the operating environment with regard to road safety. It provided input to the activity qualitative and quantitative analysis of the road safety situation in Tanzania.

A number of surveys were carried out to give an indicative picture on the current state in Tanzania. The following surveys were done:

- > A one-day survey of vehicle fitness at Kibaha check-point
- > A survey of seat-belt use in Dar es Salaam and Mbeya
- > A survey of motorcycle helmet use in Dar es Salaam, Mbeya and a rural area in Mbeya region.

In addition, we have observed some driving tests in Dar es Salaam and we have interviewed road users and passengers.

## 2.5 Recommendations

### 2.5.1 Specific and achievable interventions

Based on the analysis we have provided recommendations on specific and achievable interventions to enhance road safety in Tanzania. The interventions are short, medium and long term.

The identification of interventions provided input to the monitoring and evaluation system and the policy and regulatory implications of the recommendations to improve road safety.

## 2.5.2 Propose road safety monitoring and evaluation system

To be able to monitor the effectiveness of the interventions and whether Tanzania in general is moving in the right direction with regard to road safety we have proposed a road safety monitoring and evaluation system.

Monitoring and evaluation of interventions will allow SUMATRA to identify whether they are efficient and effective and allow for adjustments accordingly.

## 2.6 Policy and regulatory implications of recommendations

Some interventions have policy and regulatory implications. This is especially the case when changing legislation or changing responsibilities of organisations. We have - where possible - indicated these policy and regulatory implications.

## 2.7 Presentation of study findings and recommendations to stakeholders

With the purpose of disseminating the results, completing stakeholder consultations and developing local ownership of the findings, the Consultant will help to arrange a final seminar/workshop in Dar es Salaam to present the result of the study findings and recommendations to stakeholders.

The workshop is suggested to have the following programme presenting the report:

- > Review of the state of road safety in Tanzania
  - > Road safety management
  - > Safer roads
  - > Safety vehicles
  - > Safer road users
  - > Rescue services
- > Recommendations on specific and achievable interventions for short, medium and long term to improve road safety in Tanzania
- > Propose road safety monitoring and evaluation system
- > Discussion of findings and recommendations.

### 3 Road safety risk and trends

The topography and sheer size of Tanzania together with the large movement of passengers and goods along the major routes crossing the country (both in a north south and east west direction) produce many safety factors leading to approx. 4000 fatalities annually.

#### 3.1 Existing and new accident data system

There are presently two sources of accidents data both from the traffic police. One is the more generic accident data presented in excel sheets the other is a new system launched as a pilot project.

In 2015, the Road Accident Information System (RAIS) was initiated, this commenced as a pilot study in ten regions throughout Tanzania (Arusha, Kagera, Kinondoni, Mbeya, Mwanza, Pwani, Ruvuma, Singida, Tanga and Temeke).

One of the main components of the project was to capture the GPS coordinates for the location of every collision. This enabled, for the first time, an ability to plot the locations of the incidents to produce a visual representation of where the collisions were occurring. The program also upgraded the quality of data captured by the traffic police. The review team were provided with data from the RAIS database and the analyses of these records have been used in compiling this report. Comparing the number of fatalities and injuries in the 10 regions hints that RAIS has not been fully implemented in all regions as the figures are generally lower than the traditionally data from the traffic police.

**Definitions**

- Fatal/killed: Killed in road traffic accident and died on scene or within 30 days. May be more people in one crash.
- Serious/severe injured: Injured person that was hospitalised as 'in patient'. May be more people in one crash.
- Slight/Light injured: Injured person not hospitalised. May be more people in one crash.
- Damage only accidents: Road traffic accident with damage to property only
- Accident: Involves damage to property or personal injury occurring on public road (including footways) in which at least one road vehicle or a vehicle in collision with a pedestrian is involved and which becomes known to the police. One accident may give rise to several casualties.
- Casualty: Killed or injured

Table 1 Data in existing and new RAIS accident data system

For 2015 the RAIS database has:	The national statistics for 2015 were:	The RAIS database therefore holds:
<ul style="list-style-type: none"> <li>&gt; 2,151 accident records of which:                             <ul style="list-style-type: none"> <li>&gt; 824 fatal accidents</li> <li>&gt; 992 deaths</li> <li>&gt; 904 serious injury accidents</li> <li>&gt; 683 slight injury accident</li> <li>&gt; 636 damage only accidents</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>&gt; 8,337 accidents of which:                             <ul style="list-style-type: none"> <li>&gt; 2,909 fatal accidents</li> <li>&gt; 3,468 deaths</li> <li>&gt; 9,383 injury accidents</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>&gt; 26% of the total incidents recorded in 2015</li> <li>&gt; 28% of the fatal accident recorded in 2015</li> <li>&gt; 29% of the deaths recorded in 2015.</li> </ul>

Albeit the records contained within the RAIS database is limited to only ten regions within Tanzania the quality of the data is far greater than that available prior to the RAIS project.

### 3.2 International comparison

The number of fatalities per 10,000 vehicles and 100,000 population in Tanzania is similar compared to neighbouring countries as seen in Figure 3-1. However, compared to European countries where systematic approaches to improving road safety has been on the agenda for decades it is more than 30 times higher. Compared to new EU Member States, the Tanzanian figures are approx. 15 times higher when compared to number of vehicles.

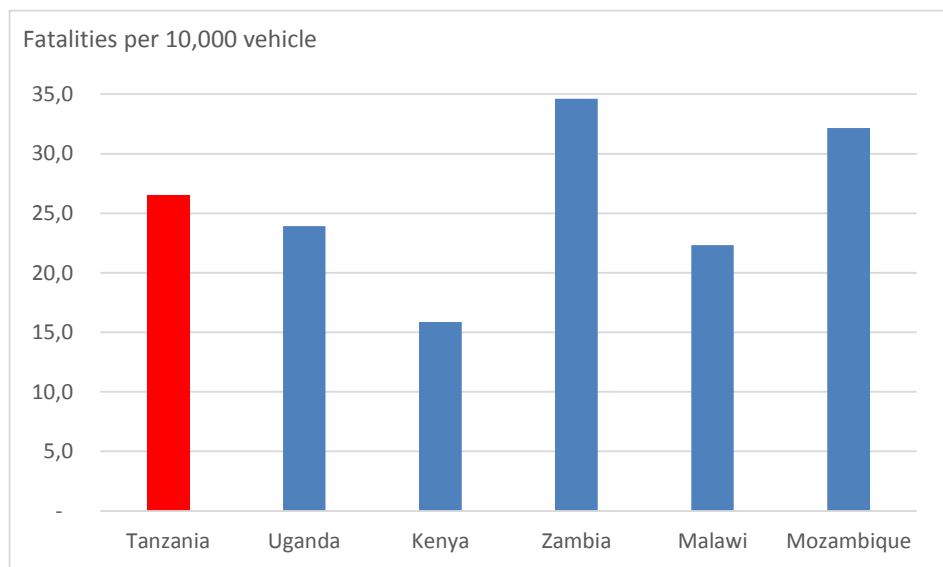


Figure 3-1 Fatalities per 10,000 vehicles in Tanzania, compared to other neighbouring countries (2013)

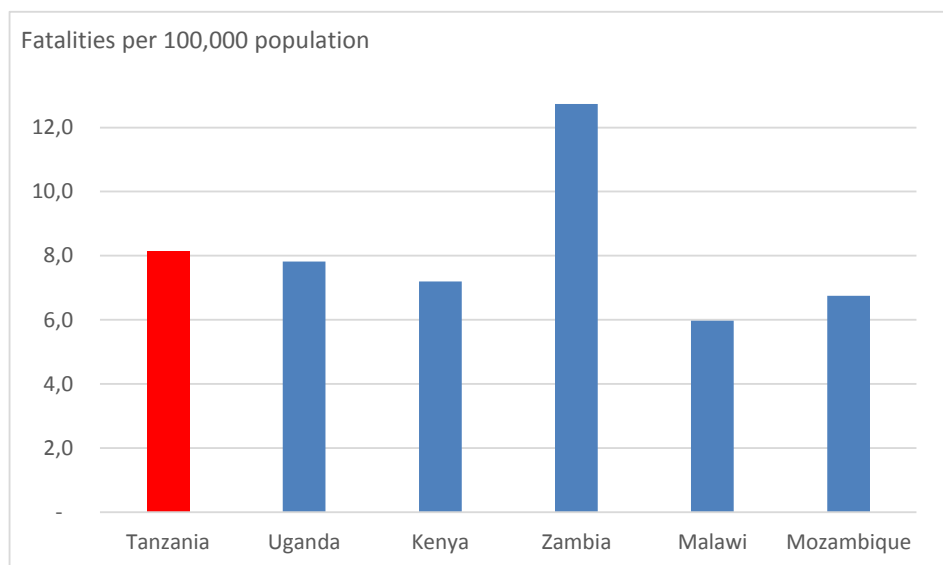


Figure 3-2 Fatalities per 100,000 population in Tanzania, compared to neighbouring countries (2013)

Today Tanzania has a relative low number of registered vehicles (512,000 cars and 4-wheeled light vehicles, 86,000 trucks and 49,000 busses, 809,000 motorised 2-and 3 wheelers and 55,000 other in 2014). With an increase in car ownership in Tanzania, it is likely that the number of traffic crashes and fatalities will increase in the years to come (despite the recent declines). This is the case unless steps are taken to focus on reducing road traffic crashes while traffic increases and to improve the knowledge about safe design of roads as well as education of road users.

### 3.3 Accident trends

The annual Police reports on traffic indicate that there has been an increasing trend in the number of deaths from 2008 to 2013 in Tanzania. However, during 2014 and 2015 a reduction in number of fatalities seem to have occurred. However, the data from e.g. 2015 may be questionable and should be checked as some regions have had surprisingly big drops in number of fatalities (up to 85%) and in number of accidents and injured (92%).

Injuries caused by road crashes in Tanzania increased until 2011 and seemed to have decreased since then.

During the years with some of the highest fatality rates in 2013 and 2012 respectively, 4,002 deaths and 20,689 injuries occurred from road crashes compared to 3,969 deaths and 20,111 injuries. Thus, more than 24,000 people were crippled or injured annually in addition to the killed people. These are just the reported deaths and injuries, and evidence from other countries suggests that the real figures are likely to be significantly higher, as not all road crashes are reported to the Police. The WHO has its own method of estimating road deaths, and it says that there were 16,211 road deaths in Tanzania in 2013 - four times higher than the Police figure. It is difficult to believe that road deaths could be this high. The WHO estimate comes from a statistical model that has never been validated for use in Africa.

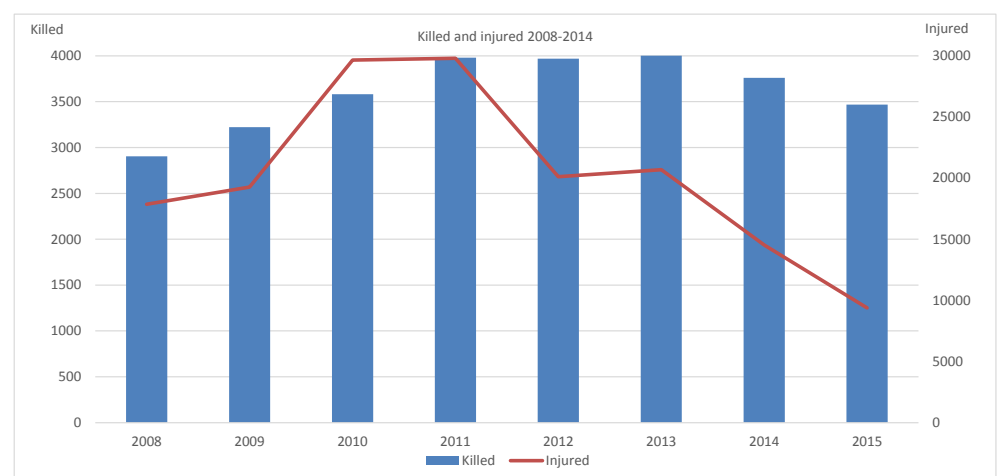


Figure 3-3 Development in fatalities and injuries in Tanzania (2008-2015)

The number of deaths in road crashes per 100,000 inhabitants has a growing trend until 2011 as seen below, and from then a declining trend.

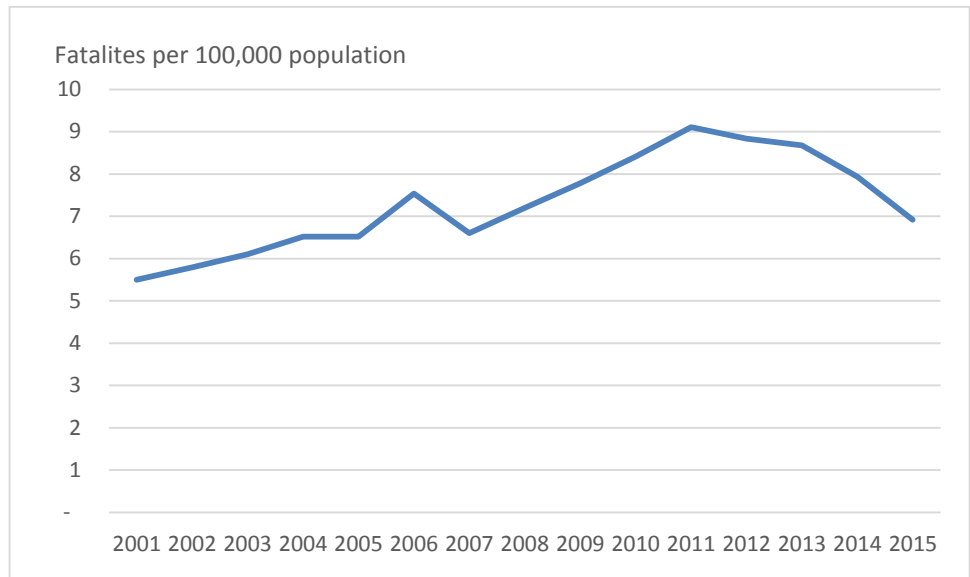


Figure 3-4 Development in fatalities per 100,000 population (2001-2010), Source: 2010 Tanzania Police Division

### 3.4 Fatality by road user category

Approximately half (53%) of the fatalities are registered to be pedestrians and cyclists in 2008 and 36 % in 2015.

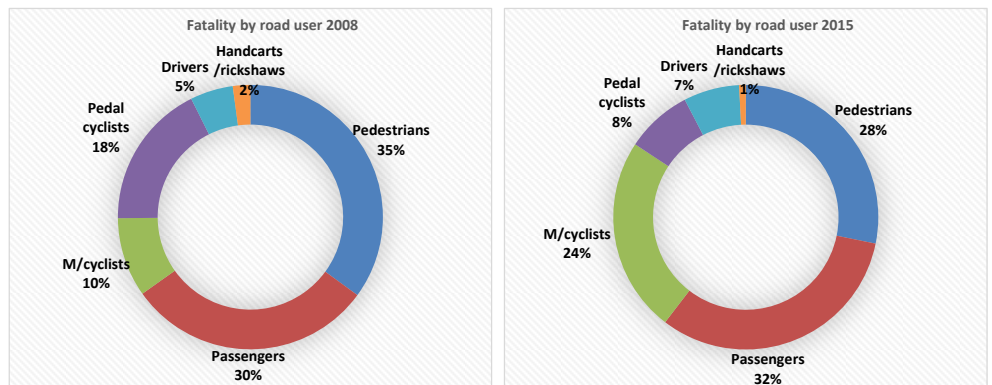


Figure 3-5 Change in fatalities by road user category (2008 and 2015), Source: Tanzania Police Division

Since 2008 the number fatalities with motorcycles has more than tripled from 282 to 870 in 2013. Thus, the share has increased from 10% to 22% during the period. In 2015, motorcycles accounted for 24% of fatalities.





Figure 3-6 Motorcycle passenger with no helmet.

The development in fatalities by road user also indicates a rapid increase in motorcycle fatalities and overall in number of passengers killed.

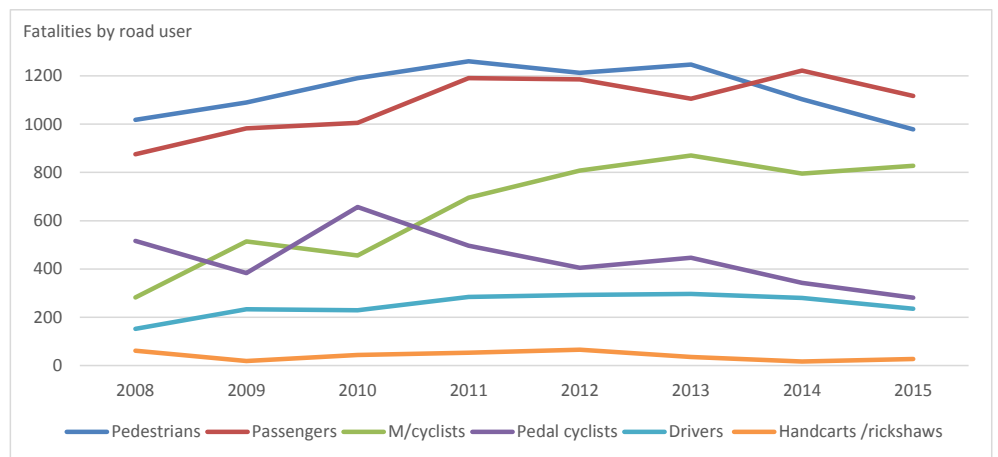


Figure 3-7 Development in fatalities by road user category (2008 - 2015), Source: Tanzania Police Division

The RAIS data show the following distribution of fatalities and injured by vehicle type.

Table 2 Distribution of fatalities and injured by vehicle type in the pilot regions in 2015

Vehicle	Fatalities	Severe injuries	Light injuries
Private car	203	239	193
Foreign car	4	6	1
Private motorcycle	89	95	51
Private pedal cycle	16	7	5
Pick up	29	30	19
Private truck	33	16	20
3 wheeler	4	5	2
Mkokoteni (pedestrian controlled vehicle)	2	0	0
Truck	103	70	51
HGV & semi-trailer	72	39	23
Truck and Trailer	23	8	9
Foreign truck	4	0	1
Dangerous goods	2	1	1
Abnormal load	2	2	2
Abnormal dimensions	1	0	0
Motorcycle	22	21	9
Tractor	13	1	4
Government vehicle	16	16	30
Defence force	2	7	4
Police	4	21	16
Police motorcycle	0	2	2
Diplomatic vehicle	0	1	0
Fire brigade	0	0	1
Ambulance	2	0	2
Rescue service	0	1	1
PSV motorcycle	54	88	37
PSV 3 wheeler	2	10	5
PSV taxi cab	2	2	0
PSV daladala (small bus)	88	86	81
private bus	9	14	12
PSV bus	76	57	67
Foreign bus	4	0	17
Other or unknown	111	59	17
Total	992	904	683

The analysis of data within RAIS identified the highest risk groups as:

- > Motorcyclist – 14 percent of accidents involved motorcycles however, 54 percent of these incidents involved one or more fatalities thus accounting for 17% of total.

- > Pedestrians – 33 percent of accidents involved pedestrians. 46 percent of those incidents involved one or more fatalities.
- > Passenger carrying vehicles (not cars or motorcycles) - make up only 17 percent of the total incidents however 39 percent of these incidents involve one or more fatality; 255 deaths recorded or 26% of recorded deaths.
- > Private cars were involved in 18 percent of accidents.

### 3.5 Road class

Information on casualties by road class is only available through the RAIS data thus it is not a full picture of the entire country but could indicate some trends.

The RAIS data shows that most fatalities and injuries are registered on the trunk roads, which is not surprising as most of the traffic is on these roads and speeds are high. More than 50% of fatalities are registered on trunk roads and 40% of serious injured while 15% of fatalities and 24% of serious injured are registered on district roads according to RAIS data – see Table 3.

*Table 3 Distribution of fatalities and injured by road class in 10 regions in 2015*

Road class	Fatalities		Severe injuries		Light injuries	
Trunk Roads	514	52%	359	40%	351	51%
Regional Roads	154	16%	137	14%	78	11%
District Roads	145	15%	215	24%	144	21%
Rural Roads	105	11%	95	11%	51	7%
City Roads	42	4%	68	8%	39	6%
not available	30	3%	29	3%	19	3%
Bridge	2	0%	1	0%	1	0%
Total	992	100%	904	100%	683	100%

### 3.6 Causes of accidents

The causes of accidents is based on the traditional accident data system. Apparently, causes of accidents are not provided in the new RAIS system.

A very large proportion of the accidents have been attributed to failure by the road users. This may be correct to some extent however, there is a lack of causation of what leads to the accident, and leads to it being serious.

Table 4 Causes of accidents in Tanzania in 2013

Causes	Accidents	%
Careless motorcyclist	5.118	21,5
Careless drivers	5.081	21,3
Dangerous driving	3.395	14,2
Excessive speed	2.039	8,6
Mechanical defects	1.623	6,8
Overtaking	1.475	6,2
Careless pedestrians	1313	5,5
Careless cyclists	979	4,1
Bad road	951	4,0
Obstructions	907	3,8
Lights	484	2,0
Level crossing	102	0,4
Careless rickshaws'	96	0,4
Animals stray	94	0,4
Intoxicated	91	0,4
Fire	52	0,2
Careless passengers	42	0,2
Total	23.842	100

Source: Traffic Police HQ

### 3.7 Type of accident

The accident data system provides some information on types of accidents. Most accidents with fatalities involve pedestrians (34%), are single vehicle accidents (26%) and head on collisions (20%). Surprisingly only 3% are registered in junctions.

Table 5 Distribution on types of accidents (RAIS data 2015)

Type of accident	Fatalities		Serious injured		Light injured		Accidents	
Single vehicle accidents	255	26%	249	28%	201	29%	455	21%
Accidents between vehicles driving same travel direction (2 or more vehicles)	154	16%	118	13%	100	15%	367	17%
Accidents between vehicles driving opposite travel direction (2 or more vehicles)	201	20%	221	24%	159	23%	380	18%
Accidents at a junction turning in same or opposite direction (2 or more vehicles)	12	1%	39	4%	14	2%	79	4%
Collision at a junction between two or more participants	19	2%	43	5%	24	4%	167	8%
Accidents w. parked vehicles	14	1%	9	1%	32	5%	20	1%
Pedestrians involved	337	34%	225	25%	153	22%	679	32%
Animals and other accidents	0	0%	0	0%	0	0%	4	0%
Total	992	100%	904	100%	683	100%	2151	100%

The picture is similar for serious and light injured as well as for accidents although accidents in junctions account for up to 12%. The distribution of seriousness by accident type is shown in Figure 3-8.

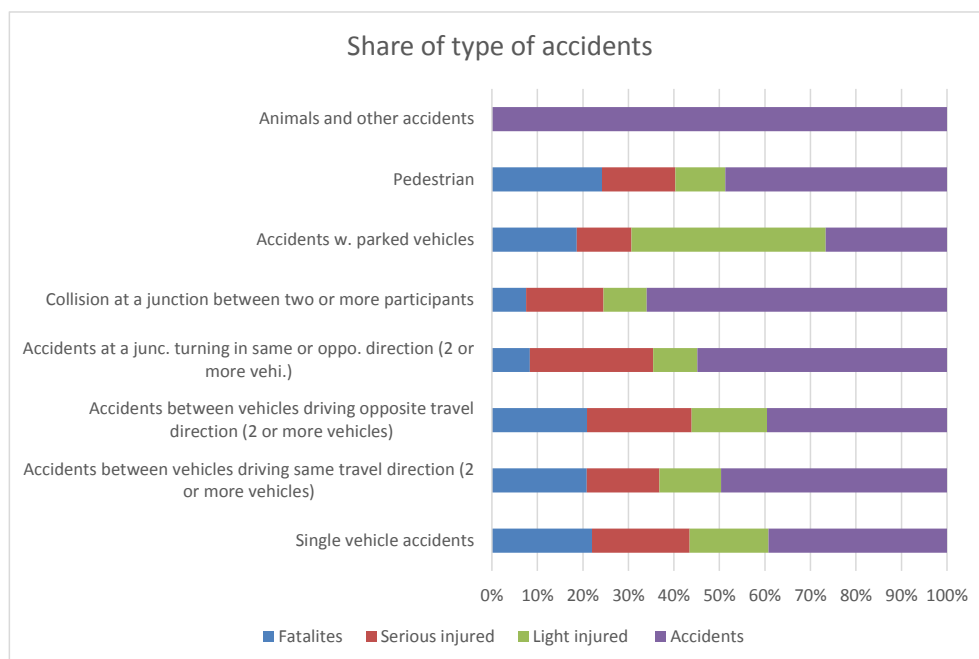


Figure 3-8 Share of accidents by accident type in 10 regions in 2015

### 3.8 Road layout

According to the RAIS data, most accidents occur on 2-lane roads (30%) and on straight sections (25%).

Table 6 Accidents by road layout in 10 regions in 2015

Road layout	Fatalities	Severe injuries	Light injuries	Accidents
1 Lane	127	113	88	262
2 Lanes	315	254	172	653
3 Lanes	16	14	12	101
Hard Shoulders	15	20	35	24
No Lanes	99	166	86	401
Not available	3	16	13	23
Sharp Curve	17	14	10	19
Slight Curve	88	81	70	134
Straight	312	226	197	534
Total	992	904	683	2151

Accidents in curves account for 7% of accidents but 10.5% of fatalities as illustrated in Figure 3-9 thus indicating more serious accidents. Similar straight sections account for 25% of accidents but 31.5% of fatalities.

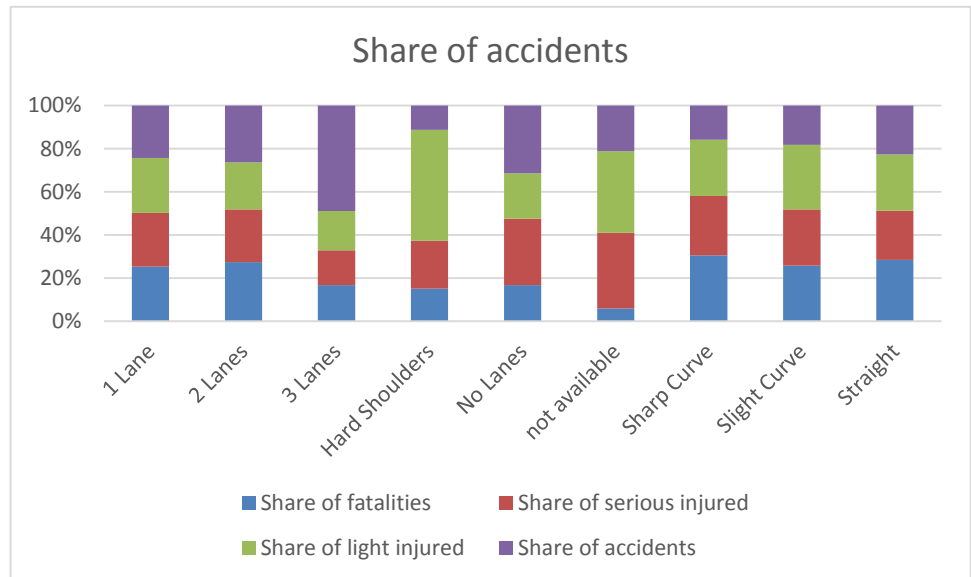


Figure 3-9 Share of accidents by road layout in 10 regions in 2015

### 3.9 Age and gender

In Tanzania males account for 80% of fatalities and 75% of injuries in 2013 according to traffic police data.

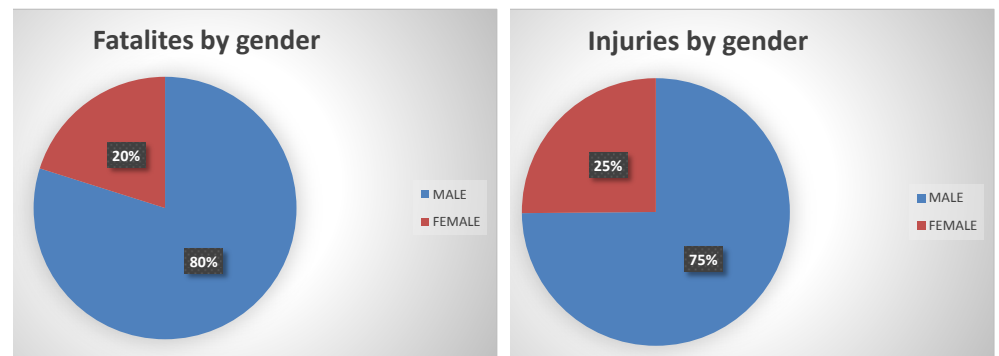


Figure 3-10 Fatalities and injuries by gender in 2013

The age group with most fatalities (22%) is between 25-29 years in 2013 according to traffic police data.

Injuries are more distributed in the age groups between 20 to 39 years as according to traffic police data they account for 14%-18% of injuries in 2013.

The distribution by age group is illustrated in Figure 3-11.

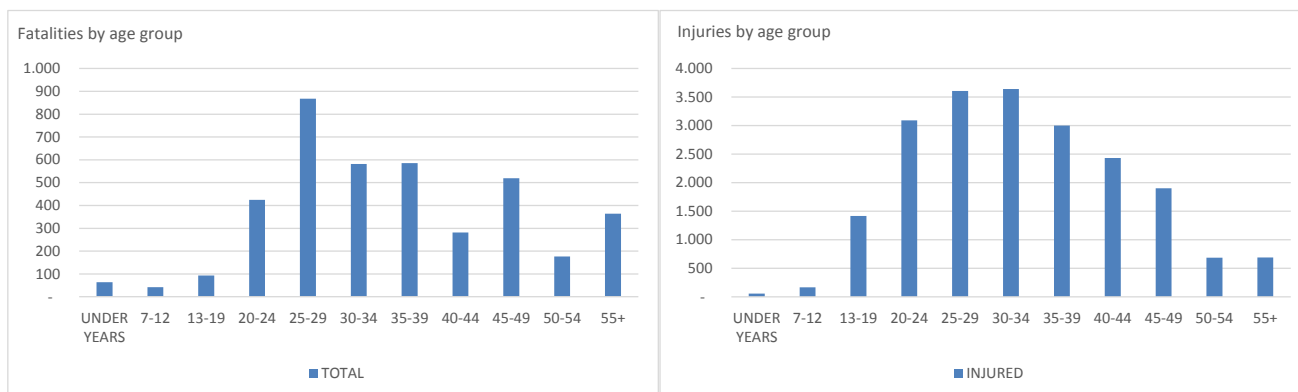


Figure 3-11 Fatalities and injuries by age in 2013

The share of fatal victims are higher for females when younger with the highest share (45%) among 7-12 years. Similar for injuries women account for 43% in each of the age groups 13-19 years and 20-24 years.

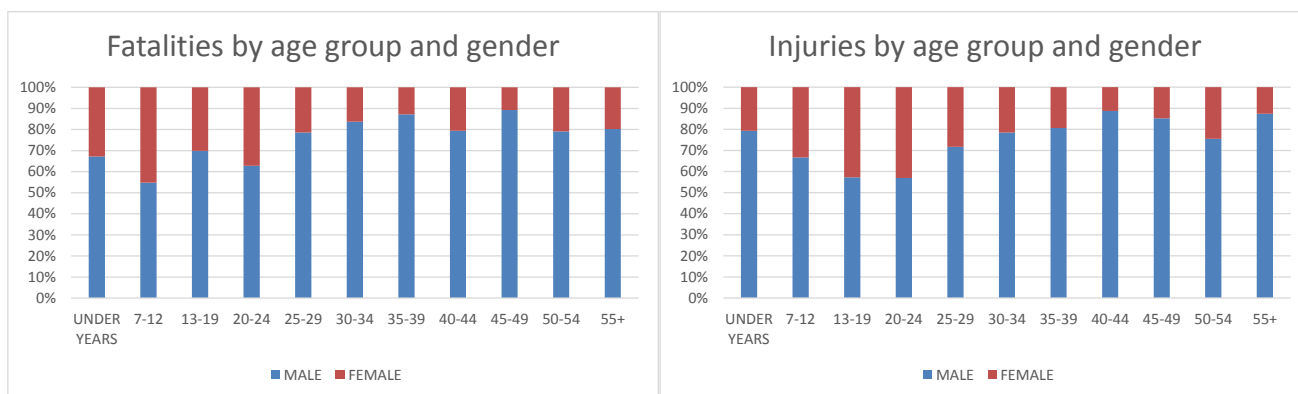


Figure 3-12 Share of fatalities and injuries by age and gender in 2013

### 3.10 By region

When distributing the number of fatalities and injuries by region there are big differences. Even though not ideal, the regions are compared by casualties per population, as no other figure on exposure is available such as veh-km in each region. However, this may indicate in which regions casualties are overrepresented but the figure should naturally be assessed with care.

Compared by fatalities per 10,000 inhabitants Iringa, Morogoro, Mbeya, Njombe, Pwani and Singida comes out above average in the years 2013, 2014 and 2015. When comparing by injuries per 10,000 inhabitants Katavi, Morogoro, Dar es Salaam and Pwani are above average in all years.

In 2015, the three regions that make up Dar es Salaam accounted for 52% of all injuries and 11% of all fatalities.

Table 7 Killed and injured by region

Region	2013		2014		2015		2013		2014		2015	
	Death	Death/ Popula tion	Death	Death/ Popula tion	Death	Death/ Popula tion	Injured	Injured /Popul ation	Injured	Injured /Popul ation	Injured	Injured /Popul ation
Arusha	176	1,04	94	0,55	26	0,15	756	4,46	149	0,88	60	0,35
Dodoma	187	0,90	192	0,92	144	0,69	406	1,95	399	1,91	280	1,34
Geita	131	0,75	130	0,75	88	0,51	256	1,47	228	1,31	195	1,12
Iringa	148	1,57	148	1,57	213	2,26	109	1,16	90	0,96	177	1,88
Kagera	150	0,61	30	0,12	86	0,35	183	0,74	12	0,05	99	0,40
Katavi	34	0,60	43	0,76	49	0,87	319	5,65	258	4,57	122	2,16
Kigoma	87	0,41	70	0,33	79	0,37	265	1,25	106	0,50	133	0,63
Kilimanjaro	204	1,24	126	0,77	72	0,44	1.180	7,19	394	2,40	239	1,46
Kinondoni, Ilala, Temeke (DSM)	542	1,24	242	0,55	367	0,84	8.442	19,34	1.999	4,58	3339	7,65
Lindi	79	0,91	137	1,58	102	1,18	340	3,93	507	5,86	292	3,38
Manyara	108	0,76	108	0,76	116	0,81	406	2,85	272	1,91	450	3,16
Mara including Tarime/Rorya	120	0,69	118	0,68	77	0,44	395	2,27	247	1,42	93	0,53
Mbeya	329	1,22	305	1,13	334	1,23	650	2,40	606	2,24	481	1,78
Morogoro	297	1,34	254	1,14	321	1,45	1.957	8,82	1.231	5,55	635	2,86
Mtwara	96	0,76	86	0,68	58	0,46	334	2,63	204	1,61	62	0,49
Mwanza	179	0,65	182	0,66	171	0,62	596	2,15	349	1,26	215	0,78
Njombe	98	1,40	93	1,32	103	1,47	116	1,65	109	1,55	73	1,04
Pwani	313	2,85	295	2,69	217	1,98	1.721	15,66	1.070	9,74	732	6,66
Rukwa	51	0,51	52	0,52	47	0,47	275	2,74	121	1,20	30	0,30
Ruvuma	116	0,84	87	0,63	138	1,00	519	3,77	554	4,02	503	3,65
Shinyanga	128	0,83	114	0,74	126	0,82	301	1,96	429	2,80	176	1,15
Simiyu	52	0,33	59	0,37	54	0,34	37	0,23	51	0,32	141	0,89
Singida	130	0,95	177	1,29	185	1,35	305	2,23	391	2,85	259	1,89
Tabora	118	0,51	177	0,77	162	0,71	602	2,63	759	3,31	406	1,77
Tanga	129	0,63	117	0,57	133	0,65	219	1,07	143	0,70	191	0,93
Total	4.002	0,92	3.436	0,79	3.218	0,74	20.689	4,74	10.678	2,45	6.483	1,49

### 3.11 Summary of trends and accidents

To summarise the trends and accidents in Tanzania the available data show:



- > An increase in fatalities until 2013 and then a surprising reduction in 2014 and 2015, especially in some regions
- > Pedestrians and cyclists accounted for half of the fatalities in 2008 and a third in 2015
- > The number of motorcyclist fatalities has more than tripled from 2008 to 2015 increasing the share from 10% to 24% during the period
- > Passenger carrying vehicles (not cars or motorcycles) - make up 26% of recorded deaths according to RAIS data
- > More than 50% of fatalities are registered on trunk roads
- > Fatality accidents involve pedestrians in 34% of cases, single vehicle accidents in 26% and head on collisions in 20% according to RAIS data for ten regions
- > Men account for most fatalities and especially the 25-29 year olds
- > Iringa, Morogoro, Mbeya, Njombe, Pwani and Singida are above average compared to fatalities per 10,000 inhabitants recent years
- > Katavi, Morogoro, Dar es Salaam and Pwani are above average compared to fatalities per 10,000 inhabitants recent years.

## 4 Road safety management

This chapter describes the gap analysis of the institutional management functions and results.

The UN Decade of Action Global Plan recommends establishing a lead agency (and appropriate coordination mechanisms) on road safety involving partners from a range of sectors through:

- > Designating a lead agency and establishing related secretariat
- > Encouraging the establishment of coordination groups; and
- > Developing core work programmes".

One of the main changes started by the Vision Zero in Sweden is a new way of dividing responsibilities of road safety. The Swedish National Road Administration sets the road safety targets and has been commissioned with the overall responsibility for road safety within the road transport system. To achieve the Swedish objectives, all stakeholders within the transport system cooperate closely on road safety work. The national government and the municipalities are responsible for the funding of the safety work, benefiting road users and road infrastructure. Other stakeholders given responsibility to improve road safety are road-users, road traffic system designers, voluntary organisations, etc.

In Denmark, the Road Safety Commission has set the national objectives on road safety which is to be achieved through combined efforts by the road authorities (Danish Road Directorate (national roads), municipalities), Danish Road Safety Council (campaigns), the police, the Danish Road Safety and Transport Agency (e.g. legislation) and the Danish Motor Vehicle Inspection Office (technical inspection). The Danish Road Directorate has an overall road sector role, which includes the issuing of road standards and to supply the sector with newest findings to improve road safety.

The following assessment is based on the methodology for "Road safety management capacity reviews<sup>8</sup>" as described in section 2.1.1 and focuses on:

- > Institutional framework and organisation of road safety
- > Road safety strategy and policy
- > Accident data and data collection
- > Funding

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<sup>8</sup> Implementing the Recommendations of the World Report on Road Traffic Injury Prevention - Country Guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects, Tony Bliss and Jeanne Breen, Global Road Safety Facility, June 2009

- > Legislation and regulation in commercial transport
- > Monitoring and evaluation
- > Research in road safety.

## 4.1 Institutional framework and organisation of road safety

For a country to be able to succeed in addressing its road safety problems effective and coordinated activities in all key sectors affecting road safety are a necessity including e.g. a strong lead agency.

According to the guideline prepared by Asian Development Bank (ADB) on "Coordination and Management of Road Safety" road safety is a multidimensional social problem involving many government agencies, so the state must play a leading role in initiating, organizing, and coordinating the national assault on road safety problems in a country.

The present institutional framework/organisation in the field of road safety in Tanzania is assessed. This includes whether responsibilities of individual institutions with regard to road safety are clear and whether they are held responsible for their activities in road safety.

### The need for political will to make road safety a governmental priority

Creating a positive political environment is essential if governments are to give road safety the priority justified by the prevailing levels of death and injury that occur on the roads in all OECD/ITF member countries and elsewhere.

Government support for any public policy issue is always subject to limits of available time (for policy development and legislation) and resources (in terms of staffing and budgetary allocations). Road safety competes with other public policy subjects for political support that may appear either more important or attractive to the politicians who will ultimately decide on the priorities of their administrations. Many factors (including the level of public interest and public pressure, the economic and political feasibility of solutions and the prospects of demonstrable success) determine whether road safety will be treated as a government priority. Accordingly, it is necessary to influence positively the political process of policy assessment through a variety of strategies.

Foremost among these strategies is the creation of a lead agency with the objective of vigorously promoting road safety within government decision-making bodies, and developing strong arguments to ensure that sufficient funds and other resources are allocated to this issue. This agency also needs to coordinate activity between government departments and encourage delivery partnerships between government and non-governmental organisations at all levels of development and implementation.

Source: Towards Zero<sup>9</sup>

In order to identify any gaps or differences from international best practice the relationship between institutions that have responsibility for road safety have been assessed.

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<sup>9</sup> Towards Zero: Ambitious Road Safety Targets And The Safe System Approach - OECD/ITF, 2008

### 4.1.1 Existing situation

The existing institutional framework and organisation of road safety is described in the following together with some of the key stakeholders in road safety.

The road safety in Tanzania is in principle overseen at three levels:

- > National Road Safety Council (NRSC)
- > Regional Road Safety Committees (RRSC)
- > District Road Safety Committees (DRSC).

In addition, there are a number of stakeholders in road safety of which some have a role in the council/committees.

#### National Road Safety Council (NRSC)

The National Road Safety Council was established in 1973 under the Road Traffic Act<sup>10</sup> and is technically seen as the lead agency in road safety. The Council was foreseen to consist of the chairman, a vice-chairman and not less than ten other members appointed by the Prime Minister. The Act made the National Traffic Commander to be the Secretary to the National Road Safety Council, but it made no provision for funding<sup>11</sup>. The Chairman of The National Road Safety Council is the Deputy Minister of Home Affairs. The functions of the Council are described in the Act:

- > to provide an effective central organization to intensify road safety activities and to exploit fully and continuously available knowledge and experience in all matters connected with road safety; to promote research into causes of road accidents
- > to promote statistical research as to the number, types and cost of traffic accidents
- > to diagnose, from research sources, causes of road accidents and to suggest counter measures to combat accident problems
- > to identify local accident hazards, devise and suggest remedies and advise authorities concerned to promote action
- > to make proposals for amending traffic and road safety legislation with a view to reducing road traffic accidents
- > to encourage and provide training and education for road users
- > to encourage and improve users knowledge of particular hazards how they arise and how to cope with them
- > to induce a more positive attitude to road safety through lectures, demonstrations, campaigns or any other means
- > to collect, prepare and disseminate educational material on road safety
- > to prepare and promulgate fully integrated programmes of public information and publicity by means of all appropriate media of mass communication

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<sup>10</sup> The Road Traffic Act, 1973

<sup>11</sup> National Road Safety Policy, Ministry of Infrastructure Development, Dar Es Salaam, September 2009

- > to advice on current or projected ideas concerning motor vehicle or trailer design, equipment and maintenance with particular reference to safety devices.

Presently the members include:

- > Ministry of Home Affairs (Chairman)
- > Traffic Police Division (Executive Secretary)
- > Ministry of Works, Transport and Communication (Deputy Chairman)
- > Tanzania Bureau of Standards
- > Tanzania Insurance Regulatory Authority
- > Ministry of Education, Science and Technology
- > Surface and Maritime Regulatory Authority (SUMATRA)
- > Attorney General's Chamber
- > Tanzania Bus Operators Association (TABOA)
- > Tumbi Hospital
- > National Institute of Transport
- > MEDIA Consultant
- > Tanzania Drivers Association
- > SAFESpeed FOUNDATION.

Despite the long list of functions in the Act, several stakeholders - including members of NRSC - say that in practice the main function of the NRSC up to now has been to organise National Road Safety Week. Funding for this is raised through sale of road safety stickers, and donations from bigger companies involved in transport. The main value of National Road Safety Week is seen to be that it brings all road safety stakeholders together, so that they can discuss and agree on safety initiatives.

One sign that the NRSC is trying to be more effective is the recent announcement of a 6-month strategy and action plan focusing on:

- > Drink driving and reckless road use
- > Speed management and fatigue management
- > Control of operation of motor vehicle licences and abuse of the road
- > Driving without license
- > Transport in busses
- > Special road use education (schoolchildren, street traders, disabled, etc.)
- > Accidents related to parking and use of the road
- > Identify and mitigate black spots
- > The importance of passengers using safety belts in buses
- > Establish the point system on licenses
- > Improve statistics on accidents
- > Fight corruption on the road
- > Improve information from the Council to promote fight against accidents.

It is unclear whether this was the first time where specific actions have been put forward to be implemented through the NRSC.

### Regional and District Road Safety Committees

The arrangement of the NRSC was replicated at regional and district levels. It is unclear whether District Road Safety Committees are functioning but some Regional Road Safety Committees are functioning, but have very little funds to do anything. A person from the private sector who is in the transport business often chairs these Committees and the secretary is the Regional Traffic Officer (RTO). E.g. in Mbeya, the chairman is the local Toyota dealer and members include:

- > Toyota dealer (Chairman)
- > RTO (secretary)
- > SUMATRA Regional Office
- > TanRoads Regional Manager
- > Local (district/city) engineer
- > Mbeya Cement company
- > Local Ministry of Health
- > Some Transporters/owners BodaBoda and Bajaji.

One of the main events they get involved in is the local Road Safety Week which is a different date to the National Road Safety Week. At the meetings, specific problems on trunk, regional and district roads are also discussed and the road authorities are asked to take action. This would often be to provide signs, and occasionally speed humps.

### Other stakeholders in road safety

There are many stakeholders involved in roads, their use and in road safety. According to some stakeholders the dividing lines are not always clear, e.g. due to lack of a holistic approach to road safety and the regulation describing their work has not been coordinated. Some the key stakeholders include:

- > Ministry of Home Affairs and Traffic police (MoHA)
- > Ministry of Works, Transport and Communication (MoWTC)
- > Surface and Marine Transport Regulatory Authority (SUMATRA)
- > Tanzania National Roads Agency (TANROADS)
- > President's Office Regional Administration and Local Government (PO-RALG) (e.g. Districts and city councils)
- > The Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC)
- > Ministry of Finance and Planning (MoFP)
- > Insurance
- > Road users
- > NGO's such as Road safety ambassadors and AMEND.

In the below their role in road safety is described briefly. Where relevant their roles in road safety work is further described in the following sections.

#### Ministry of Home Affairs and Traffic police

The Ministry of Home affairs, through the Traffic Police is responsible for enforcement of traffic laws and regulations, annual vehicle inspection, and driver

testing as well as licensing and supervision of driving schools. Together with SUMATRA, they also carry out enforcement of commercial transport.

The traffic police should maintain a suitable system recording traffic accidents as well as files on warning, arrests, convictions and complaints reported in respect of each driver. The Police should prepare and submit an annual report of road accidents and their causes and must indicate the police activities on road safety.

The Ministry of Home Affairs is chairing the National Road Safety Council and the commander of the traffic police is secretary.

#### Ministry of Works, Transport and Communication

The former Ministry of Works and the former Ministry of Transport and Communication has merged to the Ministry of Works Transport and Communication.

The Ministry of Works, Transport and Communication is overall responsible for transport policy, trunk and regional roads, axle load control (through TANROADS) and transport licensing (through SUMATRA). The Road Fund is also under the Ministry.

The tasks of the Ministry include the development, maintenance and management of the road infrastructure and all transport matters.

The Ministry has a Safety and Environment Department. Its duties include to prepare, monitor, evaluate and review the implementation of policies, legislations, regulations guidelines and standards, road safety education, road safety campaigns, and road safety statistics (RAIS) and road safety audits.

#### SUMATRA

SUMATRA was established under the Surface and Marine Transport Regulatory Authority Act, 2001 as the regulator of commercial surface and marine transport, to ensure standards and fair competition. It empowers SUMATRA to promulgate rules and regulations with regard to safety for commercial transport. The functions of SUMATRA is to:

- > Issue renew and cancel licences
- > Establish standards for regulated goods and regulated services
- > Establish standards for the terms and conditions of supply of the regulated goods and sources
- > Regulate rates and charges
- > Make rules
- > Monitor the performance of the regulated sectors, including, in relation to
  - > levels of investment
  - > availability, quality and standards of services
  - > the cost of services
  - > the efficiency of production and distribution of services.

SUMATRA also do detailed accident investigation of bus crashes to better understand the causes of bus crashes.

## TANROADS

The Tanzania National Roads Agency (TANROADS) is an Executive Agency under the Ministry of Works, Transport and Communications, established under section 3(1) of the Executive Agencies Act (Cap 245) and came into operation in July 2000. The role of TANROADS is mainly to construct and maintain trunk roads as classified under the Road Act 2007. The Agency is responsible for the maintenance and development of the trunk and regional road network in Tanzania. The total classified road network in Tanzania Mainland is estimated to be 86,472 km based on the Road Act 2007. The Ministry of Works through TANROADS is managing the National road network of about 33,891 km comprising 12,786 km of Trunk and 21,105 km of Regional roads.

TANROADS has a Road Safety and Environment Unit. They provide specialist advice on road safety engineering. They supervise consultancies, e.g. dealing with safety in design and during construction and improving awareness of the public along roads. They have work going on e.g.:

- > T1 TanZam highway –consultancy for the design of 35 blackspot schemes
- > Arusha – Holili Upgrading – consultancy for safety audit and safety awareness campaign
- > Namtumbo –Tunduru (AfDB) – consultancy for safety audit and safety awareness campaign
- > Mbinga – Mbamba Bay Upgrading - tendering process for consultant to do safety audit and safety awareness campaign is underway (AfDB)
- > BRT phase 2 in Dar es Salaam financed by AfDB
- > BRT phase 3 in Dar es Salaam – also include RSA to review design financed by World Bank
- > Awareness campaigns being done in roadside communities when roads are upgraded
- > Dar es Salaam to Morogoro Road Safety Pilot Project (AfDB-funded).

The Unit works to make sure new roads are safe, e.g. they have 2 road safety engineers reviewing the design - the implication being that these are not formal safety audits. They are monitoring whether contractors are compliant with road safety measures.

Each TANROADS Regional Office has a designated road safety focal person.

President's Office  
Regional  
Administration and  
Local Government  
Local authorities  
(districts,  
municipalities, and  
DSM city council)

President's Office Regional Administration and Local Government (PO-RALG) is the Ministry responsible to oversee the function of the local government system. Thus, the network of about 53,460 km of Urban, District and Feeder Roads is under the responsibility of PO-RALG.

The local authorities such as city councils and districts have been designated as road authorities responsible for the management and maintenance of roads under care, erecting road furniture as well as regulating speed.



The Ministry of Health, Community Development, Gender, Elderly and Children

The Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) was created by Government Notice No.144 of 22nd April 2016.

Among many tasks, the ministry is responsible for all medical and emergency care.

Ministry of Finance and Planning

The Ministry of Finance and Planning, through the Tanzania Revenue Authority is responsible for vehicle registration and fees, collection of driver license fees and renewal of driving licenses and regulation of the insurance industry.

Insurance

The insurance companies are responsible for motor vehicle insurance for private and commercial vehicles including the mandatory third party insurance. In case of accidents, they compensate victims covered by the insurance.

Road users

The Tanzania Truck Owners Association (TATO) and Tanzania Bus Operators Association (TABOA) are examples of representatives of commercial road transporters. It is the voice between the owners and the government and are represented on different boards etc.

The Automobile Association of Tanzania mission is to make roads safe for riders, drivers and pedestrians.

NGO's

Other stakeholders include NGOs such as AMEND and Road Safety Ambassadors.

**AMEND** is a NGO with offices in e.g. Tanzania. They worked with the Traffic Police to host a procession of schoolchildren through Stone Town as part of the inauguration of the United Nation's Decade of Action for Road Safety. Their work includes road safety education, media campaigns, events, advocacy, pedestrian infrastructure improvements around schools, distribution of reflector-enhanced school bags, and more. Their work is evaluated for efficacy and impact.

**Road Safety Ambassadors Group** of Tanzania is a civil society organisation dedicated to improving road safety in Tanzania. They are working in three key areas:

- > Improving public awareness of road safety issues
- > Reporting road defects and unsafe road behaviour to the authorities
- > Pushing for regulatory reform.

It was founded in 2013 as a Facebook Group. It now has 10,000 members throughout the country – all kinds of people, and all working on a voluntary basis. Communication, coordination and direction is via Facebook and WhatsApp.

Their road safety awareness work includes a campaign every November to persuade bus passengers to intervene and report cases of bad driving.

In 2015, they reported about 400 incidents of bad driving. The procedure is that the Ambassador photographs the incident on his smartphone and sends it to the Zonal Traffic Control Centre where it is picked up by Police who then stop the vehicle and take action – including fining the driver if appropriate. Very few

drivers challenge the photo evidence. Where cases have gone to court, the court has accepted the evidence provided by the Ambassador.

They are helping traffic police by giving them smartphones and improving radio communications.

#### 4.1.2 Identified gaps in institutional framework and organisation of road safety

The National Road Safety Council (NRSC) is legally empowered to be the lead agency with the aim and responsibility to direct the national road safety effort. Its role is defined in the Road Traffic Act. The members of the NRSC and the associated local road safety committees generally appear to be the right actors for road safety work and most of the involved institutions appear motivated at professional level. However, there is a general consensus and also indicated in the National Road Safety Policy that it has not been effective. Part of the problem is that Government has never provided it with any funds.

The current structure of the management of road safety is not effective with limited coordination between stakeholders to deliver road safety interventions. Responsible institutions for road safety are not held accountable for their performance. For example, it seems that the NRSC has not coordinated and followed up on the activities suggested in the Road Safety Policy from 2009.

Until recently, the Council seemed not to follow up activities from members; however, some attempts seem to be made in the 6-month strategy and action plan launched recently.

A Bill has been drafted to improve the current arrangements to implement the NRSP Policy by establishing the National Road Safety Agency and abolishing the NRSC. However, the Bill has been awaiting approval for some time. When approved it will still take some time to actually establish the Road Safety Agency with adequate staff, expertise and resources to provide effective management, coordination and funding for road safety.

According to meetings with stakeholders there is no single legislation covering the issue of road safety. Each institution is responsible to conduct separate legislative actions to improve road safety and for funding this activity.

Consequently, this arrangement has until now not been very effective. In the 2007 BICO study<sup>12</sup> it was recommended, that each stakeholder should plan how to implement the proposed measures under their mandate by preparing action plans with budgets and to request for the necessary additional resources. This seemed not to have happened or only to limited extent.

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<sup>12</sup> Study on Road Accidents in Mainland Tanzania for SUMATRA by BICO, 2007

### 4.1.3 Recommendations on interventions

Until the Government establishes the National Road Safety Agency, the focus should be on strengthening the effectiveness of the NRSC in leading and coordinating the national road safety programme.

The recently announced Action Plan is a good start, but the Council needs to be more active in directing, coordinating and progress-chasing the work of its members other than the traffic police.

It also needs to have a source of sustainable funding. If its parent Ministry cannot fund it directly, it could look to the Road Fund, as the NRSP has established that the Fund can be used to support road safety.

The Council should also be more open about its work – an annual Progress Report and perhaps a quarterly newsletter would help reinforce its role as the lead agency.

The planned Road Safety Agency/board should be established, staffed and financed.

### 4.1.4 Policy implications

Funding should be ensured for the NRSC, e.g. from the Road Fund and the Bill should be approved politically to establish, staff and finance the Road Safety Agency/board.

## 4.2 Road safety strategy and policy

In this section, it is assessed whether a National Road Safety Strategy and policy on road safety exist in Tanzania and whether it has a vision, quantitative targets and a target for interventions.

Clear targets and identification of necessary measures and provision of the needed resources are important to improve road safety. In countries with good road safety performance, such as Denmark and especially Sweden, rather ambitious targets have been set. In Denmark the number of killed and seriously injured is to be reduced by 50% in 2020 compared to 2010, i.e. a maximum of 120 killed, 1000 seriously injured and 1000 slightly injured. In 1997 Sweden adopted the zero-vision, thus "nobody should be killed or seriously injured in road transport". Many EU countries are well on their way to achieving the agreed EU target of 50% reduction by end of 2020 they are doing so by implementing target driven action plans and interventions in all key sectors.

According to the EU Non-paper<sup>13</sup> for a country to be able to have success in addressing its road safety problems there needs to be effective and coordinated activities in all key sectors affecting road safety and clearly defined performance targets that can be monitored to see if the desired improvements are occurring.

<sup>13</sup> Road safety planning. Good practice examples from national road safety strategies in the EU. Non-paper as food for thought and discussions [http://ec.europa.eu/transport/road\\_safety/pdf/national-road-safety-strategies\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/national-road-safety-strategies_en.pdf)

The EU Non-paper<sup>13</sup> also highlight that the existence of a high-quality national road safety strategy can be seen as an indicator that road safety is an issue on the political agenda. A well-crafted plan can be a tool for responsible authorities to identify the most relevant road safety actions, to focus their work efficiently and to assign the necessary resources. The road safety plan can also be a tool for accountability and transparency, communicating road safety priorities to the citizens. It also stresses that it might play a bigger role as supporting tool for countries that started working more recently on road safety.

When establishing a national strategy for road safety, the needs of all road users, including vulnerable road users must be taken into account and in addition to that the development of the country should also be anticipated, e.g. development in vehicle ownership. According to the EU Non-paper<sup>13</sup> for a country to be able to have success in addressing its road safety problems, effective and coordinated activities in all key sectors affecting road safety are necessary and clearly defined performance targets identified that can be monitored to see if the desired improvements are occurring.

A road safety strategy needs to set ambitious, but realistic targets for at least five or ten years. In addition to the road safety strategy, an action plan scheduling specific actions, responsible parties and specific resource allocation, should be developed. Setting targets for reductions in killed and serious injured is generally accepted to be a provision of a common goal for those involved in road safety. The goal should be achievable. However, the target should also be demanding in order to avoid complacency and to focus efforts on the most effective measures. Indicators relevant for the problems in Tanzania should supplement this.

#### 4.2.1 Existing situation

There has been many plans prepared in Tanzania touching on road safety. These include:

- > National Transport Policy adopted in 2003, Ministry of Communication and Transport
- > National Road Safety Master Plan, June 2004, prepared by SWEROAD for Tanzania National Roads Agency, (TANROADS), Ministry of Works
- > National Road Safety Policy, September 2009, Ministry of Infrastructure Development
- > National Road Safety Strategy 2010-2015, January 2010, Ministry of Infrastructure Development
- > Draft Implementation Strategy of the National Road Safety Policy 2009 for the period of 2015-2012, November 2014, Ministry of Works.

The **National Transport Policy** from 2003 had a policy objective to "ensure that the standards of safety shall be established implemented and maintained for each mode of transport with the view to assuring the safety of life, property as well as protection of the environment". It also mention the objective to supply road transport services without e.g. compromising customer safety, policy

direction to enhance road safety and management, to have standards and specification for public transport vehicles to e.g. ensure safety.

The **National Road Safety Master Plan** from 2004 had the vision that "Nobody should be killed or seriously injured". The national target was "By 2014 we want to achieve, compared with 2002: 25% reduction in the number of people killed and seriously injured in road traffic accidents as a result of a road accident" and a sub-target stating that " Starting 2006, the number of killed persons should be reduced every year compared with the year before". The Masterplan contained:

- > Situation and Problems
- > Vision and Possibilities
- > Policies and Strategy
- > Master Plan for Tanzania Mainland and Zanzibar
  - > Coordination and Administration of Road Safety
  - > Road Safety Funding - Financing
  - > Data and Information Management
  - > Legislation
  - > Law enforcement
  - > Road Safety Education
  - > Public Awareness
  - > Engineering - Safe Roads
  - > Engineering - Safe Streets
  - > Driver Training and Examination
  - > Vehicle Safety
  - > Transport of Passengers and Goods
  - > Medical and Rescue
  - > Evaluation and Road Safety Research
  - > Costs for Accidents
- > Implementation, Costs, Effects and Financing.

The vision statement of the **National Road Safety Policy** from 2009 is to "have a safe environment for Road Traffic System which is in accordance with internationally accepted standards". The qualitative goal is to "continually reduce the occurrence and severity of road crashes and consequently the level of fatalities and injuries in an efficient and professional manner" and the qualitative goal is to reduce road deaths by at least 25% by 2015 taking 2008 as the base year.

The policy seeks to guide and unite all stakeholders and put emphasis on cooperation and sharing of knowledge, experience, expertise and resources. The policy contains:

- > Situational analysis
- > Rationale / importance of the national road
- > Safety policy
- > Objectives (main goals and specific objectives), vision and mission of the national road safety policy
- > Road safety policy objectives, issues and statements / directions
  - > Engineering and traffic environment

- > Road safety engineering and design of safe roads
- > Vehicle weight control
- > Vehicle safety, inspection and roadworthiness
- > Driver training, testing and licensing
- > Transport of passengers and goods
- > Parking facilities
- > Education and information
  - > Public awareness about road safety issue
  - > Road safety education for children
  - > Road safety publicity
  - > Land use planning
  - > Crash data system
  - > Research and monitoring
- > Emergency response and victim support
- > Cross-cutting issues
- > Institutional framework / arrangements
- > Legal framework and law enforcement
- > Financing mechanisms for road safety programmes and activities
- > Monitoring, evaluation and review
- > Policy implementation.

The policy is very comprehensive and also suggest the directions to go, but not always in a very detailed manner. The policy also suggested the establishment of a Road Safety Board as lead agency.

The **National Road Safety Strategy** from 2010 has the same vision as the strategy described above and the same mission as the implementation strategy described below. The strategy covers:

- > Vision, mission and strategy
- > Objectives and policies
- > Holistic road safety approach
- > Five "E" programs
- > Road Safety reform map
- > Financing
- > Selected reform projects road safety
- > Technology and R&D.

The draft **Implementation Strategy of the National Road Safety Policy of 2009 for the period of 2015-2020** from 2014 provides a framework of appropriate actions to implement the policy directions identified in the National Road Safety Policy document. The vision is similar as the policy "To ensure that no body is killed or seriously injured as the result of road traffic crashes" and the mission is to " stop and reverse the increasing trend in number of road crashes, number of deaths and number of injuries through comprehensive measures covering engineering, enforcement, education and emergency care". The long-term goals are to achieve "Safe Roads, Safe Road Users, Safe Vehicles, and Expedient Post Crash Care". The implementation strategy includes:

- > Situation analysis

- > Vision, mission, objectives and strategies
- > Policy framework implementation
  - > Engineering and traffic environment
    - > Road safety engineering and design of safe roads
    - > Vehicle weight control
    - > Vehicle safety, inspection and roadworthiness
    - > Driver training, testing and licensing
    - > Transport of passengers and goods
    - > Parking facilities
  - > Education and information
    - > Public awareness about road safety issue
    - > Road safety education for children
    - > Road safety publicity
    - > Land use planning
    - > Crash data system
    - > Research and monitoring
  - > Enforcement and legislation
  - > Emergency response and victim support
  - > Evaluation and other comprehensive actions
  - > Cross cutting issues
- > Resources
- > Policy implementation strategies matrix
- > Monitoring and evaluation.

The plans, policies and strategies all have overall visions and targets and there are comprehensive suggestion for activities to improve roads safety.

## 4.2.2 Identified gaps in visions and targets

Tanzania has many and comprehensive plans, strategies and policies on road safety all with overall visions and targets but there seem to be no regional targets and no safety performance targets seem to be set, e.g. for speed measurements, seatbelt use, helmet use, targets for road users (e.g. motorcycles), etc. They tend to be over-ambitious and give no indication of priorities.

The NRSP provides a sound basis for moving forward on road safety, however the strategy seem to be less known by stakeholders.

The list of contents the areas covered by the policy and other plans are extensive and seem to address the overall issues of road safety in Tanzania.

Only a limited number of the proposals from the plans seems to have been implemented, e.g. due to lack of funds, the lack of commitment required from the stakeholders by the lead agency and the way the actions in the policy are not all detailed thus may not be easy to implement. There seem to be limited plan of actions for each stakeholder to implement measures.

The National Road Safety Agency/Board, and its funding, is yet to be established.

Regular performance reviews on safety to assess progress and make improvements are not carried out.

### 4.2.3 Recommendations on interventions

The following actions are suggested on potential actions.

- > The NRSC work to 1-year Action Plans – validated through an Annual Conference of stakeholders
- > Involved stakeholders should each prepare an action plan to implement their activities in the polices and strategies if not already done
- > Involved stakeholders should formally be held to account for performance achieved by the NRSC until a new lead agency may be established
- > Monitor and follow up on action plan and strategy should be made
- > Dedicated financing / funding mechanism should be identified e.g. from Road Fund
- > In addition to national targets regional targets for improved safety performance should be developed
- > Indicators should be suggested:
  - > Formal social cost targets
  - > Intermediate outcome targets
  - > Intervention output targets
  - > Risk group targets.

### 4.2.4 Policy implications

The main policy implication is that the NRSC should take on the responsibility to work on annual Action Plans, follow, and follow up towards stakeholders on progress. In addition to monitoring on overall targets, the NRSC should also monitor on regional targets, targets by road users, and other indicators for performance.

## 4.3 Accident data and data collection

An important part of road safety work is to have reliable and accurate road accident data that includes information on where and why road traffic accidents happen.

Road safety data can amongst others be used to:

- > Compare the road safety situation with other countries
- > Compare road safety in Tanzania between years
- > Give insight into the causes of road crashes
- > Make black spot analyses
- > Identify specific target groups, e.g. motorcycles or pedestrians



- > Prioritise police enforcement to locations where many accidents happen and to issues such as e.g. speeding
- > Evaluate the road safety work
- > Calculate the social costs of accidents.

This subject has been covered at length in every report produced in the last few years. Tanzania has always run on a paper-based system of recording road traffic accidents. A number of standalone crash database systems have been tried by the traffic police, all were based in the Traffic Police HQ in Dar es Salaam albeit controlled and hosted by the Ministry of Works, Transport and Communication. These systems suffered problems associated with:

- > A failure to properly back up the data within the police
- > The computers becoming infected with viruses
- > The Ministry of Works, Transport and Communication stopped actively assisting the police in crash data collection
- > Possible lack of ownership.

The mainstay of the crash data continued to be a paper based system albeit Excel spreadsheets were generated from these paper based reports. These spreadsheets only provided a numerical value for given parameters predominantly to produce the weekly, monthly and yearly statistical reports.

#### 4.3.1 Existing situation

The BICO study<sup>14</sup> from 2007 concluded that improvement in official accidents statistics was necessary for future monitoring of road safety situation and for decision making.

On January 1, 2015 a pilot study, funded by the World Bank's Transport Sector Support Project, to record road crashes using a program known as the Road Accident Information System (RAIS) commenced. The pilot study took place in ten regions (Arusha, Kagera, Kinondoni, Mbeya, Mwanza, Pwani, Ruvuma, Singida, Tanga and Temeke); it was led by the Ministry of Works Transport and Communication and undertaken by the Tanzanian Traffic Police.

The project commenced with a series of training sessions for the Traffic Police who were also provided with a number of computer laptops and desktop computers as well as a small number of GPS units to record the precise location of the accidents.

The police officers used a hand written form to collect the scene data and this was then entered into the RAIS computer program. A department at the Traffic police HQ undertook the quality control of the crash reports entered by the regions.

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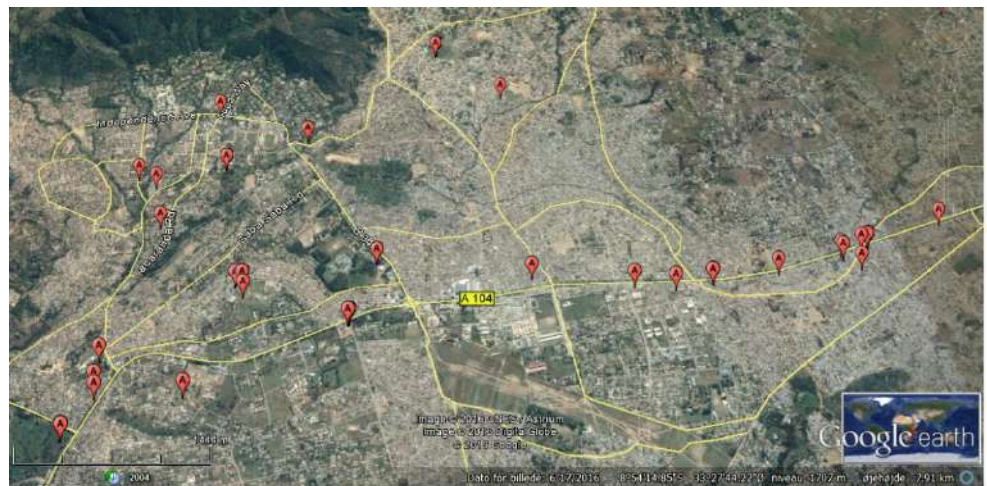
<sup>14</sup> Study on Road Accidents in Mainland Tanzania for SUMATRA by BICO, 2007

The RAIS program is an internet based system requiring a constant network connection to operate. At the time of writing this review the collection of crash data using the RAIS program was being rolled out to all regions within Tanzania. Computer and other hardware equipment was being procured and deployed during this roll out phase.

The project team were given access to the database records during the review process. The statistical analysis undertaken within this report is based on the data available within the RAIS program combined with the data from the paper-based system. The quality of the data currently being collected and recorded with in the RAIS program is an improvement on that collected in the past.

The RAIS program is not a GIS based program in its own right; it requires a third party program to undertake this activity. It is understood by the review team that a license for such a program was provided but the review team did not witness this program in use. The review team in fact identified that neither the Police nor the Ministry of Works Transport and Communication (who lead the project) had the ability to plot crash locations in a graphical form. The review team, using Google Earth produced a graphical plot of the crashes within the database. This plot was provided to both the Police and the Ministry of Works Transport and Communication to allow them to review the crash data for the first time.

The RAIS pilot project, at the time of this review, had been operating for some 18 months. The database contained some 2,800 records for 2015 which reportedly were all the reported crashes for that year. It contained further 890 records up to the end of July 2016. Anecdotal evidence suggested that it took about four weeks for incidents to be recorded into the database.



*Figure 4-1 Example of accident locations registered in RAIS and presented via Google Earth – example from Mbeya. Each mark may cover more than one accident.*

### 4.3.2 Identified gaps in accident data and data collection

An analysis of the crash data records contained within the RAIS program and that exported from the program provided to the review team exhibited the following issues:

- > The GPS location field within the program had a default setting (-6.4 / 39.2). A large number of entries did not have these default values updated to the real crash scene values thus many accidents appeared on the map in this location which was in fact in the sea just off Zanzibar.
- > In a significant number of crashes, the GPS location fields did not contain the required number of digits to produce an accurate location for the incident. Enquiries revealed the pilot project had only supplied a limited number of GPS units. The traffic police officers, being resourceful, utilised their own mobile phones with GPS applications to enable them to acquire the incident scene coordinates. The lack of having an automated process to record and transfer the information directly to the database created this type of error.
- > The statistical analysis component of RAIS only provided a limited number of options. The program did include an export capability however, this only provided a preselected number of fields within the output data set; this precluded any meaningful analysis of the data when exported from the program.
- > A sample of the paper forms completed by the police was reviewed. The form was well designed and contained the basic items required by the police for their reporting process. It also contained a number of fields designed to provide an analytical capability. The review identified the fields required by the police reporting processes were all completed in full. A number of fields associated with the analytical part were invariably not completed. When the incidents were compared in the database, they showed the same fields contained missing data; this suggested the monitoring process was not capturing these omissions.

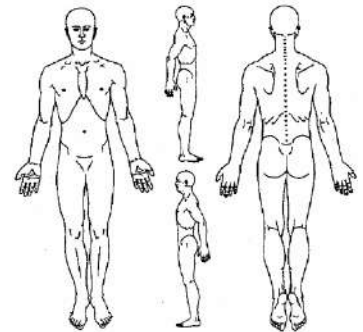
A review of the crash report form developed by the RAIS project identified the following omissions:

- > The original form used by the traffic police, prior to the RAIS project, included the following fields which have been omitted in RAIS:
  - > Description of each vehicles manoeuvre
  - > If the accident occurred at roadwork's
  - > A specific drivers error; driving too close
  - > The position within the vehicle a passenger occupied
  - > The actions of a passenger at the time of the incident
  - > A specific pedestrian's actions at the time of the incident.

Based on international best practice the RAIS database fails to collect the following information:

- > Speed limit of the road
- > Road shoulder type and condition

- > Central divider between carriageways present
- > Presence of street lighting
- > Location of incident being either urban or rural
- > Primary contributory factors
- > Secondary contributory factors
- > Traffic restrictions at the scene; one-way, pedestrian crossing etc.
- > Nearby presence of a notable landmark; school, factory, shopping area etc.
- > The status of the vehicles yearly fitness inspection
- > The direction of travel of the vehicle; north, south etc.
- > Tyres on the vehicle exhibited signs of bursting/failing.
- > Condition of the vehicles lights; on/off
- > In pedestrian accidents the vehicle that hit the pedestrian.
- > Indication as to whether an injured passenger or pedestrian is a student traveling to or from school
- > The date of death of any casualty.
- > Driver/ passenger/ pedestrian injury description based on the below profile.



The form is today already very long so it should be carefully selected what information to add in order not to make the task even more difficult for the police officers.

The fact the police were not able to produce a GIS plot of the crashes onto a map greatly limited their ability to quality control the coordinate data being entered into the database.

When the review team provided this ability many errors were identified; simply displaying the records and being able to review the data to ensure both location and description of region and district matched is seen as essential.

At the time of the review, it became apparent only a very limited analysis of the data contained within the program had been undertaken. The predefined reports designed within the program provided a numerical output, albeit in a graph format. The program did not appear to directly allow for any specific analysis, for example an ability to identify all the accident records where a bus had been involved.

The export capability of the program removed all the sensitive data such as names, addresses, vehicle numbers, driving license details, insurance details etc. It however also removed:

- > A drivers:
  - > license type
  - > age
  - > occupation
  - > injury severity
  - > seat belt use

- > drink / drugs status
- > mobile phone use
- > A vehicle's
  - > Make
  - > model type
  - > year of manufacturer
  - > Defects
  - > Damage profile
- > A Passenger details :
  - > injury severity
  - > age
  - > gender
  - > use of seat
- > A Pedestrian's details:
  - > injury severity
  - > age
  - > gender
  - > drink / drugs status
- > Vehicle / driver specific violations
- > A written description of the accident by the investigating officer.

The export file also linked fields together for example:

- > Date and time  
The date and time is provided in a single field in a long date format.
- > Vehicle type  
The vehicle description codes were produced in a single field.
- > Age range  
The age range was a single field with no relationship to whom this was referring to.

There does not seem to be a plan to give TANROADS and other road authorities full access to the database and to provide training to them on how to use it as well as the Police on how to obtain meaningful (location-specific) information from it.

### 4.3.3 Recommendations on interventions

The inability of the RAIS program to provide a GIS capability of plotting the crash locations on a map as a norm for all users is seen as a serious flaw in the current program. This is further compounded by the fact the review identified the project had purchased a license for a GIS software program which had not been installed or used during the eighteen months of the pilot program.

A search of the internet will produce a number of free GIS programs that could be used to undertake this task. There is also freely available 'open source street maps' which cover all of Tanzania. These two factors would provide the police and other stakeholders with a GIS capability for the program.

The need to maintain a comprehensive audit of the records within the database is seen as essential. The accuracy of the data stored within the system must, at all times be of the highest quality. The development of the paper crash report form was clearly seen, within the project, as important and it therefore follows that all fields of the form should be completed fully.

There is a clear need for a full audit of the 4000 or so pilot project crash records to be undertaken at the earliest opportunity and in any case before the system rolls out nationally. All errors and omissions should be identified and corrected.

The primary tasks are seen as:

- > The GPS coordinates entered actually identify the crash location.
- > The scene description fields are completed correctly; an example being the majority of the records show traffic signals being present when clearly they were not.

The RAIS program has significant limitations within the program with respect to analysing all the data held by the database. There is therefore a need to be able to export all the data to undertake this task. The program has an export capability, however, this removes or combines many fields making a meaningful analysis of the data impossible.

It is recommended this loss of data during the export function is raised with the developers of the program. There is a clear need for the Ministry of Works, Transport and Communications and the Police to have an ability to export all data in a recognisable and useful format to enable them to fully analyse and utilise the data they have collected.

The review identified a significant number of missing fields within the RAIS database that are considered essential for any meaningful analytical purposes. These gaps need to be addressed at the earliest opportunity to ensure the project maintains credibility.

MoWTC should give TANROADS and other road authorities full access to the accident database, and train them as well as the traffic police on how to use it.

#### 4.3.4 Policy implications

The main policy implication is to provide other stakeholders direct access to the accident data system.

### 4.4 Funding

The design and implementation of an effective road safety programme requires adequate financial and technical resources. Without secure and stable funding there can be little progress. The principal responsibility for funding road safety rests with central government, but it is also fair that the road user be made to contribute.

The economic losses to the country because of road crashes are very substantial – see section 1.1 and Appendix C - so investing in effective road safety interventions makes very good sense.

In countries where the responsibilities for road safety are widely shared and there is no effective coordination, as in Tanzania, it is perhaps not surprising that the road safety programme has always been under-resourced, and lacked technical and political support.

There is no international best practice when it comes to funding road safety. Most countries just allocate money from the government budget. The range of funding sources includes:

- > General tax revenues
- > Specific taxes (often traffic fines) earmarked to support road safety
- > Levies on motor vehicle insurance premiums
- > Road funds, fed from user fees (usually fuel levies)
- > Levies on vehicle and driver fees
- > Private sector sponsorship.

#### 4.4.1 Existing situation

It is difficult to estimate how much is being spent on road safety, because there are so many public and private stakeholders involved. As far as we are aware, the only government agencies with a budget line for road safety are the Ministry of Works, Transport and Communication and TANROADS. Others are presumably funding road safety activities from their general budget.

Surprisingly, the National Road Safety Council, which comes under the Ministry of Home Affairs, receives no government funding at all. It is unclear why this should be so when it is the body legally empowered to lead the nation's road safety efforts. The Council relies instead on private sponsors and the sale by the Police of Road Safety Stickers, but these resources are nowhere near enough to support a proper road safety programme. It is understood that most of the Council's money is spent on organising National Road Safety Week.

There is growing involvement from the private sector, particularly fuel and vehicle suppliers, but they cannot be expected to contribute in a big way. There seems to have been little interest from the insurance industry, despite the fact that investing in road safety so as to reduce claims would seem to be good for their business. Some donor financing occurs, but mostly for capacity building in road safety engineering and implementing pilot blackspot schemes.

The National Road Safety Policy 2009, says that road safety activities other than infrastructure improvements shall be funded largely from road user charges. It provides for the setting up of a Road Safety Fund to be funded and administered by the Roads Fund Board. The Board gets its money from a levy on fuel sales. Other sources mentioned are traffic fines, levies on motor vehicle insurance premiums, and other road user charges, such as driver and vehicle licence fees. None of these policies have been implemented. It is presumed that provision for



them is included in the proposed Road Traffic and Safety Bill, but this has yet to be passed by Parliament.

#### 4.4.2 Identified gaps in funding

Existing funding is completely inadequate to support an effective road safety programme. What little funding there is comes mostly from government and it is not stable – it varies from year to year depending on the state of the government’s finances and its priorities. In recent years, government agencies have not always received the full amount of their approved budgets.

#### 4.4.3 Recommendations on interventions

It is recommended that the Road Safety Fund be established as soon as possible – this can probably be done without new legislation. The National Road Safety Council can then make an application to the Fund, and this could include provision for a small technical secretariat. The Council would need to enter into a performance agreement with the Roads Fund Board and be willing to provide full transparency and accountability for the use of the funds received. It is recommended that the Board allocate funds for several years ahead so that the Council can plan and implement a sustainable road safety programme. In some countries, the Road Funds Board allocates a specific proportion of its revenue to the road safety agency. In New Zealand, it is 15%.

There is also a good case for a proportion of the estimated TSh 35 billion collected annually in traffic fines to be retained by the Police to finance law enforcement work. The traffic police have been chronically underfunded for decades, and this has contributed to a worsening road safety situation. In addition, as stated previously, tough but fair traffic laws, professionally and effectively implemented, will do more than anything else to improve road user behaviour sufficiently to bring about a dramatic decline in road crashes.

It makes sense to impose a levy on motor vehicle insurance premiums in order to fund a scheme to compensate victims of hit and run and uninsured drivers. There may also be scope to introduce levies on vehicle and driver licence fees, but it is arguably better to make the user pay on a travel-distance-related basis, as happens with the Roads Fund.

#### 4.4.4 Policy implications

The policy implication of these recommendation are the proposed Road Traffic and Safety Bill has to be passed by Parliament and priority is given to providing financing for the Road Safety Board from the road Fund and possible other sources of financing, e.g. different fees.



## 4.5 Regulation of road freight and passenger transport

### 4.5.1 Existing situation

The geographical area of Tanzania is extensive with travel times, from one side of the country to the other, measured in days. The movement of goods and passengers is essential not only for the Tanzanian economy but also for the bordering countries of Rwanda, Burundi and Zambia and further beyond like the Democratic Republic of the Congo.

The control of passenger and goods transport is therefore an important aspect of maintaining a safe road network within Tanzania. When an incident involves a passenger-carrying vehicle, the potential for a high number of killed or severe injury toll is inevitable. Due to the larger and heavier nature of the goods vehicles whenever they become involved in an incident it invariably is serious resulting in death and injury to other road users unfortunate to be in the area at the time.

Two bodies currently cover the control of these groups of vehicles:

- > The police undertaking the enforcement of the road traffic laws associated with the safe driving, loading and general mechanical condition of the vehicle
- > The licensing of the vehicle to operate on the road network is undertaken by SUMATRA.

The leading legislation with respect to the enforcement of traffic rules by the Traffic Police is the Road Traffic Act 1973 Amended. The police activities with respect to the majority of these matters have been covered in Section 6.2, later in the report.

The enforcement activities undertaken by the Traffic police officers, with respect to this class of vehicle, are generally associated with checking the vehicle and driver documentation and any contravention of the speed limit. A large number of Traffic Police Vehicle Inspectors undertake daily road checks to inspect the mechanical conditions of these vehicles.

The leading legislation with respect to the licensing and control of road freight and passenger transport is:

- > Goods carrying vehicles are covered under The Transport Licensing (Goods Carrying Vehicles) Regulations 2012.
- > The Transport Licensing (Road Passenger Vehicles) Regulations 2007.

The lead agency responsible for overseeing road freight and passenger transport in Tanzania is the Surface and Marine Transport Regulatory Authority (SUMATRA). The powers invested in this authority are provided under The Surface and Marine Transport Regulatory Authority Act, 2001.

The functions of the Authority are provided in S6 (1) The Surface and Marine Transport Regulatory Authority Act, 2001. This empowers the authority to:

- > Issue, renew and cancel licences
- > Establish standards for regulated goods and regulated services
- > Establish standards for the terms and conditions of supply of the regulated goods and sources
- > Regulate rates and charges
- > Make rules.

The authority has the power under section 17 (1) to require any person whom it believes could supply information that may assist the performance of any of its functions.

The authority under an amendment to the Transport Licensing Act 1973 has been given all the powers and functions invested in the Central Licensing Authority and the Regional Licensing Authorities. This power enables any police officer, member of the authority or administrative officer to stop and inspect any vehicle to ensure the provisions of the Act or any regulations are being complied with.

The regulation of passenger carrying vehicles commences with the assessment process undertaken to initially obtain a license to operate such a business. The requirements of this assessment is contained within The SUMATRA (technical Safety and Quality of Service Standard) (Passenger Vehicles) Rules 2008.

The license is valid for 1 year whereupon it must be renewed. The requirements for the renewal process are contained within The SUMATRA (technical Safety and Quality of Service Standard) (Passenger Vehicles) Rules 2008.

At each stage of the process, failure to comply fully with any of the requirements will affect the issue or reissue of the license to operate. The powers are outlined in Part IV of The SUMATRA (technical Safety and Quality of Service Standard) (Passenger Vehicles) Rules 2008.

- > Anecdotal evidence provided by SUMATRA indicated that the current process being undertaken on first application for a license is operating effectively. The required documentation and inspection processes are ensuring operators are 'fit' to be allowed to operate on the road network.
- > The review identified the renewal process requires the same documentation and inspection process but appeared to lack a structured assessment of the operators activities with respect to being involved in road accidents or committing any traffic violations during the term of the previous license.

The team carried out interviews with bus companies to try to understand the causes of bus crashes and why some bus companies do better than others do. Most bus operators indicate they know drivers should not drive too long and say that they ask their drivers not to drive too fast. When talking to bust drivers some mentioned that they were sometimes pressed by bus operators to drive faster than the speed limit and it was also mentioned that some were paying low

salaries so drivers and assistants unofficially picked up passengers along the route and kept the extra income. This leads to delays and thus a need for speeding. There was also a tendency from the interviews that companies with older busses, e.g. using a business model buying second hand vehicles were among those with suspended licences, e.g. due to accidents.

#### 4.5.2 Identified gaps in legislation and regulation

The legislation governing the licensing of vehicles for carriage of passenger and goods operations has relatively recently been drafted and in general is adequate for the current status of the operational fleet.

The requirements with respect to vehicle fitness and maintenance are also, in general, adequate for the current state of the enforcement capabilities. However, the need to develop a more comprehensive set of regulations to address modern vehicle safety standards is seen as essential. This would also require a commensurate upgrade of the vehicle inspection capabilities of SUMATRA and the traffic police.

The legislation lacks any direct controls or restrictions on the number of hours the driver of a passenger carrying or goods carrying vehicle may drive without taking a daily rest. Currently the only restriction applies to passenger carrying vehicles which, between the hours of midnight and six am are not permitted to drive on the road network. This period of enforced break is significantly less than international standards would normally require. The positive element is that it is simple and easily enforceable. The need to develop legislation with respect to the maximum driving hours and rest breaks is seen as very important. Any legislation proposed should consider similar legislation being drafted by the EAC and SADC regions. This would also require a commensurate upgrade in technology to enforce the regulations and a significant enhancement of the enforcement capabilities of SUMATRA and the traffic police.

The legislation also lacks any physical restriction (speed governor) with respect to the maximum speed the vehicle can travel at. Internationally these classes of vehicles are all controlled by a legal requirement to have speed governors fitted. The review team identified that a high percentage of the more modern vehicle fleet, both trucks and busses, registered in Tanzania are already fitted with sophisticated speed governing and vehicle tracking technology which is currently deactivated.

With respect to the speed governing technology the systems is 'hardwired' into the vehicle making it impossible for the system to be tampered with. If the system identifies any attempt to alter the settings, the vehicles power and speed reduce significantly.

The vehicle tracking technology is also 'hardwired' into the vehicle. The system is designed around an international fleet management protocol providing real time updates on all elements of the trucks use. The system can also be simply activated by the manufacture.

### 4.5.3 Recommendations on interventions

SUMATRA as the lead agency is responsible for overseeing and ensuring the operations of passenger and goods carrying vehicles are carried out safely. The legislation provides powers under the Transport Licensing Act, 1973 and regulations for SUMATRA to ensure the vehicle fleet complies with all the rules and regulations. Where these rules and regulations are not being complied with, SUMATRA has the power to suspend or revoke an operator's license.

The number of operator licenses suspended by SUMATRA during 2015 would appear not to reflect the noncompliance of regulations as identified in the Kibaha survey. The need for SUMATRA to become more proactive in this area will provide a significant deterrent factor to ensure the manner of driving and the mechanical conditions of the vehicles are improved.

For SUMATRA to take a more proactive role they need to have a greater understanding of which operators they need to target. To achieve this they need to create a knowledge base of the vehicles and operators that have either committed violations or been checked by the police for following reasons:

- > Vehicles that have been involved in road crashes.
- > Mechanical defects identified at a road check
- > Anecdotal information as to potential defects or malpractices.

SUMATRA already has a database for its current licensing activities. This needs to be expanded to include information with respect to any incident or information associated with the company, vehicles or drivers registered.

There is a clear need to facilitate a flow of information between the police and SUMATRA. This could start with the police providing a monthly report to the regional SUMATRA office with respect to passenger or goods carrying vehicles that have come to their notice. In time, this process should become automated with direct links established between the police computer systems and SUMATRA's. As a stakeholder in road Safety SUMATRA should also have access to or be automatically provided with updates from the RAIS database with respect to any incident involving any vehicle under its jurisdiction.

Having gained information of the conduct of the vehicles and companies within its jurisdiction SUMATRA will then need to create an operational enforcement and investigation section. It is envisaged this investigation section would monitor the information received from the police and undertake an initial assessment; checking to see if there are any previous reports. Depending on the result, the following actions should be undertaken:

- > Where no other reports are recorded and the matter is minor file the record
- > Where the matter involves previous reports or is of a serious nature, commence an investigation into the company.

The findings of the investigation will form the basis of the evidence of the companies conduct. This would then be used in any review hearing from which a decision with respect to any sanctions deemed necessary is to be imposed.

Given the fact that the majority of the more modern vehicle fleet registered in Tanzania already has speed governing technology 'hard wired' into the vehicle the practical application of this recognised safety feature needs to be implemented.

SUMATRA provided the review team with a proposal with respect to vehicle tracking technology as an additional 'add on' component for the vehicle fleet. The proposal would appear to have missed the fact that many of the current fleet already has such a system and this fact needs to be addressed within the proposal.

Legislation on maximum driving hours and rest breaks should be developed urgently and should consider similar legislation drafted by the EAC and SADC regions.

#### 4.5.4 Policy implications

The biggest challenge the road freight and passenger transport sector needs to address is the reduction of serious and fatal accidents this sector is involved in. The lack of a robust legal framework controlling this sector is seen as a major problem. The specific areas that need to be addressed are control of:

- > The number of hours a driver can drive given type of vehicle
- > The maximum speed a given class of vehicle can travel at
- > The general road worthiness of a given class of vehicle
- > The general design and safety features of a given class of vehicle
- > Passenger safety.

Internationally regulations controlling driver's hours are fairly uniform in nature they vary in complexity but basically provide for:

- > A maximum single driving period of 4.5 hours before a break of 45 minutes is required
- > A maximum daily driving period of between 9 and 10 hours
- > A daily rest period of not less than 8 hours.

Once the regulations are in place enforcing them has always been difficult. Internationally technology has been developed to record the activities of the vehicle and driver providing a detailed record of a driver's history.

## 4.6 Monitoring and evaluation

Monitoring and evaluation of road safety actions are important for a better understanding of the effectiveness of the measures, for improving the road safety measures in time, and for effective use of the limited funds available for

road safety. The system should be designed to inform all stakeholders of the progress and effectiveness of road safety measures, and could also be used to inform the public on progress in road safety work.

In Sweden, the Swedish National Road Administration (SNRA) and the Swedish National Road and Transport Research Institute are the agencies responsible for evaluation. Annual evaluations are carried out, based on a detailed programme with many sub-areas, each with specific targets. The main aim is to extract crash, casualty and fatality prediction curves.

Road user behaviour that is monitored includes: drunk-driving, excess speed, other violations, use of safety equipment in cars (e.g. seatbelts and child restraint systems), visibility of pedestrians and cyclists, and the use of helmets.

Other items that are monitored cover: vehicle crashworthiness, emergency services rescue times, safety opinions of the general public, and surveys to evaluate whether roads are built to safe standards.

#### 4.6.1 Existing situation

Monitoring and evaluation of road safety interventions is presently at an early stage of development in Tanzania.

Accident data is collected nationally and analysed by the Traffic Police but other stakeholders have at present not direct access to accident data in the accident database but will have to ask for data from Traffic Police.

The overall monitoring of road safety accidents by year is carried out by the Traffic Police. Before yearly reports were issued outlining the main causes of the accidents by various criteria, however, these reports seem not to be issued anymore.

There is no evidence that monitoring of specific road safety measures is carried out systematically.

Commercial road transport companies are monitored by SUMATRA but mainly with focus on enforcement/monitoring of licences. Driving schools are monitored by the traffic police also with focus on licensing.

#### 4.6.2 Identified gaps in monitoring and evaluation

There appears to be little formal monitoring done at present in terms of assessing whether any specific interventions have had the desired effect either in terms of reductions in casualties or in terms of changes in dangerous or undesirable behaviours.

There is no systematic system in place for road accident data collection and analysis by each road authority. They depend on accident data collected by the Traffic Police who collects information on each accident and e.g. present them at regional road safety council meetings.

There seem to be no system in place for data collection on average vehicle speeds, safety belt and helmet wearing rates.

The National Road Safety Policy<sup>15</sup> does mention that it is essential to evaluate the impact of policies, strategies and actions in road safety. The Government is named as responsible for monitoring and evaluation of implementation of the strategy and overall road safety. This includes monitoring progress towards the realisation of the road safety vision goals, development towards specific performance benchmarks and measurable outputs, review the vision every five years and to establish an effective system of communication. Generally, this seems not to have been implemented.

In addition, the planned Road Safety Board is named as responsible to introduce 'target – result' way of working, for establishing a mechanism to evaluate programmes etc. However, this board has not yet been established.

The Draft Implementation Strategy of the National Road Safety Policy of 2009 for the period of 2015-2020<sup>16</sup> suggest a monitoring and evaluation framework to track progress in implementation of the vision, mission, objectives and goals of the strategy. However, this have not been implemented yet.

#### 4.6.3 Recommendations on interventions

For improvement of long-term road safety in Tanzania, it will be beneficial to establish a monitoring and evaluation system. This system will help built up knowledge on what activities are successful and which are not to assist in selection of future interventions and measures:

- > Interventions should be based on analyses of accident data and the expected benefits in terms of casualty reduction or behavioural changes should be quantified and recorded along with information about how the monitoring needs to be done
- > Appropriate data collection should be organised as required to enable monitoring of impacts of road safety interventions in terms of changes in dangerous road user's behaviours or casualty reductions amongst the target groups
- > Implement an accident data collection system securing access for each road administrator to data retrieval from the Traffic Police and access to the detailed accident report data if necessary. This system shall be implemented as follows:
  - > to each TANROADS and Regional TANROADS for Trunk roads and regional roads
  - > to each district for the district roads
  - > to each City Council
- > Develop a list of indicators for road safety by main causes and/or specific items, eventually by region, in order to set-up targets on short and medium term and to monitor the achievement

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<sup>15</sup> National Road Safety Policy, Ministry of Infrastructure Development, Dar es Salaam, 2009

<sup>16</sup> Draft Implementation Strategy of the National Road Safety Policy of 2009 for the period of 2015-2020, Ministry of Works, November 2014.

- > Implement an accident monitoring system for the sites that have had improvements regarding road safety
- > Implement systems to regularly monitor and evaluate safety performance against targets.

A suggestion for a monitoring and evaluation system will be presented in Chapter 9.

## 4.7 Research in road safety

Road safety research should provide the framework against which safety policy decisions should be made so that a systematic scientific approach is applied to the problem. The countries with the best road safety records internationally are also the ones who have traditionally had the best and most active road safety research institutes and road safety research programmes. It is important that Tanzania learns from other countries and utilises the research experience and capability that does exist in the country so that more effective safety interventions can be implemented and monitored in future.

In Sweden, the Vision Zero is supported by road safety research provided by the Swedish National Road and Transport Institute (VTI), and by various universities, covering areas such as mobility and safety, road design safety standards, vehicle crashworthiness, telematics and traffic analysis. In the other countries which have a particularly good safety record (UK, Netherland) road safety research has been an important factor in driving the improvement of road safety and both these countries have excellent programmes of road safety research.

### 4.7.1 Existing situation

Currently limited research seem to be carried out on road safety in Tanzania.

The universities teaching the future road engineers, transport planners etc. appear to undertake no or limited research on road safety topics. The students also appear to get very few or no lectures on road safety issues as part of their degree courses.

It was not brought to the project team's attention if any research is undertaken at economic institutes to determine the average social costs of a fatal and severe accident since the 2007 BICO study<sup>17</sup>.

The National Road Safety Policy is not specifying specific measures and actions for enhancing the road safety research in Tanzania.

### 4.7.2 Identified gaps in road safety research

Presently, a national strategy for road safety research is not in place in Tanzania, and there is no independent national road safety research organisation, and only limited demonstration and pilot programs have been

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<sup>17</sup> Study on Road Accidents in Mainland Tanzania for SUMATRA by BICO, 2007



conducted on road safety. Thus, in Tanzania there is no systematic research on the relevant factors in road safety for e.g.:

- > Human factors
- > Road infrastructure
- > Institutional factors
- > Other factors.

One reason mentioned by stakeholders is the lack of appropriate accident data. In addition, there are no specific funding mechanism for research in road safety in place.

With little or no road safety research being undertaken in universities or in institutes, there is little information to disseminate or share amongst interested academics and researchers. Consequently, there does not seem to be any specialist road safety research journal or even annual conference or seminars where road safety research results are disseminated, discussed or shared amongst local academics and researchers apart from the annual conference held by the Tanzania Road Association (TARA) where sometimes papers are given on road safety research.

### 4.7.3 Recommendations on interventions

Research in road safety should be enhanced in order to provide more insight in the accident mechanism and to identify the proper measures and actions for reducing the number and effects of road accidents:

- > Government – e.g. through the National Road Safety Council - to compile a list of all road safety research undertaken in Tanzania in the last 10 years and to identify universities and research institutes interested in and capable of carrying out commissioned research on road safety issues
- > Develop a national road safety research strategy with clear objectives, and identify and secure the related needed funds for it
- > Start with a 1-year research programme on the most severe black spots in Tanzania involving e.g. motorcyclists, pedestrians and bicyclists and design the measures for reducing the number of accidents with pedestrians and motorcyclists on different areas and type of roads
- > Devise comprehensive framework of research projects covering e.g. vehicle factors, road factors, behavioural factors and institutional factors for implementation over a 3-5 year period
- > Systematically develop road safety research capability in universities and research institutes to develop a pool of researchers to support the safety programme in Tanzania or establish an independent national road safety research organization to carry out a national programme of road safety research
- > Encourage/support research institutes to organise an annual conference of academics and researchers to present and discuss the research findings for the commissioned research

- > Ensure that universities / research institutes and other with an interest in road safety have access to the crash database.

#### 4.7.4 Policy implications

The main policy implication include to develop a road safety research strategy and to ensure that universities / research institutes and other with an interest in road safety have direct access to the crash database.

## 5 Safer roads

International research suggests that problems with the road are a secondary causal factor in about 30% of crashes. Human error plays a much bigger part, but it is difficult to train road users not to make mistakes – whereas it is relatively easy to fix road problems. Road safety engineering is the name given to the practice of fixing road problems in order to reduce road crashes. It can be defined as a systematic, data-led process for devising and implementing road design or traffic management improvements that will cost-effectively reduce the cost of road accidents.

Many countries have now adopted the ‘safe system’ approach<sup>18</sup>. In essence, this is about building a road and traffic system that allows for human error without leading to death or serious injury. The care of human life and health is considered more important than maximising traffic flow and reducing journey times. The emphasis is on designing roads that are easier to understand, and where speeds are constrained to a safe level. This is proactive, as it encourages the incorporation of road safety in the design of roads, rather than being an afterthought<sup>19</sup> or something that can be added on later if there is any money left.

An overview of best practice is illustrated in Figure 5-1. A brief explanation of the terms used in Figure 5-1 will be helpful at this stage:

- > **Road safety audit (RSA):** a systematic and formal check on the safety of a road project before it is built
- > **Road safety inspection (RSI):** a systematic and formal review of the safety of an existing road
- > **Identifying and treating crash sites on existing roads:** a systematic process for identifying locations with an unusually high incidence of crashes, analysing the contributory factors, and then designing and implementing low-cost engineering countermeasures - also sometimes referred to as a blackspot programme, or hazardous road location programme.

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<sup>18</sup> Swedish Road Administration, Vision zero – from concept to action, Borlange, 2000

<sup>19</sup> Breen J, Humphreys R M, Melibaeva S, Guidelines for Mainstreaming Road Safety in Regional Trade Road Corridors, WP 97, SSATP, 2013

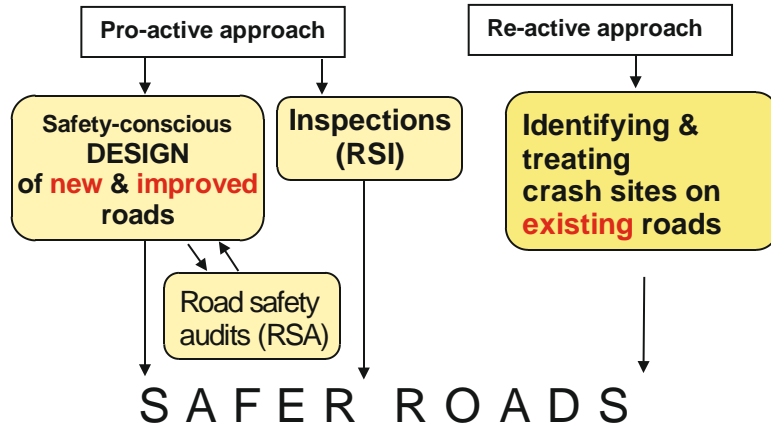


Figure 5-1 Elements of a road infrastructure safety management system.

## 5.1 Roads in Tanzania

This section is a brief presentation of the roads in Tanzania with regard to road safety.

### 5.1.1 Trunk roads

The trunk road network is now of a serviceable standard, after decades of heavy investment. Further improvements are ongoing. However, there are still many safety problems, including the following:

- > On some roads the carriageway and shoulders are not wide enough to accommodate all traffic safely, e.g., T2 Chalinze to Segera
- > Some roads pass through rolling terrain, where the frequent bends and sharp crests limit the opportunities to overtake
- > There are many sections with unforgiving roadsides (principally steep embankment slopes) that are not shielded by safety barrier



Steep embankment slope



Headwall within safety zone



Steep embankment slope



Steep embankment slope

- > There are many old, narrow bridges with weak parapets and no footways
- > Some road surfaces are in very poor condition, e.g., T1 Ruvu to Chalinze



*Limited facilities for NMT and no speed calming*



*Limited facilities for NMT and no speed calming*



*Busy road through town – no marking in junction*



*Serious rutting of road*



*Serious rutting of road*



*Worn road markings and no delineators or other background markings*

- > Although most villages on trunk roads now have speed management measures (principally speed humps), there is still some conflict between Non-Motorised Transport (NMT) and through traffic, e.g. due to lack of facilities for NMT
- > Roadway delineation (chevron signs, road markings, reflective road studs, marker posts, etc.) is generally poor, which makes for difficult driving, especially at night
- > A few sections pass through busy urban areas, where there are many conflicts, e.g., Arusha, Mbeya, Morogoro
- > Some sections have very difficult alignments, e.g., Wami, Kitonga Gorge
- > In a few sections, the traffic volume far exceeds the safe capacity of the road, e.g. T1 Dar to Chalinze, which is probably the most crash-prone section of road in the whole of Tanzania.

It must be recognised that some of the above problems will be difficult and expensive to solve.

### 5.1.2 Regional and District roads

The standard of Tanzania's rural roads is improving slowly. Traffic volumes are increasing, in large part due to the popularity of bodabodas. There has been no proper study of rural road crashes, but it is thought that one of the biggest problems is collisions between motor vehicles and NMT (pedestrians and cyclists) in villages. There are usually no speed limit signs or speed management



measures in the villages. The signing of hazards is poor. Defective road surfaces are a significant causal factor in the many motorcycle crashes, but few Districts have sufficient resources to maintain all their roads in good condition.



*Figure 5-2 Motorcycle on narrow local roads (From AMEND report<sup>20</sup> and AMEND presentation)*

### 5.1.3 Urban roads

A high proportion of all road crashes occur in built-up areas, and it is not hard to see why, for this is where the traffic conflicts are greatest. There are conflicts between traffic streams as well as conflicts between motor vehicles and NMT. Poor urban planning / traffic planning/ development control is to blame, along with decades of under investment in urban traffic and transport systems. In addition, there are no traffic engineers in the urban authorities.



*Limited space on sidewalks – pedestrians use the busy road*



*Mix of heavy motorised traffic and vulnerable road users*



*Mix of heavy motorised traffic and vulnerable road users*



*Vulnerable road users crossing several lanes on road*

Perhaps the biggest safety problem is the failure to provide for NMT - even the main streets lack adequate footways, and very little help is given to pedestrians who wish to cross busy roads. Motorists' lack of respect for NMT is partly to

<sup>20</sup> Road Traffic Injury on Rural Roads in Tanzania: A study to determine the causes and circumstances of motorcycle crashes on low-volume rural roads, Final report, V1.1, AMEND, September 2014

blame, but urban authorities could do much more to control traffic speeds, channelise traffic, and provide islands so that pedestrians never have to cross more than two lanes of traffic. Zebra crossings only provide a modest improvement in safety for pedestrians, but where they are provided they are often not well signed, or they are not located where pedestrians want to cross. Where footways are provided the authorities need to ensure that they are not obstructed by parked vehicles or hawkers.

## 5.2 Design standards and practices

Safety considerations are now given much greater importance in highway design than they used to be, but there is still some way to go. Best practice can be summarised as:

- > Terms of reference for design contracts stress the importance of providing safely for all road users, especially the vulnerable ones such as pedestrians and cyclists – if the scheme is an upgrading of an existing road, the designer must assess the existing safety problems and show how the design will remove or mitigate them
- > Terms of reference for design contracts require that a road safety engineer be part of the design team
- > Highway engineering courses give greater emphasis to designing safer roads
- > Official manuals exist that give detailed, safety-conscious design guidance - these are continually improved and re-issued as experience is gained
- > There is a comprehensive traffic sign system conforming to international and regional protocols and it is complied with
- > Designs are subject to a formal safety audit at all stages in the design process, but especially at feasibility study and preliminary design stages
- > Highway schemes are safety audited a few years after opening, and any lessons learnt are fed into revisions of the design manuals.

### 5.2.1 Existing situation

The terms of reference that TANROADS use for design contracts do not stress the importance of providing safely for all users. However, a paragraph requires the designer to identify blackspots and provide solutions. Moreover, the importance of planning the traffic management at worksites is recognised. Usually there has to be an environmentalist and sometimes a sociologist on the design team, but not a road safety engineer. There is no mention of road safety audits.

MoWTC published the *Road Geometric Design Manual, Part 1 Trunk and Regional Roads* in 2010. There is good coverage of safety considerations, though, not surprisingly perhaps, it does not advise what to do when these conflict with other considerations, such as maximising traffic capacity, providing adequate drainage, and keeping costs down. A *Low Volume Roads Manual* is close to completion and the manual will have a section on road safety. PO-RALG is providing some simple safety design guidance to District Engineers through its

IRAT (Improving Rural Access in Tanzania) project, but there are no standards and guidance on urban traffic management.

Tanzania uses the SADC (Southern African Development Community) traffic sign system. SADC published a comprehensive traffic signs manual in 2009, but there is thought to be only one copy in TANROADS, and it is unlikely that any of local authorities have a copy. MoWTC published a summary *Guide to Traffic Signing* in 2009, but it is out-of-print. Most signing and marking on the trunk and regional roads now conforms to the SADC system. The main exception is in the marking of 'no overtaking' centrelines, which are often inconsistent or just wrong; TANROADS engineers and their supervision consultants are failing to ensure that the SADC standards are followed. The durability and reflectivity of road markings is poor. District Engineers do not appear to have a good knowledge of the SADC sign system.

The various manuals are only available in hard copy, and some are out-of-print. Some design consultants may not even be aware that they exist.

### 5.2.2 Identified gaps in design standards and practices

Designs are not being done by engineers with road crash experience, and, as safety audits are rarely done, there is a real risk that roads are being built that are not as safe as they could be. There have been pedestrian safety problems with several newly-built roads in Dar es Salaam – perhaps these could have been avoided if best practice had been followed.

One of the biggest gaps is in technical guidance and capacity building for urban authority engineers – not just design of new urban roads, but also design of traffic management and safety schemes, and advice on development control.

A bridge design manual has been in preparation for some years, and needs to be finalised and published. There are many old bridges in Tanzania where there are safety concerns, such as narrowness of the deck, lack of footways, weak parapets and so on. It is important to devise cost-effective remedial measures and publicise them.

### 5.2.3 Recommendations on interventions

Safety-conscious technical manuals are needed on bridge design and all aspects of urban traffic planning and design. All manuals should be available on the MoWTC, TANROADS and PORALG websites.

For major highway projects, the preparation of Design Base Statements by the design consultants will help in identifying where the manuals need to be revised and improved.

Although adherence to standards and guidance does not guarantee that the design will be safe, it would be helpful if TANROADS made more effort to ensure



compliance. In some countries, designers are required to formally seek approval from the road authority for all proposed 'Departures from Standards.'

The biggest safety gains will come when design consultants are made to include a road safety engineer on their team. Short inputs at the beginning (when key decisions on geometry etc., are being made) and end (when the detailed design and signing is being finalised) are all that is necessary. There will still be a need for an independent safety audit of the design.

### 5.2.4 Policy implications

Highway design, whether for new roads or for upgrading existing ones, inevitably involves compromises – trade-offs between conflicting requirements. MoWTC and its agency, TANROADS, need to ensure that its designers give much greater weight to road safety, especially safe provision for pedestrians and cyclists. The National Road Safety Policy is very clear on this, but it has not been taken on board. Evidence of them doing this would be a greater emphasis on road safety in design ToRs, a requirement to use road safety engineers on design teams, an insistence on schemes being safety audited, and audit recommendations being taken seriously by road authority management.

## 5.3 Road safety audit (RSA)

A road safety audit is a detailed safety check on a road scheme before it is built. The objective is to identify potential safety problems, so that, where possible, the design can be improved to eliminate or reduce them. They embody the principle of "prevention is better than cure."

The audit is only concerned with road safety and is carried out by experienced auditors who are appointed by the road authority and who are independent of the scheme designers. The audit report lists the problems that have been identified, explains why it is a problem, and recommends remedial action. It is submitted to the road authority, and they have the final say on whether the recommendations are adopted – usually after having consulted the scheme designer. Figure 5-3 shows a typical audit workflow.

Best practice in road safety audit can be summarised as follows:

- > the earlier a scheme is audited the better – many safety-critical decisions are taken at the feasibility study stage, it is thus important to do the first audit then; the audit is repeated at the preliminary design stage and then the detailed design stage, but by this time there is likely to be little scope to make significant safety improvements
- > it must be a formal process with an audit report submitted to the road authority and a formal response – with everything put on record
- > the audit should be carried out by a team of people who together have a range of safety experience, including highway design, crash investigation, safety improvement schemes, and traffic law enforcement

- > the audit team should, be independent of both the scheme designer and the road authority, so that they are able to take a completely fresh look at the scheme
- > where there are major changes to the design during the construction these should be audited
- > road authority management must take the safety audit seriously and this includes making a decision (recorded in writing) on each of the audit recommendations.

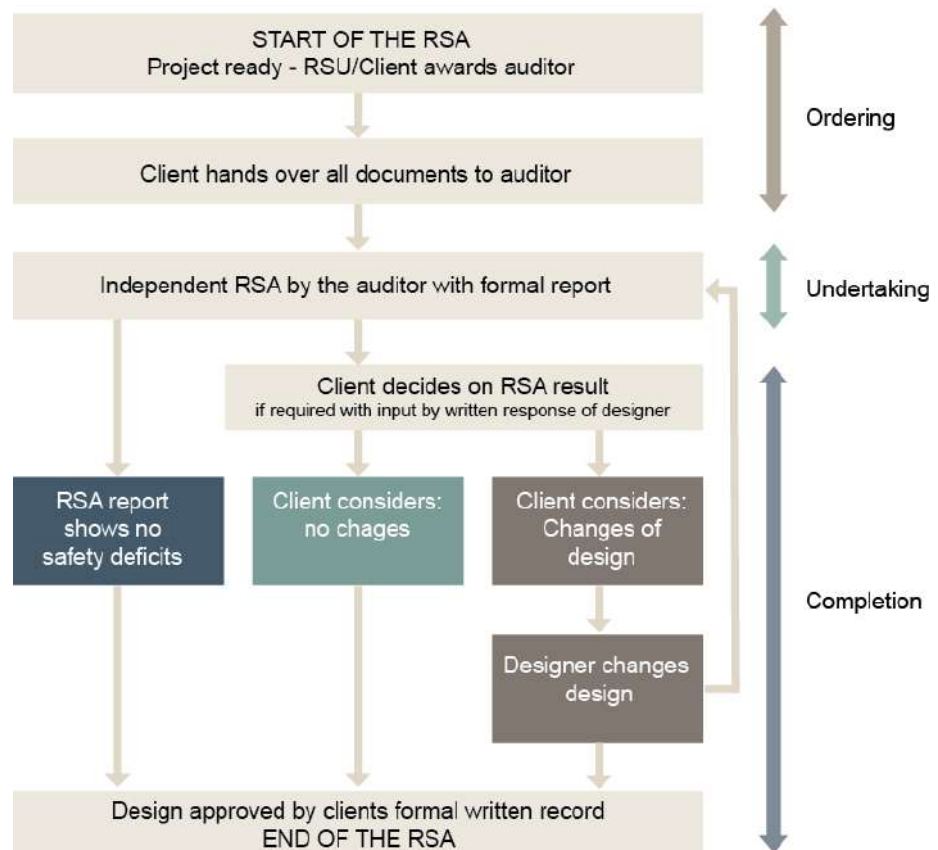


Figure 5-3 The Road Safety Audit workflow.

### 5.3.1 Existing situation

Although the need to do safety audit on major schemes has been recognised for a long time they are still rarely done. Audits were proposed in the 2004 *Road Safety Master Plan* and the 2009 *National Road Safety Policy*, as well as other road safety strategies and plans that have been prepared over the years. Section 33-1 of the *Roads Act 2007* states that the road authority shall ensure the safety of road users during the design of public roads. In 2009 the Ministry of Works produced *A Guide to Road Safety Auditing*, and training courses in safety auditing have taken place every two or three years – the last in 2014, funded by the EU.

TANROADS say their road safety engineers do an informal safety check on major projects, but this is not a satisfactory substitute for a proper safety audit. Some of the major schemes completed by TANROADS in recent times have had safety

problems, and it is possible that these might have been avoided if the scheme designs had been safety audited. According to TANROADS, it is expensive and time-consuming to employ foreign safety auditors. There is though no need to do this, as there is some local expertise that could be developed.

In many countries, the need to give greater emphasis to safety during design has been pushed by the funding agencies, but this has not happened here. However, the African Development Bank is now insisting that all the schemes it is supporting are safety audited. The only concern is that up to now these safety audits have been done late in the design process, and in some cases, after the construction work has commenced. This means that there is limited scope to remedy any safety problems that are identified. The audits could perhaps have been done in a timelier manner if they had been entrusted to local consultants, or TANROADS's own safety engineers.

### 5.3.2 Identified gaps

Safety audits are seldom done, despite the need being recognised, and training having been provided. This is in marked contrast to the consideration of the environmental aspects of road projects; every major scheme has to have its environmental impact assessed by specialists, and their report is vetted by the Government's National Environmental Management Council, who then issue an Environmental Impact Assessment Certificate. The difference of course is that there is a considerable body of legislation designed to protect the environment, and all international funding agencies have mandatory and rigorous environmental protection procedures. Unfortunately, there is nothing similar for road safety.

Safety auditing a scheme is not a guarantee of safety, as not all safety problems can be foreseen, and anyway it is likely that some of the audit recommendations will be rejected by the road authority, often on cost grounds, or because it is too late to change the design. However, auditing is relatively cheap to do, and can often identify cost-effective ways of improving safety.

### 5.3.3 Recommendations

It is recommended that TANROADS ensure that all major schemes are road safety audited at Feasibility Study, Preliminary Design, Detailed Design and Pre-opening stages. It can also be useful to do an inspection a few years after the road is completed – taking note of any crashes that have occurred. The audits can be undertaken by their own road safety engineers supplemented where necessary by engineers and others who have attended previous trainings. It is understood that TANROADS plan to recruit a consultant road safety engineer, so he / she could mentor the auditors. They must be formal audits that conform with the guidance contained in the MoWTC's "Guide to Safety Auditing". The African Development Bank's *Road Safety Manuals for Africa - New Roads: Road Safety Audit* is another useful source of advice. Copies of the audit reports, including the project manager's response, should be sent to the MoWTC so that they can monitor how well the audit system is working.

Using local engineering consultants means that audits can be arranged quickly and at limited additional cost. There are some with safety engineering experience, and once TANROADS starts offering safety audit contracts the local consultants will surely respond by building the necessary capacity. One of the TANROADS's safety engineers can be seconded to the consultant's team to ensure quality control. The most efficient way of organising this will be to appoint one firm of consultants to undertake all safety audits for TANROADS for a period of several years – this will be cheaper and much faster than procuring a consultant for each audit. Using 'in-house' auditor's means that audits can be arranged quickly and at no additional cost. The main drawbacks are that the auditors are not independent and will be heavily influenced by established TANROADS design practices, and, being junior staff, their recommendations may not be taken seriously by the project managers.

It is also recommended that the MoWTC bring in legislation to make safety audits a legal requirement. Audit reports would need to be vetted by a supervisory body, possibly the MoWTC or a new Road Safety Agency, but the approval procedure should be kept as simple as possible so as not to delay road projects.

## 5.4 Road safety inspections (RSI)

Road safety inspections aim to identify safety hazards on existing roads so that they can be removed or made less dangerous before crashes happen. Hazards typically include:

- > Missing or wrong signs and markings
- > Roadside hazards that need to be removed or shielded
- > Confusing alignments
- > Conflicts – particularly conflicts with pedestrians and cyclists
- > Missing or damaged guardrail or bridge parapets
- > New roadside development or encroachments that could affect safety.

Road safety inspections should be done by travelling along the road and recording road hazards and defects in a systematic way. Inspectors need to have good knowledge of the signing and marking system, and an awareness of common road hazards. Making a video is of great help in checking and analysing the results once the inspection team is back in the office. A formal written report is made containing the results and the recommendations. Recommendations on whether something needs to be done will often be based on a risk assessment – involving both an assessment of the likelihood of a crash happening and the likely severity of such a crash. Cost-effectiveness of the proposed remedial treatment will also be an important factor.

Road safety inspections should ideally be undertaken every three to five years for the entire road network.

### 5.4.1 Existing situation

TANROADS Regional Manager’s staff are travelling their roads frequently and will no doubt report any serious hazards they see, but this is not a satisfactory substitute for a thorough and systematic road safety inspection undertaken every few years. It is unlikely that District Engineers are doing RSIs.

### 5.4.2 Recommendations on interventions

TANROADS Regional Manager’s should arrange for road safety inspections to be done – possibly every three years for the trunk roads and every five years for regional roads. The Road Safety Focal Persons in each Region should take the lead. Preparation of a guidance note and standard survey form would be helpful in ensuring consistency throughout the network. The African Development Bank’s *Road Safety Manuals for Africa – Existing Roads: Proactive Approaches* is a useful source of advice.

Road safety inspections by the District Engineers may have to wait until their capacity to do road safety engineering is considerably strengthened.

## 5.5 Identifying and treating crash sites on existing roads

Best practice requires that this important task be undertaken in a way that is: scientific, methodical, and evidence-based. See below:

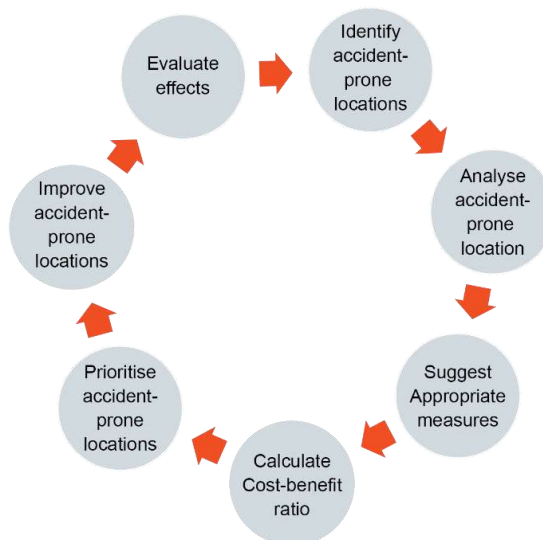


Figure 5-4 The process for identifying and treating crash sites

There are three main approaches<sup>21</sup>:

- > Single sites: treatment of specific sites or short lengths of road which have an above-average concentration of crashes (often referred to as blackspots)

<sup>21</sup> Safer Roads, A Guide to Road Safety Engineering, K W Ogden, 1996

- > Route action: treatment of roads ( typically 10-100km in length) where the overall rate of crashes is above average, but the crashes are not concentrated in specific locations
- > Area action: application of treatments over an area, typically a residential area within town which has an overall rate of crashes that is above average.

All three approaches are very dependent on the availability of reliable crash data.

The African Development Bank has produced an excellent best practice manual<sup>22</sup>.

### 5.5.1 Existing situation

Section 33-1 of the Roads Act 2007 makes all road authorities (TANROADS and local authorities) responsible for ensuring the safety of road users during the operation of public roads. However, of course, road authorities have always been concerned that their roads should be safe to use, and have sought to fix any safety problems that they became aware of. The attention paid to safety aspects has increases as the road network has developed and the number of road crashes has soared.

TANROADS has had a safety unit since its inception, but currently the unit has only one experienced road safety engineer, and there is only a small budget (it is actually a Road Safety and Environment Unit, so there are many calls on the budget). One person cannot possibly provide an adequate safety engineering service. TANROADS recognise the need to establish a road safety engineering capability in its regional offices. In some regional offices, a member of staff has been assigned to be a Road Safety Focal Person but their duties are unclear. TANROADS regional managers all have a small road safety budget, most of which is spent on signing and marking. There are thought to be few, if any, single site or route action projects being done. One of the main reasons for this is the lack of easy access to the Police crash records, and the poor quality of the information they contain, especially on crash locations.

#### Road Safety Engineering Course for TANROADS Coast Zone, 2015

The training course demonstrated that TANROADS engineers can undertake data-led blackspot identification and treatment work. They also showed the benefits of working closer with the traffic police. In addition to building capacity the workshops produced 5 blackspot schemes, which with a little further refinement, could go out to tender and be implemented. However, none have been implemented. The trainers were impressed with the interest that TANROADS engineers showed in doing this work, but this interest is not likely to be sustained if there is no funding for implementing safety schemes.

TANROADS has appointed consultants to design safety schemes for 35 high-risk sites on T1 (TanZam Highway) which were identified in a previous study. This work is being undertaken as part of the World Bank funded Southern African Trade and Transport Facilitation Project, which is expected to fund the

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<sup>22</sup> Road Safety Manuals for Africa: Existing Roads: Reactive Approaches, 2014.

implementation of the schemes. Hopefully, the success of these demonstration schemes will lead to TANROADS doing more of this work.

The **School Area Road Safety Assessment and Improvements (SARSAI)** project has many of the features of best practice road safety engineering. It aims to improve the safety of roads around those Dar es Salaam schools where students have been involved in road crashes. The crash history is investigated, and pupil's routes to school are mapped. Remedial measures have included construction of footways, zebra crossings and traffic calming measures. The Municipal Engineer is involved at all stages. So far, nine schools have been treated under the project. The safety benefits are being evaluated and the preliminary findings are encouraging. The project is managed by AMEND and funded by the FIA Foundation. Another nine high-risk schools will be treated in a second phase of the

It is unlikely that any of the local road authorities have single site, route action or area action projects. Staff have had no training in this work, and as with TANROADS, they do not have good information on where the crashes are occurring and why.

### 5.5.2 Identified gaps

Road authorities are trying to fix safety problems when they become aware of them, but they are not doing this in a very scientific and systematic way. Lack of resources, both human and financial, are a constraint, as is the difficulty in getting good reliable information on road crashes.

### 5.5.3 Recommendations

TANROADS needs to invest more staff and funds into the safety management of existing roads.



Figure 5-5 Output from RAIS giving details of a serious injury crash at the junction of Kenyatta Road, Kinondoni Road, and Ali Hassan Mwinyi Road in Dar es Salaam.

If the early success with RAIS can be sustained and TANROADS staff are given full access, one of the major obstacles will be gone (see Figure 5-5).

The Road Safety Focal Persons in the Regional Manager's offices will need more training, but equally important will be increased allocation of funds for remedial schemes. There is no point in giving staff road safety engineering skills if there is no money to do anything.

It is also important to start building road safety engineering capacity (skills and funding) in the urban authorities. There is a great potential for area action schemes.



## 6 Safer road users

Safe infrastructure is a necessary but not sufficient precondition for a good road safety performance. Another key factor in the safe system approach is to obtain safe road users, e.g. changing dangerous behaviour in traffic and protecting other road users, e.g. pedestrians from dangerous behaviour.

Getting safer road users require both appropriate and relevant traffic laws addressing safety issues. Laws are, however, not enough – they should also be enforced. In addition to enforcement, road users may also change behaviour through awareness campaigns and long-life education in schools and of drivers and other road users.

### 6.1 Road user behaviour

Road users are a mixed group e.g. containing of professional drivers of busses and trucks, private drivers of cars, motorcyclists and their passengers as well as bicyclists and pedestrians.

#### 6.1.1 Professional drivers.

The following presents some road user behaviour based on interviews with stakeholders, road users and observations in the field.

##### Bus drivers and their passengers

Recently there has been registered a number of serious accidents with busses often attributed to careless driving by the bus drivers.

Interviews with stakeholders and speed measurement by Traffic Police suggest that bus drivers do not always keep speed limits despite bus owners state that the fines should be paid by the drivers themselves. Interviews with bus drivers showed that all knew the speed limit and basic traffic rules, however most also admitted to be speeding e.g. due to:

- > Passengers pressure to go faster
- > Cannot get to the destination on time unless speeding

- > Low wages make it necessary to compete with other buses to pick up extra passengers (driver keeps the fare).



Figure 6-1 Photo from speed camera of bus speeding

Some also mention that bus owners pressure them to drive fast.



Figure 6-2 Article on serious bus crash

The main cause mentioned by drivers for accidents involving long-distance drivers are:

- > Overspeeding
- > Faulty vehicles
- > Unsafe overtaking
- > Drivers are tired and stressed.

Most bus passengers interviewed had been on a bus that had been driven dangerously – many mention they would call police or ask driver/assistant to drive more safely. Most passengers interviewed consider the bus company’s safety record when deciding which company to use and would be happy if the bus journey took a little longer in order to be sure of arriving at their destination safely.



Figure 6-3 Risky overtaking by busses.

### Truck drivers

It has been mentioned that it is difficult to find trustworthy and qualified drivers. The drivers are sometimes pressed by owners to drive too fast and to drive for too long time without a rest. There is apparently no regulation for driving and resting time.



Figure 6-4 Risky overtaking by truck uphill and near curve.

Truck drivers often speed, drive with alcohol or marihuana in the blood and some bring prostitutes in the truck. Some owners have installed a vehicle tracking system to check speeding.

### Motorcyclists including BodaBoda drivers and their passenger(s)

Motorcyclists have a reputation of taking many risks and not observing the traffic law by e.g. speeding, running for red light, doing risky overtaking's, etc. Studies carried out by AMEND<sup>23</sup> showed that a very big proportion of crashes was due to motorcycle driver behaviour and that 82% of the drivers said they had no driving licence.

During 2015, Transaid, working closely with other key stakeholders in Tanzania, have developed a training curriculum for motorcycle taxi riders. This Africa Community Access Programme (AFCAP) funded programme began by gathering and assessing any existing motorcycle training curricula to identify any gaps that need to be addressed. It was deemed vital that the development of the training curriculum had a strong support from the relevant training schools and regulatory authorities as well as feeding in valuable input from motorcycle taxi riders themselves and addressing the needs of passengers to ensure their support.



*Figure 6-5 Motorcycle driver with no helmet carrying odd cargo.*

SUMATRA and the Traffic Police were engaged from the very start and the project team conducted interviews with Driving Schools and regulatory authorities. Two stakeholder workshops were facilitated; one in Bagamoyo which focused on gathering input from BodaBoda riders, owners and passengers for the curriculum and one in Dar es Salaam that focused on gaining feedback and

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<sup>23</sup> Road Traffic Injury on Rural Roads in Tanzania: A study to determine the causes and circumstances of motorcycle crashes on low-volume rural roads, Final Report, v1.1, AMEND, 25th September 2014



input from key regulatory authorities and ministries. The training course has now been developed and awaits formal delivery.

A survey of helmet wearing rate made by the project team showed that almost 80% of motorcycle drivers were using the helmet correctly in Dar es Salaam while only 30% of the passengers were using helmets correctly. In Mbeya town, the similar figures were almost 70% for drivers and 9% for passenger and in the rural area 33% for drivers and 1 % for passengers. Similar survey carried out by AMEND<sup>24</sup> showed that of the 100 motorcycle drivers who participated in a training programme 73 said that they never wore a helmet, and all 100 said that their passengers never wore helmets. Only ten of the 100 said that they owned a helmet themselves.

*Table 8 Motorcycle helmet wearing rate (percentage) 2016*

	Dar es Salaam	Mbeya town	Mbeya rural
Driver (wearing correctly)	79	68	33
Driver (wearing incorrectly)	13	19	14
Passengers (wearing correctly)	33	9	1
Passengers (wearing incorrectly)	18	6	0

Sample sizes: DSM = 2941 Mbeya town = 1162 Mbeya rural = 244

When the team talked to motorcycle passengers, they all know that it is unsafe to ride without a helmet and most passengers would wear a helmet if the driver offered one to them – the others said they would not wear the helmet because it might be dirty.

### 6.1.2 Drivers of private cars

Drivers of private cars are involved in many accidents and many of the accidents are single vehicle accidents and head-on crashes that could indicate high speed or other circumstances leading to loss of control of the vehicle or collisions with pedestrians. Also risky overtaking's has been observed increasing the risk for head-on accidents.

The consequences become even worse when the vehicle occupants are not using seatbelts. In 2008 in Dar es Salaam, a survey showed that only 55% of front seat occupants used seatbelts. A similar survey carried out by the review team in 2016 showed that 84% were using seatbelts on the front seats. However, in Mbeya the figure was much lower at 34%.

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<sup>24</sup> Road Traffic Injury on Rural Roads in Tanzania: A population based control study assessing Road Traffic Injury on rural roads in Tanzania and the effectiveness of road safety measures at reducing injury rates. Implementation of the Road Safety Programme for the Bago to Talawanda Road, January 2013

Table 9 Seat belt wearing rate (percentage) 2008, 2016

	Dar es Salaam		Mbeya town
	2008 <sup>25</sup>	2016	2016
Driver	67	85	34
Front seat passenger	31	81	33
Driver and front seat passenger	55	84	34
Rear seat passengers	2	6	5

Sample sizes: DSM 2008 = 2723 DSM 2016 = 6264 Mbeya 2016 = 2138

### 6.1.3 Pedestrians and bicyclists

Pedestrians and bicyclist account for up to 40-50% of fatalities. Many of these have been attributed to careless pedestrians and road users. In some instances, this may be true, but many roads do not provide for safe facilities for vulnerable road users or if they do, they are occupied by petty traders and parked vehicles, thus forcing the pedestrians to use the road.

## 6.2 Traffic laws and Enforcement

Traffic law enforcement is a key to the successful implementation of a Safe System approach. It influences driving behaviour through two processes<sup>26</sup>:

- > General deterrence
- > Specific deterrence.

General deterrence can be described as the impact of the threat of detection and penalty on the public at large. Specific deterrence can be seen as the impact of actual legal punishment on those who have been apprehended.

Road traffic law enforcement is one of the instruments to secure or improve compliance with key road safety rules. Police enforcement can only be effective if they operate in a supportive environment of laws, regulations, and a sensitive penal system. Consequently, the effectiveness of police enforcement should not be viewed in isolation<sup>26</sup>.

To maximise road safety effects, traffic law enforcement should primarily prevent violations related to the number or severity of serious and fatal crashes<sup>26</sup>.

All countries around the world, when they develop a civilian police force, eventually create a division or section of the police that deal specifically with traffic associated matters. In many countries, this starts with police officers being deployed to work at intersections. This usually starts in the urban areas and then spreads into the regions as the volume of motorised traffic increases.

<sup>25</sup> Unpublished document, Safety and Environment Department, Ministry of Infrastructure Development

<sup>26</sup> DaCoTA (2012) Speed Enforcement, Deliverable 4.8t of the EC FP7 project DaCoTA

The advent of the automated traffic light system was designed to replace the need for a police officer at every intersection. However, the need to provide some presence to deter motorists from ignoring the traffic lights necessitated the continued presence of these police officers at the junctions.

The continued presence of police personnel at fixed points, spread throughout an urban area, requires a large work force. This large force of personnel requires only a limited transportation capability and a limited knowledge base to undertake their daily work schedule.

The advent of modern traffic management methods and systems designed to automatically maintain and control the flow of traffic within urban areas requires the Traffic Police to completely change its way of operating.

It is therefore an essential requirement for the Tanzanian Police Force to keep pace with the rapid change being brought about by the current road infrastructure programmes being implemented throughout the country. The Traffic Police in particular must become a very efficient, highly trained, well-equipped service. Probably the most important area of change is a requirement to be a mobile force capable of responding quickly to incidents and capable of undertaking mobile enforcement activities.

The Traffic Police are tasked with enforcing the traffic laws of Tanzania which is a crucial role in the fight to reduce the casualty statistics resulting from road traffic collisions. Any road safety initiative to reduce the crash statistics must start from a position of knowledge and understanding as to how and why each collision occurred. The Road Accident Information System (RAIS) currently piloted in eight regions within Tanzania and soon to be rolled out nationally provides the required knowledge base.

The need to present an effective and consistent enforcement deterrent on the road network of Tanzania requires dedication from all levels of the Traffic Police service. The presentation and behaviour of every officer together with the condition and roadworthiness of the enforcement vehicles must be exemplary at all times.

A traffic police vehicle is an essential piece of equipment that has a specific role in incident scene protection and management. Consideration should be given to standardising and enhancing the high visibility profile of most of the enforcement vehicles. The modern high visibility designs for vehicles create a visible presence on the roads, when this is coupled with a structured enforcement policy it will act as a strong deterrent to inappropriate driver behaviour.

When marked police vehicles are being driven, they must always present the best possible example to other road users. This will require all drivers to be trained to



the highest possible standard. The accepted benchmark of driving behaviour for a Traffic Police officer should be set much higher than that expected of the motoring public.

The enforcement of the road traffic laws of Tanzania should be fair and consistent. The belief of the motoring public must always be that they will be prosecuted if they contravene any of the traffic laws.

Enforcement personnel must deal robustly with all contraventions of the traffic law they observe when on patrol; especially if in a marked police vehicle. Whenever a traffic officer fails to deal with contraventions that occur within their view, and this is observed by the general motoring public, there is a belief by the general public that they too can 'get away with it'. Resentment and dissension grows when they are later stopped for the same style of contravention.

The non-compliance of road safety elements of any traffic law must be identified and seen by the general motoring public as an anti-social act. Sensitive but strong enforcement will ultimately gain public backing and greatly assist in the reduction of road casualty statistics.

### 6.2.1 Existing situation

The current style of enforcement of the Road Traffic laws enacted can be divided into two components:

- > Minor traffic infringements which are dealt with by the police by means of a set financial fine system
- > More serious offenses which are dealt with by the judiciary system.

The review identified the vast majority of traffic offenses being recorded were of the fixed fine style. These consist predominately of document offenses albeit within the major urban areas it is evident the police are active in detecting traffic light and speeding offenses<sup>27</sup> and on the busier trunk roads the police are active in detecting speeding offences in the villages.

For an offense to go to the judiciary this appears to require a component of serious bodily injury which usually results from road accidents. The police have to prepare a court file which involves a considerable amount of work. The file is reviewed by an Attorney to determine the quality of the evidence to substantiate the offense. According to stakeholders, some fifty percent of the cases reviewed by the attorneys were found lacking the evidence to prove the case and no further action was taken. The review identified that in the high majority of cases even if the case got to court and the defendant found guilty the penalty was only a financial fine.

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<sup>27</sup> Performance Audit Report on the Management Of Traffic Inspections and Speed Limits  
March 2012



The official figures on the number of traffic offences recorded in 2015<sup>28</sup> is:

- > A total of 1,390,482 offences were reported in 2015 compared to 1,125,672 in 2014. This is an increase of 264,810 offences, which is equivalent to 23.5 percent.
- > At national level, the number of major traffic offences reported was 8,777, which caused 3,574 deaths and 9,993 injuries to persons.
- > The regional statistic reporting large numbers of traffic offences in Kinondoni (172,009), Ilala (122,344), Arusha (112,461), Temeke (107,010) and Morogoro (86,502) while Katavi has smallest number of 7,582 offences. In Zanzibar, the region with the largest number of traffic offences is Mjini Magharibi (6,764). Regions with few offences are Kaskazini Pemba (1,299), Kusini Unguja (2,681).
- > Motorcycle offences have decreased substantially in 2015. The number of cases reported in 2015 was 2,749 cases compared to 4,304 cases in 2014. This is a decrease of 1,555 offences; a 36.1 percent decrease.

In 2015, the Tanzanian Police Force had a total of 4,327 traffic police officers. There were a total of 1,390,482 traffic offences recorded that year; this equates to each traffic police officer handled 305 traffic offences.

The Road Traffic Act 1973 as amended is still the leading legislation with respect to road traffic violations. It is the primary Act that gives the police their powers with respect to road safety enforcement. The Act is now by any standards old and in need of updating to take account of the significant changes in vehicular transport and road safety initiatives.

This review has identified that every review undertaken in the last twenty years has made comment of this fact. In more recent times, a number of proposals to update this foundational law have been made (Road Traffic and Safety Bill); at the time of writing this report, it is unclear when this Bill will be approved and become law.

### Effectiveness of existing measures

The quality of the enforcement currently being undertaken is directly affected by the effectiveness of the traffic laws enacted. The laws are required to set the standard and thus the ability the Traffic Police to enforce them. The current legislation and therefore the enforcement activities fail to provide any meaningful deterrent factors.

Great emphasis is put on ensuring a vehicle has the right documentation, which is important, however it is not what causes the road accidents. The Tanzania police force in their annual report<sup>29</sup> provided details of the strategies they are adopting for road safety; table reproduced below.

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<sup>28</sup> Crime and Traffic Incidents statistics Report 2015.

<sup>29</sup> Crime and Traffic Incidents statistics Report 2015

Road Traffic Accidents		
Offenses 2015	Possible causes	Strategies
8,777	i. Violation of traffic rules such as over speeding, not following road signs, symbols and traffic lights. ii. Poor transport vehicles, iii. Poor road conditions, iv. Inadequate knowledge and skills among road users.	i. To increase the number of traffic police officers ii. Use of community policing program iii. Enforce control of passenger vehicles not to travel after 22:00hrs iv. Control over speeding by setting checkpoints schedule of passenger vehicles v. To strengthen patrols and highway inspection vi. Strict provision of notification penalties and punish offenders who violet road traffic act. vii. Suspend driving licence for those who cause fatal and injuries accidents viii. Implementing procedure to reduced drivers points for each offence and ultimately to deregister driving licence ix. Restrict driving licence for specific offences and periods x. Provide education program on road safety xi. To liaise with stakeholders to ensure that employers have well trained drivers to reduce accidents that can be avoided.

As a high-level overview, the table provides some excellent initiatives. The review identified that these initiatives were being passed out to the Region Traffic Officers to implement within their region. It is however at this level the practical components of how, where and when for each of the initiatives were addressed. The Regional Traffic Officers deployed their personnel and what equipment they had to the best of their ability.

The Regional Traffic officers currently are using their local experience and assumptions as to how best they can undertake this task. The information currently available to these officers lacks any detailed information with respect to locations and target groups.

The new Road Accident Information System' (RAIS) being implemented by the traffic police has the ability to provide answers to the questions of where and when as well as providing some guidance as to which violation is more likely to reduce the road accidents. Utilising this tool to its maximum capability will enable a more comprehensive and structured approach to enforcement activities.

The review has analysed some of the causation factors outlined in the Tanzania police force in their annual report of 2015, there observations being:

### Traffic light intersections

The first causation outlined in the Police's road accident strategy relates to traffic signs which include traffic lights. The review observed the measures being taken at traffic light controlled junctions; officers stopping and reporting drivers that failed to obey the red traffic lights. However, few motorcyclists take any notice of traffic signals and the police do not stop them. What is of a concern is the fact that the same officers earlier in the day stood in the same junction overriding the light sequence; this produces a mixed message to the road users.

The need is to ensure the drivers, including motorcyclists, always comply with the traffic lights; to enforce this action this must happen all the time. If the traffic lights are not functioning as they should they must be fixed. If it is necessary for a police officer to take over control of the junction then either:

- > The traffic lights continue to function and the police officer works in combination with the light sequence
- > Where the light sequence is wrong provide the police with an ability to:
  - > Provide a facility to manually change the lights.
  - > Switch the traffic lights off completely and allow the police officer to assume control of the junction.

Keep the message consistent and clear; obey the traffic lights. The preferred action would always be to keep control of the traffic using the traffic lights, not a police officer on the road. However, the Police give, as reason for controlling signal-controlled junctions that without their control traffic will queue across the junction and block it.

It was also observed by the review team that the officers undertaking traffic control in the junctions were not always in high visibility clothing and therefore hard to spot. A driver approaching the junction is concentrating more on looking to see if a police officer is stood in the junction than he is on what the traffic lights are indicating. This is especially so when such activities by the police are undertaken at night at congested intersections. In the major cities, the police were observed with high visibility clothing and illuminated wands however, it was of great concern to see a single officer working a poorly lit and very congested junction alone.

### Speed enforcement

Speed is also given within the strategy as a being a significant factor. Speed is a factor of a huge number of road accidents. The fact an accident has happened indicates the one or more drivers were travelling at a speed which exceed their ability to react and avoid a collision.

The setting of local speed limits is legally the responsibility of the Engineer-in-Chief (Ministry of Works, Transport and Communication), but in practice the road authorities do it. The factors that should be considered when setting local speed limits are:

- > The road and its road environment (road function, number of lanes, alignment, etc.)
- > Existing development (presence of schools, residential areas, etc.).
- > The nature and level of road user activity (pedestrian, cyclist, heavy vehicles, etc.)
- > Accident record.

Other factors which should be considered when setting speed limits and their revision include: type of carriageway (single or dual carriageway), super-

elevation, straightness of the road, functional classification, volume of traffic, vehicle weight etc.

In Tanzania there are three general speed limits stipulated by law: according to Section 51 of the Road Traffic Act of 1973, the speed limit for the vehicles with more than 3.5 tonnes is 80 km/h. For lorries and buses, the general speed limit on all road types, except on urban roads, is 80 km/h. In built-up areas, the speed limit is according to the Act 50 km/h for all vehicles but may occasionally locally be set at 60 km/h.



In urban areas where signed speed limits are set by the road authority, the location and signage of such speed limits lack consistency and credibility. There are long stretches of 50 km/h restrictions which do not exhibit characteristics that would justify such a limit. It is often found within these extended sections that the police undertake speed enforcement.

The speed limits set within the traffic laws are simple and functional however they lack a maximum speed limit for private cars and vehicles under 3.5 tonnes, outside built-up areas. The standard of the road network outside the main urban areas, in the main, is not designed to be driven at high speeds. The original design specification was set at 110 km/h; however, the current condition of the road network would suggest this speed is now unsafe. From a road safety prospective, a maximum speed limit for all private cars should be set.










There is a clear need for a detailed review of the current speed limits to ensure they comply with internationally accepted road safety standards. A maximum speed limit for private cars using the network outside of an urban limit should also be created; this is recommended to be a maximum 100 km/h.


The Traffic police working within the boundaries of the law and speed limit signs placed out under the authority of the Engineer-in-Chief (Ministry of Works, Transport and Communication) generally only undertake speed enforcement within the 50 km/h limits. The current equipment being used by the police is the Dragon Eye Speed Lidar machine fitted with a digital camera which records the evidence. In the past many motorists stopped for alleged speeding claimed that the speed radar reading they were shown was not for their vehicle.

### Poor transport vehicles




Poor conditions of transport vehicles is also given within the strategy as a being a significant factor. To assess the actual quality of the vehicle fleet using the road network the project team undertook a survey. This was carried out at the Kibaha checkpoint on T1 TanZam Highway with the assistance of the Traffic police, Sumatra and a member of the Regional Road Safety Committee.

The checkpoint operated over a 6-hour period and randomly selected a cross section of vehicles. The below table highlights the findings of the survey:

Vehicle Type	Defects Identified	Condition summary
	Rear tyre sidewall split both sides – kerb impact. Defective front brake - not correctly adjusted on full application wheel still rotates – driver admitted slackening the brakes to stop him being thrown over handlebars.	Dangerous condition
	Defective front brake – missing disc calliper and brake pads. Defective rear brakes - not adjusted wheel rotates when brakes fully applied. Drive chain very slack – danger of coming off the cogs.	Dangerous condition
	Front windscreen was cracked. Rear left hand wheel had a retaining stud missing.	Reasonable condition
	No defects	Good condition
	No defects	Good condition
	No defects	Good condition
	Tyres with very low tread depth, front left and rear left. No seat belts fitted in the vehicle	Poor condition

Vehicle Type	Defects Identified	Condition summary
	Overloaded vehicle with excess passengers to seats. Defective hand brake – broken linkage Defective foot brakes – air in system and brake fluid leaking from master reservoir. Front right hand wheel rim cracked Rear right hand side missing stud from wheel. No seatbelts fitted in the vehicle	Dangerous condition
	Defective handbrake – linkage broken Excessive play on all joints between the steering wheel and road wheels. Spring hangers on the rear axle had no bushes – repaired with incorrect sized hangers. Front right hand tyre defective – chunks of tread missing Rear left hand tyre defective side wall damage Fuel leaking from the fuel tank Passenger side door locks broken. No seat belts fitted in the vehicle.	Dangerous condition
	No defects	Good condition
Large Bus 	Lots of oil leaks around the engine. Fuel tank mounted on the rear right hand side shows signs of leakage. Right hand rear inner tyre devoid of tread on outer edge.	Generally good
	School bus (empty) Operation of the steering while static – knocking evident from the drop arm linkage. Front windscreen cracked.	Poor condition
Small/medium HGV 	Loose steering geometry	Poor condition
	Front indicator lens broken Front right hand steering bush joint loose.	Dangerous condition
	Defective handbrake - Steering box and linkage worn with excess play. Front left hand tyre worn with chunks of tyre missing within the tread area. Rear left hand tyre with holes in the sidewall. Battery retaining box and straps broken	Dangerous condition
	Rigid truck (Government owned) towing a drawbar trailer. The general condition of this vehicle was very poor Most of the road wheels had studs missing The driver and passenger door locks were defective as were the steps to get into the vehicle. The vehicle was towing a draw bar trailer with engineering plant attached. The towing eye and pin had no securing lock – a rag was tied around the pin to stop it jumping out.	Dangerous condition



Vehicle Type	Defects Identified	Condition summary
	The trailer had no braking system fitted with an estimated gross weight of some 5 tons. The trailer had no lighting board or connections to the drawing vehicle.	
Large HGV 	Articulated tipper truck Tractor unit Bushes missing on the suspension stabiliser bars. Passenger door lock broken Passenger lower step broken. Main right hand headlight high beam defective Trailer unit had a damaged left hand side mudguards made of metal producing dangerous condition.	Dangerous condition
	Articulated Petrol tanker. The 2 <sup>nd</sup> axle right hand side tyre on the tractor unit was worn on both shoulders – defective king pin. One of the retaining straps of the fuel tank was broken; a ratchet strap was being used to secure the tank to the chassis.	Poor condition.
	Articulated tipper truck Tractor unit Right hand side defective suspension air sac - broken pipes Left hand wheels had studs missing Driver's left hand side rear view mirror broken. Left hand foot rest broken Trailer unit Every wheel of the trailer had multiple missing wheel studs	Dangerous condition

The significant factors highlighted from the survey were:

- > Missing wheel nuts
- > Damaged and defect tyres
- > Steering defects
- > Defective braking systems
- > Damaged and broken suspensions
- > Unsecure trailer connections.

The most significant vehicle stopped was a government owned vehicle. It was a rigid goods vehicle with a draw bar trailer attached. The general condition of this vehicle was very poor with almost every wheel having studs missing. The vehicle was towing a draw bar trailer with engineering plant attached thereon. The towing pin of the trailer had not been secured within the towing eye mechanism; an old rag was simply tied around the pin in a vain hope it would not jump out. The trailer had no braking system fitted with an estimated gross weight of some five tons. The trailer had no lighting board or connections to the drawing vehicle.

## 6.2.2 Identified gaps in traffic laws and enforcement

Based on the findings of the Kibaha checkpoint the current traffic laws provided a legal framework that covered all the defects identified. In all respects, the driver and owners of the vehicle could have been reported for the defects found. However, one of the complications is that, although the RTA says vehicles must be roadworthy, the law does not define what constitutes roadworthiness. There

is a clear need for, what is international known as a 'Construction and Use' style legislation, which defines what must be fitted to a vehicle and how it must function. This provides a clear guideline for the police and owners of vehicles to know what must be fitted and how it must work; thus if fitted but not working an offense.

The number of enforcement tickets issued increases every year and from this, a vast sum of money is raised. The traffic police enforce the law to the best of their ability given the restraints of manpower equipment and mobility. A significant investment in equipment for the police has just begun within the last year or so. This is clearly evident in Dar es Salaam and is slowly reaching the other regions. This investment must continue at an even faster pace to ensure the police are able to enforce the road traffic laws across the entire road network of Tanzania.

Many of the reviews over the last few years have identified gaps in the current road traffic laws of Tanzania; these findings have not altered. The main areas of concern raised by these reviews and this assessment are:

- > The absence of a maximum speed limit, on rural roads, for private cars and vehicles less than three and a half tons.
- > The absence of a regulation requiring all occupants seat in any moving vehicle to wear seatbelts.
- > The requirement for all occupants riding on a motorcycle to wear and securely fasten a crash helmet.
- > The absence of a regulation prohibiting the use of a mobile phone whilst driving a motor vehicle. Internationally this is seen as one of the major causes of accidents.

The Police are actively working to close some of these loopholes with the help of the Bloomberg Road Safety Initiative for Tanzania –supported by GRSP and WHO.

The legal framework to mandate every person sat in a moving motor vehicle must wear a seat belt is missing. The current requirements for only the front seat driver and passenger completely misses the point; the unrestrained rear seat passengers would be thrown forward in a crash impacting the front seat passengers and causing their deaths.

This review however has looked specifically at how the current traffic rules affect the work of the traffic police. Using the Kibaha checkpoint as an example an analysis of the defects detected shows the current traffic laws, albeit in a simple form, do provide violations for each of the defects.

Therefore, it is not that the traffic rules do not cover such issues as dangerous vehicles or bad driving but rather the punishment and more importantly, the deterrent factor to force the driver to drive safely or the owners to maintain the vehicles in a road worthy condition is not present.



There is a clear need however for the police, with respect to vehicle examination, to become more proactive in this area. Within the current legislation, the options available for mechanical defects found on goods and passenger-carrying vehicles needs to be more robustly enforced.

The traffic police are chronically underequipped and underfunded. There is the impression that traffic law enforcement is done in a rather ad hoc unplanned way; officers are stationed at the same places every day, so there is no element of surprise. This possibly reflects the chronic lack of vehicles available to the traffic police. There also appears to be no mobile police patrols outside the major urban areas. The new initiative with the police having electronic devices to issue violation tickets is a start to stream lining the ticketing system. The second intervention of changing the legal framework to allow penalty points to be added to driving licenses is another good development. Both of these initiatives in themselves will enhance the enforcement process; fine value goes up if not paid and repeated offenses results in the loss of the driving license.

Internationally the suspension of a driving license has a very high deterrent factor only because the potential for being detected whilst driving without a driving license is very real. The automated detection systems put in place produce a real perception that you will be caught. When caught driving without a license following suspension the penalty is also very severe. The need to develop such a deterrent capability and real perception among the general motoring public in Tanzania will be essential for this initiative to work.

### 6.2.3 Recommendations on interventions

The need to strengthen the current road traffic rules as outlined in this and all the previous reviews is seen as essential and should be undertaken without any further delay.

The mechanical condition of any vehicle and especially passenger and goods carrying vehicles operating on the road network must be of a safe standard. The survey undertaken at the Kibaha checkpoint suggested this is generally not the case.



SUMATRA is the lead agency responsible for licensing the operations of passenger and goods carrying vehicles. The legislation provides powers under the Road Traffic Act and regulations for SUMATRA to ensure the vehicle fleet complies with the rules and regulations. Where these rules and regulations are not being complied with SUMATRA has the power to suspend or revoke an operator's license. This is seen as a significant deterrent factor that could be applied to the operators. Internationally this has been shown to greatly affect the daily operations of this industry.

The number of operator licenses suspended by SUMATRA during 2015 would appear not to reflect the noncompliance of regulations as identified in the Kibaha survey. The need for SUMATRA to become more proactive in this area will provide a significant deterrent factor to ensure vehicle conditions are improved.

For SUMATRA to take a more proactive role they need to have a greater understanding of which operators they need to target. To achieve this they need to create a knowledge base of passenger and goods carrying vehicles which have come to notice for the following reasons:

- > The defects the traffic police are detecting on the road network.
- > The vehicles being involved in road crashes.
- > Anecdotal information as to potential defects or malpractices.

To facilitate a flow of data between the police and SUMATRA this should start with a simple methodology; direct link between the local traffic police and a local SUMATRA office. In the medium term, SUMATRA will need to develop a database of all the information with direct links to the police and the RAIS database.

Having created a knowledge base SUMATRA will then need to quantify which operators it should investigate further. They will need to have a task force that can undertake this activity. The task force will need to gather further evidence as to an operator's failure to comply with the regulations. The findings of the task force will then form the basis for a review hearing and any sanctions deemed necessary to be imposed.

Mandate the wearing of seatbelts by all occupants sat in a moving motor vehicle. Children under e.g. the age of 12 years or under 1.5 metres in height should also not be permitted to sit in a moving vehicle unless they are using a child safety seat or booster seat.

The traffic police need to improve planning, management, monitoring, and audit of enforcement programmes; a targeted intelligence-led policing. There is need for a greater mobility capability to produce a real deterrent; drivers should think there is a possibility they could be caught 'anytime anywhere'. The deterrence value of Police patrols on the busiest trunk roads is essential.

The traffic police should be allowed to keep a proportion of the fine income to pay for improved enforcement to e.g. finance vehicles and equipment for enforcement.

The deterrent effect of all traffic law enforcement can be greatly enhanced through better publicity. Internationally local radio broadcasts daily bulletins warning motorists of the current police enforcement campaigns; they warn but do not say where. This creates the unknown factor and making the motoring public more cautious.

### 6.2.4 Policy implications

SUMATRA needs to develop a strong enforcement capability and traffic police should be allowed to keep a proportion of the fine income to pay for improved enforcement.

## 6.3 Police Training

Today's Police working environment requires a high skill base to perform the complex tasks required by a modern transportation system. Officers are required to work in an efficient, cost-effective, and safe manner. Training should be considered as a performance improvement tool and is needed when personnel are not performing up to a recognised standard. To evaluate the requirements a formal training needs assessment should be undertaken. The assessment should be undertaken in a scientific manner using recognised measuring criteria. A successful training needs analysis will identify what areas of knowledge need to be enhanced and who needs the training. It is counter-productive to offer training to individuals who do not need it or to offer the wrong kind of training. A Training Needs Analysis helps to put the limited training resources to good use as well as reducing the amount of downtime experienced by the extraction of officers from their operational role.

Traffic police work is a specialised element of normal police activities; although it can be undertaken by all departments of the police service. In many countries, a police officer receives basic training when they join the service. An element of this training includes sessions on traffic enforcement associated with the laws governing vehicles using the road network. When an officer is assigned to the traffic section of the police service, they normally undertake a period of additional training specifically on road traffic laws and the enforcement of such.

The use of highly technical equipment to enforce laws has developed over the years and now forms a substantial element of a modern road traffic patrol officer's daily work. The correct use of this equipment also requires certification of the officer at regular intervals.

Many police forces develop their own 'Traffic Patrol Officers' courses to ensure their staff are proficient in all aspects of their work. These courses last about three weeks and each officer is required to undertake a refresher course every three to four years. The training syllabus for the basic course often includes elements on:

- > Definition of a road and public place
- > Definitions of a vehicle and a motor vehicle
- > The law with respect to the construction requirements and use of a motor vehicle – dangerous condition
- > The lights required on vehicles
- > The law with respect to construction and use of tyres
- > Powers to stop, test and inspect vehicles
- > Powers to prohibit vehicles
- > Registration and licensing of vehicles

- > Powers with respect to Public Service vehicles
- > Powers with respect to heavy goods vehicles
- > Traffic signs – their meaning and what constitutes an offence
- > Speed limits and their enforcement
- > Driving documents – fraudulent
- > Dealing with road accidents
- > Scene management of incidents on the road
- > Driving offences
- > Foreign vehicles
- > Hazardous chemicals
- > Large loads – legal requirements
- > Alcohol and drugs impairment.

Vehicle inspections are often undertaken by a specialist unit within the traffic department that have a specific responsibility associated with the mechanical condition of vehicles being used on the road network. The police officers responsible for this work is often taken from the members of the traffic department so will have undertaken the additional training as outlined above.

For their specialist task however, they should receive training and attain a specific qualification with respect to vehicle examination. The current technology being fitted to motor vehicles of all classes demands additional training elements and often very specific qualifications on the subjects.

The basic course for vehicle examiners teaches the student how to examine all motor vehicles including motorcycles to ensure their compliance with the traffic laws. Where faults are found, the method of reporting on them and where appropriate, prohibition procedures are covered. The elements covered on such courses often include:

- > The Acts and Regulations as respect to the legal requirements associated with the construction and use of motor vehicles
- > The Acts and Regulations which confer powers and offences
- > Correctly identify components and their associated connections
- > Correctly describe the function of components and correctly
- > Ability to remove those components to facilitate closer inspection where necessary
- > In relation to an investigation into a road traffic collision compile an accurate report and list any conclusions.

There is a clear need to enhance the training provided to the traffic patrol officer with respect to enforcement of the traffic rules and vehicle inspection techniques. The development of the safety features fitted to the modern vehicle has demanded the police become more knowledgeable and proactive in this role. The increase in the use of technology to achieve this task places additional requirements and demands for a modern and structured training program to be developed.

### 6.3.1 Existing Situation

The current changes and developments within the Tanzania police force have created a significant demand for an increased knowledge base for its personnel. The force is attempting within its limited budget allowance to redress the knowledge gap that exists.

The current status of training, beyond the basic training, which an officer receives when they join the force, appears to be more of a reactive program to the changes being experienced. The specialist areas of knowledge in for example vehicle technology has not moved forward with the pace of change of the vehicle fleet using the road network.

Another example of the reactive training program is evident in the RAIS crash database which has recently been rolled out nationally. It is clear some training has been undertaken however a review of the crash data would suggest many of the reports have been completed incorrectly suggesting a need for further training or clarification.

### 6.3.2 Identification of gaps in training

There is a need to start planning the training programs in advance of any developments / changes being proposed. The lack of a structured training program which has been developed from a formal training needs assessment review is potentially failing to provide the best use of the limited training budget.

Any initiatives or amendments to legislation must incorporate both a financial and practical commitment to providing a training program to ensure the greatest benefits are gained.

### 6.3.3 Recommendations on interventions

The need to undertake a formal training needs assessment for all Traffic Police personnel will be required to develop a long term structured training program. The specific areas that need addressing are associated with:

- > Enforcement techniques and technology
- > Vehicle technology and safety features
- > Crash scene investigation and data collection
- > Crash database training.

## 6.4 Driver training and testing

There is some focus on driver training and testing within Tanzania. A number of reviews and studies conducted over the last ten years have all identified the benefits of developing a sound driver training program. The following was assessed:

- > Driver training schools

- > Driver training
- > Driver testing.

## 6.4.1 Driver training schools

### Existing situation

A national driver-training program has been created for PSV drivers and the legislation includes the licensing of training facilities and instructors.

The review team visited a number of driving schools both within Dar es Salaam and in Mbeya. All the facilities provide a number of courses with the major one being the basic course to drive a private car. The courses on average last between two and five weeks at National Institute of Transport (NIT) and Vocational Educational and Training Authority (VETA) (PSV and HGV), and they had a high student uptake with some reportedly having eighty students per course.

Private driving schools generally do 20 lessons with 10 hours for theory and 10 hours for practical training. For practical training, there is 1 instructor in the car with several trainees.

The NIT has developed driver training for the more specialised driving courses for HGV and PSV. The headquarters of this organisation is in Dar es Salaam, it also has a number of centres spread around the country. The review team visited the facilities in Dar es Salaam where they were provided with a detailed explanation of the courses developed by the institution.

A summary of the type of specialised courses available throughout Tanzania are reproduced below:

- > PSV course (for PSV C) - 10 days
- > PSV course (for C1) - 10 days
- > PSV course (for C2) - 10 days
- > PSV course (for C3) - 10 days
- > HGV course (for E) - 10 days
- > Advanced driver course Grade II (Industrial) - 4 weeks
- > Advanced driver course Grade II (VIP) - 4 weeks
- > Advanced driver course Grade I - 4 weeks
- > Senior drivers course - 6 weeks
- > Driving instructors course - 10 weeks
- > Transport Officers course - 2 weeks
- > Vehicle Inspection and Driver examination course – 15 weeks
- > Transport control systems – 2 weeks
- > Vehicle inspection and appraisal – 15 weeks
- > Fork lift truck course – 5 days.

The review identified the legal requirements for the creation of driving schools and qualifications for the instructors are credible. The schools the review team

visited within Tanzania reported differing awareness of a national curriculum; some reportedly followed the set curriculum while others denied knowledge. To the knowledge of the project team, there is no set curriculum or national curriculum for car driver training; however, NIT and VETA may have their own. The training however appeared in the main to be based on elements that are required to pass the final test as opposed to developing a comprehensive driving knowledgebase.

An EAC driver training curricula exist for large commercial vehicles with the latest addition to the curriculum being produced by Transaid in January 2015<sup>30</sup>. It is however understood the recommendations have not been adopted or implemented in Tanzania yet.

In March 2015, Transaid in cooperation with AFCAP have developed a curricular for motorcycle (bodaboda) training<sup>31</sup>. It is however understood the recommendations have not been adopted or implemented in Tanzania yet.

### Identified gaps in driver training school

The absence of any simple driver simulation machines to allow novices to learn to drive in safety is seen as an issue. The current legislation forbids provisional driving license holders from driving on the road unless under the instruction of a qualified driving instructor. Given also the high student numbers on each course having a facility to learn at their own pace to drive a vehicle is seen as essential.

The practical element of driver training is the ability to drive a vehicle on a road amongst the existing traffic conditions. With respect to international standards, the time period allotted to this very important aspect was very short. The lack of vehicles available at the driving schools and the number of instructors would appear to be the main limiting factor.

The lack of a lead agency overseeing and controlling the authorisation and activities of driving schools is seen as watering down the high priority that Tanzania reportedly gives to this important activity. The need for a government agency to lead this activity is seen as essential.

The driver training curricula for large commercial vehicles and the curricular for motorcycle (bodaboda) training has not been adapted yet. In addition, a national curricular for ordinary motorcycle drivers seem to be missing.

### Recommendations on interventions

The creation of a lead agency to coordinate and control all aspects of driver training is essential. With respect to driving schools, they should take on the

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<sup>30</sup> <http://www.transaid.org/wp-content/uploads/2015/10/Technical-Case-Study-Developing-the-East-Africa-Community-Standardised-Curriculum-and-Instructors-Manual.pdf>

<sup>31</sup> <http://www.transaid.org/wp-content/uploads/2015/09/AFCAP-Boda-Boda-Training-Curriculum.pdf>

authorisation of the school and if instructors complies with the legal requirements of the law.

The need to have a structured and comprehensive driver-training curriculum and training materiel which is disseminated to all the driving schools is seen as essential. The lead agency should also undertake regular audits to ensure the curriculum for driver training is followed by the driving schools.

The current fees a driving school are legally allowed to charge does not take account of the actual cost of providing a quality driver training program. The need to reassess the cost of training commensurate to the standard of training that is required for achieving the reduction in road deaths and injuries expected.

It is recommended the EAC driver training curricula for large commercial vehicles and the curricular for motorcycle (bodaboda) training is adopted and implemented in Tanzania. In addition, a national curricular for ordinary motorcyclist should be prepared and implemented.

## 6.4.2 Driver training

### Existing situation

Tanzania has to date created the legal framework and environment to enable driver-training centres to be developed. The training program covers both theoretical and practical components to ensure a student gains a knowledge base prior to undergoing a final test procedure.

The training program adopted by the majority of training facilities visited by the review team is based around the style of license the student requires. The current categories of driving license available in Tanzania are:

- > Motor cycles
  - > A License to drive motor cycles with or without a sidecar and whose capacity exceeds 125cc or 230kg.
  - > A1 License to drive motor cycles without sidecar and whose capacity is less than 125cc or 230kg.
  - > A2 License to drive motor powered tricycles and quadra-cycles.
  - > A3 License to drive moped whose capacity does not exceed 50cc.
  
- > Private Vehicles
  - > B License to drive all types of motor vehicles except motor cycles, commercial, heavy duty and public service vehicles.
  
- > Public Service Vehicles
  - > C License to drive public service vehicles with seating capacity of 30 and more passengers in addition to the driver, Vehicles in this category may be combined with a trailer having a maximum authorized mass of not more than 750kg. Applicants must have held Class CI or E license for a period of not less than three years.



- > C1 License to drive public service vehicles with a seating capacity of 15 but less than 30 passengers in addition to the driver. Vehicles in this category may be combined with a trailer having maximum authorized mass of not more than 750kg. Applicants must have held Class D license for a period of not less than three years.
- > C2 License to drive public service vehicles with seating of four but less than fifteen Passengers. Vehicles in this category may be combined with a trailer having maximum authorized mass of not more than 750kg. Applicants must have held Class D license for a period of not less than three years.
- > C3 License to drive public services vehicles with a seating capacity of four or fewer passengers inclusive of the driver. Vehicles in this category may be combined with a trailer having a maximum authorized mass of not more than 750kg. Applicants must have held a Class D license for not less than three years.
  
- > Commercial Light Duty Vehicles
  - > D License to drive all types of vehicles except motor cycles, heavy duty and public service vehicles.
  
- > Commercial Heavy Duty Vehicles
  - > E License to drive all types of vehicles except motor cycles and public serves vehicles. Applicants must have held Class D License for not less than three years.
  
- > Track Laying Vehicles
  - > F License to drive truck laying vehicles steered by their trucks.
  
- > Farm/ Mine Vehicles
  - > G License to drive farm or mine vehicles.
  
- > Learners
  - > H Provisional license for learn.

Learner drivers are only permitted to drive on the road network while being trained by a registered driving instructor employed by a registered driving school.

The length of the courses is dependent on the complexity of the vehicle and the legal requirements. The theoretical or classroom based components are reportedly the same for all classes of license.

The documentation provided to each student appeared to vary between the driving schools and reportedly, this was not provided by central government; albeit the review was informed this materiel was produced by the government.

The practical element of driver training is the ability to drive a vehicle on a road amongst the existing traffic conditions. Although the review team were unable to assess an actual driving session anecdotal evidence provided suggested the current program lacked any structured elements associated with identifying and avoiding actual or potential dangers.

Many of the driving schools provided, as an additional course, what they called Defensive Driver Training. This included many elements of recognising and avoiding actual or potential danger. Internationally basic driver training includes this as an essential element.

### Identified gaps in driver training

Compared to international standards, the total actual time period allotted to each student for driving a vehicle on the road amongst real traffic conditions is very short. This reflects the fact that the driving test is, by international standards, quite easy to pass.

The Highway Code, which is the official legally-backed guide to safe driving, has been out of print for years. A number of projects has highlighted this in the last few years. However, MoWTC have revised version and this has been signed off by the current Minister of Works and the Minister of Home Affairs – MoWTC is to reprint it this year.

The lack of a structured practical driving training program to include elements associated with an awareness of potential or actual danger and was of avoiding it.

### Recommendations on intervention

The current practical driving period allocated to each student is dependent on the number of vehicles a particular driving school has; the fewer the vehicles the less time a student has driving the vehicle. But private driving schools will and do provide a student with as much practical driving experience as they think is necessary to pass the driving test. Regulations should be created, bases on international best practice, to stipulate the minimum hours driving a student should receive.

The printing and distribution of the Highway Code should be expedited and be freely available, to every student undertaking a driving course. The code should be regularly updated and kept in print to ensure it is as widely available as possible. There is a need to develop a national driver training curriculum potentially including it within a legal framework, which is the case in some countries.

There is also the need to improve the practical driving training program to include more elements associated with recognising and avoiding potential or actual danger.

### Policy implications

The driving license system in Tanzania currently fails to recognise the difference between a manual and an automatic gearbox. Most cars registered in Tanzania are now fitted with automatic gearbox's, and it would appear from anecdotal evidence many trainees are not interested in learning how to drive manuals. To come into line with international policy there is a requirement to have the law changed to recognise this omission.

### 6.4.3 Driver testing

The concept of a final test, with respect to driver training, is to ensure a student has learnt and is capable of demonstrating they can safely drive a vehicle on the road network.

#### Existing situation

The Tanzanian traffic police conduct all the testing currently being undertaken to obtain a driving license. The number of driving licenses being issued within Tanzania suggests this is a very high workload for the police, and anecdotal evidence suggests that they rush candidates through the test in order to get finished on time. Driving tests can usually be arranged within a few days.

The driving test consist of a theory and practical test. The theory is divided in to questions on signs general knowledge test (more complex questions). The trainee is asked 10 questions and 8 correct answers are required to pass the test. Practical test is in real traffic for maybe up to 3 km with the police examiner and the driving school instructor in the back. Following the test in traffic, they should show they are able to reverse and park.

The role of any examiner is a specialised profession; it should always complement the high standards set by the courses developed to train the students in whatever subjects being learnt. Driver training and testing is no different to any other subject. As it is proposed to develop a national driver training curriculum so the elements and standards for the testing should be developed in line with international best standards. A standardisation of the testing should be achieved with a formal marking system included with documentation completed for each examination. The need to remove the current inconsistency between examiners is seen as essential.

The requirement to inspect and license the operations of the various training facilities together with conducting all the final examinations falls on the traffic police. Nearly all the reviews over the last few years has identified this as an issue and made various recommendations.

#### Identified gaps in driver training

The need to audit the quality and consistency of the examinations and the examiners is paramount to ensuring the standards set are being met. Any police officer undertaking the role of examiner should have been trained and competent to be authorised as an examiner.

The review identified the legal requirements and content for the driving tests albeit very basic were creditable however, the lack of an audit process has potentially created weak points within the system. Currently there are no formal checks or auditing of the final examination process or the police examiners undertaking the task.

#### Recommendations on intervention

Nearly all the reviews over the last few years have identified the need for a lead agency in driver training and testing. Whilst waiting for this to happen there are

already institutions within Tanzania that are able to progress the development of a formal training and testing curriculum.

NIT with its associate agencies has already developed and undertakes HGV and PSV driver training programs. It would be a simple adaption of these courses to develop the private vehicle driver training.

NIT also currently provides the training courses for the police examiners. The enhancement of this training to include a formal documented testing procedure would provide a significant improvement to the current issues. In the short term, NIT could also provide an auditing process on the final testing to ensure a standardisation of the process has been achieved.

## 6.5 Road safety education in schools

Young children are impulsive, easily distracted, and have poor judgement of speed and distance. They are not good at assessing risk. This makes them vulnerable to being killed or injured on the road. Official statistics show that in 2013, 106 children under the age of 13 died in road crashes, and another 226 were injured. Most of these were probably pedestrians. Children's ages tend not to be reported accurately, so there is some doubt about these figures – they look low.

Children's lack of skill in coping with traffic risks is compounded by their frequent exposure to traffic, especially if they live in towns. Children play outside in the street, and almost all schoolchildren, even quite young ones, walk to and from school unaccompanied by adults. Because the streets lack footways and safe crossing points the children are coming into conflict with moving vehicles on every journey.

Teaching children how to use the road safely not only gives them practical skills but also helps build positive, safe, caring attitudes that will serve them well throughout their lives. When teaching young children the emphasis will be on building awareness and equipping them with road crossing skills, whereas older children should be taught how to assess and manage risks. Most countries rely on schoolteachers to deliver road safety education, but others send specialist trainers into the schools.

Best practice in road safety education for children can be summarised by the six 'P's:

- > start **P**re-school
- > be **P**ractical
- > follow **P**riniples of child development
- > be **P**resented frequently
- > involve **P**arents
- > have a **P**lace in the school curriculum.

This is a huge challenge, and few, if any, countries in the world have been able to deliver road safety education of this standard. One of the difficulties is that evaluating road safety education programmes is not easy, and has rarely been done, so there is a lack of evidence about their effectiveness.

### 6.5.1 Existing situation

As in many other areas of road safety in Tanzania, it is unclear who is responsible for road safety education.

The Ministry of Works, Transport and Communication has funded a programme of road safety education in primary schools for many years. It takes the form of cascade training of teachers in one Region each year. The Tanzania Institute of Education organises the training, and it takes the form of a one-week course for a group of teachers drawn from the Region's primary schools. These teachers are then meant to go back and teach road safety in their own schools, and also train teachers in neighbouring schools. It is asking a lot of the teachers, as they are not paid to do this additional work, and can probably not reclaim their expenses. Despite the fact that this is a long-running programme, it has not reached every Region in the country – and, as the training is not repeated, it is likely that over time some of those teachers who have been trained will have moved on or retired. Consequently, there is some doubt as to how effective this programme is at getting road safety taught in all or even most primary schools. There has been no evaluation of the programme. It accounts for a significant share of the MoWTC's small road safety budget.

It is understood that the MoWTC has been in discussion with the Ministry of Education regarding the inclusion of road safety in the school curriculum. The Ministry of Education is reluctant to make space in the already-crowded curriculum for road safety, but has conceded that it could be worked into other subjects. This is better than nothing, but experience in other countries suggests that this will not be as effective as having a lesson focussing on road safety.

The road safety charity AMEND has been delivering road safety training in Dar es Salaam primary schools since 2009. To date they have been to 165 high-risk schools (some of them more than once) and taught nearly a quarter of a million students. They have developed a standard lesson plan which includes classroom teaching as well as practical exercises in the schoolyard. AMEND use a team of 8-10 instructors who will spend the whole day in the school teaching the students in groups. They have gone back to some schools a few weeks later and found that the students had remembered a large proportion of what they were taught. This programme conforms very well to what is considered to be good practice in road safety education. It is likely to be effective in getting Dar's young students to behave more safely on the roads, though it would be good to confirm this by means of before and after studies of their actual behaviour. AMEND has done similar work in 49 schools outside Dar es Salaam, but as part of specific projects, not a long-term programme as in Dar. AMEND receives no financial support from Government. It funds the Dar programme from its own

resources and with the support of organisations such as the FIA Foundation, Puma Energy and TOTAL.

### 6.5.2 Identified gaps in road safety education

Only a small proportion of children in Tanzania are receiving road safety training, and it is not clear how effective it is, because there has been almost no evaluation. It is suspected that, apart from the AMEND programme in Dar, there is too much emphasis on talking to children and not enough on getting them to learn by doing, either on the road (under careful supervision) or off-road in a school playground. In addition, the training is probably not being given frequently enough for the knowledge and skills to really sink in. There is no guidance on what should be taught and how best to teach it, and there are also no materials (posters, worksheets, etc.) that trainers could use. Evidence from other countries suggests that the availability of training materials makes it much more likely that schoolteachers will make the effort to do something on road safety.

The existing programmes, such as they are, focus on primary school children. They will not reach children that are not in school. In addition, there are no programmes for older children, although some private schools are believed to do some road safety teaching.

### 6.5.3 Recommendations on interventions

It has to be accepted that there is no realistic prospect of being able to develop a universal high-quality road safety education system in the foreseeable future. There are just too many children needing to be taught, and the already over-stretched school system cannot be expected to cope with this extra task. The focus needs to be on finding a way to deliver sustainable training to the groups in greatest need – which are probably the children in the cities, towns, and villages along the busiest roads.

Face-to-face training by specialist trainers is always going to be the best method. In the cities and larger towns, we recommend that Traffic Police officers be given this task. They are already doing some road safety publicity work, so it is not a major change in their responsibilities. It also fits in with the Tanzania Police's plan to give more emphasis to community policing. The officers would need some guidance on what to teach and how (see below). The aim should be for them to visit each of the largest primary schools at least once a year.

Another option is to use the Community Development Officers that are employed by local authorities to assist people at ward level plan development projects, tackle local problems, and promote health awareness. With a small amount of training themselves, they could be tasked to go into their local schools to deliver road safety training. This could work well in the more rural authorities.

Some years ago, the Ministry of Works, Transport and Communication developed a Road Safety Teaching Pack which comprised a number of colourful

posters together with a set of trainers' notes. These notes contained instructions on how to get children practicing road skills using a 'pretend road' in the schoolyard or other open space. The intention was to send the Teaching Pack out to sample of schools and then later check to see how many of the schools had made use of it, and how. Even if only a small proportion of these schools had just put the posters on the wall and not done any teaching, it would probably have been cost-effective way of raising road safety awareness. Unfortunately, lack of funds prevented the project going ahead, but it should now be re-started. The Teaching Pack can usefully be developed into a simple manual that guides teachers, Police and others in how to deliver effective road safety education. In addition, schools which the Police cannot visit should be sent the Teaching Pack in the hope that they will at least put the posters up on the wall.

There is considerable popular support for teaching children how to stay safe on the roads, and there is a need to encourage and support civil society organisations that are interested in helping. It might be possible to get Scouts and Guides to do some of the training in schools, especially if their expenses could be met by local charities or service organisations. All trainers should be encouraged to follow the guidance in the Teaching Pack.

## 6.6 Community road safety education

There is a need to promote informal, community-based road safety education for adults, as well as the children that are outside the school system. Community education programmes have been reasonably successful in other areas, such as health, agriculture and the environment. They are better able to target local safety problems, and, because the local community is fully involved and 'owns' the programme, they are likely to be more effective.

The key characteristics of a successful community education programme are thought to be:

- > The involvement of the community is critically important, but this presupposes that the community is interested in doing something about road safety
- > The interventions are identified, planned and managed by the community
- > All groups are involved (male, female, young and old)
- > They may involve schools but this is not the focus
- > Sustainability
- > Aim to raise awareness and promote safer behaviour.

South Africa has some experience of community road safety work, but not enough has been done to identify 'best practice' regarding organisation and the design and implementation of interventions.

### 6.6.1 Existing situation

The Millennium Challenge Corporation's road upgrading projects included efforts to raise road safety awareness in project-affected communities. The road building contractors employed trainers to do awareness-raising (mostly in schools) and help the local communities resolve specific safety problems. In one village, they built a well-equipped playground to help keep children away from the works site. Some Danida-funded road projects have also had a community element.

The African Development Bank (AfDB) have gone further and are funding the appointment of consultants to promote road safety along each of the roads that are being upgraded with their funds. The consultant is required to:

- > Identify or establish village committees or community-based organisations and train them to undertake road safety activities
- > Conduct road safety awareness campaigns to people living along the project road – focussing on safe use of the road, and living safely with road construction work.

Although some of the AfDB projects are underway, the road safety consultants have yet to start working.

PO-RALG are trialling a scheme whereby local authority Community Development Officers are being trained to raise road safety awareness and action in local communities.

### 6.6.2 Identified gaps in community road safety education

Tanzania's development partners are to be praised for promoting community road safety education, but by tying it to road projects there is a risk that capacity and interest will decline once the project is over. Moreover, the precise objectives and the scale of effort required have not been specified, resulting sometimes in the contractor doing the minimum necessary to avoid defaulting on their contractual obligations. There has been no evaluation of this work, so there is no knowledge on how effective this has been.

### 6.6.3 Recommendations on interventions

It is likely that for the foreseeable future it will be necessary to rely on road projects to fund community road safety education. However, in order to get better value for money, it is recommended that TANROADS should be much more specific in what they want their contractor / consultant to do.

Specifications could include:

- > Knowledge or behavioural targets, e.g., 80% of motorcyclists wearing helmets
- > Input by staff (e.g., man-months)
- > Staff qualifications and experience
- > Indicative budget for campaigns.



It is also important that either TANROADS or the Ministry of Works, Transport and Communication develop and publish a 'Good Practice Manual' to guide the contractors and consultants in this work. As stated earlier, there is little past experience to go on, but it should be possible to look at what has been done in other areas and develop some simple guidelines on how to proceed and what is likely to work best. As more experience is gained, and outcomes evaluated, the manual can be re-written.

## 6.7 Campaigns

Almost all crashes involve a road user making a mistake. It may be that the person lacks the knowledge or skills to use the road safely, but very often, it is because of carelessness – reflecting a lack of consideration for others. Road safety campaigns can influence road user behaviour and raise awareness of road safety issues. They are often called publicity campaigns, but all the evidence indicates that, unless you are just trying to raise awareness, the publicity needs to be complemented by law enforcement. For example, if you want to get people to wear seat belts you first publicise why seat belts should be worn and then follow this with intensified enforcement of the seat belt law. It is the enforcement part of the campaign that has the power to get people to change their behaviour.

Best practice for behaviour-change campaigns can be summarised as follows:

- > Single issue (e.g. seatbelts, mobile phone use, speeding, etc.) with a single concise message - NOT 'Behave safely on our roads'
- > Targeted at the group that are the worst offenders
- > Know the target audience – what makes them offend – what is likely to persuade them to change
- > Choose the media carefully – TV has the advantage of wide reach and realism, but is expensive – Radio is good for simpler messages and reaching people while they are in their cars – Flyers (handed out to the targets) are cheap and can be effective – Billboards are useful if you have a strong, simple message with an effective graphic, and you can choose a good location, such as going into or out of town - SMS has potential.
- > Publicity material that catches the attention of the audience by generating fear and anxiety (e.g., this is how you will feel after you have killed your girlfriend in a crash caused by you drunk-driving) can be effective, but horror (e.g., images of blood and nasty injuries) is best avoided
- > Campaigns will generally last no more than a few weeks, but will need to be repeated several times a year for several years
- > The ability and willingness of the Police to carry out intensified enforcement in support of the campaign is highly critical – and these enforcement efforts need to be well publicised
- > Evaluation is difficult and can be expensive, but should be attempted. The key questions are; what proportion of the target audience were aware of the campaign, and how many of those say that their behaviour has changed?

### 6.7.1 Existing situation and gaps

There have been no national road safety campaigns in recent years. National Road Safety Week could perhaps be called a campaign, but it is a long way from best practice, because:

- > It does not focus on a single issue – there is no national campaign message
- > There is no publicity, other than a report in the national press on the opening speech
- > There is no accompanying enforcement
- > There is no evaluation.

National Road Safety Week has value in bringing together road safety stakeholders in one place where they can discuss progress and future plans, but it does little to raise awareness or change behaviour.

Organising local road safety campaigns could be one of the functions of the Regional Safety Committees of the National Road Safety Council. These Committees retain 50% of the revenue from the sale of Road Safety / Vehicle Fitness stickers by the Police, so they have some funds. These Committees do outreach work with BodaBoda drivers and schools, but they do not mount proper single-issue campaigns as such.

### 6.7.2 Recommendations

Running a successful national campaign in a country as large as Tanzania requires considerable financial and organisational resources. TV advertising is likely to have the greatest reach, but this is very expensive. In addition, achieving the necessary intensity of law enforcement effort is also likely to be difficult.

In the meantime, it is recommended that the Regional Traffic Officers mount behaviour-change campaigns in their main towns, with support from the MoWTC, the local committees of the NRSC, and the district authorities. This has been done before and does not require a lot of money or organisational effort. Each campaign would involve:

- > Selection of an issue (see below)
- > Giving publicity to the issue over several days by means of local radio, loudspeaker vans, distribution of flyers (designed and printed by NRSC or MoWTC) etc.
- > Intense enforcement by local police over five days – but with warnings rather than fines being given in the first day or so
- > Giving publicity of the results (number of offenders warned / fined, observed change in behaviour) by means of local radio, or loudspeaker vans.

It should be feasible for each Regional Traffic Officer to undertake at least three such campaigns each year. The key unsafe behaviours that could be effectively targeted through campaigns are:

- > Failure of drivers and passengers to wear seat belts
- > Failure of motorcycle drivers and passengers to wear helmets
- > Inappropriate speed – especially in built-up areas
- > Use of mobile phones while driving (it would help if regulations prohibiting mobile phone use are enacted, but even without these someone who uses a mobile phone when driving can be considered guilty of the offence of careless driving)
- > Driving without front and rear lights at night
- > Drinking and driving (day and night)
- > Red light running.

All Regional Traffic Officers attend the National Road Safety Week, so this could be the opportunity for the National Traffic Commander, with the help of the NRSC and MoWTC, to set up the programme, and provide guidance and training. It will be essential for the National Traffic Commander to monitor the programme and progress-chase where necessary.

Some civil society organisations have an interest in promoting road safety and they should be supported. One of the ways of doing this would be for the MoWTC / NRSC / Police to develop a toolkit containing advice on best practice and samples of publicity material (flyers, posters, logos, etc.) that they could use. There is lots of good road safety publicity material on the internet. The GRSP also just launched its Road Safety Advocacy Toolkit, though this is more for organisations wanting to campaign for government to do more about road safety.

## 6.8 Insurance

It is expected that individuals who have suffered loss in a road crash through no fault of their own should be compensated in a fair and timely manner. However this is not a simple thing to arrange, and few, if any, countries in the world have fully achieved it. The principal method of doing this is to require all drivers and transporters to take out a third party insurance policy. Road crash victims can claim on the policy, but they normally have to prove to the insurance company that their policy-holder was at fault. Some say that it is unfair to require the claimant, often an ordinary person with limited resources, to take on a powerful insurance company. State-run 'no-fault' insurance systems do exist in a few countries, but some, such as South Africa's Road Accident Fund, are run at a loss, and there are complaints about long delays in settling claims.

Most countries have a system whereby victims of crashes caused by uninsured drivers or drivers who flee the scene can be compensated. The fund is fed from a levy on premiums.

In a few countries, the motor vehicle insurance industry makes a major contribution to funding road safety through a levy (typically 5-10%) on third party insurance premiums. The industry has a vested interest in making sure that there are sufficient funds to support an effective road safety programme.

Insurance companies in many of the more developed countries also support road safety by increasing the premiums of any driver or transport operator that is not thought to be taking safety seriously. Drivers who have been convicted of driving offences will be charged a high price to obtain insurance. In addition, claimants who are partly at fault (for example by not wearing their seatbelt) will get reduced compensation.

### 6.8.1 Existing situation

The Motor Vehicle Insurance Act (RE 2002) makes it compulsory to have third party insurance when driving or permitting others to drive. Government vehicles are exempt, which places any victim of crash caused by a driver of a Government vehicle in some difficulty.

The Act requires that the policy covers unlimited liability for personal injury to third parties, except in the case of passengers in buses, where the maximum liability per person is TSh30 million and the maximum liability per crash is TSh100 million. This means that, if you are a bus passenger injured in a crash with many victims, you may not receive adequate compensation.

Cover for third party property damage can be quite low, so in a bad crash it may not be enough to cover all the repair costs. The Police are thought to be enforcing vehicle insurance requirements fairly effectively.

### 6.8.2 Identified gaps in insurance

There is no system for compensating victims of hit and run or uninsured drivers, though the Insurance Regulator has plans to set one up.

There are no official guidelines for determining personal injury compensation values. Insurance companies usually make an offer based on the victim's level of injury, age, average earnings etc. If the claimant is not satisfied with the insurance company's offer they can take the case to court, though this usually takes so long that the claimant gives up and settles. Road accident victims are not compensated from Insurance immediately after the accident e.g. to cover treatment cost.

Insurance companies say that motor vehicle insurance is a high-risk, low-profit business, but nevertheless there is a lot of competition, so premiums for car insurance are quite low – much lower than in neighbouring countries. Although companies are keen to reduce risks, they are reluctant to be too tough with customers over their safety record for fear of losing business to their competitors. Insurance premiums for long-distance bus services are quite high, because of the risks, and insurance companies will refuse to provide cover to companies with bad safety records.

The public has a low opinion of insurance companies due to their perceived reluctance to pay claims. However, the recent appointment of an Insurance

Ombudsman should help to force the few unscrupulous insurance companies to behave better.

### 6.8.3 Recommendations on interventions

The Insurance Regulator should review third party insurance cover limits regularly to ensure that they are in line with costs, and are fair. It seems unfair that victims of very bad bus crashes may get less compensation than victims of other crashes.

The Insurance Regulator should consider whether it would be in the public interest to publish guidelines on personal injury compensation values. There is a risk that they might be set quite low (as with workmen's compensation) in which case claimants would be worse off than they are now.

It is recommended that the Insurance Regulator give greater priority to the setting up a fund to compensate victims of hit and run and uninsured drivers. This is badly needed.

The Insurance Regulator should work on setting up a system allowing road accident victims to benefit from insurance immediately after the accident particularly in covering treatment cost. This should be done through a review of the legislation and identification of potential system to be implemented.

Although the idea of a fault-free motor vehicle insurance system is quite attractive, the practical difficulties of making this work and sustainable are formidable. The present system is far from ideal, but with careful regulation and with the right of appeal to the ombudsman, it is probably the best way forward.

The insurance industry should be encouraged to participate more actively in the national road safety effort. It is not just their money that is needed (by means of a voluntary or mandatory levy on premiums) but also their business expertise. They can also help by discriminating against drivers and transport operators who do not have a good safety record.

### 6.8.4 Policy implications

There are policy implications for the Insurance Regulator to ensure that for example victims of serious bus crashes are compensated at a fair level and are not limited by a cap in limitations per event making compensations per victim low instead of treated as other victims. The setting up of a fund for hit and run victims compensations will also require policy changes as well as a system to compensate road accident victims immediately after the accident e.g. for covering e.g. treatment costs. Legislative changes is needed.

## 7 Safer vehicles

In its simplest form the concept of vehicle safety is that the design and construction of the vehicle will limit the injury sustained by the human occupants within and those struck by the vehicle when it is involved in a crash. The complexity of the subject is daunting but has been covered in numerous articles and technical reports over the years.

The original automobile safety standards date back to 1909 when they were adopted into of the first International Traffic Convention which introduced the concept of 'type approval' for new motor vehicles. A type approval procedure usually requires tests to be carried out on a vehicle model to ensure that it complies with regulatory standards before it is available for sale in the country or region concerned.

The EU, for example, uses a Whole Vehicle Type-Approval system under which manufacturers can obtain approval for a vehicle type in one Member State and then sell it across the EU without any further checks. Registration of the model must be granted on a simple presentation of a certificate of conformity.

In contrast, in the USA (and Canada) a self-certification system is used. Rather than carry out approval tests, it is the manufacturer's responsibility to certify that their vehicle is in compliance with Federal Motor Vehicle Safety Standards. The National Highway Traffic Safety Administration's Office of Vehicle Safety Compliance then randomly each year selects models and equipment to be tested at independent testing laboratories.

The passenger car has become one of the most heavily regulated products in human history being subject to a wide range of national, regional, and international standards. As the automobile industry becomes ever more global in structure, so the case for a globally harmonised system of regulations is becoming steadily more powerful.

The UN World Forum for Harmonization of Vehicle Regulations hosted by the United Nations Economic Commission for Europe (UNECE) is the primary global body responsible for the development of passenger car safety standards.

In March 2010 the World Forum began preparing an International Whole Vehicle Type Approval system which once operational will operate at a global level. It is expected that the negotiations on the framework will be completed by 2016.

Major vehicle producing middle income countries, such as Brazil, China, and India are yet to become parties to the 1958 Agreement which includes all the most important passenger car safety regulations. As a result, there are many new cars being produced today in emerging economies that are sub-standard in comparison with the UN's minimum safety requirements.

In 2013, a record level of 65 million new passenger cars were manufactured but it is estimated that as many as one third would fail to pass the minimum safety standards for front and side crash tests, and about half do not have Electronic Stability Control systems fitted. A key part of standardising car safety is, therefore, to ensure that global vehicle production and a regulatory system of standards remain aligned and fit for purpose.

It is often stated that the extra cost will make cars unaffordable in the low and middle-income countries. The additional costs involved in meeting the basic frontal crash test only demands a body shell that incorporates a crumple zone. The engineering required for a crumple zone is well known and non-demanding technically. It usually requires the inclusion of some extra stiffening structures combined with deliberate failure points designed to limit intrusion into the occupant area in the event of a crash. The extra cost is limited to a small amount of extra steel per unit in a typical vehicle body shell.

A very important construction trend in the passenger car industry is the growing use of so-called 'global platforms'. In order to promote economies of scale, lower costs and improve profitability many carmakers are using modular production units with standardised manufacturing process and common parts applied to a wide variety of different models sold across their global markets. It has been estimated that in the second half of this decade 50% of the passenger cars sold globally will be based on just twenty core platforms.

The other key safety feature is the fitment of air bags; as the use of air bags has become almost universal across the high-income countries the unit costs of this life saving technology has dropped by around 60%. Today the typical price of an airbag sold by the suppliers is around \$50. As global growth in the airbag market continues to expand across the middle income countries, the unit costs will fall even further.

Electronic Stabilisation Control now costs less than \$50 and given that it works in conjunction with ABS costs in the middle income countries may be a little higher from \$75 to \$100 if both systems need to be fitted. ABS is a standard fitment in many new cars, ranging from 80% in China, 100% in Brazil and 27% in India.

The East African Community Transport Facilitation strategy has addressed vehicle safety standards in Chapter 8 it states.

*...Vehicle Safety standards exist in the region; most of these were adopted partly from the European states and America. Burundi and Rwanda are based on the American standards while Kenya, Tanzania Mainland and Zanzibar as well as Uganda are using their own standards developed largely from the American and English practice.*

Due to the geographical location of Tanzania with a predominately free movement of vehicles from the bordering countries there is a difficulty controlling the quality of vehicles on its road networks. It relies on its bordering countries to regulate their own vehicles to a similar standard. It is therefore ultimately necessary for any vehicle safety strategy to be harmonised throughout the East African Community.

## 7.1 Existing situation

The majority of the private sector vehicle fleet comprises vehicles that are around 10 years of age. These vehicles lack many of the basic safety features seen in developing countries for vehicles of that age.

The Tanzania Bureau of standards has regulations with respect to the mechanical condition and safety standards a vehicle must attain. The same standards are reportedly applied for imported vehicles both new and second hand.

The yearly vehicle inspection process required by the law is to all intents and purposes ineffectual. Evidence provided to the review team indicated the inspection should commence with an external visual assessment. There then should follow a more detailed inspection of the lights, wheels, tyres, and interior safety features. The test is concluded with the inspector driving the vehicle to ensure steering, brakes and engine performance are satisfactory. However, this is said not to happen and there are doubts whether yearly vehicle inspection process is required by the law for cars. From this year, there are intentions to start doing annual inspections, but the traffic police may not have sufficient manpower.

The most basic safety feature fitted to nearly all vehicles using the road network is a seatbelt. The legal framework to ensure every person sat in a vehicle must wear the seatbelt has not been enacted.

## 7.2 Identified gaps to get safer vehicles

The lack of any effective standards on imported vehicles is allowing the sale of sub-standard vehicles which, if permitted to continue, will ensure decades of avoidable fatality risk are inevitable.

The Tanzania Bureau of Standards (TBS) standard on roadworthiness does not seem to be used by the Police and is probably not legally enforceable, because it is not referred to in the Road Traffic Act.



The current legislation fails to define what safety equipment must be fitted in a vehicle as well as the correct operation and maintenance of that equipment. It also precludes any specific laws and descriptions of what constitutes an unsafe vehicle. Internationally these laws are often known as 'Construction and Use' regulations. They detail the standard requirements for fitting the equipment and for its operation and maintenance.

The vehicle inspection process required by the law is to all intents and purposes ineffectual; anecdotal evidence provided to the review team suggested that at most the average vehicle only receives a visual inspection by a vehicle examiner.

The vehicle inspection process is completely incapable either within the legal framework or more importantly practically of examining and assessing the 'high end' modern vehicle fleet currently seen on the road network.

### 7.3 Recommendations on interventions

Tanzania should take a leading role in the devolvement of a safe system approach to vehicles allowed to be registered as Tanzanian. The primary areas that need to be addressed have been outlined in a number of reviews over the last few years and for all new vehicles, it should require:

- > Vehicles to be constructed with crumple zones for frontal and side impacts which comply with international standards
- > Vehicles to be fitted with air bags for the driver and passenger as a minimum
- > Vehicles fitted with ABS and Electronic Stabilisation Control.

If the sale of new sub-standard cars is allowed to continue decades of avoidable fatality risk are inevitable. The sooner that all new vehicles registered in Tanzania are required to meet acceptable safety standards the quicker will be the overall improvement in passenger car safety.

Tanzania should create a 'Construction and Use' style regulations, e.g. comprehensive set of Vehicle Construction and Roadworthiness Regulations under the RTA based on the vehicle standards in the 'Harmonised Road Transport Regulatory System for the ESA Region' this should be done as a matter of priority without waiting for the agreement of all countries.

### 7.4 Policy implications

The need to develop a set of standards with respect to vehicle safety is seen as essential. The need is to develop some basic elements as outlined in this report; it is not initially necessary to make this legislation too complex. Using something like the Harmonised Road Transport Regulatory System for the ESA Region as a start will provide an excellent starting point; these can always be amended / enhanced later as the technology and demand dictates.

## 8 Post-Crash Response

Post-crash response primarily deals with the ability to limit the trauma experienced by persons involved in road crashes after the crash. A trauma patient that has been involved in a road crash will require:

- > Medical stabilisation to insure no further injury is sustained
- > Fire and rescue to facilitate their removal from the vehicle where they are either trapped or their injury requires parts of the vehicle to be removed (roof cut off)
- > Recovery services to remove the vehicle from the scene of the incident for either further investigation or safety reasons.

### Trauma care

Internationally there have been a number of studies by medical experts; they found that in high-income countries about 50% of deaths from road traffic crashes occurred within minutes either at the scene or while in transit to hospital. Where a seriously injured patient reaches a hospital around 15% of deaths occurred within 1-4 hours after the crash, this increases to around 35% after four hours.

Death resulting from a road collision can be classified into three time zones:

- > Deaths occur in a very short time following the impact as a result of overwhelming injury.
- > Deaths occur during the intermediate or sub-acute stage. These deaths occur within several hours of the event and are frequently the result of treatable conditions.
- > Deaths occur days or weeks after the initial injury and are the result of infection, multisystem failure or other late complications of trauma.

The World Report in 2005 on Road Traffic Injury Prevention underlined, there is not so much a "golden hour" in which interventions have to take place but more of a chain of opportunities for intervening across a longer timescale. A comparative study of mortality among seriously injured patients across a range of countries found that for low-income and middle-income countries, the vast majority of deaths occurred in the pre-hospital phase.

A Swedish study into survivability in fatal road traffic crashes concluded that 48% of those who died sustained non-survivable injuries. Out of the group who sustained survivable injuries, 5% were not located in time to prevent death, 12% could have survived had they been transported more quickly to hospital and a further 32% could have survived if they had been transport quickly to an advanced trauma centre<sup>32</sup>. A UK study estimated that 12% of road crash victims with serious skeletal trauma went on to have significant preventable disability<sup>33</sup>. The appropriate management of road casualties following the crash is a crucial determinant of the chance and quality of survival.

The provision of medical care or first aid care facilities on highways and busy roads should be an essential component of any new or upgrade road program. The need to have ambulances and trained health personals capable of reaching the scene of an incident in a reasonable period of time is essential. The greatest risk to a trauma victim, that has survived the actual crash, is how they are initially removed from the vehicle and subsequently transported to nearby hospitals for treatment. There is a need to create awareness among all sections of the society to treat accident victims with care and without fear so that the morbidity and mortality can be reduced.

Many deaths can be prevented if the casualties are treated immediately. The basic aims of first aid are:

- > To save life,
  - > airway
  - > bleeding
  - > circulation
- > To stabilise the casualty and treat for shock,
- > Call for medical assistance.

One of the most common causes of a road accident death is due to loss of oxygen supply. This is mostly caused by a blocked airway. Normally it takes less than 4 min for a blocked airway to cause death. If proper first aid is given, road accident victims have a greater chance of survival and a reduction in the severity of their injuries.

Protection is needed for two main vulnerable groups:

- > Pedestrians, who in urban areas constitute up to 70% of the fatalities
- > Passengers commuting on buses, trucks, and minibuses, who constitute the next largest population group affected.

The injury profile for road traffic crashes in developing countries differs in important ways from the profile seen in developed countries. The safe approach

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<sup>32</sup> Henriksson, E. M., Öström, M. Eriksson, A. (2001) Preventability of vehicle-related fatalities. *Accident Analysis and Prevention*, 467-475

<sup>33</sup> Mckibbin, B., Ackroyd, C.E., Colton, C.L., King, J.B., Smith, T.W.D., Staniforth, P., Templeton J. & R West (1992) *The management of skeletal trauma in the United Kingdom*. British Orthopaedic Association, November, 1992

methodology outlined in the UN decade of action and similar reports from around the world is known to make a significant difference to trauma injuries sustained by vehicle occupants. The wearing of seatbelts by all vehicle occupants has been proved to reduce trauma injury. Modern vehicle designs and a safe system approach to road design needs to be given the highest priority by governments as well as the public at all levels.

### Fire and Rescue

The need to develop a response capability for extracting injured or trapped occupants from a vehicle that has been involved in an incident is an essential element of providing a post-crash response capability. The need to create specialised units that have the equipment and technical knowledge to safely dismantle vehicles and assist the medical response team to extract injured or trapped occupants is essential.

### Recovery

The safe removal of vehicles from the scene of an incident is important activity for many reasons:

- > The modern motor vehicle has many features which, post-crash, can become very dangerous; the electronic safety components for the air bags for example remain live and capable of discharging
- > In many cases the need to further examine the vehicles involved to determine causation factors will require the removal of the vehicle to a secure place for evidential purposes
- > To enable a damaged vehicle to be cleared from the road to allow traffic to flow again.

The safe removal of a vehicle from the scene of an incident requires specialist vehicles and knowledge that ensures the vehicle is not damaged further during the process. In many instances, there will be a need to recover a vehicle onto a flatbed truck for evidential purposes.

Internationally many police forces have procured their own recovery vehicles to enable them to remove vehicles from the road network for safety and security reasons. The police also utilise the recovery vehicles when they need to remove vehicles that have been involved in a crash where they need to undertake further evidential examinations.

In some countries, the private sector is used to provide a recovery capability which is often linked to the motor vehicle insurance sector for funding. In these countries, the police makes an arrangement with the private companies to provide a service to them for their requirements; this however has a cost implication that the police have to pay for.

## 8.1 Existing situation

### Medical

The Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) is the lead organisation with respect to trauma care in Tanzania. The ministry is aware that in previous years the provision of Emergency Medical Services (EMS) has not been given a very high priority. There is also agreement that trauma from vehicle crashes is now accounting for the greatest increases.

Currently road accident trauma victims are cared for in local hospitals staffed with personnel who are neither trained to internationally accepted levels nor equipped to provide complete resuscitative care. Seriously injured victims are then transferred to facilities in Dar es Salaam.

The first Emergency Medicine residency in Tanzania was initiated in 2010 and produced its first graduates in 2013. In 2011, a dedicated Emergency Nursing curriculum was introduced as well as the Emergency Medical Association of Tanzania (EMAT). The first Emergency Medicine professional society in the country was formed and ratified by the MoHCDGEC.

EMAT was given the mandate to develop feasible initiatives for the dissemination of emergency care training to district and sub-district facilities. However, significant gaps still exist in the capacity for emergency medical care which includes shortages in human resources, essential equipment and infrastructure.

The MoHCDGEC has also identified that when new roads are developed or an existing route is upgraded the severity and number of road crashes increases. MoHCDGEC is exploring the idea of introducing EMS facilities when roads are improved. There is a World Bank supported project to establish EMS facilities on the T1 TanZam Dar es Salaam to Morogoro section as a pilot which is planned to commence in December 2016.

The World Bank project has identified hot spots where they would like to create EMS centres. A national call centre will be established at Muhimbili Hospital with a '115' phone number. The centre will be operating 24 hours a day and it is envisaged this will reduce the response time to around 10 minutes. The project plans to have 5 ambulances with two crews for each vehicle.

### Fire and Rescue

The Fire and Rescue Force is legally mandated to rescue people in the event of road traffic crashes (s, 8(a) The Fire and Rescue Act, 2007). They have some modern appliances, and firemen have the training and basic equipment with which to extricate casualties safely from crushed vehicles. Firemen are trained in first aid, and each vehicle has a first aid kit. The Force has a target of being on the scene within 5 minutes of being notified, but in practice, this is rarely achieved. One of the major constraints is that the Force only has stations in the towns and cities. If the Police request them to attend a road crash which is a long way from town it will take time to get there, and, if they do not have

enough fuel for their vehicles, as sometimes happens, they will not be able to respond.

The Fire and Rescue Force is chronically underfunded and need to strengthen their capability to extricate casualties from crashed vehicles.

There are detailed plans to build small fire stations every 100 kilometres or so along the busiest trunk roads, such as TanZam, Chalinze to Arusha, Dodoma – Mwanza, etc., but they have no budget for implementation. There is little prospect of receiving funds for this in the near future, yet an estimated TSh 30 billion is collected every year by way of Fire Levy on vehicles, and industrial and commercial buildings, almost all of which is kept by the Treasury.

### Recovery

Private sector recovery companies do exist in Tanzania but are small and have limited capabilities.

## 8.2 Identified gaps in post-crash response

The current status of the EMS facilities within Tanzania is unable to provide even the most basic post-crash trauma care. The entire system relies on members of the public using their own vehicles to convey the injured to a medical facility.

Other than the one hospital in Dar es Salaam that has a full EMS capability all the other medical facilities located at each of the regional centres can only provide limited EMS capabilities. Outside of these centres, little or no EMS capability is available.

Fire and rescue services are only available in towns and cities, leaving a very large part of the country, and many crash-prone roads, unprotected.

One of the difficulties in achieving a coordinated emergency response is that each service has its own emergency number and their communications equipment is not compatible, so they have to use phones to talk to each other.

There is a lack of formal breakdown services means that broken down and crashed vehicles can remain on the road for days, and are a hazard.

Another problem is the failure to adopt and enforce SADC / UN codes of practice regarding the signing and documenting of hazardous cargoes – making it sometimes difficult for firemen to know what they are dealing with.

## 8.3 Recommendations on interventions

In 2012 deaths from road accidents was statistically in 9<sup>th</sup> place in the top 15 causes of death in the world. By 2020 deaths from road accidents is expected to reach 3<sup>rd</sup> place. Medical advances have been made in the majority of the other

causes of deaths; the same approach needs to be made for road accident deaths.

To achieve the greatest reduction in the road death toll Tanzania needs to enhance its EMS capability; this is a long term goal but one that must be pursued at a commensurate pace to the problem that exists.

Alongside the important objective of developing a robust EMS capability there is a need to develop local community action groups trained in 'first aid' and basic EMS techniques. Internationally this approach has been shown to make a significant difference to the survival chances of a trauma victim especially in rural conditions where response times for all of the emergency services are long.

The current program of providing first aid training to the police needs to be enhanced to a much higher standard with a final examination and formal certification at the end. The greater mobility currently being provided to the police will increase their ability to attend the scenes of crashes more quickly and thus demand they provide a more proactive trauma care to the parties involved. Developing the first aid training to a much higher standard will also require the police vehicles to be equipped with comprehensive first aid package. There should also be a requirement for a refresher training course and requalification every two years.

A program to provide more advanced first aid training to the drivers of Goods and passenger carrying vehicles should be developed and made a mandatory requirement for the issue of an operations license. The requirement for these vehicles to also have specifically itemised first aid equipment which is commensurate with the requirements of the training course, would provide a significant enhancement to the trauma care capability. There should also be a requirement for a refresher training course and requalification every two years.

A start must be made in establishing fire stations along the busiest crash-prone roads. It would make sense to build them alongside the EMS stations being planned by the MoHCDGEC with the help of the World Bank. Development of a system for break down services should be initiated including an assessment of necessary legislation and identification of appropriate system.

## 8.4 Policy implications

It will have policy implications to make the licensing of commercial transport dependent on having advanced first aid training. The development of EMS services will require political focus.

There is an urgent need to provide funding to develop a proper nationwide fire and rescue service. When vehicle owners and others pay their annual Fire Levy they expect to see the funds being used to improve the fire service, but this is not happening. The amount collected each year is enough to buy 20 new fire appliances. Treasury needs to allow more of this revenue to be retained by the

Fire and Rescue Force, so that they can start implementing their development plans.

There may be a need for change in legislation to e.g. allow that the Police can force owners to damaged or broken down vehicles to remove them, or the Police should be able to remove them themselves.



## 9 Monitoring and evaluation

It is important to monitor road safety activities to ensure that measures are cost effective and knowledge is obtained on good and bad practices.

According to ADB Guidelines on Road Safety<sup>34</sup> the use of monitoring frameworks is to be recommended and generally results in greater success in terms of implementation of action plans. Thus, appropriate targets and performance indicators should be established and all plans and programs monitored to ensure effectiveness.

To monitor the implementation of the Road Safety Policy and e.g. the recommendations in this report, annual plans of actions should be prepared to be implemented by stakeholders. When focusing on monitoring of an overall action plan aimed at institution building and strengthening the key agencies with road safety responsibilities must focus on whether the objectives of the action plan are being achieved<sup>34</sup>. It is necessary to ensure that the activities of the stakeholders have been effective and that the impact of such activity is having the desired effect in terms of strengthening the capability of the country to tackle the problem.

Performance indicators should be identified to monitor whether or not the desired impact has been achieved and results achieved. They can also be used to identify whether the project is progressing as desired in terms of development and institutional impact.

Given that funds are always limited for such purposes, it is imperative that the money available is spent in the most wise and effective way to tackle the problem. When specific initiatives are implemented, the effectiveness of that measure should be monitored and evaluated e.g. by looking at accident data from the before and after situation for equivalent periods of time<sup>34</sup>.

Table 10 provides a list of potential indicators that may be used for inspiration in selecting targets and indicators for the road safety strategy and in the process of preparing a monitoring and evaluation programme for Tanzania.

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<sup>34</sup> Road Safety Guidelines for the Asian and Pacific Region, Road Safety Action Plans and Programs, Asian Development Bank

Table 10 List of potential indicators

Road safety performance indicators	
Category	Examples of possible indicators
Risk exposure	Traffic volumes by vehicle and road user type
Final safety outcomes	Number of deaths and injuries recorded by Police (both total and by road user groups, e.g. pedestrians, and by drink-driving, speeding, etc.)
	Hospital data for road deaths and injuries recorded by Health authorities
	Other sources of death and injury registration
Intermediate safety outcomes	Average vehicle speeds by road type: summer and winter, daylight and darkness, weather
	Speeding, mean speed, speed variance, speed limit violations (percentage above speed limit, 10 km/h above speed limit etc.)
	Front and back seat safety belt wearing rates (driver and passengers) and child restraints usage including correctly fitted restraints
	Motor cycle, moped and cycle helmet wearing rates (driver and pillion)
	Use of pedestrian crossing facilities by pedestrians
	Failure to stop or yield at junctions or at pedestrian crossings
	Red light running
	Inadequate headways – close following
	Incidence of drinking and driving (both total and by road user groups)
	Drug impairment levels
	Use of daytime running lights (for all roads, per road type pre vehicle type)
	Use of reflective devices for cyclists and pedestrians
	Percentage of drivers that state they have fallen asleep or nearly fallen asleep while driving
	Excessive overtaking (frequently changing lanes to overtake)
	Vehicle compliance with testing standards
	Vehicle crash safety ratings
	Vehicle age measure of the passenger car fleet
	Percentage of new cars with the top star rating according to EuroNCAP
	Percentage of technically defective vehicles
	Average emergency medical services response times
	Time from injury to adequate medical care
	Availability of Emergency Medical Service stations per 10,000 citizens, and pr. 100 km length of rural public roads
Targeted audience groups' recall and assessed relevance of publicity and awareness campaign messages	
Community attitudes to road safety	
Intervention outputs	Number of safety engineering treatments per section of road network
	Skid resistance of road surfaces (winter and summer)
	Road infrastructure crash safety ratings (risk and protection scores)
	Percentage of road network not satisfying safety design standards
	Percentage of safe junctions
	Number of emergency medical services responses to road network crashes
	Hours of Police enforcement targeting high-risk behaviours
	Numbers of Police infringement notices issued
Media frequency and reach of publicity and awareness campaigns supporting Police enforcement	

Road safety performance indicators	
Category	Examples of possible indicators
	Hours of school-based education activities
	Volume of driver training, testing and licensing activities
	Volume of vehicles tested
Adopted from:	<ol style="list-style-type: none"> <li>1. Road Safety Management. Capacity Reviews and Safe System Projects. Guidelines. Global Road Safety Facility. Tony Bliss and Jeanne Breen.</li> <li>2. An Application of a road network safety performance indicator. Georg Yannis at. all. Paper for International Conference Transport Safety Performance Indicators. Serbia Belgrade.</li> <li>3. Vägverket 2008.</li> <li>4. Road Safety performance indicators and evaluation a towards a comprehensive and responsive system. Peter van der Knaap. Paper for International Conference Transport Safety Performance Indicators. Serbia Belgrade.</li> <li>5. Safety monitoring and performance indicators based on UD decade "pillars". Alan Ross et. all. Paper for International Conference Transport Safety Performance Indicators. Serbia Belgrade.</li> </ol>

Apart from monitoring whether the stakeholders are implementing the actions relevant for them e.g. the following indicators may be relevant for Tanzania:

- > Deaths and injuries recorded by Police (total)
- > Number of fatalities and serious injured by road user groups, e.g. pedestrians, motorcyclists, busses
- > Number of fatalities and serious injured by region
- > Number of fatalities and serious injured caused by:
  - > Speeding,
  - > Drunk drivers,
  - > Head-on collisions,
  - > Single accidents
- > Other indicators could be:
  - > Proportion of drivers and passengers wearing seat belts
  - > Proportion of motorcyclists wearing helmets correctly
  - > Proportion of drivers above the permissible alcohol limit
  - > Share of drivers exceeding speed on different type of roads and road user (trunk roads, provincial roads, district roads, roads in linear villages and cities) (busses, HGV, etc.).

## 10 Summary of interventions

The tables on the following pages summarises the activities of the different interventions in the following areas:

- > Improve road safety management
- > Safer roads
- > Safer road users
- > Safer vehicles
- > Improve handling of crash victims

### 10.1 Interventions for improved road safety management

The potential interventions and tentative implementation schedule to improve road safety management could be summarised as:

Proposed action	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
Strengthen institutional framework and organisation of road safety	<ul style="list-style-type: none"> <li>&gt; Strengthen the effectiveness of NRSC in leading and coordinating the national road safety programme</li> <li>&gt; NRSC more active in directing coordinating and progress chasing work of all members</li> <li>&gt; Obtain sustainable source of financing from e.g. Road Fund</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Establish the Road Safety Agency/Board including staffing and financing</li> <li>&gt; Prepare annual progress reports and maybe quarterly newsletters</li> <li>&gt; Obtain sustainable financing from e.g. Road Fund</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Prepare annual progress reports and maybe quarterly newsletters</li> </ul>
Improve road safety strategy and policy	<ul style="list-style-type: none"> <li>&gt; NRSC to work on 1-year Action Plans</li> <li>&gt; NRSC to seek the active collaboration of all stakeholders in preparing the Action Plan and obtain their commitment to implement it</li> <li>&gt; NRSC to hold stakeholders accountable for performance</li> <li>&gt; Identify financing and funding mechanisms</li> <li>&gt; Monitor and follow up on action plans</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Suggest indicators for monitoring and evaluation</li> <li>&gt; NRSC and Road Safety Agency/Board eventually hold stakeholder accountable for performance</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>
Improve accident data and data collection	<ul style="list-style-type: none"> <li>&gt; All fields in forms should be filled – make sure no gaps are allowed</li> <li>&gt; Identify and use GIS program to</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Continued audit of the records within RAIS database</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Continued audit of the records within RAIS database</li> </ul>

Proposed action	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
	<ul style="list-style-type: none"> <li>present crash registrations</li> <li>&gt; Do comprehensive audit of the records within RAIS database and correct all errors and omissions</li> <li>&gt; Enable the RAIS database to export all data without combining data to allow for meaningful analysis</li> <li>&gt; Ensure TANROADS, other road authorities and interested stakeholders have direct access to accident database</li> </ul>		
Improve regulation of road freight and passenger transport	<ul style="list-style-type: none"> <li>&gt; SUMATRA to be more proactive in suspending licences for e.g. poor vehicles</li> <li>&gt; Create a knowledge base of vehicles and operators committed violations or being checked by police</li> <li>&gt; Expand current database on suspended licences to include information on incidents</li> <li>&gt; Facilitate flow of information between SUMTRA and Traffic Police</li> <li>&gt; Introduce legislation on driving and resting time</li> <li>&gt; Consider to take into account that many modern vehicles are born with vehicle tracking system when introducing new</li> <li>&gt; SUMATRA and Police to enforce the existing legal requirement for buses to be fitted with speed governors</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Develop automated system with direct links between police computer systems and SUMATRA's</li> <li>&gt; SUMATRA to create an operational enforcement and investigation section</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>
Improve funding	<ul style="list-style-type: none"> <li>&gt; Establish Road Safety Fund under Road Fund</li> <li>&gt; NRSC to apply for funds from Road Safety Fund or Road Fund</li> <li>&gt; NRSC to establish performance contract with Fund and be accountable</li> <li>&gt; Funds should be allocated years ahead</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Impose levy on motor vehicle insurance premiums to fund a scheme to compensate victims of hit and run and uninsured drivers</li> <li>&gt; Continued funding from Fund</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Continued funding from Fund</li> </ul>
Improve monitoring and evaluation	<ul style="list-style-type: none"> <li>&gt;</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Establish a monitoring and evaluation system to regularly monitor safety performance against target</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>
Improve research in road safety	<ul style="list-style-type: none"> <li>&gt; NRSC to complete a list of road safety research carried the last 10 years</li> <li>&gt; Ensure universities and research institutes and others with interest in road safety have access to the crash database</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Develop a national road safety research strategy</li> <li>&gt; Develop a 1 year research programme on most severe black spots</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Device comprehensive framework of research projects</li> <li>&gt; Develop road safety research capability in universities and research institutes</li> <li>&gt; Encourage/support organisation of annual conference on road safety research</li> </ul>

## 10.2 Interventions for safer roads

The potential interventions and tentative implementation schedule to get safer roads could be summarised as:

Proposed action	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
Improve designs standards and practices	<ul style="list-style-type: none"> <li>&gt; Demand road safety engineer to be part of design team (include in ToR)</li> <li>&gt; Ensure RSA of design</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Develop safety conscious technical manuals on bridge design ad all aspects of urban traffic engineering and make them available on the official websites</li> <li>&gt; Preparation of Design Base Statement by design consultant to identify where manuals need adjustments</li> <li>&gt; Ask for approval of departures from design standards</li> </ul>	>
Improve road safety audit (RSA) practices	<ul style="list-style-type: none"> <li>&gt; TANROADS to ensure that all major road schemes are safety audited at feasibility stage, preliminary design, detailed design and pre-opening stages</li> <li>&gt; TANROADS to recruit a consultant road safety engineer to mentor auditors</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Use local engineers for RSA through framework agreement</li> <li>&gt; Make RSA legal requirement</li> </ul>	>
Improve road safety inspections (RSI)	<ul style="list-style-type: none"> <li>&gt; TANROADS to prepare guidance note and standard form</li> </ul>	<ul style="list-style-type: none"> <li>&gt; TANROADS Regional Managers arrange for RSI on their network through focal person</li> </ul>	<ul style="list-style-type: none"> <li>&gt; TANROADS Regional Managers arrange for RSI on their network through focal person</li> </ul>
Improve identifying and treating crash sites on existing roads	<ul style="list-style-type: none"> <li>&gt; TANROADS to invest more staff and resources in safety management of existing roads</li> <li>&gt; More training for road safety focal persons in the Regional Managers Office</li> <li>&gt; Increase allocation of funds for remedial measures</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Build road safety engineering capacity (skills and funding) in urban authorities</li> </ul>	>

### 10.3 Interventions for safer road users

The potential interventions and tentative implementation schedule to get safer drivers could be summarised as:

Proposed intervention	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
Improve traffic laws and enforcement	<ul style="list-style-type: none"> <li>&gt; Strengthen current road traffic rules, e.g. on speed limits in rural areas, seatbelts, helmet for passengers, use of mobile phones</li> <li>&gt; Make it mandatory for all occupants in a vehicle to use seatbelt including child restraint system for children</li> <li>&gt; Police to improve planning, management, monitoring and audit of enforcement programmes through data led enforcement</li> <li>&gt; Ensure passenger and goods vehicles are of good standard by actively using licencing system</li> <li>&gt; Develop direct link between local traffic policed and local SUMATRA to exchange knowledge on professional vehicles</li> <li>&gt; Undertake a formal training needs assessment for all Traffic Police personnel</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Improve mobility capability for traffic police</li> <li>&gt; Create and use a knowledge base of passenger and goods vehicles being detected or involved in accidents</li> <li>&gt; SUMATRA to develop a database with all information with direct link to police and the RAIS database</li> <li>&gt; Create task force to investigate operations further based on above system</li> <li>&gt; Enhance publicity of traffic law enforcement in order to maximise the deterrent effect</li> <li>&gt; Training in enforcement techniques and technology</li> <li>&gt; Training in vehicle technology and safety features</li> <li>&gt; Training in crash scene investigation and data collection</li> <li>&gt; Training in crash data database</li> </ul>	>
Improve driver training schools	<ul style="list-style-type: none"> <li>&gt; Prepare structured and comprehensive driver training</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Create entity to coordinate and control all aspects of driver</li> </ul>	>

Proposed intervention	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
	<ul style="list-style-type: none"> <li>curriculum and training material</li> <li>&gt; EAC driver training curricula for large commercial vehicles is adopted and implemented</li> <li>&gt; Curricular for motorcycle (bodaboda) training is adopted and implemented</li> <li>&gt; A national curricular for ordinary motorcyclist should be prepared and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>training</li> <li>&gt; Reassess the cost of training</li> </ul>	
Improve driver training	<ul style="list-style-type: none"> <li>&gt; Create regulation to provide minimum hours driving by student</li> <li>&gt; Printing and distribution of Highway Code should be expedited and easily available</li> <li>&gt; Develop national driver training curriculum</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Regular update Highway Code and keep in print</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Regular update Highway Code and keep in print</li> </ul>
Improve driver testing	<ul style="list-style-type: none"> <li>&gt; Development of formal training and testing curriculum, e.g. based on NIT courses</li> <li>&gt; Implementation of an improved, and standardised driving test throughout Tanzania</li> <li>&gt; Enhance training course for police examiners to include formal documented testing procedure</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Provide an auditing process for final testing to ensure standardisation</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>
Improve road safety education in schools	<ul style="list-style-type: none"> <li>&gt; Deliver sustainable training to those in greatest need, e.g. in cities, towns and villages along main roads by face to face training by e.g. police officers</li> <li>&gt; Guidance on what to teach and how</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Community Development officers trained to be able to deliver road safety training in local schools</li> <li>&gt; Re-start the Teaching Pack by developing simple manual for trainers</li> <li>&gt; Get scouts and guides to do training at schools following above guidance</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Develop high level universal road safety educations system</li> </ul>
Improve community road safety education	<ul style="list-style-type: none"> <li>&gt; TANROADS/MoWTC to develop and publish Good Practice Manual on community road safety education</li> <li>&gt; TANROADS be more specific in demands to community road safety education in road projects</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>
Improve campaigns	<ul style="list-style-type: none"> <li>&gt; RTOs to undertake local campaigns (3 yearly) through radio, vans, flyers and local enforcement, and communication of results</li> <li>&gt; All RTO to attend National Road Safety week for setting up programmes and exchange of experience</li> <li>&gt; National Traffic Commander to monitor progress</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Support civil society organisations with an interest in promoting road safety, e.g. by developing toolkit</li> <li>&gt; Regional launched campaigns (3 yearly) through radio, vans, flyers and local enforcement, and communication of results</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Wider use of TV advertising for national road safety campaigns</li> <li>&gt; Intensify national enforcement in connection with campaign</li> </ul>
Improve insurance system	<ul style="list-style-type: none"> <li>&gt; Set up fund to compensate victims of hit and run, and uninsured drivers</li> <li>&gt; Ensure that victims of serious bus crashes are not compensated less than other victims</li> <li>&gt; Review regular third party insurance cover limits to ensure they are in line with costs</li> <li>&gt; Continue system with appeal possibility to ombudsman</li> <li>&gt; Review legislation and identify a system allowing road accident victims to benefit from Insurance immediately after the accident particularly in covering treatment cost.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Consider whether it is in public interest to publish guidelines on personal injury compensation values</li> <li>&gt; Encourage insurance industry to participate in national road safety effort</li> <li>&gt; Setting up a system allowing road accident victims to benefit from Insurance immediately after the accident particularly in covering treatment cost.</li> </ul>	<ul style="list-style-type: none"> <li>&gt;</li> </ul>

## 10.4 Interventions to ensure safer vehicles

The potential interventions and tentative implementation schedule to ensure safer vehicles could be summarised as:

Proposed action	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
Ensure safer vehicles	<ul style="list-style-type: none"> <li>&gt; Create a comprehensive set of basic vehicle construction and road worthiness regulations (Construction and Use)</li> <li>&gt; Intensify roadside vehicle fitness inspections</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adopt higher standards for new vehicles in Tanzania, including crumple zones, air bags, ABS and electronic stabilisation control</li> <li>&gt; Introduce mandatory regular vehicle road worthiness checks of all vehicles, complemented by random roadside inspections</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Adopt higher standards for new vehicles in line with technological improvements</li> </ul>

## 10.5 Interventions for post-crash response

The potential interventions and tentative implementation schedule to improve post-crash response could be summarised as:

Proposed interventions	Proposed activities in		
	Short term (1-2 years)	Medium term (3-5 years)	Long term (6 years -)
Improve post-crash response	<ul style="list-style-type: none"> <li>&gt; Implement pilot project on EMS services</li> <li>&gt; Develop local community groups trained in first aid</li> <li>&gt; Enhance training programme for police to higher standard</li> <li>&gt; Equip police vehicles with comprehensive first aid package</li> <li>&gt; Establish fire stations along the busiest crash-prone roads.</li> <li>&gt; Assessment of necessary legislation and identification of appropriate system for breakdown services</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Enhance EMS capability nationwide</li> <li>&gt; Refresher training course and requalification in first aid every two years</li> <li>&gt; Develop advanced first aid training to HGV and PSV drivers and make it mandatory for issue of operation licence</li> <li>&gt; Development and implementation of a system for break down services</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Enhance EMS capability (continued)</li> <li>&gt; Refresher training course and requalification in first aid every two years for police, HGV and PS drivers</li> </ul>



## 11 Recommendations on priority

The following present recommendations for priority of interventions and a package of suggested priority interventions for short- and medium term.

### 11.1 Priority of actions

The recommendations on priorities are based on the result of the gap analysis as well as on best practice on what should be in place to improve road safety and on actions expected leading to fast and significant impacts, and can be described as follows:

- > **Priority 1:** Actions that are identified as necessary to provide the framework to do road safety work and actions with a significant impact on road safety performance are considered to need urgent attention and are thus recommended for highest priority.  
This includes setting the framework for road safety work by strengthening road safety management, providing safer roads where many accidents happen today, to avoid accidents on new roads (RSA), and to improve their behaviour through tougher rules and enforcement that is more effective.
- > **Priority 2:** Actions identified important with some impact but not being addressed at present are considered of medium priority. For instance, this includes softer measures to change behaviour and to establish visions and targets, etc.
- > **Priority 3:** Actions identified as having smaller impact or already being addressed are considered of lower priority.

Table 11 Suggested priority of actions

Area	Intervention	Priority
Strengthen road safety management	Strengthening the institutional framework and organisation of road safety including the role and capability of the NRSC	1
	Improve road safety strategy and policy	2
	Improve accident data and data collection, and access to data	1
	Improve regulation of road freight and passenger transport	1
	Improve funding	1
	Improve monitoring and evaluation	2
	Improve research in road safety	3
Safer roads	Improve designs standards and practices	2
	Improve road safety audit (RSA) practices	1
	Improve road safety inspections (RSI)	2
	Improve identifying and treating crash sites on existing roads	1
Safer road users	Intensify enforcement of traffic rules and regulations by Police and Sumatra	1
	Improve driver training and testing	2
	Improve road safety campaigning	2
	Improve education in schools	2
	Improve community road safety education	2
	Improve insurance system	2
Safer vehicles	Create a comprehensive set of vehicle construction and road worthiness regulations (Construction and Use)	2
	Devolvement of a standard system for new vehicles in Tanzania, including crumple zones, air bags, ABS and electronic stabilisation control	2
	Improve roadside vehicle inspections	2
	Introduce mandatory regular vehicle road worthiness checks of all vehicles	3
Improve post-crash response	Implement pilot project on EMS services	2
	Develop local community groups trained in first aid	2
	Enhance training programme for police to higher standard first aid	1
	Equip police vehicles with comprehensive first aid package	1
	Enhance EMS capability nationwide	2
	Develop advanced first aid training to HGV and PSV drivers and make it mandatory for issue of operation licence	2
	Establish fire stations along the busiest crash-prone roads.	2

## 11.2 Priority actions

It is recommended to implement the specific activities described for short and medium term under the priority 1 actions. These include activities under the following four main areas and actions:

- > Safer road users
  - > Intensify enforcement of traffic rules and regulations by Police and Sumatra
- > Strengthen road safety management
  - > Strengthening the institutional framework and organisation of road safety including the role and capability of the NRSC

- > Improve accident data and data collection, and access to data
- > Improve regulation of road freight and passenger transport
- > Improve funding
  
- > Safer roads
  - > Improve road safety audit (RSA) practices
  - > Improve identifying and treating crash sites on existing roads
  
- > Improve post-crash response
  - > Enhance training programme for police to higher standard first aid
  - > Equip police vehicles with comprehensive first aid package.

## Appendix A People met

- > Mr Nahson I. Sigalla – NIS, Director, Economic Regulation, SUMATRA
- > Mr Johansen Kahatano – JK, Director, Transport Regulation, SUMATRA
- > Mr Geoffrey L. Silanda – GLS, Manager, Road Safety & Environment, SUMATRA
- > Mr Magiri Ngangaji, MPRD, SUMATRA
- > Mr Samson Ngasda – SN, Statistician, SUMATRA
- > Mr Charles J. Ngaluko – CJN, Research Officer, SUMATRA
- > Ms Veronica Bartholomew – VB, SPROC (Procurement), SUMATRA
- > Mr Leo J. Ngomi – LGN, MNCMO, SUMATRA
- > Mr Chester Kapintia, STRO, SUMATRA
- > Mr Gabriel Anthony, SR1MO, SUMATRA
- > SUMATRA Board
- > Denis Daudi, SUMATRA in Mbeya
- > Mohammed R. A. Mpinga – DCP, Deputy Commissioner of Police, Commanding Officer, Traffic Police Division
- > F. M. Musilimu, - ACP, Traffic Police
- > Insp Yohannas Mjema, Traffic Police
- > Insp Gwau
- > Sgt Aquilino
- > Sgt ? Driving license and vehicle tester
- > Sgt Omary Luyagaze, Traffic Cases Investigation, Traffic Police, Mbeya
- > Butusyo A. Mwambelo – SSP, Regional Traffic Officer-Mbeya, Traffic Police
- > Ins. Peter Kapaswe, Instructor (driver and vehicle testing), Traffic Police, Mbeya
- > Olivia Mtandi, RAIS data, Traffic Police, Mbeya

- > Mr Julius Chambo, JC, Director of Safety and Environment, Ministry of Works, Transport and Communication
- > Ms Joyce Mbunju, DSE, Road Safety Engineer, Safety and Environment Unit, Ministry of Works, Transport and Communication
- > Hamisi Isamili, Ministry of Works, Transport and Communication
- > Ms Leah Mkude, Safety and Environment Unit, Ministry of Works, Transport and Communication
- > Ms Hezron Nyandaro, Safety and Environment Unit, Ministry of Works, Transport and Communication
- > Mr Jan Bijl – JB, Consultant to MoWTC, Egis international
- > Ms Zafarani A Madayi – ZAM, Head of Road Safety and Environment, Tanzania National Roads Agency (TANROADS)
- > Ms Aisha Hussain, Road Safety and Environment Unit, TANROADS
- > Eng. Paul L. S. Lyakurwa, Regional Manager Mbeya, TANROADS
- > Eng. Selemoni R. Lawena, HPL-Mbeya, (Planning), TANROADS
- > Lowine E. Malori, Road Engineer (District engineer), Mbeya District
- > Ms Catherine Gwaliu. AgSA, State Attorney Mbeya
- > Rogers Francis, Prosecutor in Charge Mbeya
- > Eng. Prof Zacharia M D Mganilwa, Rector, National Institute of Transport (NIT)
- > Eng. Dr Ethel D Kasembe, Dept. Rector planning, National Institute of Transport (NIT)
- > Leonard Sempoli - Head of Transport Safety & Environmental Studies Department, National Institute of Transport (NIT)
- > Ngusekela David- public relations officer, National Institute of Transport (NIT)
- > Juma Manday - public relations officer, National Institute of Transport (NIT)
- > Mr Neal Rettie – NR, TA on driver training, TransAid
- > Mopondo – Mo, TA on driver training TransAid
- > Lameck P. Kihinga, Principal, VETA Mbeya

- > Rajabu Ghuliku, ESCC, Course Coordinator, VETA Mbeya
- > Dr Ewas Kwesi, Ministry of Health
- > Dr Mary Kitambi, Ministry of Health
- > Msalale Myrian, Acting Hospital Director, Mbeya
- > Commissioner for Domestic Revenue - CDR, Tanzania Revenue Authority
- > Mama Mafuru - MF, Tanzania Revenue Authority
- > Patrick Musa, PM, Senior Transport Economist, AfDB
- > Martin Humphreys, Lead Transport Economist, World Bank
- > Vincent K. D. Lyimu (Hon), Insurance Ombudsman
- > Fabian N Mbegele, Principal Insurance Officer
- > Margaret Mufelmi, Registrar of Complaints
- > Anna Abdiel Abayi, Senior Insurance Officer, TIRA
- > Elia Kajiba, Director of Licensing & Market Conduct Supervision, TIRA
- > Eliezer Hiliyai Rweikiza, Corporate Commercial Manager, TIRA
- > Mary Kessi, NPO – Road Safety Program, WHO
- > A H Issango, RTO Pwani Region
- > Augustus Fungo, National Coordinator, Road Safety Ambassadors Group of Tanzania (telephone interview)
- > ASP Deus Sokoni, Tanzania Police Force
- > Frank J Lyatuu, Victory Driving School
- > Ms Josephine Protace, Chairwoman, Pwani Regional Road Safety Committee
- > Aliasgher Somji, Manager, Alliance Insurance
- > Mr Njoka Eliuboto, Executive Secretary, TABOA
- > Mremi, Managing Director, Dar Express
- > Richard Augustine Zuberi Mkurugenzi, Managing Director, Zuberi Bus Services and Kasesa Express

- > Adnan Ayub Khan, Simiyu Express bus company
- > Francis A Sengo, Assistant to Director, Super Feo Express
- > Mr Emmanuel J. Kakuyu, Chief Executive Officer, TATO A
- > Yona Afrika, Standard Officer, Tanzania Bureau of Standards
- > Stephen Miller, After Sales Manager, Scania Tanzania Ltd
- > Lars Eklund, General Manager, Scania Tanzania Ltd
- > Eliud Nyauhenga, Road Fund Manager
- > Patrick Binon, Driver Trainer, Scania Tanzania Ltd
- > Dick Komakech, CARDNO (Engineering consultants to PORALG) (telephone interview)
- > Chief Allan L. M. Mwaigaga, Chair Regional Road Safety Committee Mbeya, Toyota Dealer and Bus Operator
- > Taufiq Bhanji, Managing Partner, Fleet Track
- > Henry Bantu, Executive Chairman, Safe Speed
- > Tom Bishop, Amend
- > Yusuf A. Ghor, Automobile Association of Tanzania
- > Commissioner General Andengenyne, Fire and Rescue Force
- > Commissioner H H Mhando, Fire and Rescue Force

## Appendix B Documents studied

- > The Road Traffic Act from 1973 that is the main current legislation governing road safety in Tanzania
- > The Road Traffic Act, 1973, (No. 30 OF 1973), Regulations Made under sections 114 (1)(p) The Road Traffic (Maximum Weight of Vehicles) Regulations, 2001
- > The Surface and Marine Transport Regulatory Authority Act 2001 – sets out the role of SUMATRA
- > Highway Code – developed by Ministry of Infrastructure Development in 2008- is a set of rules and advice on how to use the roads based on road traffic law and good driving practice
- > The Transport Licensing Act - 1973
- > The Transport Licensing (Goods Carrying Vehicles) Regulations, 2012
- > The Transport (Road Passenger) Licensing Regulation 2007
- > The Road Traffic (Maximum Weight Vehicle) Regulations, 2001
- > Passenger Vehicle - Technical Safety and Quality of Service Standard Rules 2008
- > Bajaj (Motor Cycle and Tricycle) Regulations, 2010
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- > The Road Traffic (Notification of Offences) Regulations GN249/2000
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- > The North South Corridor Road Safety Review - Road Safety Capacity Management Review, April 2013
- > Road Safety in the African Region 2015, WHO
- > UN Global Plan for the Decade of Action for Road Safety, 2011-2020
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- > [http://www.kiwirap.org.nz/safe\\_road\\_system.html](http://www.kiwirap.org.nz/safe_road_system.html) and <http://www.roadwise.asn.au/safe-system-approach-to-road-safety.aspx>
- > Implementing the Recommendations of the World Report on Road Traffic Injury Prevention - Country Guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects, Tony Bliss and Jeanne Breen, Global Road Safety Facility, June 2009
- > Road safety planning. Good practice examples from national road safety strategies in the EU. Non-paper as food for thought and discussions [http://ec.europa.eu/transport/road\\_safety/pdf/national-road-safety-strategies\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/national-road-safety-strategies_en.pdf)
- > Swedish Road Administration, Vision zero – from concept to action, Borlange, 2000
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- > Safer Roads, A Guide to Road Safety Engineering, K W Ogden, 1996
- > Road Safety Manuals for Africa: Existing Roads: Reactive Approaches, AfDB, 2014
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- > Road Traffic Injury on Rural Roads in Tanzania: A study to determine the causes and circumstances of motorcycle crashes on low-volume rural roads, Final Report, v1.1, AMEND, 25th September 2014
- > Road Traffic Injury on Rural Roads in Tanzania: A population based control study assessing Road Traffic Injury on rural roads in Tanzania and the effectiveness of road safety measures at reducing injury rates. Implementation of the Road Safety Programme for the Bago to Talawanda Road, January 2013
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- > A Harmonised Road Transport Regulatory System for the ESA Region – Final Report (Volume 1 and 2) - Regional Standards, COMESA
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## Appendix C Estimation of Economic Costs of Road Accidents

### Introduction

Estimation of economic costs of roads accidents is associated with a combination of many issues and shall be seen in the perspective of the prevailing society with linkages to loss for victims and families, the public health system, insurers and taxpayers. Generally, the burden of injuries (fatal or serious) can be addressed to following categories of which several are difficult to measure:

- > Medical costs (emergency transport, hospitals, rehabilitation, funeral expenses, etc.)
- > Cost of police, fire, legal and victim services, cost of property damage
- > Costs of work loss or productivity losses
- > Costs of quality of life for victims and families.

### Estimation of Economic Costs of Road Accidents in Tanzania

The estimation of economic costs of road accidents in Tanzania are based on a number of assumptions for GDP, GDP per capita, estimation of value of life, number of fatal road accidents, and estimates for serious and minor road injuries. The estimation is made for the years 2013-2015 based on the latest best available data on road accidents in Tanzania.

The key assumptions on the economic costs of road death and injury are those used by the International Road Assessment Programme (iRAP) when costing road safety projects. Data from a few countries that have studied crash costs in depth has enabled them to develop a model that they believe can be used worldwide, but there remains considerable uncertainty about the accuracy of the results.

The number of fatal road accidents, reported by the traffic police, was in 2013 4,002, in 2014 3,760 and in 2015 3,468. Below Figure 11-1 show the reported development in fatal road accidents.



Figure 11-1 Reported fatal road traffic accidents. Source: Traffic Police

According to the World Bank classifications for countries, and in this case for Tanzania, countries with a GNI per capita less than USD 1,025 are classified as low-middle income as of 2013.

The annual GDP and GDP per capita development are shown in below Figure 11-2. The figure shows the annual development in GDP according to Bank of Tanzania indicating almost TSh 70,953 billion (USD 45 billion) in GDP and a GDP/capita of TSh 1.6 million (USD 986) in year 2013, TSh 1.7 million (USD 1049) in year 2014 and TSh 1.9 million (USD 956) in year 2015:

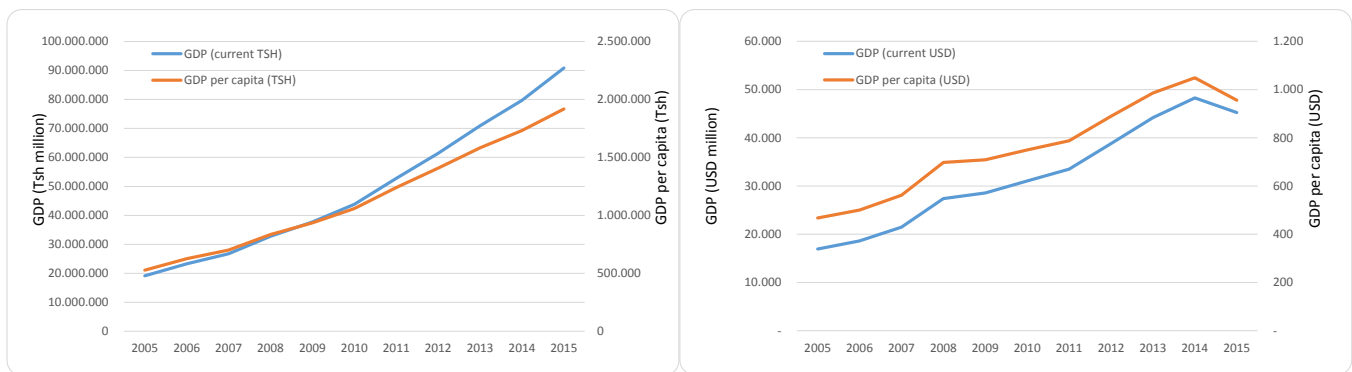


Figure 11-2 GDP and GDP per Capita development in TSh and USD. Source: Bank of Tanzania

The main assumptions used for the estimation of the economic costs of accidents in Tanzania are as follows in below table:

Main Assumptions		2013	2014	2015	Source
GDP Tanzania (Million TSh)		70,953,000	79,718,000	90,864,000	BOT
GDP per capita Tanzania (TSh)		1,583,658	1,732,513	1,918,935	BOT & BOS
Value of Fatality (Million TSh):	<i>Value of a Life for low income countries = 100 x GDP per capita</i>	158.37	173.25	191.89	iRAP
Value of serious injuries (Million TSh)	<i>25% of value of fatality</i>	39.59	43.31	47.97	iRAP
Value of minor injuries (Million TSh)	<i>1% of value of fatality</i>	1.58	1.73	1.92	Consultant's estimate
Estimated number of fatality		4,002	3,760	3,468	Traffic police
Estimated number of serious injuries	<i>10 times more than fatalities</i>	40,020	37,600	34,680	iRAP
Estimated number of minor injuries	<i>30 times more than fatalities</i>	120,060	112,800	104,040	Consultant's estimate

The estimated economic costs of road accidents in Tanzania in year 2013 to 2015 are presented below:

Estimated economic cost of fatal, serious and minor road injuries:	2013	2014	2015
Estimated Economic cost of fatalities (million TSh)	633,797	651,420	665,475
Estimated economic cost of serious injuries (million TSh)	1,584,392	1,628,456	1,663,600
Estimated economic cost of minor injuries (million TSh)	189,695	195,144	199,757
<b>Value of total estimated economic cost of fatalities, serious and minor injuries (million TSh)</b>	<b>2,407,8842</b>	<b>2,475,020</b>	<b>2,528,832</b>
<b>Estimated GDP loss due to road traffic accidents (fatal and serious injury)</b>	<b>3.4%</b>	<b>3.1%</b>	<b>2.8%</b>

The estimated GDP loss due to road traffic accidents (fatal, serious and minor injuries) in Tanzania in year 2013 is 3.4 %. In the years 2014 and 2015 it represented 3.1% and 2.8% of GPD in current prices respectively. The analysis does not include the costs of property damage, which would further add to the total value and could depending on the value setting of such category, be a considerable influencing factor. Neither does it take account of the probability

that the real number of road crashes is significantly higher than that recorded by the Police.

### Difficulties using simple monetary economic approach for poorer communities

Experience of poor communities in coping with medical catastrophes is very different than normally experienced by more economically developed communities. The special problems faced by poor families can include the following<sup>35</sup>:

- > Inappropriate or absence of treatment leading to complications and longer treatment time
- > Reallocation of labour of family members and reduced productivity of whole family
- > Permanent loss of job for the victim even if he/she survives
- > Loss of land, personal savings, household goods
- > Poor health and educational attainment of surviving members
- > Dissolution or reconstitution of household.

The above issues are normally not factored in the standard iRAP economic estimates of the costs of road accidents in poor societies. If a family member is injured in a poor family and being bed ridden at home or the hospital, the whole family gets involved in the care of the patient. This normally results in reallocation of labour of all family members. Those on daily wages lose their income. Children may not be able to go to school, and older family members may spend less time in the care of children and infants.

The household has to cope with the time and financial demands of the situation and this can have a permanent effect on the health of children and infants in the family with consequences of loss of income, less attention, worsening hygiene at home, etc.

Since a large number of poor households depend on daily wages and temporary jobs, and often do not have health insurance, or the assistance of social welfare schemes, a serious injury can result in permanent reduction of income. In cases of prolonged treatment or death of the victim, the family may end up selling most of their assets and land and getting trapped into long-term indebtedness.

There is very little work done to understand these issues and the calculation of losses in purely monetary terms may underestimate the actual cost of road accidents. For poor communities, this method does not even capture the economic losses in all their complexity. The effect of injury and death on the family structure, crushing of hopes and aspirations of future generations, and the psychology of the community are just not considered.

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<sup>35</sup> Social Cost of Road Traffic Crashes in India, Dinesh Mohan, Henry Ford Professor for Biomechanics and Transportation Safety, Transportation Research and Injury Prevention Programme, Indian Institute of Technology, New Delhi

## Appendix D Results of surveys on seatbelt and helmet wearing rates

### Seat belt wearing rate (percentage) 2008, 2016

	Dar es Salaam		Mbeya town
	2008 <sup>1</sup>	2016	2016
Driver	67	85	34
Front seat passenger	31	81	33
Driver and front seat passenger	55	84	34
Rear seat passengers	2	6	5

<sup>1</sup> Unpublished document, Safety and Environment Department, Ministry of Infrastructure Development

Sample sizes: DSM 2008 = 2723 DSM 2016 = 6264 Mbeya 2016 = 2138

### Motorcycle helmet wearing rate (percentage) 2016

	Dar es Salaam	Mbeya town	Mbeya rural	Kilolo rural <sup>1</sup>
Driver (wearing correctly)	79	68	33	50
Driver (wearing incorrectly)	13	19	14	
Passengers (wearing correctly)	33	9	1	4
Passengers (wearing incorrectly)	18	6	0	

<sup>1</sup> 2015. Source: Bishop et al, *The magnitude and characteristics of road traffic injury in Kilolo District Tanzania*, Amend, 2015

Sample sizes: DSM = 2941 Mbeya town = 1162 Mbeya rural = 244 Kilolo rural = 908