



THE UNITED REPUBLIC OF TANZANIA

NATIONAL AUDIT OFFICE



PERFORMANCE AUDIT REPORT ON MANAGEMENT OF ROADS FURNITURE

The Ministry of Works, Transport and Communication and
Tanzania National Roads Agency



A REPORT OF THE CONTROLLER AND AUDITOR GENERAL

MARCH 2017

THE UNITED REPUBLIC OF TANZANIA



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PREFACE

The Public Audit Act No. 11 of 2008, Section 28 authorizes the Controller and Auditor General to carry out Performance Audit (Value for- Money Audit) for the purposes of establishing the economy, efficiency and effectiveness of any expenditure or use of resources in the MDAs, LGAs and Public Authorities and other Bodies which involves enquiring, examining, investigating and reporting, as deemed necessary under the circumstances.

I have the honour to submit to His Excellency the President of the United Republic of Tanzania, Dr. John Pombe Magufuli and through him to the Parliament a Performance Audit Report on Safety in Road Transportation focusing on Management of Roads Furniture in Tanzania.

The report contains conclusions and recommendations that directly concern the Ministry of Works, Transport and Communication and TANROADS. These institutions were given the opportunity to scrutinize the factual contents and comment on the report. I wish to acknowledge that the discussions with MoWTC and TANROADS have been very useful and constructive. My office intends to carry out a follow-up at an appropriate time regarding actions taken by the audited entities in relation to the recommendations in this report.

In completion of the assignment, the office subjected the report to the critical reviews of the following experts Prof. Theophil Rwebangila and Eng. Abdul A. Awadh who came up with useful inputs on improving the output of this report.

This report has been prepared by Mr. Michael Malabeja - Team Leader, Ms. Asimuna Kipingu and Mr. Pendaël Ulanga - Team Members under the supervision and guidance of Mr. James Pilly - Assistant Auditor General and Ms. Wendy W. Masoy - Deputy Auditor General.

I would like to thank my staff for their devotion and commitment in the preparation of this report. My thanks should also be extended to the audited entities for their fruitful interaction with my office.



Prof. Mussa Juma Assad
Controller and Auditor General
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March, 2017

TABLE OF CONTENTS

PREFACE	II
TABLE OF CONTENTS.....	III
LIST OF TABLES	V
LIST OF ABBREVIATION/ACRONYM.....	VII
CHAPTER ONE	1
INTRODUCTION	1
1.1 BACKGROUND	1
1.2 AUDIT DESIGN.....	2
1.2 ASSESSMENT CRITERIA	3
1.3 METHODS AND IMPLEMENTATION OF THE AUDIT	5
1.4 LIMITATIONS FOR DATA COLLECTIONS.....	6
1.5 STANDARDS USED FOR THE AUDIT	6
1.6 DATA VALIDATION PROCESS.....	6
1.7 STRUCTURE OF THE AUDIT REPORT	6
CHAPTER TWO	7
ROADS FURNITURE MANAGEMENT SYSTEM.....	7
2.1 DEFINITION OF THE ROADS FURNITURE	7
2.2 OBJECTIVES OF MANAGEMENT OF ROADS FURNITURE	7
2.3 POLICIES AND LEGISLATIONS GOVERNING ROADS FURNITURE.....	7
2.4 GOVERNMENT INITIATIVES TO MANAGE ROADS FURNITURE.....	7
2.5 FINANCING MANAGEMENT OF ROADS FURNITURE	9
2.6 MAIN ACTORS FOR MANAGEMENT OF ROADS FURNITURE	10
2.7 PROCESS OF THE ROADS FURNITURE MANAGEMENT	13
2.8 COORDINATION OF THE MANAGEMENT OF ROADS FURNITURE	15
CHAPTER THREE.....	16
AUDIT FINDINGS	16
3.1 PLANNING FOR PROVISION OF ROADS FURNITURE	16
3.2 PROVISION OF ROADS FURNITURE.....	19
3.3 MAINTENANCE OF THE ROADS FURNITURE.....	35
3.4 MONITORING, EVALUATION AND PERFORMANCE REPORTING ON ROADS FURNITURE	
MANAGEMENT ACTIVITIES	41
3.5 COORDINATION BETWEEN MoWTC, TANROADS AND OTHER STAKEHOLDERS.....	46
CONCLUSION	49
4.1 OVERALL CONCLUSION.....	49
4.2 SPECIFIC CONCLUSIONS	49
CHAPTER FIVE	52

RECOMMENDATIONS	52
5.1 PLANNING FOR PROVISION OF ROADS FURNITURE	52
5.2 MAINTENANCE OF ROADS FURNITURE	52
5.3 MONITORING, EVALUATION AND PERFORMANCE REPORTING FOR ROADS FURNITURE	
MANAGEMENT ACTIVITIES	53
5.4 COORDINATION BETWEEN MoWTC, TANROADS AND OTHER STAKEHOLDERS.....	54
REFERENCES.....	55
APPENDICES.....	57
APPENDIX ONE: AUDIT QUESTIONS AND SUB-QUESTIONS USED DURING THE AUDIT	57
APPENDIX TWO: CHECKLIST FOR ROAD SAFETY AUDIT	58
APPENDIX THREE: METHODOLOGY	62
APPENDIX FOUR: REPOSSES OF AUDIT RECOMMENDATIONS FROM TANROADS	65
APPENDIX FIVE: REPOSSES OF AUDIT RECOMMENDATIONS FROM MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION	81

LIST OF TABLES

Table No.	Title	Page No
1.1	Selected Visited Roads	3
1.2	Assessment criteria	4
2.1	Fund released by RFB for the management of roads furniture	10
2.2	Responsibilities of the key actors of the management of roads furniture	11
3.1	Extent participation of other stakeholders	16
3.2	Extent of safety need assessment	18
3.3	Extent of compliance/noncompliance to standard and specifications	20
3.4	Consideration of key aspects during provision of roads furniture	25
3.5	Extent of vandalism/theft on the visited roads	27
3.6	Disability Signs Budget Allocation	37
3.7	Need for maintenance of roads furniture	38
3.8	Ratio of Road network against focal person	41
3.9	Status of road safety audit conducted on the visited roads	42
3.10	Examples of Road Safety Audits' recommendations which were not implemented	44

LIST OF FIGURES

Figure No.	Title	Page No
2.1	TANROADS Organisation Structure	12
2.2	Process descriptions for the management of roads furniture	15

LIST OF PHOTOS

Photo No.	Title	Page No
3.1	Reinforced concrete sign at Wilunze Makalavati village along Dodoma- Morogoro road	21
3.2	Reinforced concrete sign along TANZAM Highway at Igawa-Mbeya section	21
3.3	Fainted signs along Segera -Tanga road	21
3.4	Fainted signs along Mbeya-Lwanjilo-Chunya road	22
3.5	Worn out road markings along TANZAM Highway (Igawa-Mbeya) road	22
3.6	Kilometre Marker post seen along TANZAM Highway	23
3.7	Short informatory signs observed at Mbeya city staggered junction Km 0+00 at Mbeya -Lwanjilo-Chunya	23
3.8	Protruding start of guardrail fishtail along Iringa - Dodoma road	24
3.9	Missing warning sign along Iringa-Dodoma road at km 120+200 from Iringa	26
3.10	Missing guard rails along Kilwa road (Lindi-Mtwara) at Mikindani area in Mtwara	27
3.11	Various Vandalised furniture as captured by auditors during field visit	29
3.12	Improperly located road signs and markings as captured by auditors during field	30
3.13	Mis-located roads furniture captured by auditors during field visit	31
3.14	Obstructed Zebra Crossing Captured by auditors along Mbeya-Lwanjilo-Chunya	32
3.15	Warning signs erected very close to a zebra crossing along Mbeya -Lwanjilo - Chunya road	33
3.16	Sample of inventory form	36
3.17	Corroded guardrail with parts missing at Mikindani area as captured by auditors	38
3.18	Corroded road sign captured by auditors at Chimala village	39
3.19	Unattended damaged guard rail along Dar es Salaam - Chalinze road	39
3.20	Conflicting of the message between prohibition of parking and presence of legally allowed parked vehicle on carriageway.	48

LIST OF ABBREVIATION/ACRONYM

APA	Annual Performance Agreement
BOQ	Bill of Quantities
EIA	Environmental Impact Assessment
FY	Financial Year
G.I.S	Geographical Information Science
GoT	Government of Tanzania
INTOSAI	International Organization of Supreme Audit
ISSAIs	International Standards for Supreme Audit Institutions
LGAs	Local Government Authorities
MDAs	Ministries, Departments and Agencies
MoWTC	Ministry of Works, Transportation and Communication
NA	Not Applicable
RAIS	Road Accidents Information System
RFB	Road Fund Board
RMMS	Road Maintenance Management System
RSA	Road Safety Audit
SADC	Southern African Development Community
SUMATRA	Surface and Marine Transport Regulatory Authority
TANROADS	Tanzania National Roads Agency
TANZAM	Tanzania Zambia
TARA	Tanzania Roads Association
TEMESA	Tanzania Electrical, Mechanical and Electronics
TZS	Tanzania Shillings
UN	United Nations

EXECUTIVE SUMMARY

Road accidents are amongst the leading causes of death and injury worldwide. In Tanzania, road transport is the most dominant mode of transportation. It carries over 80 percent of passenger traffic and over 75 percent of freight traffic. In 2014 about 1.2 million road safety incidents were reported compared with 0.7 million in 2013. This is an increase of 64 percent. These road safety incidences caused about 4,000 deaths and about 15,000 injuries nationwide.

With increasing cases of roads safety incidents in Tanzania, stakeholders from different sectors have expressed concern and demand for urgent need to reduce the number and severity of road accidents. Research shows that about 80% of the roads accidents are attributed to the human factors. However, untimely maintenance of roads and roads furniture, lack/inadequate traffic signs and markings resulting to poor visibility are mentioned by experts as amongst the factors contributing to road accidents.

In Tanzania, most of the road furniture are old, dilapidated and some are not of required standard. This has to some extent contributed to an increase of road accidents. In recent years, there have been a public outcry from different stake holders; media, parliament members and experts in road safety requiring improvement of safety in road transport sub-sector. These experts urge the government to install and manage road signs, markings, safety barriers, traffic signals, lightings and marker posts as these will contribute to addressing safety in road transportation. They are a key source of information for road users especially to drivers of motorised and non- motorised vehicles.

Using its legal mandate, the National Audit Office of Tanzania (NAOT) conducted a performance audit on management of roads furniture. The objective was to find out whether the Ministry of Works, Transport and Communication (MoWTC) through Tanzania National Roads Agency (TANROADS) effectively manage roads furniture which is important for safety of the roads to all users. Specifically, to determine whether: a) TANROADS consider needs of road users when planning for roads furniture installation, b) adequately maintains roads furniture; c) MoWTC effectively oversee and evaluate roads furniture activities and; d) there is coordination between MoWTC, TANROADS and other key stakeholders in management of roads furniture.

The audit focused mainly on provision of roads furniture (road signs, markings, safety barriers and traffic signals), maintenance of roads furniture, monitoring of roads furniture and coordination among the key actors. The audit covered a period of 5 financial years, from 2011/2012 up to 2015/2016. The audit scope covered both new and aged roads. The auditors visited roads whose total length was 1,394.7kilometres, equal to

4 % of the national roads network (trunk and regional) totalling 33,287 km. The visited roads include, Dar-Chalinze, Chalinze-Segera-Tanga, Tanga-Horohoro, Morogoro-Dodoma, Dodoma -Iringa, TANZAM Highway (Iringa-Mbeya), Mbeya-Lwanjilo-Chunya and Kilwa Road (Lindi-Mtwara).

Major Findings and Conclusions

Road safety issues are not sufficiently, because TANROADS does not adequately consider needs of road users when planning for provision of roads furniture. In addition to that, maintenance of existing roads furniture is not adequately done. Besides, TANROADS does not appropriately integrate road furniture data and information in its maintenance systems. On the other hand, the coordination between TANROADS and other road safety actors is not functioning well. The following are specific conclusions based on audit objectives.

TANROADS does not adequately consider needs of road users when planning for provision of roads furniture: Involvement of key stakeholders during planning of the roads was given less attention in most of the road projects. Though the mandatory EIA are being done, the technical aspects of safety of road users are superficially covered. Road designers to a large extent base on geometrical design manual while ignoring participation of other road safety stakeholders. At the planning stage TANROADS consider the design speeds of 50-100kph which apply for the motorized road users only. Road users' needs assessment was seldom done. Since the road safety is a headquarters based activity, the TANROADS regional offices are not adequately involved.

MoWTC and TANROADS do not effectively monitor and evaluate roads furniture activities: Road safety audit, as tool for monitoring safety of the roads is not effectively conducted. Even, the few road safety audits conducted, did not cover all stages of the road projects. Recommendations and findings of the road safety audits are not effectively implemented to improve and correct the deficiencies. 75 percent of the recommendations from the previous road safety audit were not implemented. This was because of absence of clear follow up mechanisms for the implementation of the recommendations of road safety audit.

Weak coordination between MoWTC, TANROADS and other key stakeholders allowing an overlapping and duplication of responsibilities: The system of data and information sharing among the actors is not working properly. For example, the identified black spots are not adequately shared with MoWTC or TANROADS. There is a weak coordination between TANROADS and LGAs regarding installation of Bill Boards in urban centres.

Inadequate capacity building on road safety issues: Though road safety issues are technical in nature, TANROADS has not built adequate capacity for its staffs to handle the issues effectively. The follow up and enforcement exercised by TANROADS to demand compensation from the vehicles or persons damaging road features is weak and not effective. Thus, most offenders do not pay the compensation required for restoring damaged roads furniture.

TANROADS does not adequately maintain roads furniture: Roads furniture are not sufficiently featured in the TANROADS maintenance system and therefore not sufficiently budgeted for.

Important road signs were missing: In some instances, important warning signs were missing in the visited roads. Although TANROAD allocated TZS 310 million for installation of signs for people with disabilities, disability signs were inadequately installed in the eight visited roads as per fund received.

Sub standards Installed roads furniture: Road signs, markings and guardrails were not of required standard. e.g. most of signs were faint along Chalinze-Segera-Tanga, Morogoro -Dodoma and Mbeya -Lwanjilo-Chunya roads. Fainted signs included regulatory speed limit signs, bridge and curves warning signs, some worn-out road markings including white centreline and edge yellow acoustic line.

RECOMMENDATIONS

Based on the audit findings and conclusions, the following recommendations were issued:

TANROADS should:

- i. Involve key stakeholders of road safety during planning and designing of roads and ensure that, road safety audit teams include different experts such as traffic police officials, urban planners and knowledgeable local people
- ii. Strengthen supervision to ensure that all required road signs, markings and guard rails are provided as per specification
- iii. Not issue certificate of completion of the road works (substantial or final), if the safety aspects of the road such as road signs and road-surface markings, guard-rails and all safety structures are not dully completed.
- iv. Establish mechanisms of collaboration with Police and communities living alongside the road on protection of roads furniture against vandalism

- v. Ensure that, the budget allocated to their regional offices for roads safety includes installation of signs for people with disabilities are used for intended purpose.
- vi. Prepare plans for maintenance of roads furniture and allocate budget specifically for that;
- vii. Update the forms for road condition and inventory survey to capture information related to condition of roads furniture.
- viii. Planning and budgeting for the roads furniture maintenances should be included in the RMMS
- ix. Set a response time for replacement or repair of damaged or stolen roads furniture.
- x. Establish a sustainable in house capacity building program to the regional road safety focal persons and the staff responsible for road safety and environment issues.
- xi. Direct regional offices to use legal procedures to compel those who damage any roads furniture to compensate for the damage.
- xii. Ensure that awareness campaigns are continuously conducted and the public knows the contacts of the focal road safety personnel for each region.
- xiii. Clearly state who is responsible for implementing the road safety audit recommendations between directorate of projects and directorate of maintenance.
- xiv. Set the timeframe for implementation of recommendations issued in roads safety audit reports.
- xv. Send the Road Safety Audit reports to TANROADS regional offices to facilitate implementation of recommendations
- xvi. Share the road safety audit reports with other key stakeholders such as Road Fund Board, SUMATRA and TEMESA
- xvii. Ensure that teams conducting road safety audits are compassed of multi-disciplinary members as required by the guide for road safety audit.

To enhance Monitoring, Evaluation and performance reporting mechanisms for roads furniture management activities

MoWTC should;

- i. Set plans and strategies for Monitoring and Evaluation of Roads Safety Audit
- ii. Ensure that, TANROADS conducts roads safety audit at each stage of the road project i.e. from the planning stage to operation of the road
- iii. Ensure that, the recommendations from roads safety audits are implemented
- iv. Develop a set of indicators for monitoring the RSA system.

CHAPTER ONE

INTRODUCTION

1.1 Background

Road accidents are amongst leading causes of death and injury worldwide. It becomes a matter of great personal tragedy, social and economic costs in terms of valuable lives lost, medical treatment, insurance and damage to public and private property¹. Every year more than 1.17 million people die in road accidents around the world. Nearly 0.5 million people die and up to 15 million people are crippled or injured in road accidents in developing countries each year². The total direct and indirect cost of road accident is estimated at about 1 to 3 per cent of total gross domestic product in most of the countries worldwide.

In Tanzania, Road transport is the most dominant mode of transportation. It carries over 80% of passenger traffic and over 75 per cent of freight traffic³. In 2014 about 1.2million road safety incidents were reported compared with 0.7 million in 2013. This shows an increase of 64 per cent. These road safety incidences caused about 4,000 deaths and about 15,000 injuries nationwide⁴.

Justification of the Audit

With increasing cases of roads safety incidents in Tanzania, different stakeholders from different sectors have called for an urgent need to take measures which will lead to reducing the number and severity of road accidents. Several studies and researches show that, about 80 per cent of the roads accidents are attributed to the human factors while 15 per cent of the accidents are attributed to the vehicle factors and 5 per cent attributed to roads environment factor⁵.

In addition, untimely maintenance of roads and roads furniture, lack of traffic signs and markings, poor visibilities were quoted to be other factors that makes road environment dangerous to road users and contribute to road accidents. The change of human behaviour has been an endless effort done by government and other stakeholders. However, the current move is to ensure that, government takes all measures to deal with causes linked with roads environment such as roads furniture. At the 2006 Annual Roads

¹Agarwal, P. K., Jain, V., & Bhawar, U. (2013). Development of a hierarchical structure to identify critical maintenance components affecting road safety. *Procedia-Social and Behavioural Sciences*, 104, 292-301.

²World Health Organization. (2013). *Global status report on road safety 2013: supporting a decade of action*: World Health Organization.

³Can the transport sector develop programme deliver, MKUKUTA" F.Y. Addo-abad

⁴Crime Statistics Report January-December, 2014 produced by Police Force and National Bureau of Statistics, January, 2015

⁵ SUMMATRA

Convention organized by Tanzania Roads Association (TARA) the participants also supported that, improved roads environment contributes to a reduction of the roads accidents.

In Tanzania, most of the roads furniture are old, dilapidated and some are not of required standard. This has to some extent contributed to an increase of road accidents.

In recent years, there have been a public outcry from different stakeholders; media, parliament members and experts in road safety requiring improvement of safety in road transport sub-sector. These experts urge the government to install and manage the road signs, markings, safety barriers, traffic signals, lightings and marker posts as these will contribute to addressing safety in road transportation. They are a key source of information for road users motorized and non- motorized.

Using its legal mandate, the National Audit Office of Tanzania (NAOT) conducted a performance audit on the Management of roads furniture.

1.2 Audit Design

1.2.1 Main Audit Objective

The objective of this audit was to determine whether the Ministry of Works, Transport and Communication (MoWTC) through Tanzania National Roads Agency (TANROADS) effectively manage roads furniture which is important for safety in road transportation.

Specific Objectives;

- a) To determine whether TANROADS consider needs of road users when planning for provision of roads furniture;
- b) To determine whether TANROADS adequately maintain roads furniture;
- c) To assess whether MoWTC effectively monitor and evaluate roads furniture activities; and
- d) To assess whether there is coordination between MoWTC, TANROADS and other key stakeholders in the management of roads furniture.

For more details on audit questions refer **Appendix One**.

1.2.2 Scope of the Audit

The audited entity is the Ministry of Works, Transport and Communication (MoWTC) together with its agency i.e. TANROADS. The audit covered provision of the roads furniture (road signs, markings, safety barriers and traffic signals), maintenance of roads furniture, monitoring of roads

furniture and coordination among the key actors and stakeholders. The audit covered a period of five financial years, from 2011/2012 up to 2015/2016.

The audit scope covered both new and existing roads. The Performance Audit covered the following roads:

Table 1.1 Selected Visited Roads

S/N	Road	Mileage (km)
6	TANZAM Highway (Igawa-Mbeya)	330
5	Dodoma -Iringa	270
4	Morogoro-Dodoma	263
2	Chalinze-Segera-Tanga	248
1	Dar-Chalinze	99
3	Tanga-Horohoro	72
7	Mbeya-Lwanjilo-Chunya	72
8	Kilwa Road(Lindi-Mtwara)	41
Total (km)		1395

Source: TANROADS Roads Network Coverage Distance Chart

Table 1.1 shows the selected roads with a total length of 1,395 kilometres which are equal to 4 percent of 33,287 km of national roads (trunk and regional roads). Due to homogeneity nature of the road network in Tanzania, the selected sample of roads represents the total population of roads in the country.

The eight (8) roads were randomly selected from the road network based on geographical representation and condition i.e. existing and newly constructed. The audit covered only the paved part of the road network. Although unpaved roads are equally important regarding safety issues, due to time and limited resources unpaved roads could be considered in the future audit.

1.2 Assessment Criteria

The criteria for the audit are summarised in the **Table 1.2**.

Table 0.2 Assessment criteria

Theme	Criteria	Source
Installation of Roads furniture	<p><i>TANROADS should install roads furniture in accordance with the policy, directives, regulations and best practice and ensure:</i></p> <ul style="list-style-type: none"> <i>The design and construction of all road facilities consider needs of all road users including vulnerable and physically disadvantaged</i> <i>Road markings meet need; command attention; be legible; convey a simple, clear meaning at a glance; be placed to give road users time to respond; and command respect</i> <i>Road markings to be in good visibility state day and night; good skid resistance; durability; clarity of message; symbols and words should be elongated in the direction of the traffic.</i> <i>The sign posts and plates to be made by galvanized steel pipe (for sign posts) and steel sheets or aluminium alloy sheets (for sign plates) and the coloured areas should be made from sheeting of the appropriate colour or by applying coloured overlay film onto white sheeting</i> 	<ul style="list-style-type: none"> <i>Section 64 of the Road Traffic Act (Cap 168 R.E 2002)</i> <i>section 31 of the Roads Act, 2007</i> <i>A Guide to Traffic Signing, 2009 part 2 page 1</i> <i>The National Road Safety Policy (2009) page 17 &18</i> <i>section 5400 of the Ministry's Standard Specification for Road Works, 2000</i>
Maintenance of roads furniture	<ul style="list-style-type: none"> <i>Roads and their furniture to be maintained for short, medium and long term.</i> <i>Routine Maintenance is required to be carried out to all roads in good and fair condition including roads which have been rehabilitated</i> 	<ul style="list-style-type: none"> <i>Section 6(1) of the Roads Act</i> <i>Operational Guideline for District Roads Maintenance, 2014</i>

Theme	Criteria	Source
Monitoring of roads furniture	<ul style="list-style-type: none"> • MoWTC to monitor TANROADS performance each year • Ministry to carry out independent formal safety audits for all major projects and any others where there are safety concerns • Road safety audits should be performed by a small team of people who have a variety of experience and expertise 	<ul style="list-style-type: none"> • Section 3.4 and 5.8 of the Executive Agencies, Act, 1977 • Section 4(b)(c)(d)(e)(f) and (h) of the Roads Act, 2007 • The National Road Safety Policy 2009 • The Guide to Road Safety Auditing, 2009
Coordination between Key actors	<ul style="list-style-type: none"> • Road safety issues are of cross cutting nature and therefore need close coordination of stakeholders 	<ul style="list-style-type: none"> • The National Road Safety Policy, 2009,

1.3 Methods and Implementation of the Audit

To ensure that data collected give comprehensive Photo of the situation on the management of roads furniture, data were collected from MoWTC and TANROADS. These organizations play important roles on management of roads furniture. Three main methods were used for data collection. These methods include interviews, documents review and physical observations.

The audit team conducted Interviews to collect primary data and to clarify or confirm information from the documents reviewed and allow officers to provide explanations on how things are done regarding management of roads furniture. Several interviews with a purpose to gain insights on management of Roads furniture were conducted with officials of MoWTC, TANROADS headquarter and TANROADS regional offices.

In addition to interviews, the audit, reviewed various key documents to assess the performance on the set strategies and plans relating to roads furniture management.

Further, the audit conducted field visit for eight roads. The field visit was made to observe the status of the existing roads furniture in the roads.

The collected data were both qualitative and quantitative. Qualitative data were summarised and coded to compare different responses. Quantitative data were analysed by using statistical tools e.g. excel. The results were presented in tables. Detailed process of the methods is presented in **Appendix Three**.

1.4 Limitations for Data Collections

In some instances, audit team, could not get a readily available data from documents. In such cases the team relied on verbal information. To check the validity of collected data and information, the team subjected the draft report to the experts.

1.5 Standards Used for the Audit

The audit was done in accordance with the International Standards for Supreme Audit Institutions (ISSAIs) issued by the International Organization of Supreme Audit Institutions (INTOSAI). These standards require that the audit is planned and performed to obtain sufficient and appropriate evidence to provide a reasonable basis for the findings, conclusions and recommendations based on the audit objectives.

1.6 Data Validation Process

MoWTC and TANROADS, who directly concerned with this audit, were given the opportunity to go through the draft report and comment on the figures and information presented. They confirmed on the accuracy of the figures used and information being presented in the audit report. Furthermore, the information was crosschecked and discussed with experts on the management of roads furniture to ensure validation of the information obtained.

1.7 Structure of the Audit Report

The remaining part of the report covers the following:

- Chapter two describes the system and process for Management of road furniture in Tanzania, where responsibilities of different key actors are described;
- Chapter three provide an account of the findings on Management of roads furniture in Tanzania;
- Chapter four provides conclusions for the audit; and
- Chapter five outlines recommendations to be implemented to improve the current situation.

CHAPTER TWO

ROADS FURNITURE MANAGEMENT SYSTEM

This chapter provides a description of the audit area. It focuses on defining key players and stakeholders, policy and legal framework governing the management of roads furniture. The chapter also underlines the roles and responsibilities of key actors and the processes followed in management of roads furniture.

2.1 Definition of the roads furniture

The term roads furniture encompasses objects used for safety and control of traffic in addition to those for assisting the driver. Roads furniture items provide drivers with the necessary warnings, rules, distance and directional information for safety purpose. It includes road signs of all descriptions, lighting, safety fences, barriers, guard rails, bollards and verge marker posts.

2.2 Objectives of management of roads furniture

The aim of roads furniture management is to improve the road user's safety and driver's perception and comprehension of the continually changing appearance of the road. Elements addressed herein include pedestrian and cycle facilities, guard rails, traffic signs, road markings and marker posts. Apart from Management of roads furniture, there are various programs implemented by MoWTC and TANROADS including; Road safety audits, road inspections, roads condition survey, Inventory survey, Road Maintenance Management System (RMMS) and Budget allocations as detailed in section 2.4.

2.3 Policies and legislations governing roads furniture

Generally, the management of roads furniture is governed by the Roads Traffic Act, The Roads Act, 2007 and its regulations, The Highway Code, 2008, National Road Safety Policy, 2009, A guide to Traffic Signing, A guide to Road Safety Auditing, High way Code, 2008, Tanzania Road Geometric Design Manual, 2012, Operational Guideline for District Roads Maintenance, 2014 and SADC Road Safety Program of Action in Support of UN Decade of Action Road Safety 2011-2020 as explained in **Appendix Two**.

2.4 Government initiatives to manage roads furniture

Government through MoWTC and TANROADS has various initiatives to ensure that roads furniture are properly installed, maintained and replaced. The following are some initiatives that have been undertaken by

the government;

i. Road Safety Audit

MoWTC has initiated Road safety audit (RSA) programmes guided by the Guide on Road Safety Auditing, 2009. *Road safety audit is a systematic and formal safety performance examination of a road project.* The objective is to identify potential safety problems, so that, where possible, the design can be improved to eliminate or reduce them. Road safety audits are a vital tool in a road authority's safety management system. They provide an opportunity for road safety professionals to ensure that all road users' safety needs are adequately addressed at various stages of road project.

According to the Roads Act and the National Road Safety Policy, MoWTC is responsible for carrying out road safety audit at every stage of the road project. Road safety audit is more concerned with "fitness for purpose" than compliance with technical standards⁶. This means checking that the scheme meets the safety needs of everyone. Special attention is given to whether the needs of vulnerable road users have been met, because experience indicates that highway designers focus largely on the needs of motor vehicle traffic. The program consists of eight stages which are feasibility study, preliminary design, detailed design, road works, pre-opening, post-opening and existing roads, Audit of traffic management schemes and audit of building developments. Each stage is worked out separately. Checklist and the detailed road safety audit is as shown in **Appendix two**.

ii. Road Maintenance Management System (RMMS)

The MoWTC through TANROADS has developed the Road Maintenance Management System (RMMS). The system is the Agency's road network database used for maintenance planning/programming, contracts monitoring and production of reports. It provides a repository for information on the road network administered and managed by TANROADS. It provides the Agency with series of modules which support the decision-making process within the road maintenance.

The system keeps information from inventory and condition survey data on the road network. The data are used by the system for annual and multiyear planning and programming of road maintenance. RMMS projects needs for one year under budget constraints and for Budget Split (BSM) which accumulate the maintenance needs across all regions and maintenance type. Also, it analyses the consequences of budget allocations in terms of distribution between the regions and maintenance

⁶Ministry of Infrastructure Development; A guide to road safety Auditing, 2009

type. The system comprises of four Modules as follows;

iii. *Routine /Recurrent maintenance*

TANROADS is supposed to carryout routine maintenance on all road projects in good and fair condition including roads which have been rehabilitated. Routine maintenance means all maintenance works required continuously or at intervals on every road whatever its engineering characteristics or traffic volume. It comprises of activities such as grass cutting, drain cleaning, culvert and bridge cleaning and maintenance, road furniture and bridge guardrails maintenance, paved road patching, edge repair, crack sealing, and line remarking, also unpaved road grading, shaping, and pothole repairs.

For routine maintenance RMMS is used to estimate and prioritize the annual maintenance needs for paved and unpaved roads as under budget constraints

iv. *Periodic maintenance*

This involves maintenance works undertaken at intervals of specific periods or years including but not limited to resealing, overlaying, fog spraying and shoulder reforming or re-gravelling. The RMMS is used to estimate and prioritize the periodic maintenance budget.

v. *Spot improvements*

Spot Improvement is carried out to roads in fair and in transient to poor condition. This includes localized maintenance works carried out on paved and unpaved roads on short sections (typically 1 km or less) of roads to ensure a reasonable level of possibility. It comprises of activities such as road surface repairs, embankment repairs, culvert and drainage repairs, localized road reshaping and re-gravelling, and the construction of diversions. Spot improvement is usually done due to the excessively poor condition of a road over a short section that threatens the flow of traffic.

vi. *Contracts Monitoring*

RMMS is used for monitoring contracts implementation progress. The system is used for planning and payment of the maintenance contracts in the form of Bills of Quantity (BOQ).

2.5 Financing management of roads furniture

The Ministry of Works, Transport and Communication (MoWTC) is responsible for the implementation of roads furniture management through TANROADS as an implementing agent. The aim is to ensure safety in road transportation for all road users. Nevertheless, the Ministry

requires fund to implement the set plans and strategies. Funding for the management of roads furniture is done by Road Fund Board (RFB). Table 2.1 shows the funds released by RFB for the management of roads furniture during the financial years 2011/12 to 2013/14.

Table 0.1: Fund released by RFB for the management of roads furniture

Financial Year	Road Safety Audit	Inventory	Road Furniture Installation	RMMS	Road Furniture Maintenance
	<i>Amount (TZS) Mio</i>	<i>Amount (TZS) Mio</i>	<i>Amount (TZS) Mio</i>	<i>Amount (TZS) Mio</i>	<i>Amount (TZS) Mio</i>
2011/2012	25	549	Nil	451	1,200
2012/2013	20	815	Nil	385	1,700
2013/2014	60	825	Nil	575	1,700

Source: TANROADS

2.6 Main actors for management of roads furniture

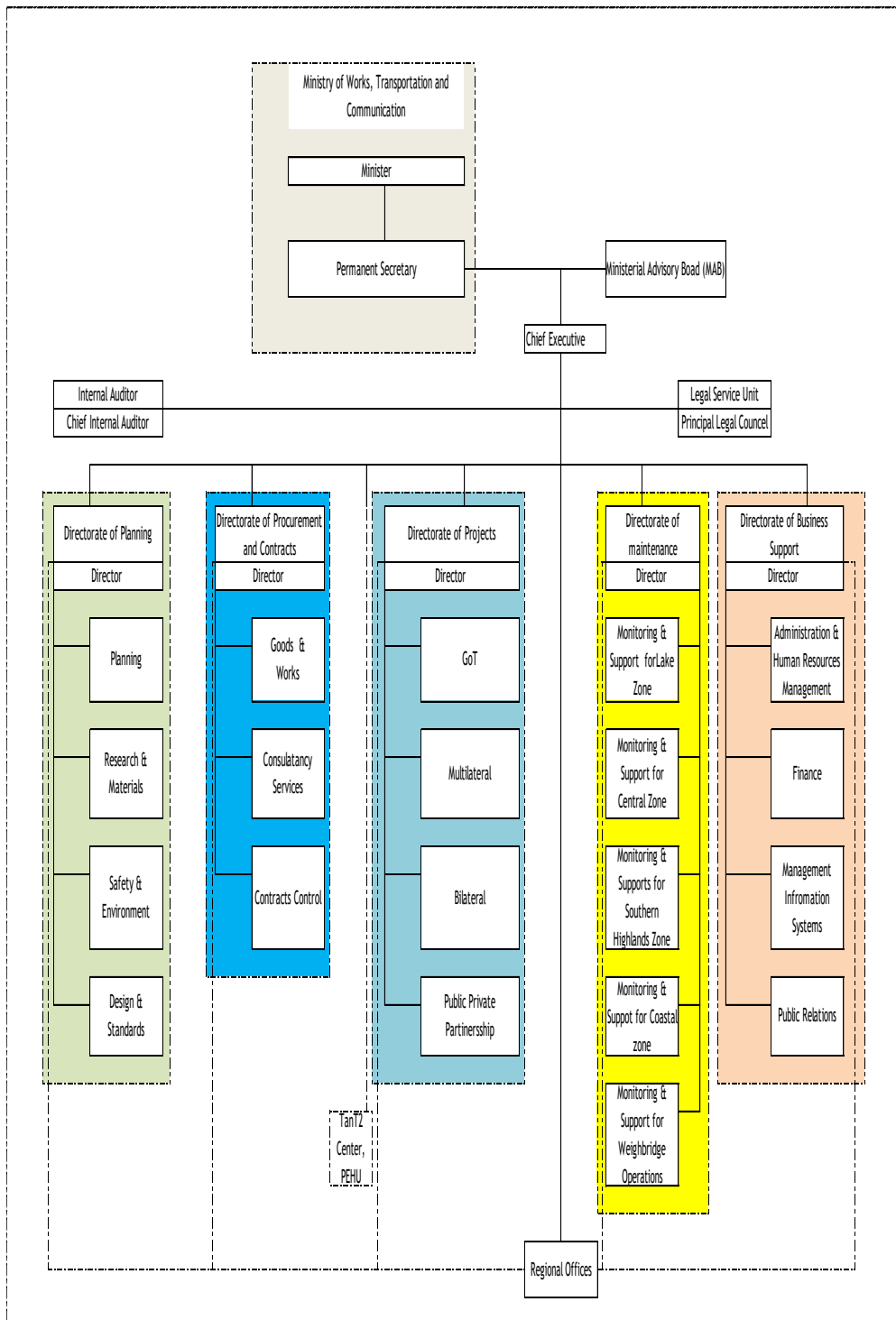
In management of roads furniture main actors are the Ministry of Works, Transport and Communication (MoWTC) and Tanzania National Roads Agency (TANROADS). The key stakeholder is the Ministry of Home Affairs-Traffic Police Department. Other stakeholders include TEMESA, SUMATRA and the Roads Fund Board. Table 2.2 shows responsibilities of the key actors and the stakeholders on the management of roads furniture.

Table 0.2 Responsibilities of the key actors of the management of roads furniture

Actor	Responsibilities
MoWTC	<ul style="list-style-type: none"> To formulate road policy; To cause to be prepared and coordinate the implementation of roads investment and development programmes; To prepare guidelines, standards and specifications for road works and monitoring the performance of the road network; To promote and foster capacity building in road sector; To promote involvement of the private sector in development, maintenance and management of roads; To oversee and monitor road safety and environmental issues; To audit or to cause auditing of the road authority in terms of financing, safety, technical and management in road works; Initiating and coordinating safety awareness

Actor	Responsibilities
	activities as well as initiate studies on safety issues; and <ul style="list-style-type: none"> • Evaluate performance of safety in road transportation.
TANROADS	<ul style="list-style-type: none"> • Undertake procurement and management of contracts for design, maintenance, emergency repair, spot improvements, rehabilitation, upgrading and construction of roads under its control; • Improve road safety; and • Advising the Ministry of works on standards and specifications for road works.
TEMESA	<ul style="list-style-type: none"> • Maintenance of the traffic and street lights;
Traffic Police	<ul style="list-style-type: none"> • Enforcement of traffic laws and regulations; • Protection of roads furniture; • Black spots identifications
SUMATRA	<ul style="list-style-type: none"> • Oversee safety in road transportation
Roads Fund Board	<ul style="list-style-type: none"> • To develop and review periodically the formula for allocation and disbursement from the Fund to TANROADS, local authorities and other agencies and advise the roads Minister accordingly; • To recommend to the roads Minister allocation of funds for TANROADS, local authorities and other road agencies to undertake road management at a level that is suitable and affordable; • To disburse funds from the Fund to TANROADS, local authorities and other agencies; • To ensure that the operations of TANROADS, local authorities, other road agencies and the Fund are technically and financially sound; and • To monitor the use of the funds disbursed to TANROADS, local authorities or other agencies for the objects of the Fund.

Figure 0.1: TANROADS Organisation Structure



2.7 Process of the roads furniture management

Based on various⁷ documents reviewed by Auditors, the process of managing roads furniture goes through planning of the roads furniture, installation of roads furniture, roads inspection, inventory, maintenance, monitoring and evaluation.

i. Planning for installation of the roads furniture

Roads furniture as the pillar to road safety is built on the road from the very start of planning of the design. Planning for the roads furniture is done in two stages i.e. pre- design stage and detailed design.

At the pre-design stage TANROADS is responsible for carrying out road safety audit to identify whether the needs of all road users are considered. The aim is to develop the network of the motorized and non-motorized road users' routes.

Further at the detailed design stage, TANROADS is responsible for reviewing the designs submitted by the consultant, and thoroughly check safety issues and recommend accordingly. Also at this stage TANROADS is responsible for commissioning a road safety audit to see how many issues identified in previous audits have been dealt with. It is a chance to check all the details, including signs and markings, safety barrier, roadside obstacles, lighting, landscaping, pedestrian facilities, and connections to existing roads.

ii. Installation of the roads furniture

Roads furniture is installed during the construction of the roads based on the design. They are installed by the contractors employed by TANROADS. The responsibility of TANROADS at this stage is to supervise the installation of the roads furniture. The TANROADS supervising engineer is responsible to ensure that roads furniture is installed accordingly in terms of quality of materials used and placement of the furniture.

iii. Maintenance of the roads furniture

TANROADS is responsible for maintenance of roads and their furniture under its jurisdiction. MoWTC is responsible for overseeing maintenance activities carried out by TANROADS. Maintenance activities are done by contractors employed by TANROADS. The role of TANROADS is to supervise the maintenance activities.

There are five types of maintenance which are routine maintenance; spot improvement; periodic maintenance; emergency maintenance; and

⁷Guide to the Road Safety Auditing, Guide to traffic signing, Standards specification for roads works.

rehabilitation. Maintenance of roads furniture is done during the routine maintenance which is conducted yearly. The planning for roads maintenance involves activities such as inventory, condition survey and maintenance budget generation. Each activity is undertaken separately;

Inventory: TANROADS is responsible for conducting and maintaining inventories. This is carried out after every five years for general inventory and yearly for spot inventory to get information of the available features in a road, type of the features and their dimensions. The objective of the inventory is to identify the needs of a road and to update the RMMS.

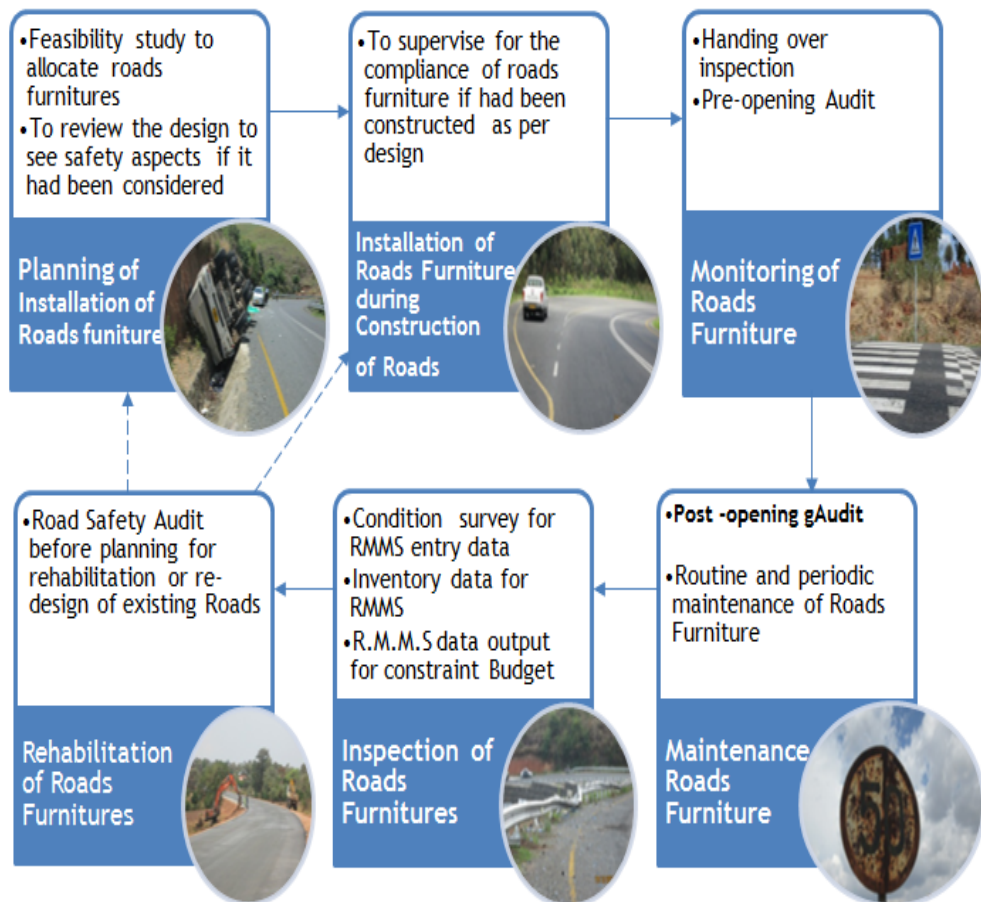
Condition survey: TANROADS is duty bound to carry out condition survey. This is carried out twice in a year for unpaved roads and once for paved roads. The objective of it is to know the general condition of the road in terms of surface and other major structures such as bridges. After the survey, the data are fed to the RMMS which generates the output of which is the condition of the road, type of maintenance needed and the budget located.

iv. Monitoring of roads furniture management activities

MoWTC and TANROADS are responsible for monitoring roads furniture activities. Road safety audits and Inspections are the tools used by the Ministry and TANROADS to monitor and evaluate roads safety management activities. Before and during construction of the roads, the Ministry and TANROADS are supposed to conduct road safety audits to oversee if the safety aspects have been considered at all stages of road project. Before the handing over of the newly constructed and upgraded roads, TANROADS/MoWTC is supposed to conduct inspection. The objective is to check for any hazardous feature and that all the design details have been correctly implemented, and that the signing is quite clear.

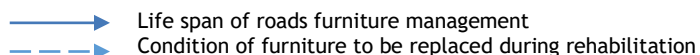
Further during the operation of the roads, the MoWTC and TANROADS are supposed to carry out road safety audit to identify safety deficiencies of the design, layout and roads furniture as described in appendix three. **Figure 2.2** is the process description of the management of roads furniture.

Figure 0.2 Process descriptions for the management of roads furniture



Source: Auditors sketch of process for road furniture management based on Road Audit Guideline (in relation of stages of road project summarized in appendix two)

Legend:



2.8 Coordination of the Management of roads furniture

MoWTC is responsible for coordinating the implementation of road investment and development program. Also, they are responsible for developing the communication system with the stakeholders as far as management of roads furniture is concerned.

CHAPTER THREE

AUDIT FINDINGS

This chapter presents findings of the audit which addresses the audit objectives outlined in chapter one. The chapter presents findings on planning for installation of roads furniture, installation and maintenance of the roads furniture, monitoring and evaluation of roads furniture activities as well as coordination amongst the road safety actors and stakeholders.

3.1 Planning for provision of roads furniture

TANROADS is supposed to involve key stakeholders in road safety during the planning for provision of roads furniture. Also, MoWTC/TANROADS has to ensure that, key aspects of road safety are considered during planning for provision of roads furniture. The audit found the following:

3.1.1 Involvement of stakeholders during planning for installation of roads furniture

The Audit reviewed eight roads project reports to find out whether TANROADS involved other road safety stakeholders such as; Traffic Police officers, urban planners and knowledgeable local people at different phases of road project. Table 3.1 shows extent of stakeholder involvement.

Table 3.1 Extent Participation of Other Stakeholders

Visited Roads	Stages of Road Projects					
	Feasibility Study	Pre-Design Stage	Detail Design Stage	Pre-Opening	Post-Opening	Operation of road
Dar-Chalinze	No information	No information	No information	No information	Partly involved	Partly involved
Chalinze-Tanga	No information	No information	No information	No information	Partly involved	Partly involved
Tanga-Horohoro	No information	No information	No information	Partly involved	Partly involved	Partly involved
Morogoro-Dodoma	No information	No information	No information	Partly involved	Partly involved	Partly involved
Dodoma-Iringa	No information	No information	No information	Partly involved	Partly involved	Partly involved
TANZAM Highway (Igawa-Mbeya)	No information	No information	No information	Partly involved	Partly involved	Partly involved
Mbeya - Lwanjilo-Chunya	No information	No information	No information	No information	No information	No information
Kilwa road (Lindi-Mtwara)	No information	No information	No information	No information	No information	Partly involved

Source: Auditors analysis

As seen in **Table 3.1**; only four (4) road projects out of eight (8) partly involved the stakeholders during feasibility study. TANROADS to large extent involves stakeholders during Environmental Impact Assessment (EIA) studies. There was no information on participation of stakeholders at pre-design and detail design stages. These roads were constructed many years back and the information was not available at TANROADS offices.

Further, on eight roads it was found that stakeholders were partly involved at post opening and operation stages. Meanwhile, involvement of the stakeholders is also to give them a sense of ownership of the road and its furniture so that they may protect it. Usually involvement of stakeholders was done in form of public awareness campaigns. Awareness on roads safety and environmental issues was done to communities living alongside the roads.

The campaigns in most cases were done through open public meetings, community village meetings, group discussions and distribution of public awareness materials like posters and leaflets. Usually, other agenda includes the cooperation between TANROADS, LGA and Police. For example, TANROADS Tanga region was found to have good coordination with Police in identification of the black spots. The observed best practice in Tanga is partly due to good communication network established with Police and Local community living along the road.

Because TANROADS did not fully involve the stakeholders during initial and detailed design phases, some important safety features were therefore left out leading to important furniture not being provided during construction, as explained in **Section 3.2.2**. Among key stakeholders are Police Department. The audit noted that TANROADS did not adequately use accident data collected by the Police to identify accident black spots as reasonable safety needs assessment method for planning for installation of roads furniture. This was evidenced by missing of important signs and markings on some of the eight visited roads.

The Audit noted that along Dodoma - Iringa road at Seluka and Mlowa villages, primary schools were situated beside the road but there was lack of pedestrian crossing facilities, as well as lack of speed limiting measures (warning signs) to control traffic. Missing of these important safety measures at those places could be the result of non-involvement of all key stakeholders at the design stages of road project.

Based on the interview with TANROADS officials, road designers are guided by the Geometric Design Manual. The manual requires a designer to use the design speed while designing a road. The manual is meant to assist the designer to provide the needed level of service at the safest and least economic cost possible. Most elements of design (design speed, stopping

sight distance, passing sight distances, curves, etc.) are determined by safety consideration alone.

However, the audit noted that, geometric design manual is not compatible with urban roads. The manual is more compatible with trunk and regional roads. TANROADS officials revealed that, at the planning stage, TANROADS paid attention to the design speed aspects which is 50-100 kph for the motorized road users. It is possible that, more stakeholders and important safety furniture are ignored in road project process.

3.1.2 Consideration of safety needs of road users during the planning for installation of the roads furniture

TANROADS was supposed to conduct needs assessment of all categories of the road users during the design phase of road projects i.e. motorized, non-motorized and people with disabilities. In addition, TANROADS are supposed to have a system in place for identifying safety needs, collection of information and data for road safety. The audit noted that TANROADS has no established system of identifying safety needs of the road users.

Thus, TANROADS has not conducted safety need assessment of road users for the whole country. However, TANROADS has contracted a consultant to undertake the needs assessment of the different road users but the work had not been completed by the time of this audit. Since TANROADS did not conduct Road Safety Audit, it was unable to properly plan for road safety activities, and sometimes these activities are done on ad-hock basis. In the eight roads visited, the needs assessment was done on some of them by consultants as shown in the **Table 3.2**.

Table 3.2: Extent of safety needs assessment

Visited Road	Need Assessment					
	Feasibility Study	Pre-Design Stage	Detail Design Stage	Pre-Opening	Post-Opening	Operation of road
Dar-Chalinze	No	No	No	No	No	No
Chalinze-Tanga	No	No	No	No	No	No
Tanga-Horohoro	No	No	No	YES	YES	YES
Morogoro-Dodoma	No	No	No	No	No	No
Dodoma-Iringa	No	No	No	No	No	No
TANZAM Highway (Iringa-Mbeya)	No	No	No	No	No	No
Mbeya -Lwanjilo-Chunya	No	No	No	YES	YES	YES
Kilwa Road (Lindi-Mtwara)	No	No	No	No	No	YES

Source: Auditors analysis

Table 3.2 above shows that the needs assessment was seldom done. From the interview with TANROADS officials, the Audit found out that the organization has insufficient staff for conducting needs assessment of road users for planning of provision of roads furniture. Road safety activities are of specialized nature and TANROADS have limited qualified human resource for undertaking these tasks.

The TANROADS Business Plans for 2011/2012 to 2015/2016 period does not indicate any plans for recruiting staff to undertake these tasks. Instead, TANROADS has planned to conduct on-job training to its staff (Engineers/Technicians) on road safety audits and black spots countermeasures. However, audit has noted that road safety seems to be a Head Quarter based activity and the TANROADS regional offices are not properly equipped to collect data and report to the department related to road safety.

3.2 Provision of roads furniture

3.2.1 Adherence to Standard and specification

TANROADS has to ensure that installed roads furniture are of required standard and meets the specifications. However, this audit noted a couple of road signs, road markings and guard rails that were not up to standard and specifications. For example, on some of the visited roads auditors observed installed road signs made of reinforced concrete material instead of aluminium alloy sheets mounted on galvanized steel pipes as per standards and specifications. In addition, in some areas the colour used for signs were not appropriate. The road markings were done using paints that are not specifically manufactured for road marking. Thus, the markings fade and disappear in a short time.

Also, auditors observed guardrails with projecting ends i.e. fish tails and no concrete end blocks. The reflective plates were not fixed to most of the guard rails making them not clearly visible during the night. This may result in road traffic crashes especially during night time. This also endangers other road users such as pedestrians and cyclists.

Table 3.3 shows the extent of compliance/noncompliance to standards and specifications on visited roads. The assessment as shown in the table: 'No' refers to the road network with road furniture that comply with standard; 'Partly' refers to the road network with furniture that comply with standard to about 50 percent of furniture did not comply with standards; while the one rated 'Most' refers to the road network with furniture that did not comply with standard to up to 75 percent.

Table 3.3 Extent of compliance/noncompliance to standard and specifications

Visited Road	Existence of Condition/weakness of furniture in relation to standard and specifications							
	Reinforced concrete signs instead of standard	Fainted signs	Worn-out road markings	Substandard height	Guard rails without fishtail buried or end block	Guard rails with no reflectors	Small size Road sign (plates)	Corroded roads furniture
Dar-Chalinze	No	Partly	Most	Partly	Most	Most	Partly	Partly
Chalinze-Segera-Tanga	No	Most	Partly	No	Partly	Partly	Partly	Partly
Tanga-Horohoro	No	Partly	Partly	No	No	No	No	partly
Morogoro-Dodoma	Most	Most	Most	Partly	Partly	Most	Most	No
Dodoma-Iringa	No	Partly	No	No	Partly	No	No	No
TANZAM Highway (Igawa-Mbeya)	Most	Partly	Most	No	Most	Most	Partly	Most
Mbeya - Lwanjilo-Chunya	No	Most	Partly	Partly	No	Partly	Partly	No
Kilwa Road(Lindi-Mtwara)	No	Most	Partly	Most	Partly	Most	Most	Most

Source: Auditors analysis

Table 3.3 shows that Tanga-Horohoro Roads have complied to a large extent with required standards for roads furniture. Morogoro-Dodoma Road and Kilwa (Lindi-Mtwara) Road scored low compliances with requirement of roads furniture standard. The compliance on Tanga-Horohoro Road could be because of appropriate planning and close supervision which might not have been the case for Morogoro-Dodoma and Kilwa roads.

As of the use of reinforced concrete signs, Morogoro -Dodoma road and Iringa-Mbeya road (between Igawa and Mbeya section) had most of reinforced concrete signs. The rest of the roads had no reinforced concrete signs. Some of the reinforced concrete signs found in the mentioned roads are shown in **Photo 3.1** and **3.2** below



Photo 3.1 Reinforced concrete sign captured by auditors along TANZAM Highway at Igawa-Mbeya section on 16/12/2016



Photo 3.2 Reinforced concrete sign captured by auditors on December 13, 2016 at Wilunze Makalavati village along Dodoma- Morogoro road (57km) RHS from Dodoma

The uses of concrete materials for road signs hinder the visibility as they are not reflective and can increase severity in the event of accidents. These signs do not comply with the requirement of a Guide to traffic signing 2009 and the Standard Specification for Road Works, 2000. Audit team had observed most faded signs along Chalinze-Segera-Tanga, Morogoro -Dodoma and Mbeya -Lwanjilo-Chunya. The most faded signs include regulatory signs for speed limits. **Photo 3.3** and **3.4** below shows faded signs.



Photo 3.3: Fainted signs Captured on December 13, 2016 along Seger - Tanga road



Photo 3.4: Fainted signs captured on December 19, 2016 along Mbeya-Lwanjilo-Chunya road

Audit found that, the faded signs were not made from sheets of the appropriate colour or did not use coloured overlay film onto white sheets as required by Standard Specification for Road Works, 2000. The paint and sheets were substandard and so they faded when exposed to the sun. Therefore, the signs are not serving the intended purpose.

In all eight visited roads, road markings mainly; centreline and edge yellow acoustic lines, had dis-appeared or faded to the extent that they are not seen easily. Worn-out road markings were mostly found on Dar-Chalinze, Morogoro-Dodoma and Iringa-Mbeya (Igawa-Mbeya section) roads. The audit noted that, the paint used for the markings was not reflectorized as per standards/specifications. It is not known whether this is due to supervision weakness. The use of substandard paints increases frequency of maintenance by TANROADS which implies more maintenance cost.

Also, the worn-out centreline inhibits separation of traffic movement, while the worn-out edge yellow line inhibits separation of motorized and non- motorized road users. All these shortcomings contribute to the increased risk of road accidents. Photo 3:5 below shows the worn-out centreline and edge yellow acoustic line.



Photo 3.5 Worn out road markings along TANZAM Highway (Igawa-Mbeya) road captured by auditors on 20.12.2016

In addition, the audit observed kilometre marker posts without any letters and numbers to show the distances to the next town/centre (see **Photo below**).



Photo 3.6 Kilometre marker post seen along TANZAM Highway

In addition to worn out road markings, the audit noted some road signs with substandard heights along Dar-Chalinze, Morogoro-Dodoma and Mbeya -Lwanjilo-Chunya roads. **Photo 3.7** is an example of substandard height signs.



Photo 3.7 Short informative signs observed at Mbeya city staggered junction
Km 0:00 at Mbeya -Lwanjilo-Chunya

The observed signs were shorter than the required 1.8m above ground level as per standards. One of these signs is on the beginning of Mbeya-Lwanjilo-Chunya road (km 0.00). Some road sign poles are protruding above the sign plates.

The audit noted guard rails with projecting ends i.e. fish tails not buried nor had concrete end blocks along Dar-Chalinze, Morogoro-Dodoma and Iringa-Mbeya (Igawa-Mbeya section) roads. This is contrary to the Standard Specification for Road Works, 2000. Most of these guard rails had no reflective plates which make them not clearly visible to the road users during the night. As the result, they increase the risk of fatality of road traffic crashes especially during night. Also, they endanger safety of other road users such as pedestrians and pedal cyclists. **Photo 3.8** below is an example of substandard erected guard rails.



Photo 3.8 Protruding start of guardrail fishtail along Iringa - Dodoma road.
Captured by Auditors on 16/12/2016

3.2.2 Consideration of key aspects of safety during provision of roads furniture

National Road Safety Policy, 2009 require roads authority⁸ to consider key aspects of safety during provision of roads signs, markings and other furniture. **Table 3.4** below shows some of the key aspects for safety which were missing in the visited roads.

The assessment as shown in the **Table 3.4**: 'No' Refers to the road network with road furniture that has no problem with some aspects of safety; 'Partly' refers to the road network lacking about 50 per cent of important aspects of the safety; while those rated 'Most' refers to the road network lacking more than 75 percent of important aspects of the safety.

⁸ TANROADS

Table 3.4: Consideration of key aspects during provision of roads furniture

Visited Road	Key aspects of safety				
	Lack of signs at hazardous areas/ missing signs	Poor Visibility	Mis-location of road signs and markings	Obstruction on Zebra Crossing	Inadequate disability signs
Dar-Chalinze	No	Partly	Partly	Partly	Partly
Chalinze-Segera-Tanga	Partly	Partly	Partly	Partly	Partly
Tanga-Horohoro	Partly	Partly	No	Partly	No
Morogoro-Dodoma	Most	Most	Partly	Partly	Most
Dodoma-Iringa	Most	Most	Partly	Partly	Partly
TANZAM Highway (Igawa-Mbeya)	Most	Most	Most	Partly	Most
Mbeya - Lwanjilo-Chunya	Partly	Most	Most	Most	Most
Kilwa (Lindi-Mtwara)	Partly	Partly	No	Partly	Most

Source: Auditors analysis

From the **Table 3.4** Mbeya-Lwanjilo-Chunya road lack most of the key aspects of road safety. This implies that, this is the most unsafe road out of the eight visited roads. At the time of the audit in December, 2016, the road had been completed and handed over to TANROADS (was still under defect liability period). This means that TANROADS had accepted unsafe road. The reasons could be ignoring of safety aspects during the various phases of the project implementation ranging from feasibility to design to construction and commissioning.

On the other hand, Tanga-Horohoro Road had to a large extent complied with most of safety features. However, the audit observed that, Morogoro-Dodoma, Dodoma-Iringa and TANZAM Highway (Iringa-Mbeya) roads missed most signs at hazardous sections of the roads. Besides that, in the same roads, some important signs were missing including the ones showing end of speed limits.

The audit had also observed that, Morogoro-Dodoma, Dodoma-Iringa and TANZAM Highway (Iringa-Mbeya) roads missed most signs at hazardous sections of the roads. Besides that, in those roads, some important signs were missing including the ones showing end of speed limits. Also, there was lack of signs at the sharp bends and warning of possible falling stones

at Nyang'oro area along Dodoma-Iringa road and on sections of Mbeya-Lwanjilo-Chunya road. **Photo 3.9** below shows lack of signs at the stone failing section of the road.



Photo 3.9 Missing warning sign along Iringa-Dodoma road at km 120:200 from Iringa.

Missing important sign and zebra markings were also observed at Seluka and Mlowa primary schools along Dodoma-Iringa road. At this section, there were no pedestrian crossing facilities and speed calming measures to control traffic.

Likewise, at Igurusi area along Mbeya-Iringa (Igawa-Mbeya) road there were warning signs for the pedestrian crossing but there were neither zebra crossing markings nor the guidance signs. This brings confusion to the roads users. Missing signs and markings on important and hazardous sections of the roads could be attributed to lack of regular inspections by TANROADS to evaluate the safety needs.

In addition, the audit noted a missing protective guard rail along Lindi-Mtwara at Mikindani area in Mtwara. The road is alongside the shores of Indian Ocean on this area. Although the purpose of guard rails is to alert and show where the road is passing on a dangerous section, they also help to reduce the fatality in case of accident. Presence of guard rails at Mikindani will help the drivers drive cautiously. **Photo 3.10** below shows the missing guard rail at Mikindani area.



Photo 3.10 Missing guard rails along Kilwa road (Lindi-Mtwara) at Mikindani area in Mtwara. Photo taken by auditors on 17-Feb-2017

TANROADS official interviewed said that missing of signs is due to vandalism and theft of road signs. Table 3.5 shows the extent of vandalism/thefts on the roads visited.

Table 3.5 Extent of vandalism/theft on the visited roads

Roads Financial Year	Number of vandalized/stolen roads furniture							
	Mbeya - Lwanjilo - Chunya	Dar - Chalinze	Chalinze - Segera - Tanga	Tanga - Horohoro	Morogoro - Dodoma	Dodoma-Iringa	TANZAM Highway (Iringa - Mbeya)	Kilwa (Lindi-Mtwara)
2011/2012	-	8 signs	-	-	172 signs	-	-	-
2012/2013	-	5 signs	47 signs	12 signs	7 signs	-	26 signs	-
2013/2014	80M Guardrail	3 signs	26 signs	-	-	-	-	-
2014/2015	25M Guardrail	4 signs	20 signs	-	-	-	21 signs	-
2015/2016	43 road signs	5 signs	48 signs	3 Signs	8 signs	-	8 signs	-
Total	105M guardrail 43 signs	25 signs	141	15	187	-	55 signs	-

Source: TANROADS Head quarter

From Table 3.5, it is evident that vandalism/thefts is a major problem. For example, Morogoro-Dodoma and Chalinze-Segera-Tanga roads had higher incidences of vandalism/thefts compared with other roads.

However, data on vandalism/theft provided by TANROADS does not match with situation as observed by the auditors on some visited roads. For example, along Dodoma- Iringa road TANROADS data shows there were no missing signs, while the audit team observed stolen road signs and damaged guardrails at Nyang'oro area. This suggests that, TANROADS does not have correct information of the roads furniture. Nevertheless, it did not appear that vandalized/stolen roads furniture was timely replaced.

This could be because of:

- Inadequate inspection by TANROADS regional offices to identify stolen roads furniture;
- TANROADS put low priority in allocating budget for the activity;
- TANROADS has poor relationship with the local communities along the roads who could act as informers; and
- TANROADS has not established incentives for those who are willing to volunteer information on vandalism.

In addition to that, the inventory surveys carried out does not include the stolen or missing furniture. As the result, the affected sections remain with no signs and increasing potential risks of road crashes. **Photos 3.11 (a,b,c, and d)** below show the damaged/Vandalised/stolen roads furniture.



Photo 3.11a: Damaged guard rail along Mbeya-Lwanjilo-Chunya road. Source: Auditors'



Photo 3.11b: Remaining piece post of stolen road sign along Mbeya-Lwanjilo-Chunya road. Source: Auditors'



Photo 3.11c: Remaining piece post of stolen bridge chevron sign along Tanga-Horohoro road Ndoyo Bridge. Source: Auditors'



Photo 3.11d: Vandalised road sign (Y-junction) along Mbeya - Iringa road at Chimala Village. Source: Auditors'

Photo 3.11: Various Vandalised furniture as captured by auditors during field visits

In addition to the missing roads furniture, the audit also observed roads furniture with poor visibility along Morogoro-Dodoma, Dodoma-Iringa, TANZAM Highway (Igawa- Mbeya) and Mbeya -Lwanjilo-Chunya roads. Road signs and markings were not easily seen from a distance during day and night. This is because of the materials used were not reflective. Also, the guard rails lacked reflective plates. Further, the audit observed that improper location impaired the visibility of the roads furniture. For example, along Dodoma-Iringa road at GAPCO filling station (Iringa town) and Mbeya-Lwanjilo-Chunya road the audit observed some zebra crossings located at sharp bends. Since the pre-opening inspections and safety audits were carried out and highlighted the issues of visibility, the

shortfalls should have been dealt with before the roads were handed over to TANROADS.

Also, on Lindi to Mtwara section of Kilwa Road, the audit observed several signs which were not visible due to obstruction by long grass and tree leaves. This is a result of inadequate inspections and lack of routine maintenance. Poor visibility of roads furniture contributes to road crashes. **Photo 3:12 (a and b)** below show improperly located road signs and markings.



Photo 3.12a: Zebra crossing at the sharp curve along Dodoma-Iringa road



Photo 3.12b: Zebra crossing located at the sharp curve along Mbeya-Lwanjilo-Chunya road

Photo3.12: Improperly located road signs and markings as captured by auditors during field visit

Further, the audit observed mis-located road signs and markings. This is an indication that signs placing was not as per specification. Most of mis-located signs and markings were seen along Igawa to Mbeya section of TANZAM highway and Mbeya - Lwanjilo-Chunya road. Along Mbeya-Lwanjilo -Chunya road the audit observed the following:

- Missing advance direction warning signs at sharp curves;
- Road marking allowing overtaking on sharp curves and on a hilly section.
- Pedestrian crossing warning sign installed ahead of zebra crossing markings thus causing the driver to see the zebra crossing markings before the warning sign; and

- Warning Signs for beginning of prohibited speed limit of 50 kmph are located at the middle of villages and not on the beginning (this is possibly due to inadequate updating of the needs of new location for signs and markings).

Along Dodoma-Iringa road at Mkungugu village, audit observed the pedestrian crossing signs and humps signs pointing the wrong direction and therefore not serving the intended purpose. **Photos 3.13 a, b and c** below show mis-located roads furniture.



Photo 3.13a: Mislocated Pedestrians sign along Dodoma- Iringa Road at Mkungugu village



Photo 3.13b: Warning sign erected ahead of zebra crossing along Mbeya-Lwanjilo-Chunya road near Mbugani Zahanati



Photo 3.13c: Roads marking allowed overtaking in a sharp curve along Mbeya-Lwanjilo-Chunya road.

Photo 3.13: Mis-located roads furniture captured by auditors during field visit

Further to that, the audit observed obstructed zebra crossings. This was more common along Mbeya -Lwanjilo-Chunya. Also, zebra crossing ending in the ditch or guard rails without the provision of pedestrian slabs to facilitate pedestrians to cross off the shoulder. This encourages pedestrians to cross at the shortest direct route and put them at risk of falling in the ditch, knocking themselves on the guard rails or being hit by

vehicles. **Photo 3:14** shows obstructed zebra crossing.



Photo 3.14: Obstructed Zebra Crossing Captured by auditors along Mbeya-Lwanjilo-Chunya road

The standard requires that, warning signs be placed at about 60m before a certain feature. However, contrary to that the audit observed short distances from the warning signs to the features such as humps, zebra crossing, curve, bridge or junction. For example, along Mbeya-Lwanjilo-Chunya Road the audit team observed a pedestrian crossing warning sign installed very close to the zebra crossing. The short distance⁹ did not give drivers enough perception time to respond to the sign thus posing a risk of accident. **Photo 3.15** shows one of warning signs installed very close to a zebra crossing.

⁹ Less than 60M as per the standard specifications for road works, 2000.



Photo 3.15: Warning signs erected very close to a zebra crossing along Mbeya - Lwanjilo - Chunya road.

On the other hand; on all visited roads, the audit noted that provisions of signs for people with disability was inadequate in urban and rural areas. Although there were no documented records about the installation of disability signs for Tanga region, auditors observed disability signs installed in both urban and rural areas.

Despite TANROADS having allocated TZS 309.7 million in the year 2015/2016 for erection of signs for people with disabilities in the eight visited regions, only about 15 percent of required disability sign was installed as detailed in **Table 3.6**.

The Audit found out that the TANROADS' regional offices did not use the allocated budget for the intended purpose. According to the interview with TANROADS regional offices, some of the fund for disability signs was used for other activities depending on the priorities at that time. For example, Mbeya regional office used the funds for disability signs and roads safety activities for procurement of traffic control signal facility which was installed at Mafiat staggered junction. Mtwara regional office did not install any disability sign despite receiving TZS 21.460 Million in the financial year 2015/2016 for this purpose.

Similarly, other regions also reallocated the received safety fund for other maintenance activities. As the result disability signs were not installed as budgeted for. This shows that the regional offices are not keen on attending to issues related to road safety and in particular to road furniture.

The **Table 3.6** below shows the allocated budget and the trend of implementation of installation of the disability signs.

Table 3.3 Disability Signs Budget Allocation

Visited Regions	Amount Allocated in Financial Year 2015/2016 (TZS Millions)	Required Number of Disability Signs for FY 2015/2016	Actual Number of Installed Disability Signs for FY 2015/2016	Percentage of installed signs
Dar es Salaam	61.068	No information	No information	
Coast	38.039	88	26	29.5
Tanga	36.322	No information	No information	-
Morogoro	43.261	504	38	7.5
Dodoma	31.619	No	No	
Iringa	33.041	30	30	100
Mbeya	44.936	96	12	12.5
Mtwara	21.460	No information	Nil	Nil
Total	309.746	718	106	14.8

Source: TANROADS strategic plans and progress reports

From **Table 3.6**, out of 718 required signs for people with disabilities, only 106 were installed, which equal to 14.8 percent of the required signs. Iringa is ranking high on compliance as they have installed 100 percent of requirement.

However, the audit noted that TANROADS has no information for other regions on installation of disability signs. For example, in Dodoma Region, the audit observed four disability signs installed in urban area, but the same was not shown in TANROADS data.

TANROADS was supposed to conduct need assessment to identify the actual demand of disability signs for each region before disbursing the fund to procure the disability signs. However, the audit noted that, TANROADS allocated fund for financial year 2015/2016 without considering the needs of a region. For example, for installation of disability signs, Iringa region was given a total of TZS 33 Million for installation of 30 signs while Morogoro was given 43.3 Million for installation of 504 signs. Most of these regions did not plan and establish need for disability signs; therefore, the given fund was not adequately spent. TANROADS disbursed funds for procuring disability signs based on the coverage of road network of each region.

3.3 Maintenance of the Roads Furniture

TANROADS is required to set up, keep and update road maintenance management system (RMMS) which shall be used for planning and resource allocation for roads maintenance activities.

3.3.1 Plans for Maintenance of Roads Furniture

The audit noted that, established RMMS is not adequately catering for planning and budgeting for maintenance of roads furniture. This is because RMMS uses data collected mostly from road condition surveys and spot inventory surveys whose contents do not fully capture the actual condition of roads furniture. On review of the road condition and inventory survey forms the audit noted that the items contained in these forms do not support effective planning for maintenance of roads furniture. The inventory form focused only on number of assets including signs and guardrails present on the road.

In addition to that, the road network condition surveys form does not capture the condition of the various roads furniture. As the result, RMMS is not helpful in planning for maintenance of roads furniture. The main consequence noted by auditors is that, the created unconstrained budget from RMMS does not portray the need of maintenance of roads furniture. In that case, during preparation of BOQ, items of roads furniture were missed because they were not originally included in unconstrained budget. This makes difficult for TANROADS to prepare the reliable budget for road safety and maintenance of roads furniture¹⁰. Below is an extract of the inventory survey form.

¹⁰Because TANROADS has no baseline information or known demand for maintenance of roads furniture

TANROADS -ROAD INVENTORY SURVEY

REGION

Recorded by.....

Survey Ref.....

Road No

Link No

 Date ...

From

To Survey Distance(km)

Start node

End node

Start GPS S: E:

End GPS S: E:

Sub-Link No	<table border="1" style="width: 50px; height: 20px;"></table>
Length (m)	Width (m)
Vegetation width (m)	

Guard Rails (m)
Left Drain (m)
Right Drain(m)
Cutt-off Drain (m)

Bridges/Drift (note 4)		
	Dist.(m)	type
1		
2		
3		

Surface Type	Base (note1)
AM	AB
ST	AP
EG	GB
EE	SB
NE	Unknown

No of Mitre Drains
No Of Signs

Junctions (note 7)		
	Dist.(m)	type
1		
2		
3		
4		

Shoulder Type (Note 1)		
Sealed	Unsealed	Non

Dist. To Rail Crossing (M)

Shoulder width (M)

Cross Section (Note 6)	C F S N
------------------------	---------

Adjacent land use (Note 5)	C F S N
----------------------------	---------

Junctions (note 2&3)			
	Dist.(m)	Size	Type
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Gradient and Curvature			
Flat		Straight	
Rolling		Bendy	
Hilly		Winding	
steep			
single/ Dual carriageway		S	D

No. of Lanes	1	2	3	4
--------------	---	---	---	---

Notes:

1. Enter only for paved roads:

Base type

shoulder width,shoulder type

Single/dual carriage way

No lanes

2. Size:actual size in mm

For Pipe Culvert: diameter (d)

For Box Culverts: height and width (h x w)

3. culvert types

MAIN (M) or SIDE (S) and:

Concrete, Steel circular,Steel arch, Timber, Bush, Drum,Undefined.

4. Bridge types

Bailey,concrete,composite,Timber,Large,Culvert Drift ,Slab,Beam Undefined

5.Adjacent land use

U=Urban, V= village ,I= industrial,R= Rular

6.Crosssection

C=Cut, F=Fill, S=Sidelong Ground,N=Non

7.Junction

L=Left, R=Right , X=Crossroads,O=Roundabout, S=Slip

Photo 3:16 Sample of inventory form

3.3.2 Implementation of the maintenance plans

Maintenance of roads furniture include; repair of damaged signs and guard rails, replacement of missing or stolen furniture, repainting of worn-out markings, repair or replacement of damaged safety barriers, maintenance of traffic light and traffic signal.

However, the audit noted that, throughout the eight visited roads there were unmaintained roads furniture. The audit reviewed the work plan of TANROADS regional offices, most of the plans lack element of maintenance of roads furniture. The audit was not able to establish the linkage between percentages of routine maintenance budget spent on roads furniture maintenance because TANROADS did not prepare specific budget for roads furniture maintenance. This indicates that, priority of TANROADS is maintenance of pavement and major structures rather than roads furniture. As the result, the roads lack effective road furniture and become unsafe.

The assessment as shown in the table, ‘No’ mean that, the road furniture on this road network are newly installed therefore no need for maintenance. The column rated ‘Partly’ means that about 50% of existing roads furniture need to be maintained. While those rated ‘Most’ mean that, more than 75% of the existing roads furniture needs maintenance.

Table 3.4 Need for maintenance of roads furniture

Visited Road	Extent of need of roads furniture maintenance			
	Repair of road signs	Replacement of road signs	Repair and replacement of safety barriers	Repainting of roads markings
Dar-Chalinze	Partly	Partly	Most	Most
Chalinze- Segera-Tanga	Partly	Partly	Partly	Partly
Tanga- Horohoro	No	No	Partly	Partly
Morogoro- Dodoma	Most	Most	Partly	Partly
Dodoma-Iringa	Partly	Partly	Partly	Partly
TANZAM Highway (Igawa-Mbeya)	Partly	Most	Partly	Partly
Mbeya - Lwanjilo-Chunya	No	Most	Most	Partly
Kilwa road (Lindi-Mtwara)	Most	Partly	Most	Partly

Source: Auditors analysis based on observation

From the **Table 3.7** above, Kilwa (Lindi-Mtwara) road, Mbeya -Lwanjilo-Chunya and Dodoma-Iringa roads were found to have large needs for maintenance of roads furniture. Those needs include replacement and repair of road signs and guard rails. Most of the guard rails have been damaged. Along Lindi-Mtwara road at Mikindani area the audit observed about 2 km long of guardrails severely corroded and some parts of it completely removed as shown in **Photo 3:17**.



Photo 3.1 7: Corroded guardrail with parts missing at Mikindani area as captured by auditors

In addition, most of the signs along this road are worn out and need to be replaced. The routine and recurrent maintenance carried out by TANROADS does not adequately cover maintenance of roads furniture. One of the reasons could be that TANROADS had not set a response time for replacement or repair of damaged or stolen roads furniture.

Further, the audit also noted several corroded roads furniture along Iringa-Mbeya (Igawa-Mbeya section). In other roads, condition of roads furniture in terms of corrosion was moderate. **Photo 3:18** below is an example of corroded road sign.



Photo 3.18: Corroded road sign captured by auditors at Chimala village as captured by auditors on 20/12/2016

The audit further noted that, TANROADS was not assessing the risks of increased road accidents due to damaged roads furniture. **Photo 3.19** shows damaged guard rail along Dar es salaam-Chalinze road.



Photo3.19: Unattended damaged guard rail along Dar es Salaam - Chalinze road as captured by auditors on 21.12.2016

TANROADS claim that inadequate and untimely maintenance was due to delay and uncertainty of funding from Road Fund (RF) and other sources. The TANROADS business plan for 2015/16 has shown an irregular pattern in FY 2014/15. The normal pattern of flow of funds from RF is to receive about 25 percent of the annual budget each quarter in every financial year. However, up to the end of the FY 2014/15 only TZS 187,457 million (39.93 percent) was disbursed against the expected TZS 410,808 million as per Annual Performance Agreement (APA) leaving a deficit of TZS 223,351 million.

In addition, TANROADS did not receive TZS. 11,197 million which were spent on the approved surplus funds of FY 2011/12 program and TZS 4,069 million for emergency works in FY 2012/13. This trend had a negative effect on performance of Contractors as they could not be paid timely. Thus, the delays in disbursement of funds had a bearing on the physical and financial performances recorded at the end of the FY 2014/15. However, the audit noted that the allocation of the funds to the road works activities was irrational and low priority was given on activities related to road safety.

3.3.3 Resources allocation for Maintenance of Roads Furniture

To provide and sustain safe roads for all users, it is important that TANROADS, MoWTC and other stakeholders in road sector allocate sufficient resources including finance, equipment and trained staff. TANROADS directed each of its regional offices to identify a safety focal person who will coordinate safety activities within the region. The audit noted that the identified focal persons did not receive adequate training on current issues on road safety. As the result, they are not exposed to the recent technology for road safety in the market. For them to be effective they have to be familiar with geographical Information systems (GIS) to monitor the real-time road safety activities at a road and should possess reasonable knowledge of Road Accident Information System (RAIS) which is in a trial version.

3.3.4 Enforcement of demand for compensation from people who damage/ vandalise roads furniture

Audit noted that, there was no proper enforcement of demand for compensation from people or vehicles that damage roads furniture. The current practice is that, the vehicle or person who damage road features is asked by TANROADS through writing to compensate the equivalent cost for the damaged item. The audit expected that, the damage of the furniture could have been covered by the third-party insurance. However, this was not the case in practice. The follow up and enforcement approach is weak and therefore not functioning.

Document review from Tanga Region has shown that five truck owners did not pay the compensation amounting to TZS 46.4 million in 2015/16.

The audit noted that, the TANROADS regional offices did not use court procedures to compel the offenders to compensate for the damage. This was because regional offices have no legal capacity, in most cases they have to ask legal assistance from TANROADS head quarter. Furthermore, the audit noted that road safety activities in each region could not be done efficiently because of heavy work load given to the focal person as shown in **Table 3.8**.

Table 3.8 Ratio of Road network against focal person

Region	Road network in Km	No of focal person	Ratio km/focal person
Dar es Salaam	600.97	1	600.97
Morogoro	1,891.48	1	1,891.48
Coast	1,365.17	1	1,365.17
Tanga	1,796.99	1	1,796.99
Dodoma	1,685.31	1	1,685.31
Iringa	1,192.73	1	1,192.73
Mbeya	2,255.63	1	2,255.63
Mtwara	1,055.72	1	1,055.72

Source: Auditors analysis

From **Table 3.8** it is seen that the ratio of road network (km) per focal person is quite large in some regions. The focal person is expected to receive information about road safety on daily basis. Current practice is that safety information is collected during periodic and routine maintenance activities.

Since routine maintenance is not conducted as planned, then there is a delay in attending safety issues. Lack of timely information on road safety to the focal person is caused by lack of established reporting system concerning road safety from the public. When accident occurs only the police are informed, and attend at the incident. This could be because the contacts of the focal persons are not known by the public.

In addition, there is no established avenue for focal persons to collaborate with police on performing safety activities. The primary duty of the focal person is not only on safety issues, he/she is an officer with other line functions. As the result, he/she does not participate fully in road safety activities.

3.4 Monitoring, Evaluation and Performance Reporting on Roads Furniture Management Activities

3.4.1 Set-up Mechanisms for Monitoring, Evaluation and Performance Reporting

For an effective and sustainable management of roads furniture, there is need for an appropriate system for collection, storage, analysis (evaluation) and sharing of information among stakeholders.

MoWTC and TANROADS do not have a monitoring and evaluation plan for road furniture activities. Instead they use road safety audit as a tool to monitor road furniture. However, the audit noted that the RSA audit activities are not monitored and evaluated to assess its achievement

against pre-defined safety milestones (indicators), problems encountered in the audit process, effectiveness of the audit system.

The Ministry has no road furniture monitoring and evaluation plan with a complete set of indicators. In addition to this, the audit did not find any kind of other performance evaluation reports that might include problems encountered in the M&E process, the effectiveness of the M&E process and the effectiveness of RSA. Since MoWTC has not carried out monitoring and evaluation on road furniture condition or safety, the conducted RSA has not been effective. In the roads where RSA was conducted, the audit found several missing issues as referred in previous sections (**Section 3.2 and 3.3**), which could have been addressed in the RSA.

Although the Ministry replaced M&E process with RSA, both TANROADS and MoWTC did not conduct road safety audit at every stage of the roads project implementation as required. **Table 3.9** shows status of road safety audit conducted on the sampled roads.

Table 3.9 Status of road safety audit conducted on the visited roads.

Visited Road	Road Safety Audit						As per Manual/ Guideline	
	Feasibility Study	Preliminary Design Stage	Detailed Design Stage	Pre-Opening	Post-Opening	Operation of road	Actual conducted	Required
Dar-Chalinze	NA	NA	NA	NA	NA	ONGOING	1	6
Chalinze-Tanga	NO	NO	NO	NO	NO	NO	0	6
Tanga-Horohoro	NO	NO	NO	YES (It was during Construction)	NO	NO	1	6
Chalinze-Morogoro	NO	NO	NO	NO	NO	ONGOING	0	6
Morogoro-Dodoma	NO	NO	NO	NO	NO	NO	0	6
Dodoma-Iringa	NO	NO	Design Review	NO	YES	NO	1	6
TANZAM Highway (Igawa-Mbeya)	NO	NO	NO	NO	NO	NO	0	6
Iringa - Mafinga	NO	NO	NO	NO	NO	ONGOING	0	6

Visited Road	Road Safety Audit						As per Manual/ Guideline	
	Feasibility Study	Preliminary Design Stage	Detailed Design Stage	Pre-Opening	Post-Opening	Operation of road	Actual conducted	Required
Mafinga-Igawa	NO	NO	YES	NA	NA	NA	1	6
Igawa - Mbeya	NA	NA	NA	NA	NA	ONGOING	0	6
Mbeya-Lwanjilo - Chunya	NO	NO	NO	YES	NO	ONGOING	1	6
Kilwa (Lindi-Mtwara)	NO	NO	NO	NO	NO	NO	0	0
Total							5	66

Source: TANROADS Headquarters

Table 3.9 shows that, only 5 road safety audits were conducted out of 66 road safety audits which were supposed to be conducted. Neither TANROADS nor MoWTC conducted road safety audits at the stage of feasibility study or during design stages. Generally, these are crucial initial stages of road construction projects where important aspects of road safety needs are considered. The audit noted that, TANROADS only review drawings during detailed design stage without comparing them with the actual condition on-site. This is contrary to the road safety audit guideline which requires them to conduct the full safety audit at these stages. As the result, there is a high risk of overlooking important safety features of a road in the design phase.

In addition, Road safety audits were not done at pre-opening, detail design and post-opening stages. However, a few safety audits were done during operation of the road as shown in **Table 3.9**. These were done on Mbeya-Lwanjilo-Chunya road, Dodoma-Iringa road, Tanga-Horohoro road and on some sections of TANZAM highway.

The staff from department responsible for environment and safety at TANROADS confirmed that road safety audit is not conducted because of shortage of human resources. At the time of audit the department had two personnel, whereas at MoWTC there were four personnel. TANROADS and the Ministry have made minimum efforts to enhance capacity of their road safety units. Both TANROADS and MoWTC heavily rely on engaging consultants. This approach is costlier to the government.

Lack of road safety audit resulted into failure to timely identify potential safety issues which need to be addressed at different stages of road project. This weakness has been observed in all the visited roads as shown in **Table 3.9**.

3.4.2 Use of Road Safety Audit Reports to Improve Safety in Road Transportation

The essence of conducting road safety audits is to improve and correct the deficiencies to make the roads safe. Recommendations and findings of the audits are supposed to be shared and implemented by relevant institutions. The audit found that, most of the recommendations from the road safety audits undertaken were not implemented. This is possibly due the fact that, MoWTC does not have a monitoring and evaluation plan for road furniture and road safety activities. **Table 3.10** below shows the recommendations raised by road safety audits which were not implemented by the time of this audit.

Table 3.10 Examples of Road Safety Audits' recommendations which were not implemented

Road	Location (chg.)/ km	Recommended issued
Mbeya - Lwanjilo - Chunya Road (November 2015)	0.000	Replace the small and short road sign with the standard one. The warning signs to be 900x900mm. Route direction signs and information signs to be raised to 1.8m above the ground.
	0.000-3.200	Road marking should be repeated following the guidance to traffic signing
	0.000 -36.000	Sharp corners but overtaking is not prohibited, no overtaking line should be applied
	9.800 - 10.300	a) Bus bay should be relocated at proper place b) Zebra crossing should be shifted to place where there is enough visibility, guide rails should not block the pedestrian crossing and drainages at zebra crossing should be fully covered to allow pedestrian to pass safely
	0.000 -36.000	Road marking are substandard and they have been worn out quickly
Iringa - Dodoma road (May,2016)	0.870 RHS	<ul style="list-style-type: none"> The pedestrian crossing marking should be relocated on a straight, level section. Install speed calming measures to slowdown oncoming vehicles
	1.000, 1.140, 1.400 and 2.400	Provide pedestrian crossing signs W306 and R360 on pedestrian crossing markings and remark pedestrian crossing RTM4 and Speed hump WM10 by using reflecting painting.
	3.120	Provide warning signs (W332) on both

Road	Location (chg.)/ km	Recommended issued
		directions
	3.400 -5.000 RHS (Sambala College)	Provide advance direction sign GD1 and warning sign W115. The orientation of give way sign R2 should be rotated to face drivers from minor road which enters the main road.
	5.100 & 58.500	Provide road humps warning signs W332 on both approaches for each village.
	14.300 - 15.500 (Nduli Airport)	provide warning signs and regulatory sign on Roundabout (W201 and R137) on both approaches and Roundabout Compulsory Direction
	23.300 and 49.300 (Nyang'oro)	Give way signs R2 should be rotated to face the required direction so can be easily seen by drivers.
	92.200 RHS Migori Primary School	Provide regulatory pedestrian crossing signs R360 and warning pedestrian crossing signs W308 on both approaches. Provide speed calming measures (W332) to control moving traffic with its necessary road signs on both approaches.
	Ch.94.700 RHS Mtera Primary School	Provide regulatory pedestrian crossing signs R360 and warning pedestrian crossing signs W308 on both approaches.
	Villages between 105.300 and 253.300	Refit the pedestrian signs W307 to be in an appropriate direction so they can delivery message to intended traffic. Provide road humps warning signs W332 on both directions with supplementary plate to show the number of road humps ahead
	120.200 LHS	Provide warning signs W334 and W335 for traffic moving on both approaches. Rocks are falling on the road but there are no warning signs
	123.500 (Mtera Town)	Straightening the T-junction Chevron warning sign W409 in a required shape and position.
	164.300 LHS Seluka primary school and 207.900 Mlowa	Provide regulatory pedestrian crossing sign R360, warning pedestrian crossing sign W308 to regulate and warn the drivers on school ahead for drivers moving on both approaches.
	123.200 and 208.600	Provide information signs IN16 to inform the drivers on the gate ahead on both approaches.
	250.900 and 254.200 roundabouts	Provide warning and regulatory signs (W201, (W408), R137 and R103) on Roundabout ahead on each approach.

Source: Road safety audit reports for Mbeya-Lwanjilo-Chunya and Iringa - Dodoma Road

From **Table 3.10** above and other reviewed Road Safety reports¹¹, more than 75% of the recommendations made from the road safety audits were not implemented. The audit found that lack of implementation is due to several factors including:

- i Recommendation did not mention specifically who should implement the recommendation (whether directorate of projects or directorate of maintenance);
- ii Insufficient follow-up. At some instances the department of safety, environment and social activities are not involved during the site hand over;
- iii The recommendations lack the timeframe for implementations;
- iv The road safety audit reports are not sent to TANROADS regional offices to facilitate implementation and also reports were not shared with key stakeholders such as Road Fund Board, SUMATRA and TEMESA;
- v Recommendations and findings of the audits are not integrated within RMMS to be included in the budgeting process.

The road safety audits will have no meaning if their recommendations are not implemented; and the costs incurred may be considered as waste of resources (tax payers' money).

3.5 Coordination between MoWTC, TANROADS and other stakeholders

Road safety issues are of cross cutting nature and therefore need close coordination of stakeholders. Effective coordination is expected to include, sharing of data and information, systematic flow of information among the actors and clear understanding of roles and responsibilities of each actor.

In relation with data sharing, the audit noted gaps on sharing information on identification of black spots between TANROADS, MoWTC and Traffic Police Department. The audit found out that TANROADS has no instant access to the Roads Accident Information System (RAIS) and therefore may not be in a position to know where improvements have to be done to reduce accidents (black spots). It was also found out that information about black spots and other safety issues were not updated regularly in

¹¹ Tanga-Horohoro, Tanzam Highway

the RAIS.

Further, audit noted that, there were divided efforts for identifying black spots between MoWTC and TANROADS. For example, TANROADS procured the services of an independent consultant to carryout black spot identification for all road networks while MoWTC in collaboration with Traffic Police conducted black spots identification via RAIS. These efforts could have been combined for effective black spot identification and the funds that were paid to consultant could have been used to improve the RAIS.

However, the audit noted good coordination between some TANROADS Regional Offices such as Tanga where road safety information was closely shared between Regional Traffic Police, TANROADS and the Local Government Authorities.

Although MoWTC and TANROADS are supposed to conduct road safety audits, the Audit noted an element of overlapping and duplication of roles and responsibilities. TANROADS was found to undertake responsibilities of RSAs and MoWTC as well. However, MoWTC focus more on quality assurance and ensuring compliance with established guidelines and follow up of the implementation of recommendations from the conducted road safety audit.

Coordination between TANROADS and LGAs

During the audit, it was noted that, obstruction of most of roads signs in urban centres was due to installation of bill boards which are controlled by LGAs. This is because of the existing conflict of ownership of road reserve areas. The municipal bylaws give them authority to govern all areas within their jurisdiction. This has been a big problem as the installed bill boards block visibility of road signs. In all eight visited roads, the audit noted this problem.

For example, in Iringa town TANROADS installed parking prohibition signs but the Municipal council has continued to allow parking of vehicles on the prohibited section and collect parking fees. **Photo 3.20 (a and b)**; Shows the conflicting of the message between prohibition of parking and presence of legally allowed parked vehicles on carriageway.



Photo 3.20b: Allowed parked vehicle on the prohibited parking sign. Photo taken by auditors in Iringa town on 16.12.2016

Photo 3.20a: Allowed parked vehicle on the prohibited parking sign in Iringa town.

Photo 3.20: Conflicting message between prohibition of parking and presence of legally allowed parked vehicles on carriageway.

CHAPTER FOUR

CONCLUSION

4.1 Overall conclusion

TANROADS has the responsibility of maintaining the national road network and to preserve the investment as well as to make it safe for road users. However, TANROADS has not fully achieved this objective. Road safety issues are not well dealt with, because TANROADS has not adequately considered needs of road users when planning for provision of roads furniture. In addition, the installed roads furniture to a large extent do not comply with set standards and are not well maintained. Besides that, TANROADS has not appropriately integrated road furniture data and information in its roads maintenance systems.

4.2 Specific conclusions

The following are specific conclusions based on audit objectives;

4.2.1. TANROADS inadequately consider needs of road users when planning for provision of roads furniture

Involvement of key stakeholders during planning of the roads is given less attention in most of the road projects. Involvement of stakeholders throughout the road project stages is still a challenge. To a large extent, the designers are guided by the use of Geometric Design Manual while giving less consideration on participation of other road safety stakeholders. The used manual is more suitable for the design and construction of trunk and regional roads.

Installation of Roads Furniture did not adhere to standard: Road signs, markings and guardrails did not meet the standard. Some Road signs were made of reinforced concrete instead of galvanized steel pipes for sign posts and aluminium alloy sheets for sign plates. In addition, the road markings are done using paints of poor quality, contrary to the required specifications. Thus, they wear out fast, lose their reflective ability and they are not easily visible. The guard rails had projecting ends i.e. fish tails not buried nor concrete end blocks. The reflective plates were not fixed to most of the guard rails hence reducing their visibility during the night. All these factors make the roads unsafe and contribute to increase of road traffic accidents.

Important aspects of safety were missing in the Installed Roads Furniture: Even though the visited roads were in operation and some of them had just been completed, key aspects of road safety were missing. Moreover, the road sign markings were faint and guard rail lacked the reflective plates making them not easily visible. This could be due to inadequate designs or weak supervision during construction stage of the project. Furthermore, TZS 309.746 million was allocated for erection of signs for people with disabilities for the eight selected regions for the financial year 2015/2016. Because of the low priority given to installing disability signs, most of the regional offices used funds allocated for road signs disability to perform other maintenance activities.

4.2.2 TANROADS does not adequately maintain roads furniture

Roads furniture are not adequately featured in the TANROADS Maintenance system. Planning for roads furniture maintenance is not clearly outlined in the TANROADS maintenance planning systems. The RMMS has no capability for planning and budgeting for the roads furniture maintenance. This is because, RMMS is not capable of capturing the information on roads furniture collected during inventory and condition survey.

Vandalism (stealing and damage) of roads furniture is a wide spread challenge that was observed during the audit. TANROADS has not adequately addressed this challenge nor developed a comprehensive strategy to deal with it. Even though TANROADS conducts routine and recurrent maintenance, the vandalised roads furniture were not attended timely. Enforcement of penalties for vandalism or stolen signs is inadequate.

Despite the road safety issues being technical in nature and requires knowledgeable professionals to manage them, TANROADS did not adequately build the capacity of its staffs in this area. As the result, they are not capable of analysing road safety issues and developing effective countermeasures.

4.2.2.1 MoWTC and TANROADS do not effectively monitor and evaluate roads furniture activities

Monitoring and Evaluation and Road safety audits were not adequately conducted. In practice, MoWTC and TANROADS replaced role of M&E with RSA. Because of lack of M&E MoWTC and TANROADS did not assess performance and effectiveness of RSA. As a result, the road designs have overlooked important safety features. in addition, findings and Recommendations from Road Safety Audits are not adequately implemented. RSA has not been effective because Ministry did not monitor and evaluate RSA activities. As a result, the recommendations derived

from road safety audit findings are not effectively implemented by the owner of the road (MoWTC/TANROADS) to improve and correct the deficiencies. Besides that, TANROADS Head office did not share Road Safety Audit reports with key stakeholders to facilitate implementation of the recommendations.

4.2.2.2 Weak coordination among key actors resulting to overlapping and duplication of responsibilities

Issues concerning road safety in Tanzania will continue to be challenging in the absence of strong coordination among the stakeholders. There are weaknesses in the system of data and information sharing among the main actors. For example, the identified black spots by Traffic Police Department are not adequately shared with MoWTC or TANROADS. The RAIS is not effective to assist TANROADS for improvement of black spots as it is not accessible.

CHAPTER FIVE

RECOMMENDATIONS

This chapter presents recommendations to the Ministry of Works, Transport and Communications and TANROADS which, if implemented, will improve the management of roads furniture and address weaknesses noted in all four elements of the roads furniture as discussed in the previous chapters.

5.1 Planning for provision of roads furniture

To ensure that all needs of road users are considered during planning for provision of roads furniture, TANROADS should:

- a) Involve key stakeholders of road safety during planning and designing of the roads;
- b) Strengthen project supervision to ensure that all designed roads signs, markings and guard rails are provided/installed properly as per specification;
- c) Ensure that safety needs of road users are taken into consideration during the provision of roads furniture;
- d) Not issue certificate of completion of the road works (substantial or final) if safety aspects of the road such as road signs, road-surface markings, guard-rails and all safety features as designed are not fully completed; and
- e) Establish mechanisms of collaboration with Police and communities living alongside the road on the importance of protection of road furniture against vandalism.

5.2 Maintenance of roads furniture

For effective Maintenance of roads furniture, TANROADS should:

- a) Prepare plans specifically for maintenance of roads furniture and allocate budget specifically for that;
- b) Update the forms for road condition and inventory survey to capture information related to roads furniture;
- c) Include the planning and budgeting for the roads furniture maintenances in the RMMS; and
- d) Set a response time for replacement or repair of damaged or stolen

roads furniture.

Resources allocation for Maintenance of Roads Furniture

- a) TANROADS should establish a sustainable in house capacity building program to the regional road safety focal persons and the staff responsible for road safety and environment issues;
- b) TANROADS should use legal procedures to compel those who damage any road furniture to compensate for the damage;
- c) TANROADS should ensure that awareness campaigns are continuously conducted and the public knows the contacts of the focal road safety personnel for each region; and
- d) Ensure that, the budget allocated to the regional offices for roads safety includes installation of signs for people with disabilities and is used for intended purpose.

5.3 Monitoring, Evaluation and performance reporting for roads furniture management activities

To enhance Monitoring, Evaluation and performance reporting mechanisms for roads furniture management activities, MoWTC should:

- a) Set plans and strategies for Monitoring and Evaluation of Roads Safety Audit;
- b) Ensure that TANROADS conducts roads safety audit at each stage of the road project i.e. from the planning stage to operation of the road;
- c) Ensure that the recommendations from roads safety audits are implemented; and
- d) Develop a set of indicators for monitoring the RSA system.

Recommendation addressed to TANROADS

TANROADS should ensure that:

- a) Roads safety audit reports specifically address who should implement the recommendation between directorate of projects and directorate of maintenance and assign responsibility for implementing the recommendations;
- b) Road safety audit teams should involve different experts such as traffic police officials, urban planners and knowledgeable local people;

- c) Timeframe is set for implementation of recommendations;
- d) Road Safety Audit reports are sent to TANROADS regional offices to facilitate implementation of recommendations;
- e) Road safety audit reports are shared with other key stakeholders such as Road Fund Board, SUMATRA and TEMESA; and
- f) Teams conducting road safety audits are composed of multi-disciplinary members as required by the guide for road safety audit.

5.4 Coordination between MoWTC, TANROADS and other stakeholders

To reduce overlapping of roles and duplication of efforts in dealing with road safety issues MoWTC should ensure that there is a clear understanding of the roles and responsibilities of each institution and introduce a systematic way of dealing with data and information sharing.

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APPENDICES

Appendix one: Audit Questions and sub-questions used during the audit

Planning of road designs	
Question 1	<i>Does TANROADS consider safety needs of all road users during the planning for installation of roads furniture?</i>
Sub-question 1.1	<i>Does TANROADS involve key road safety stakeholders during planning of the road furniture installation?</i>
Sub-Question 1.2	<i>Does TANROADS consider key aspects of safety in road transportation during planning for installation of roads</i>
Installation and Maintenance of the roads furniture	
Question 2	<i>Does TANROADS effectively install road furniture on the public roads?</i>
Sub-Question 2.1	<i>Does TANROAD ensure that the road sign and marks and other furniture meet the required standard?</i>
Sub-Question 2.2	<i>Does TANROADS consider key aspects of safety when installing roads furniture?</i>
Sub- Questions 2.3	<i>Does TANROADS have plans in place for the maintenance of Roads furniture?</i>
Sub-Question 2.4	<i>Are the maintenance of road furniture including road signs, markings and guardrails adequately carried out?</i>
Sub-Question 2.5	<i>Does TANROADS allocate adequate resources for maintenance road furniture?</i>
Monitoring of Roads Furniture management	
Question 3	<i>Does Ministry of Works, Transportation and Communication and TANROADS have mechanisms in place to monitor the roads furniture?</i>
Sub-Question 3.1	<i>Does the MoWTC and TANROADS regularly conduct road safety audits and inspections to oversee the installation of road furniture?</i>
Sub-Question 3.2	<i>Are the results of RSA and inspection well communicated to the TANROADS regional offices and other stakeholders for implementation?</i>
Sub-Question 3.3	<i>Does TANROADS properly use the information obtained from monitoring to improve road safety?</i>
Coordination among the key actors	
Question 4	<i>Does MoWTC ensure that management of roads furniture is well coordinated?</i>
Sub-Question 4.1	<i>Do TANROADS, POLICE traffic effectively coordinate together to carry out their roles and responsibilities related to road</i>
Sub-Question 4.3	<i>Do TANROAD adequately involve other stakeholders to participate while undertaking the road safety audit?</i>

Appendix Two: Checklist for road safety audit

Type of Audit	Focus on the roads furniture
Stage 1-Feasibility study	
Stage 2-Preliminary design	<ul style="list-style-type: none"> • Layout which encourage slow, controlled speeds at and on the approach to STOP and GIVE WAY signs / lines • Adequate provision for pedestrians and cyclists; • The junction design which permit adequate signing; • Need of crossing to be equipped with barriers and signals.
Stage 3-Detailed design	<ul style="list-style-type: none"> • Adequate bus lay-bys, rest areas, etc.; • Lay-bys, rest areas, etc. located and designed to safe standards; • Adequate signing of the trap lanes signed; • Adequate sight lines at and on the approach to STOP and GIVE WAY lines and other critical decision points; • Adequate and correct signing in accordance with the Traffic Signs Manual; • If lighting is to be provided, the lighting columns to be in a safe place; • Signals be clearly seen on the approach to the junction; • Will the signals be hidden in bright sunshine? Are the signal heads fitted with backing boards? • Are the signal lamps the correct size? • Are there at least two signal heads (primary and secondary) controlling each traffic movement? • If there are two or more lanes on the approach, is there a need to provide a second primary signal - on a traffic island? • Is there likely to be any confusion over which signal controls each movement? • Is there sufficient lateral clearance between signal heads and the carriageway? • Do the signal colors, arrangement, signal sequence, and signal timings conform to accepted practice? Are they in accordance with the Traffic Signs Regulations and the advice in the Traffic Signs Manual? • Does the signal phasing prevent any unexpected conflict situations? • Is there a phase to accommodate pedestrians? Are the settings and timings adequate for safe use? • Can pedestrians get confused about which signal applies to them? • Is the junction properly marked in accordance with the advice in the Traffic Signs Manual?

Type of Audit	Focus on the roads furniture
	<ul style="list-style-type: none"> • Is the stop line perpendicular to the center line? • Is the control equipment located in a safe place where it will not interfere with visibility and is unlikely to be hit by errant vehicles? Is there safe parking for the maintenance vehicle? • Are there sharp bends on the ramps? (consider use of chevron signs and safety barrier) • Do the signs convey the correct message? • Are signs located in appropriate and safe places? • Do signs give adequate information to drivers? • Are gantry signs needed? If gantry signs are used can they be seen at night? Do they need to be externally illuminated? • Are safety barriers provided where necessary? • Has steel beam guardrail been designed correctly? <ul style="list-style-type: none"> • Do the main crossing points have features / facilities to help pedestrians (e.g. “dropped kerbs”, refuges, “build-outs”, zebra crossings, signal-controlled crossings, etc.) • Is the crossing located where visibility is adequate? Will there be adequate visibility to queue tails?
Stage 4-Road works	<ul style="list-style-type: none"> • Does the signing provide sufficient advance warning of the roadworks? • Is all the signing in accordance with the provisions of the Traffic Signs Manual? • Does the signing and channelization provide clear guidance to drivers on which way they should go? • Are the barricades, markers and other channelization devices adequate (check size, robustness, colour, visibility, spacing, etc.)? • Will there be a need for speed humps, speed limit signs, no overtaking signs, or other speed control measures?
Stage 5-Pre-opening	<ul style="list-style-type: none"> • Are safety barriers provided everywhere they are needed? Are they long enough to prevent an out-of-control vehicle from reaching the hazard? • Do safety barriers restrict visibility? • Do safety barriers block pedestrian desire lines? • Has steel beam guardrail been designed and installed correctly (check beam height, post spacing, lateral clearance, spacer blocks, nuts and bolts, reflectors, terminal pieces, and whether the beams have been overlapped correctly)? • Check the need for more signs and markings.

Type of Audit	Focus on the roads furniture
	<ul style="list-style-type: none"> • Are the STOP and GIVE WAY lines visible at a safe stopping distance? • Can the signals be seen clearly on all approaches? • Is the alignment of the signal heads correct? • Are the signal lamps bright enough? or too bright (glare)? Can the signals be seen by only those who need to see them? • Is the sequence of operation correctly set? (include pedestrian phases if appropriate). • Are lane markings for dedicated turns adequate? • Are all pedestrian signals functioning correctly and safely? • Check that all signs and markings are correctly placed on round about • Are the correct signs used and are they correctly placed? Check the visibility, legend and legibility in both daylight and in darkness. • Are there spelling or design errors? • Do they give the correct message to drivers? Are they readable? • Are they located in a safe place? Are they interfering with visibility at junctions? Are clearance standards met? • Do the signs obstruct footways? • Are safety barriers needed to protect posts from vehicle impact? • Are any more signs required? • Are all the road markings placed correctly and fully visible? Are reflective pavement markers correct and visible? • Check that all redundant signs (including markings) from the old alignment and temporary signs used during construction have been removed • Is there sufficient pedestrian guard railing? Has it been installed correctly? Does it obstruct visibility?
	<ul style="list-style-type: none"> • Are safety barriers provided where necessary? Are they long enough to prevent an out-of-control vehicle from reaching the hazard? • Are the terminal arrangements (upstream and downstream ends) safe? • Do safety barriers restrict visibility? Do safety barriers block pedestrian desire lines? • Has steel beam guardrail been designed and

Type of Audit	Focus on the roads furniture
<p>Stage 6-Post Opening</p>	<p>installed correctly (check beam height, post spacing, lateral clearance, spacer blocks, nuts and bolts, reflectors, terminal pieces, and whether the beams have been overlapped correctly)?</p> <ul style="list-style-type: none"> • Are there sufficient warning signs? • Have speed limits been imposed? - are they correctly signed? • Is the signing on the approach to a junction adequate? • Is there adequate provision for pedestrians and cyclists at the junctions? • Where there are signals: Do they operate correctly? Are they clearly visible (in all conditions)? Can signals only be seen by those who should see them? Are control boxes located in a safe place? • Are there many pedestrians and cyclists crossing the bridge? Can they cross safely? • Traffic signs: <ul style="list-style-type: none"> ○ Are all the necessary signs in place? ○ Are they readable? (consider in all conditions)? ○ Are they located in a safe place? ○ Do they give the correct message? ○ Is there any confusion in the message they give? ○ Do the posts need protection? ○ Is edge delineation adequate? ○ Are road markings correct and in good condition? <p>Are reflective pavement markers (road studs) correct and in good condition?</p>

Appendix Three: Methodology

Theme	Methods for implementation	Purpose
<i>Installation of roads furniture</i>	<i>Physical Observation</i>	<ul style="list-style-type: none"> • To observe conditions of the installed signs, markings, safety barriers and marker post
	<i>Interview with TANROADS:</i> <ul style="list-style-type: none"> • Department of Road safety and environment officials • Directorate of planning • Directorate of project 	<ul style="list-style-type: none"> • Confirm or explain information from the documents reviewed; • To get clues of relevant information regarding installation of roads furniture in cases where information in the formal documents was lacking or missing; and • To get context and additional perspectives to the information gathered
	<i>Document Review</i> <i>Plans</i> <i>Progress reports</i>	<ul style="list-style-type: none"> • To check whether roads furniture to be installed are planned well • To confirm if the furniture is installed as per plan or design • To corroborate information obtained from interviews
<i>Maintenance of roads furniture</i>	<ul style="list-style-type: none"> • Interview with TANROADS staff of Directorate of maintenance, TANROADS regional offices staff 	<ul style="list-style-type: none"> • Confirm or explain information from the documents reviewed; • To get clues of relevant information

Theme	Methods for implementation	Purpose
		<p>regarding maintenance of roads furniture in cases where information in the formal documents was lacking or missing; and</p> <ul style="list-style-type: none"> • To get context and additional perspectives to the information gathered
	<ul style="list-style-type: none"> • Document review from 2011/2012-2015/2016 Financial Years: <ul style="list-style-type: none"> ○ Maintenance guideline/manual ○ Maintenance plans ○ Bills of Quantity ○ RMMS ○ Condition survey and inventory forms ○ Progress reports 	<ul style="list-style-type: none"> • To check maintenance standard required • To check implementation of roads furniture maintenance programme • To check the function of RMMS on contracts management, Budget and maintenance plans in relation to roads furniture • To check the content in condition survey and inventory forms regarding roads furniture maintenance programme
	Physical Observations	<ul style="list-style-type: none"> • To inspect or check condition of existing furniture
Monitoring of roads furniture	<p>Interview with MoWTC Official</p> <ul style="list-style-type: none"> • Director of Safety and environment • Director of Roads 	<ul style="list-style-type: none"> • Confirm or explain information from the documents reviewed; • To get clues of relevant

Theme	Methods for implementation	Purpose
		<p>information regarding monitoring of roads furniture such as; reporting mechanism, what is reported, frequency of reporting and how is monitored</p> <ul style="list-style-type: none"> • To get context and additional perspectives to the information gathered
	<p>Document review:</p> <ul style="list-style-type: none"> ○ Monitoring reports ○ Road Safety Audit ○ Annual report 	<ul style="list-style-type: none"> • To check road safety audit on what was recommended and how TANROADS Implemented the audit findings • To check progress of Road safety activities from selected Regions
Coordination	<p>Interview with;</p> <ul style="list-style-type: none"> • MoWTC Officials • TANROADS Officials • TARA • POLICE • Other NGOs and Stakeholders 	<ul style="list-style-type: none"> • To check the performance and compliance to the roles and responsibilities of each actor on the management of roads furniture
	<p>Document Review;</p> <ul style="list-style-type: none"> • Organisation structure • Annual report 	<ul style="list-style-type: none"> • To check the roles and responsibilities of actors regarding roads furniture management • To check the flow of communication between actors on the management of roads furniture

Appendix Four: Responses of Audit recommendations from TANROADS

A: Overall Responses

- | | |
|------|---|
| i. | The Author concluded that most of roads furniture are old, dilapidated and out of standard which increase the occurrence of accidents while he/she only sampled 4% (1,394.7km) of the total road network of (33,287Km) under TANROADS Jurisdiction which is not appropriate. The sample size used is not enough to conclude that the performance of TANROADS in road safety management is poor. |
| ii. | The Audit report should provide percentages of TANROADS' performance indicating how much percentage of good and poor performances as we believe that what has been reported as poor performance is much less than our good performance. |
| iii. | The negative perception of the Report on the management of Road Furniture starts on the Cover page, the photos used on the cover page show that the road furniture on the roads under jurisdictions of TANROADS are very poor. We advise the Author to try using photos showing both good and poor road furniture. |
| iv. | Executive summary should have been included in the report |

B: Specific Responses

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	Involve key stakeholders of road safety during planning and designing of roads and that, road safety audit teams should include different experts such as traffic police officials, urban planners and knowledgeable local people	<ul style="list-style-type: none"> • During planning and design of roads, TANROADS involves various stakeholders including Planners, Engineers, Economists and other relevant officials from Local Authorities, Police traffic and communities. • TANROADS has been using three options to carryout RSA i.e.: <ol style="list-style-type: none"> 1. In-house audit team: The In-house RSA is always conducted using TANROADS Experts; 2. Instructing the Design Consultant to conduct RSA 3 as per TOR; and 3. Hiring an Independent Consultancy Firms to undertake comprehensive RSA. <p>The options 2 and 3</p>	<ul style="list-style-type: none"> • TANROADS will continue to ensure that the Contracts of the Design Consultants emphasize the need to consult the local Planners, Engineers, Authorities and communities during designing stage. • TANROADS in carrying out Road Safety Audit / Inspection using independent firms will continue to include Traffic Police as a key staff to undertake RSA and other relevant stakeholder 	Routine

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
		of RSA are conducted in accordance with the “A Guide to Road Safety Audit Guide 2009” Section 1.4. The RSA is conducted using a multidisciplinary team of experts including, Road safety Engineer, Traffic Police Officer, Highway Engineer, and Sociologist or Communication officer.	s including Local Government, Public etc.	
	Strengthen the supervision to ensure that all required road signs, markings and guard rails are provided properly as per specification.	TANROADS has been closely supervising road construction works throughout the project implementation period by hiring the Supervising Consultant, who is full time at site as Resident Engineer to supervise routine construction works on behalf of TANROADS; conducting monthly site visits and meetings to monitor works progress and performance; designate Project	Improvement of supervision and monitoring the installation of road signs and markings along Trunk and Regional roads will be emphasized.	Routine

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
		Engineers from Head Office and Regional offices; hiring independent Consultancy firm for undertaking RSA from design stage up to post opening stage of the project (e.g. RSSP 1 and 2, TSSP, Arusha - Holili road projects, BRT 2 and 3, SATTFP); and undertake in-house RSA by our Road Safety Engineers from HQ and Regional Offices. The aim is to ensure that road furniture, signs and markings are placed properly as per standards specification in the road projects.		
	Not issue certificate of completion of the road works (substantial or final, if the safety aspects of the road such as road signs and road-surface markings, guard-rails and all safety structures are not fully completed.	TANROADS always take over the completed road projects after final inspections that involve various TANROADS experts. The inspection examines among other aspects, the adequacy of installation of the required road furniture including, road signs, road marking, guard	TANROADS will continue to ensure that taking over of road project is done only when the required road furniture is installed as per Contract specification.	Routine

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
		rails, animal crossings, pedestrians' crossings etc. as per standard specifications. The completed roads will be taken over from Contractor when TANROADS is satisfied with the performance.		
	Establish mechanisms of collaboration with Police and communities living alongside the road on protection of road furniture against vandalism	TANROADS used to collaborate with Traffic police and communities (Local Leaders) once road accidents happen and damaging the road furniture.	TANROADS will continue to work together with Traffic police and communities (Local Leaders) to protect vandalism and damaging road furniture by drivers or other road users.	
	The budget allocated to their regional offices for roads safety includes installation of signs for people with disabilities are used for intended purposes.	The funds allocated to the Regional offices for roads safety including the installation of signs for people with disabilities have used as intended. This is because almost all the Regional offices have already installed the signs	TANROADS will continue requesting Regional Managers to submit Action Plans for Implementation of road safety activities for ensuring allocated funds are	

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
		<p>and submitted the progress reports accordingly. This was also reported to us by a Chairperson of the Association of People with Disabilities Tanzania when he was giving his appreciation to TANROADS for taking care of them.</p> <p>Nonetheless, all Regional Managers have been instructed to submit their Action Plans for each financial year and subsequently submit their Quarterly Progress Reports for implementation of the road safety activities including installation of signs for people with disabilities. The aim is to ensure that the allocated funds are spent as intended.</p>	spent as intended.	
	Prepare plans specifically for maintenance of roads furniture and	TANROADS Regional Managers have been preparing and	TANROADS Regional Managers will continue to	

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	allocate budget specifically for that.	<p>submit to the HQ the Action Plans for implementation of the Road Safety Activities Annually for reporting to the Road Fund Board. The Plans are prepared after assessing their needs of road furniture for each road under their jurisdiction.</p> <p>However, the budget does not include Emergency Funds for immediate replacement or installation of vandalized or damaged road furniture.</p>	<p>prepare the Action Plans for implementation of Road Safety activities annually as per allocated budget.</p> <p>TANROADS has requested for additional fund allocation from Road Fund Board whereby part of requested fund will be allocated as Emergency Funds for immediate replacement or installation of vandalized or damaged road furniture.</p>	
	Update the forms for road condition and inventory survey to capture information related to roads furniture.	TANROADS is updating the Inventory Survey Forms to capture road furniture parameters. However, the updating of condition survey forms does not include conditions of the road	TANROADS will ensure that the ongoing updating of the Inventory Survey forms to capture road furniture parameters includes details on the	Immediately

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
		furniture.	<p>conditions of the road furniture.</p> <p>This will be considered by TANROADS Management. However, it should be noted that this modification has cost implication for fully implementation due to fact that the method of data collection must be revised and RMMS system need to be reprogrammed to be able to accommodate this modification. Subsequently, this will require capacity building for training of all staff that runs the system and hiring the specialist to reprogram the</p>	

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
			system.	
	Planning and budgeting for the roads furniture maintenances should be included in the RMMS.	Noted	See the details above (No. 7)	
	Set a response time for replacement or repair of damaged or stolen roads furniture.	TANROADS has not set specific timeframe for replacement, repair or installation of damaged or vandalized road furniture. This is due to the fact that, TANROADS has no budget allocated as Emergency Funds for immediate replacement or installation of vandalized or damaged road furniture.	The 'response timeframe' will be set by TANROADS upon receipt of allocation confirmation of requested additional fund from Road Fund Board whereby part of requested fund will be allocated as Emergency Funds for immediate replacement or installation of vandalized or damaged road furniture.	30 th September 2017
	Establish a sustainable in house capacity building program to the regional road safety focal persons and the staff responsible for road safety and	TANROADS has been conducting In-house trainings on Road Safety, environmental and social issues management to its staff including	TANROADS will continue build capacity of its Road Safety focal persons of regional offices by	

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	environment issues.	Road Safety Focal persons of Regional Offices and Project Engineers from Headquarters. Also a number of TANROADS staff including our Regional Road Safety Focal Persons have been participating in various trainings and workshops organized by other recognized National and International institution that are involved in Road Safety capacity building.	conducting In-house On-job training in zonal wise in every year, in order to equip the engineers with road safety knowledges and to facilitate them attending International road safeties training.	
	Direct regional offices to use legal procedures to compel those who damage road furniture to compensate for the damage.	TANROADS always using Regional offices to Manage and enforce vandalism or damaging road furniture and to control installation of boards as well as Management of road reserve to enforce Road Acts Na.13 of 2007 and its Regulations of 2009.	TANROADS will insist its Regional Managers in collaboration with Police to enforce drivers, who damaged road furniture and penalizing according to Road Acts Na.13 of 2007 and it's Regulations of 2009.	
	Ensure that awareness campaigns are	TANROADS has been conducting Public awareness	<ul style="list-style-type: none"> TANROADS will continue to 	

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	continuously conducted and the public knows the contacts of the Focal Road Safety person for each region.	campaigns on safe use of roads, impacts of vandalism of road furniture, axle load control, road reserve management and environmental management. Different methodologies have been used to disseminate the awareness messages to the public including public meetings along the project roads; participation in the National events such as Road Safety Week, Nanenane, Environmental Day, Public Service week and others; distribution of Awareness materials such as posters, brochures, leaflets, stickers, burners, T-shirts, caps, cups etc.; Media such as Radios, Newspapers, TVs, Blogs; and TANROADS Website (www.tanroadshq.go.tz).	<p>raise awareness to public on safe use of roads, impacts of vandalism of road furniture, axle load control, road reserve management and environmental management.</p> <ul style="list-style-type: none"> • The contacts of Road Safety Focal Person for each region will be uploaded to the TANROADS Website to enable the public to give any information related to road furniture. 	
	Ensure that the	Noted	TANROADS	Immediate

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	recommendations from roads safety audits are implemented		will ensure that the road safety improvements recommended by In house Road Safety Audit Teams are implemented by Contractors during road project implementation. Regular monitoring and follow-up to project sites will be conducted to ensure that the recommendations are adequately implemented by Contractors.	
	Assign responsibility for implementing the recommendations between Directorate of Projects and Directorate of Maintenance	TANROADS has its internal communication system whereby the Directorate of Projects (DPR) who is responsible for managing road Works Contracts communicates with Supervision Consultants and Contractors during road projects implementation.	Presentation of the RSA reports will be improved by indicating responsibilities of Directorates and Regional Managers to implement the recommendations provided in the reports.	Immediate

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
		<p>On the other hand, the Director of Maintenance (DM) is responsible for managing the existing roads. Therefore, the In-house RSA reports prepared by DPL for newly completed roads are submitted to the DPR and Regional Managers for instructing the Consultant and Contractor to implement the recommendations provided.</p> <p>Also the In-house inspection reports prepared by DPL for existing roads are submitted to the DM and Regional Managers for implementation of recommendations provided in the report.</p>		
	Send the Road Safety Audit reports to TANROADS regional offices to facilitate implementation of recommendations	Noted	The Road Safety Audit Reports will also be shared with regional offices for implementation of recommended improvements	Routine

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
			.	
	Share the road safety audit reports with other key stakeholders such as Road Fund Board, SUMATRA and TEMESA	<p>The reports of in-house Road Safety Audit are prepared for internal use within TANROADS to improve road safety on the project roads. These reports have not been shared with outsiders.</p> <p>Refer to our response to your recommendation No. 1 above we have indicated that there are three options of conducting RSA within TANROADS. One of the options is to hire an Independent Consultancy Firm for undertaking a comprehensive RSA for projects. Therefore, the RSA reports prepared by the firms are the ones which are to be shared by different stakeholders outside TANROADS including the Financiers of respective road projects.</p>	TANROADS will share the reports of In-house Road Safety Audit report with Road Fund Board (Financier) and regional offices.	Immediate

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	Ensure that teams conducting road safety audits are composed of some multi-disciplinary members as required by the guide for road safety audit.	<p>Refer to our response to your recommendation No. 1 above we have indicated that there are three options of conducting RSA within TANROADS.</p> <p>The undertaking of the In-house RSA involves TANROADS staff from HQ and Road Safety Focal Persons from our Regional offices.</p> <p>The undertaking of comprehensive RSA Design Consultants and Independent Consultants involves a multidisciplinary team of experts including Road Safety Engineer, Traffic Police Officer, Highway Engineer, and Sociologist or Communication officer (e.g. RSSP 1/2, TSSP, BRT, Arusha - Holili etc. as required by "A Guide to Road Safety Audit Guide 2009" Section 1.4.</p>	TANROADS will continue to ensure that the Independent Consultant hired for undertake the RSA include Traffic Police as one of his key staff for the assignment.	Immediate
	LGAs are properly guided on installation of bill	TANROADS is using the Road Reserve Management	TANROADS will continue using the	Routine

S N	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	TANROADS Should ensure that:			
	boards in urban centers.	<p>Manual (2016) to guide on the use of Road Reserve. According to the Manual the permit must be issued by the Regional Managers to allow erection of the Billboards and other acceptable activities.</p> <p>The billboards that are obstructing the visibility of the drivers on the roads have been removed by TANROADS Regional Managers and penalize the owners. This is ongoing exercise.</p>	Road Reserve Management Manual to govern the erection of the Bill Boards and other activities in the Road Reserve to ensure that the visibility of the road is maintained.	

Appendix five: Responses of Audit recommendations from Ministry of Works, Transport and Communication

A: Overall Responses

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| <p>i. The RAIS Database is still under deployment. Distribution of RAIS equipment to all Police regions and training to the Police Officers was completed in January, 2017. Its effectiveness can be well proven after the system becomes fully functional.</p> <p>ii. Executive summary should have been included in the report</p> |
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B: Specific Responses

SN	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	Ministry Should ensure that:			
1.	TANROADS conducts roads safety audits at each stage of the road project i.e. from the planning stage to operation of the road	Agreed with the recommendation	<ul style="list-style-type: none"> The Ministry will make follow up through Monitoring and Evaluation 	Ongoing
2.	Recommendations from Roads Safety Audits are implemented	Agreed with the recommendation	<p>The Ministry is taking various initiatives to ensure recommendations from safety audits are implemented as follows:</p> <p>i) Make follow up through Monitoring and Evaluation (M&E) conducted quarterly</p>	Ongoing

SN	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	Ministry Should ensure that:			
			ii) Enquire response on action taken on road safety audit recommendations from TANROADS	
3.	There is clear understanding of roles and responsibilities of each institution	Agreed with the recommendation	The Ministry will continue to remind their institutions /Agencies to execute their duties as per their Establishment Order.	Ongoing
4.	There is a systematic way in terms of data and information sharing	The Ministry will ensure systematic data sharing to all stakeholders using Road Accident Information System	The Ministry will conduct training on the use of the system to staffs from TANROADS, Ministry of Home Affairs (MOHA) and Ministry of Works,	2017/2018

SN	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	Ministry Should ensure that:			
			Transport and Communications (MoWTC).	
5.	The RAIS Database is user friendly and the data is easily accessed by the stakeholders	Agreed with the recommendation	The Ministry will improve the system to suit stakeholders needs and training on the use of the RAIS is planned to be conducted to stakeholders	Ongoing
6.	LGAs are properly guided on installation of advertisement board in urban centres	Agreed with the recommendation	The Ministry through TANROADS conducts a routine check up to ensure that Advertisement Boards in Urban areas are properly installed according to the	Ongoing

SN	RECOMMENDATIONS	TANROADS COMMENT(S)	ACTION(S) TO BE TAKEN	TIMELINES
	Ministry Should ensure that:			
			Road Reserve Manageme nt Manual (2006)	