



The Ministry of Works and Transport, Tanzania

FINAL REPORT

Gap Analysis on Road Infrastructure Safety Training and Capability in Tanzania

NOVEMBER 2022



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and Transport,
Tanzania

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ACRONYMS

ACET	Association of Consulting Engineers Tanzania
AQRB	Architects and Quantity Surveyors Registration Board
ARU	Ardhi University
BICO	Bureau for Industrial Cooperation
COET	College of Engineering and Technology
CPD	Continuous Professional Development
CRB	Contractors Registration Board
DIT	Dar es Salaam Institute of Technology
ERB	Engineering Registration Board (Tanzania)
FIDIC	The International Federation of Consulting Engineers
GRSF	Global Road Safety Facility
IET	Institution of Engineers Tanzania
iRAP	International Road Assessment Program
IRF	International Road Federation
MIS	Management Information System
NACTE	National Council for Technical Education
NGO	Non-Government Organisation
NIT	National Institute of Transport
OSHA	Occupational Safety and Health Authority
PIARC	World Road Association
SJUIT	St. Joseph University in Tanzania
TANROADS	Tanzania National Roads Agency
TARA	Tanzania Road Association
TARURA	Tanzania Rural and Urban Roads Agency
TCU	Tanzania Commission for Universities
UDSM	University of Dar es Salaam
UKAid	UK Government's Foreign, Commonwealth and Development Office
UNECA	United Nations Economic Commission for Africa
UNRSC	United Nations Road Safety Collaboration
UNRSF	United Nations Road Safety Fund
USD	United States Dollar

EXECUTIVE SUMMARY

The Ten Step Plan was produced in 2020 by the United Nations Road Safety Collaboration (UNRSC) Safer Roads and Mobility Group partners. The plan is aimed at providing countries with a clear process for establishing systems, building capacity and creating partnerships to support implementation of the UN Convention on Road Traffic and Road Signs and Signals and achievement of the [UN Global Road Safety Targets](#) 3 and 4 for safer new and existing roads. Tanzania is the very first country in the world implementing the Ten Step Plan via a pilot project.

According to the Ten-Step Plan approach, performing gap analysis is priority number one in the project implementation. In this study, gap analysis is performed with the aim to compare the existing training provision, capability and professional accreditation schemes in road infrastructure safety in Tanzania with the desired training targets. This will help to identify the gaps between the current and the desired training provision in road infrastructure safety.

In order to produce the Gap analysis report, the following tasks were undertaken:

- Identifying universities and training institutions around the country;
- Determining the research tool or instruments for data collection and analysis;
- Gathering data;
- Performing data analysis assessing the training provision, capability and professional accreditation schemes in infrastructure safety in Tanzania;
- Providing study findings and recommendations.

The study identified a total of 15 universities and training institutions around the country that offer civil engineering, infrastructure trainings and accreditation services. These institutions included 6 universities, 2 technical institutions, 2 associations, 1 firm and 4 boards. A questionnaire survey was created to collect data from the identified institutions. Due to the limited project's budget the survey was sent to 13 institutions excluding 2 universities located outside of Dar es Salaam. 10 survey responses were received representing a response rate of 72%.

The results from the survey showed that there are training needs in the following areas;

- Road Safety Impact Assessment,
- Road Safety Data System,
- Road Safety Engineering,
- Road Safety Auditing,
- Risk Assessment and Mapping,
- Road Attribute Coding and
- Star Rating for Design and for Schools.

The respondents also recommended the following additional road safety related courses:

- Road sign allocation guidelines
- Standard allocation of bus bays
- Road speed control infrastructure standards and guideline
- Drivers' training in road safety
- Fleet Management
- Road Crash Rescue Program

In terms of capability, 6 out of 10 institutions reported having 0 experts for providing training in most of road safety courses. Only 3 institutions reported having 1 to 4 and 1 institution having 10 to 19 training experts. The top three challenges reported by institutions in providing trainings include:

- Lack of trainers/experts
- Lack of training materials/resources
- Lack of funds

On the other hand, main conclusions regarding the accreditation scheme in Tanzania include;

- Institutional/organisation accreditation is done through the following channels:
 - Universities apply through TCU
 - Technical institutions apply through NACTE
 - Organisations/associations/firms apply through ERB using Management Information System (MIS) or AQRB
- The accreditation renewal process follows similar procedure as when first applying for accreditation.

The results of this study brought to attention the existing training, capability, and professional accreditation system in the country. The findings in this report supports the establishment of a new national training, accreditation and certification scheme that responds to the new road safety targets and builds institutional capacity to sustain the National Road Assessment Programme.

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1 Project Scope and Purpose

The Ten Step Plan was produced in 2020 by the United Nations Road Safety Collaboration (UNRSC) Safer Roads and Mobility Group partners. The plan is aimed at providing countries with a clear process for establishing systems, building capacity and creating partnerships to support implementation of the UN Convention on Road Traffic and Road Signs and Signals and achievement of the [UN Member States Agreed Global Targets](#) 3 and 4 for safer new and existing roads (UNRSC, 2020).



Tanzania is the very first country in the world implementing the Ten Step Plan via a pilot project jointly funded by the United Nations Road Safety Fund (UNRSF) and by the UK Government's Foreign, Commonwealth and Development Office ([UKAid](#)), through the Global Road Safety Facility ([GRSF](#)) of the World Bank. The project is being implemented by a consortium made up of the United Nations Economic Commission for Africa (UNECA), International Road Federation (IRF), World Road Association (PIARC), International Road Assessment Program (iRAP) and Tanzania Road Association (TARA) in close collaboration with the World Bank and the Government of Tanzania through the Ministry of Works and Transport, Tanzania National Roads Agency (TANROADS) and Tanzania Rural Roads Agency (TARURA), research institutions, NGOs, and industry stakeholders (gtKP, 2020).

The Tanzania Ten Step Pilot Project aims at reducing traffic fatalities and injuries in Tanzania by building the institutional capacity and regulatory framework to improve infrastructure safety (management, road safety audits and assessments, investment, design standards, upgrades and monitoring) and to pilot the approach with concrete action and planned and/or existing road projects. This is a two-year project designed to meet the specific needs of Tanzania with some of the expected outcomes including, to establish a National Road Assessment Programme (TanRAP), and to establish a training, accreditation and certification scheme (that supports new road safety targets and builds institutional capacity to sustain the National Road Assessment Programme).

Through these expected outcomes, one of the tasks proposed in the pilot project in Tanzania following the 10-Step approach outlined by the United Nations Road Safety Collaboration (UNRSC) group is to conduct gap analysis. Gap analysis is priority number one (1) of the UN ten-step plan approach for safer road infrastructure. The purpose of the Gap analysis is to identify the difference between the current performance and desired performance. In this study, gap analysis study is performed with the aim of analyzing and determining existing training provision, capability and professional accreditation schemes in road infrastructure safety in Tanzania. The findings from the gap analysis will help to build an effective and sustainable national training and accreditation scheme; and mobilise national and international partnerships and collaborations.

2 Task Objectives

The objectives of this project's task are as follows;

- To review and identify the gaps on existing training and capability in the country
- To review and identify the gaps on existing university training provision and professional accreditation schemes within the country.

3 Approach and Methodology

As stated in the preceding section, in this study a gap analysis is to be performed to explore existing training provision, capability and professional accreditation schemes in infrastructure safety. This section summarizes the approach used in this study to accomplish the task's objectives.

3.1. Identify Existing Universities and Training Institutions

A comprehensive search to identify universities, technical institutions, agencies and organisations that will be used to collect the needed data for the project was performed. The majority of the searches were done through the Tanzania Commission for Universities (TCU) and the National Council for Technical Education (NACTE) websites. Further search on organisations/associations and accreditation boards was done through Engineers Registration Board (ERB) and other channels. The universities and training institutions that are offering civil engineering and infrastructure courses were identified.

According to the Tanzania Commission for Universities (TCU), there are 52 approved university institutions in Tanzania as of 30th April, 2021 (TCU, 2021). A total of 6 universities were identified, those which offer civil engineering and infrastructure courses. 4 of these universities are located in Dar es Salaam, Tanzania. Also, according to the recent National Council for Technical Education (NACTE) report (NACTE, 2021), there are 96 registered technical institutions. A total of 9 technical institutions were identified, those which offer civil engineering and transportation related courses. Only 2 of these technical institutions are located in Dar es Salaam, Tanzania. Due to the limited project's budget and time, only universities and technical institutions located in Dar es Salaam were included in the study. Hence, a total of 4 universities and 2 technical institutions were selected for the data collection. In addition, based on the performed search, 2 associations, 1 firm and 4 boards were identified and selected for the study to perform gap analysis on the country's existing training provision and capability. The list of the identified universities, training institutions and organisations is shown in Table 1 below.

Table 1. Identified Universities and Training Institutions

TCU	NACTE	ASSOCIATIONS	FIRMS	BOARDS
University of Dar es Salaam (UDSM)	Dar es Salaam Institute of Technology (DIT)	Institution of Engineers Tanzania (IET)	Bureau for Industrial Cooperation (BICO)	Engineers Registration Board (ERB)
Ardhi University (ARU)	National Institute of Transport (NIT)	Association of Consulting Engineers Tanzania (ACET)		Contractors Registration Board (CRB)
St. Joseph University in Tanzania (SJUIT)				Architects and Quantity Surveyors Registration Board (AQRB)
St. Augustine University of Tanzania, Dar es Salaam Centre				Occupational Safety and Health Authority (OSHA)

3.2. Determining the Research Tool or Instruments

In order to perform a gap analysis to identify the gaps on existing training and capability on university training provision and professional accreditation schemes in Tanzania, the following steps were followed to determine the research tools and instruments for the study:

- 1 Picking a focus area– based on the aims of the Ten Step Plan project, collecting information on current training on road infrastructure safety was selected as the focus area of the study.
- 2 Defining the desired targets – in order to compare the current state of training on road infrastructure safety with the desired targets, a list with all the required training courses on road infrastructure safety was created. The list was compiled after thorough research and consultation with iRAP, PIARC, TARA, and sub-working group 3 for the Ten Step Plan project.
- 3 Identifying the tool to determine the current state of things – based on the nature of the study, several research tools were considered in collecting data required for gap analysis. These tools include;
 - In-person interviews – this includes face-to-face interviews with the identified institutions to collect useful information for the study.
 - Institutional data – this includes drawing on existing information available through the institutional websites and offices about training on road infrastructure safety.
 - Questionnaire Survey – this includes administering a questionnaire survey to the institution’s representatives to obtain in-depth information on their existing training provision and capability on road infrastructure safety.

After a review of each proposed tool and a discussion done with the sub-working group 3, conducting the questionnaire survey was selected as the best tool for collecting the required data for the study. This was because it can be used to efficiently gather in-depth information required for the gap analysis. It is also easy to administer and cost-effective compared to in-person interviews. The Institutional data approach was discounted due to the unavailability of enough information to support the study.

3.3. Questionnaire Survey

A questionnaire survey was deemed the best tool to utilise for the study to solicit and obtain in-depth information on existing training provision, capability and professional accreditation schemes in infrastructure safety in Tanzania. The questionnaire survey was developed and administered online through survey monkey in English language. The questions in the survey were formed based on the study's objectives, the focus area and the desired target as explained in section 3.2 above. The inputs from sub-working group 3 were considered in developing and validating the questionnaire. Appendix A shows the questionnaire survey that was synthesized and sent to the primary individuals for each identified institution.

The survey was focused at determining the existing road safety courses offered by the institutions, how are they delivered, their capabilities, their challenges and limitations and the accreditation system. Both open-ended and closed-ended questions were used in the survey to allow for respondents to give insights on all aspects relevant to the objectives of the study.

Respondents were asked a set of questions grouped into four parts; **Part 1:** background information – to collect contact information of the primary individual responding to the questionnaire; **Part 2:** state of practice – to collect information on current training, procedures, and practices on road infrastructure safety; **Part 3:** additional/general comments – to collect any additional insights on road safety training that might assist in performing gap analysis accurately; and **Part 4:** accreditation system – to provide insight into the accreditation system in the Country.

Through web searches and consultation with the TARA team, a list of relevant personnel to which the survey was sent was compiled as shown in Appendix B. The list comprised of 14 personnel. Each personnel was contacted either by email or in-person and asked to fill in the questionnaire survey. For those contacted through email, a survey invitation with an URL link was sent. For in-person contacts, a printed version of the survey was administered. Follow-ups were done consistently to remind participants to fill out the survey. The data collection process was finalized in July 2022 with a total number of responses 10 out of 14 for a response rate of 72%. The results of the survey are discussed in the following sections.

4 Survey Results – Gap Analysis

This section provides qualitative analysis of the survey results and the findings of the surveys. The results will help to inform on the gaps in existing training and accreditation schemes in the country.

4.1. Profile of Respondents

4(40%) of the respondents are from universities and technical institutions with 2(20%) from Public University and 2(20%) from Public Technical institution, while 2(20%) of the respondents are from Professional Registration (and Accreditation) Board, 2(20%) of the respondents are from Regulatory

Authority, 1(10%) of the respondents are from Professional Organisation/Association and 1(10%) of the respondents are from Consulting Firm.

Table 2. Type of Organisation

Organisation	Response Percent	Responses	Name of the Organisation
Public University	20.0%	2	UDSM and ARU
Private University	0.0%	0	
Public Technical Institution	10.0%	1	NIT
Private Technical Institution	0.0%	0	
Professional Organisation/Association	20.0%	2	IET and ACET
Consulting Firm	10.0%	1	BICO
Professional Registration (and Accreditation) Board	20.0%	2	ERB and AQRB
Regulatory Authority	20.0%	2	OSHA and CRB
	Answered	10	

- According to the survey, the respondents hold the following titles:
- Head of institutional department – Transportation and Geotechnical Engineering (UDSM)
- Lecturer of Civil Engineering (ARU)
- Head of Regional Centre of Excellence for Road Safety (NIT)
- Training officer – Directorate of Training, Promotion, Research and Statistics (OSHA)
- President of an association (ACET)
- Research officer (CRB)
- Executive secretary of an association (IET)
- Registration Officer (ERB)
- Registrar (AQRB)
- Manager of a firm (BICO)

6 out of 10 respondents (60%) have 6-9 years of experience within the organisation. 2(20%) of the respondents have worked 10-19 years within the organisation, 1(10%) of the respondents have worked from 3-5 years within the organisation and 1(10%) of the respondents have been working for 0-2 years in the organisation.

4.2. State of Practice

4.2.1. Assessment of the capacities and training needs

To collect information on current training, procedures, and practices on road infrastructure safety, institutions and organisations were asked the following questions;

- Does the institution currently provide training or accreditation in this area?
- How many staff/experts does the institution have trained or accredited in this area?
- How do you rate the average level of expertise of trainers in this area?
- What type of certification does the institution provide after completing this course?
- Does the institution plan to provide training or accreditation in this area in the coming years?
- How do you rate the need of this course at the institution?

The answers from the above question can be found in the following tables:

Table 3. Answers to "Does the institution currently provide training or accreditation in this area?"

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA	TOTAL
Road Infrastructure Safety Management Tools & Methods	✓										1
Blackspot Analysis and Treatment	✓										1
Route/Corridor Analysis and Treatment	✓										1
Network/Area Analysis and Treatment	✓										1
Maintenance Inspections	✓		✓						✓		3
Road Safety Inspections	✓										1
Road Safety Assessment	✓										1
Road Safety Impact Assessment											0
Work Zone Safety Guidelines			✓								1
Road Safety Data System											0
Road Safety Audit (RSA)	✓		✓								2
Road Safety Engineering											0
Road Safety Engineering Basic Principles	✓		✓								2
Traffic and Crash Data Collection	✓		✓								2
Risk Assessment and Mapping											0
Highway Design and Traffic Engineering	✓	✓				✓	✓		✓		5
Speed Management	✓		✓								2
Safe System Approach			✓								1
Economic Appraisal and Funding	✓								✓		2
Monitoring and Evaluation	✓								✓		2
Road Survey	✓								✓		2
Road Attribute Coding											0
Road Analysis and Reporting	✓		✓								2
Star Rating for Design and for Schools											0

According to table 3 above, the following trainings are not provided by any of the institutions responded to the survey;

- Road Safety Impact Assessment,
- Road Safety Data System,
- Road Safety Engineering,
- Risk Assessment and Mapping,
- Road Attribute Coding and
- Star Rating for Design and for Schools.

This shows the need for these courses to be included in the training institutions. The results also showed “Highway Design and Traffic Engineering” is being offered in half of the institutions responded to the survey (5 out of 10). The University of Dar es Salaam (UDSM) offers more trainings on road infrastructure safety than other institutions. Institutions with blank responses either skipped the question or responded “No” or “Not applicable” to the question.

Table 4. Answers to "How many staff/experts does the institution have trained or accredited in this area?"

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA	TOTAL
Road Infrastructure Safety Management Tools & Methods	1-4										1-4
Blackspot Analysis and Treatment	1-4							1-4			2-8
Route/Corridor Analysis and Treatment	1-4										1-4
Network/Area Analysis and Treatment	1-4										1-4
Maintenance Inspections	1-4		10-14						1-4		11-28
Road Safety Inspections	1-4										1-4
Road Safety Assessment	1-4										1-4
Road Safety Impact Assessment											0
Work Zone Safety Guidelines			4-9								4-9
Road Safety Data System											0
Road Safety Audit (RSA)	1-4		4-9								5-13
Road Safety Engineering											0
Road Safety Engineering Basic Principles	1-4		10-14								11-28
Traffic and Crash Data Collection	1-4		10-14								11-28
Risk Assessment and Mapping											0
Highway Design and Traffic Engineering	1-4	1-4				4-9			1-4		7-21
Speed Management	1-4		10-14								11-28
Safe System Approach			4-9								4-9

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA	TOTAL
Economic Appraisal and Funding	1-4								1-4		2-8
Monitoring and Evaluation	1-4							1-4	1-4		3-12
Road Survey	1-4								1-4		2-8
Road Attribute Coding											0
Road Analysis and Reporting	1-4		4-9								5-13
Star Rating for Design and for Schools											0

Table 5. Answers to "How do you rate the average level of expertise of trainers in this area?"

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA
Road Infrastructure Safety Management Tools & Methods	Advanced									
Blackspot Analysis and Treatment	Advanced									
Route/Corridor Analysis and Treatment	Advanced									
Network/Area Analysis and Treatment	Advanced									
Maintenance Inspections	Advanced		Advanced						Advanced	
Road Safety Inspections	Advanced									
Road Safety Assessment	Advanced									
Road Safety Impact Assessment										
Work Zone Safety Guidelines			Intermediate							
Road Safety Data System										
Road Safety Audit (RSA)	Advanced		Intermediate							
Road Safety Engineering										

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA
Road Safety Engineering Basic Principles	Advanced		Advanced							
Traffic and Crash Data Collection	Advanced		Intermediate							
Risk Assessment and Mapping										
Highway Design and Traffic Engineering	Advanced	Advanced				Advanced			Advanced	
Speed Management	Advanced		Intermediate							
Safe System Approach			Intermediate							
Economic Appraisal and Funding	Advanced								Advanced	
Monitoring and Evaluation	Advanced								Advanced	
Road Survey	Advanced								Advanced	
Road Attribute Coding										
Road Analysis and Reporting	Advanced		Intermediate							
Star Rating for Design and for Schools										

Table 6. Answers to "What type of certification does the institution provide after completing the course?"

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA
Road Infrastructure Safety Management Tools & Methods							Certificate			
Blackspot Analysis and Treatment										
Route/Corridor Analysis and Treatment										
Network/Area Analysis and Treatment										
Maintenance Inspections			Certificate						Certificate	

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA
Road Safety Inspections										
Road Safety Assessment										
Road Safety Impact Assessment										
Work Zone Safety Guidelines			Certificate							
Road Safety Data System										
Road Safety Audit (RSA)			Certificate							
Road Safety Engineering										
Road Safety Engineering Basic Principles			Certificate							
Traffic and Crash Data Collection			Certificate							
Risk Assessment and Mapping										
Highway Design and Traffic Engineering		Degree				Certificate			Certificate	
Speed Management			Certificate							
Safe System Approach			Certificate							
Economic Appraisal and Funding									Certificate	
Monitoring and Evaluation									Certificate	
Road Survey									Certificate	
Road Attribute Coding										
Road Analysis and Reporting			Certificate							
Star Rating for Design and for Schools										

Table 7. Answers to "Does the institution plan to provide training or accreditation in this area in the next five years?"

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA	TOTAL
Road Infrastructure Safety Management Tools & Methods	✓		✓				✓				3

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA	TOTAL
Blackspot Analysis and Treatment	✓		✓								2
Route/Corridor Analysis and Treatment	✓		✓								2
Network/Area Analysis and Treatment	✓		✓								2
Maintenance Inspections	✓		✓						✓		3
Road Safety Inspections	✓		✓								2
Road Safety Assessment	✓		✓								2
Road Safety Impact Assessment	✓										1
Work Zone Safety Guidelines	✓		✓								2
Road Safety Data System	✓		✓								2
Road Safety Audit (RSA)	✓		✓								2
Road Safety Engineering	✓		✓								2
Road Safety Engineering Basic Principles	✓		✓								2
Traffic and Crash Data Collection	✓		✓								2
Risk Assessment and Mapping	✓										1
Highway Design and Traffic Engineering	✓	✓	✓			✓	✓		✓		6
Speed Management	✓		✓								2
Safe System Approach	✓		✓								2
Economic Appraisal and Funding	✓								✓		2
Monitoring and Evaluation	✓								✓		2
Road Survey	✓		✓						✓		3
Road Attribute Coding	✓										1
Road Analysis and Reporting	✓		✓								2
Star Rating for Design and for Schools			✓								1

Table 8. Answers to "How do you rate the need of this course at the institution?"

Course	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA
Road Infrastructure Safety Management Tools & Methods	Medium		Medium							
Blackspot Analysis and Treatment	Medium		High							
Route/Corridor Analysis and Treatment	Medium		Medium							
Network/Area Analysis and Treatment	Medium		Medium							
Maintenance Inspections	Medium		High						High	
Road Safety Inspections	Medium		High							
Road Safety Assessment	Medium		High							
Road Safety Impact Assessment	Medium		Small							
Work Zone Safety Guidelines	Medium		Small							
Road Safety Data System	Medium		High							
Road Safety Audit (RSA)	Medium		Medium							
Road Safety Engineering	Medium		High							
Road Safety Engineering Basic Principles	Medium		High							
Traffic and Crash Data Collection	Medium		Medium							
Risk Assessment and Mapping	Medium		Small							
Highway Design and Traffic Engineering	Medium	High	Medium			High			High	
Speed Management	Medium		High							
Safe System Approach	Medium		Medium							
Economic Appraisal and Funding	Medium		Small						High	
Monitoring and Evaluation	Medium		Small						High	
Road Survey	Medium		Medium						High	
Road Attribute Coding	Medium		Small							
Road Analysis and Reporting	Medium		Small							
Star Rating for Design and for Schools	Medium		Medium							

The responses provided on Table 8 above are based on how the respondents feel the need for a course based on the needs of the students and institutional goals. The results showed 3 out of 10 institutions expressed a high need for the highway design and traffic engineering course and 2 institutions showed the need for a maintenance inspections course. Other courses with 1 institution each expressing a high need include; Blackspot Analysis and Treatment, Road Safety Inspections, Road Safety Assessment, Road Safety Data System, Road Safety Engineering, Speed Management, Economic Appraisal and Funding, Monitoring and Evaluation, and Road Survey.

4.2.2. Additional Training Needs

The following topics were listed by respondents as additional topics that are needed in the country to ensure safer road infrastructure:

- Road sign allocation guidelines – this includes providing general guidance on sign mounting and positioning for each specific sign type including regulatory signs, warning signs, guidance signs, and information signs.
- Standard allocation of bus bays – this relates to providing standard guidance on bay allocation for buses at bus stops and bus terminals.
- Road speed control infrastructure standards and guideline – this includes providing standards and guidelines for speed management approaches that are appropriate to the primary purpose of the road and provide balance between mobility and safety for all roadway users.
- Drivers’ training in road safety – this includes providing training to drivers with the skills to be more competent, vehicle safer, and reduce death and injury on the road.
- Fleet Management – this relates to providing training on fleet operations and management with the purpose of overseeing fleet performance and efficient fleet operations.
- Road Crash Rescue Program – this includes providing training on effective post-crash response.

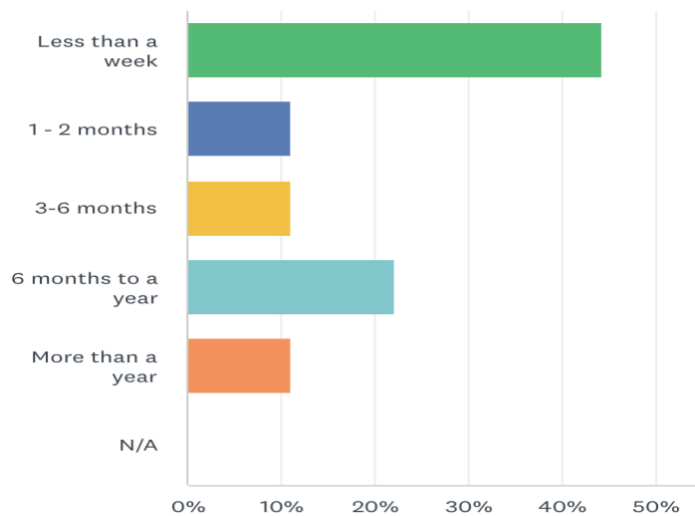
4.2.3. Delivery of Trainings

Respondents were asked to select all that applies on how they deliver their trainings. Half of the respondents – 5 (50%) claimed that they deliver trainings through in-person structured training and/or through study tours. 4(40%) through dissemination of presentations and annual meetings, seminar & workshop. 1(10%) through live webinars as shown in Table 9 below.

Table 9. Delivery of Trainings

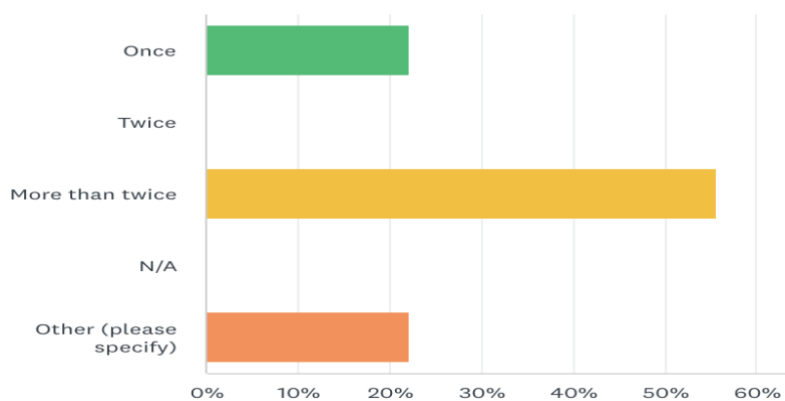
Delivery of Trainings	Response Percent	Responses
In-person structured training	50.0%	5
Live webinars	10.0%	1
Webinars available to take at-your-own-pace	0.0%	0
Online workshops	0.0%	0
Dissemination presentations	40.0%	4
Annual meetings, seminars & workshop	40.0%	4
Study tours	50.0%	5
N/A	0.0%	0

Figure 1. Duration of courses provided by the institutions



According to the survey results shown in Figure 1, most institutions provide trainings for less than a week.

Figure 2. Frequency of providing trainings in a year



4.2.4. Trainings and Trainers

Respondents were asked to specify the number of people in their institutions that have participated in trainings related to road safety for the past five years. 3(30%) of respondents reported that 10 to 49 people have participated in road safety trainings, 2(20%) of respondents reported 1 to 9 people and 1(10%) of the respondents each reported 250 to 999 and 1000+ people have participated in road safety related trainings.

Table 10. Number of people participated in road safety trainings in the past five years

Number of people	UDSM	ARU	NIT	IET	ACET	BICO	ERB	CRB	AQRB	OSHA
1 – 9	✓								✓	
10 – 49			✓		✓		✓			
50- 249										
250-999		✓								
1000+				✓						
Unknown						✓		✓		✓

Figure 3. Ways institutions get trainers/facilitators for training programs

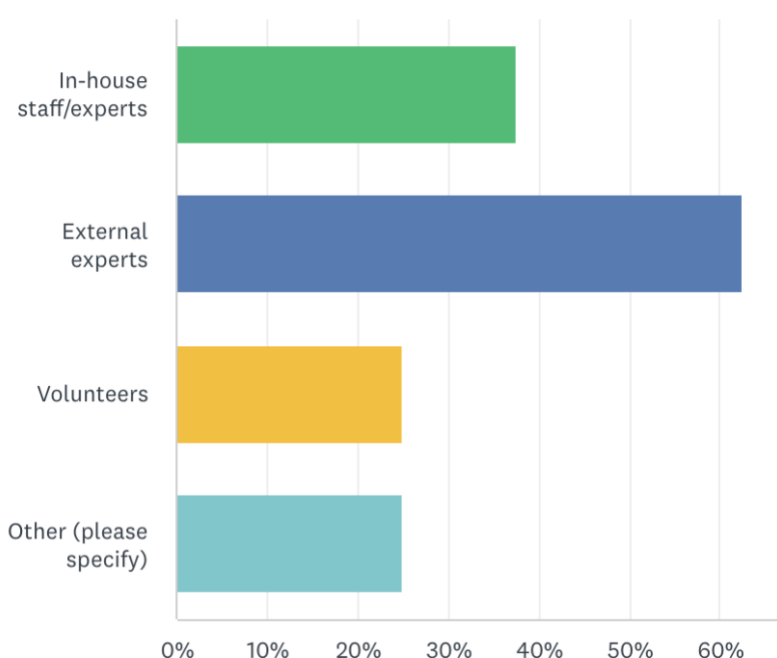


Figure 3 shows the results in which respondents were asked to select the ways that applies to how they get trainers/facilitators for their training programs. 62.5% of respondents reported the use of external experts to provide trainings at their institutions while 37.5% use in-house staff/experts. 25% of respondents use volunteers and other 25% use other ways including engaging public participants/experts from all corners of the country to apply to conduct trainings.

Tables 11 and 12 below show the responses of the respondents regarding ways in which they get new courses added to their training program/curriculum and how they are accredited:

Table 11. Ways of adding new course to the training program/curriculum

Organisation	Ways of adding new course to the training program/curriculum
UDSM	New courses are added through curriculum reviews based on tracer studies. The tracer studies undertake nationwide stakeholders needs assessment. Further, curriculum reviews benchmarks against regional and international best practice.
ARU	After every three years the University Conduct mid curriculum review and full curriculum after every 6 years
IET	Comments from engineers from the industry
ACET	The curriculum is set by FIDIC (The International Federation of Consulting Engineers)
BICO	Comments from engineers from the industry
ERB	Suggested through organizing committees
CRB	Need basis review to gather opinions from stakeholders & evaluators in collaboration with internal experts
AQRB	Stakeholders analysis
OSHA	1. There those stipulated in the OHS Act No5, 2003 2. Through researches 3. The Compliance gaps observed by OHS Inspectors

Table 12. Ways of getting the courses accredited

Organisation	Ways of getting the courses accredited
UDSM	Through Tanzania Commission of Universities (TCU)
ARU	Through Tanzania Commission of Universities (TCU)
NIT	The National Council for Technical Education (NACTE)
IET	Through Engineers Registration Board (ERB)
ACET	Through Engineers Registration Board (ERB)
BICO	Through Engineers Registration Board (ERB)
ERB	Through Continuous Professional Development Unit
CRB	N/A (internally)
AQRB	Through Board of directors' approval
OSHA	Through OSHA itself

4.2.5. Trainings Challenges

Respondents reported the following challenges or barriers limiting the institution's ability to provide training on road infrastructure safety:

- Lack of trainers/experts (44.44%)
- Lack of training materials/resources (44.44%)
- Lack of funds (33.33%)
- Lack of time (11.11%)
- Other
 - I. The authority concentrates on occupational safety and health (OHS) (11.11%)
 - II. The institution does not major on road related trainings; it oversees all construction works in general. If need arise, it would consider having trainings on such areas (11.11%)
 - III. The institution is mandated to monitor buildings & civil works (11.11%)
 - IV. Institutions like TANROADS have their own training units/departments (11.11%)
 - V. Few students and application to road safety courses (11.11%)

4.3. Accreditation System

Out of 10 survey respondents, only 2 institutions responded that they provide accreditation services. These institutions are ERB and AQRB.

The accreditation services listed by the respondents are as follows;

ERB

- Accreditation of Continuous Professional Development (CPD) courses
- Accreditation of degree programmes from higher learning institutions

AQRB

- Provide certificate of professional registration to individuals & firms.

4.3.1. Course Accreditation

Respondents reported the following steps to be taken by the institution to receive course accreditation:

- 1) By conducting need survey of the potential need of the course
 - 2) Develop curriculum
 - 3) Present curriculum to group stakeholders
 - 4) Go through institutional approval organ
 - 5) Apply for accreditation through the accreditation board
 - i. Universities apply through TCU
 - ii. Technical institutions apply through NACTE
 - iii. Organisations/associations/firms apply through ERB Management Information System (MIS) or AQRB
- 1) Pay the required fee
 - 2) Accrediting board sending its experts to check whether the applying institution meets the requirement for accreditation in terms of number of staffs, their education, institution capacity (facilities, library, class rooms sizes etc.)
 - 3) Receive accreditation

Respondents reported the following eligibility criteria for course accreditation:

- Adequacy in staffing/ enough number of experts in a program/course to be accredited
- Availability of learning facilities
- Establishment of required courses that are properly defined i.e. approved curriculum/workshop

Respondents reported the following information regarding the range of fees associated with course accreditation:

ERB

Depends on the participation fee

AQRB

Tshs 150,000 – 300,000

NIT

500 – 1200 USD

Respondents reported the following requirements for an institution to receive CPD Course Accreditation?

- Trainers/facilitators' qualification and experience
- Training program/course content/curriculum
- Nature of training/course delivery
- Duration of the training
- Participants required

Respondents listed the following qualifications of the trainers to provide an accredited course:

- Holder of a relevant certificate /degree for the program with pass above average
- An expert for a good number of years in the area of his expertise
- An engineer and have a knowledge of that course.

Respondents reported the following steps for an individual to receive accreditation

- Apply and take the course,
- Complete the course,
- Pass course exam/assignment.

5 Conclusion

This study was conducted with the aim of performing gap analysis on existing training and capability on existing university training provision and professional accreditation schemes within the country relating to road infrastructure safety. Survey methods were utilized to get an in-depth input to conduct qualitative analysis, and gain insight on the current state on training, capability and accreditation system and identify the gaps between the existing and desired targets.

As a summary from the survey analysis the following road safety topics/courses have been ranked based on how they are provided by the institutions responded to the survey. The courses with least percentage are listed first to show training needs in those areas:

Course	Response Percent	Responses	Institution offering the course
Road Safety Impact Assessment	0%	0	
Road Safety Data System	0%	0	
Road Safety Engineering	0%	0	
Risk Assessment and Mapping	0%	0	
Road Attribute Coding	0%	0	
Star Rating for Design and for Schools	0%	0	
Road Infrastructure Safety Management Tools & Methods	10%	1	UDSM
Blackspot Analysis and Treatment	10%	1	UDSM
Route/Corridor Analysis and Treatment	10%	1	UDSM
Network/Area Analysis and Treatment	10%	1	UDSM
Road Safety Inspections	10%	1	UDSM
Road Safety Assessment	10%	1	UDSM
Work Zone Safety Guidelines	10%	1	NIT
Safe System Approach	10%	1	NIT
Road Safety Audit (RSA)	20%	2	UDSM, NIT
Road Safety Engineering Basic Principles	20%	2	UDSM, NIT
Traffic and Crash Data Collection	20%	2	UDSM, NIT
Speed Management	20%	2	UDSM, NIT
Economic Appraisal and Funding	20%	2	UDSM, AQRB
Monitoring and Evaluation	20%	2	UDSM, AQRB
Road Survey	20%	2	UDSM, AQRB
Road Analysis and Reporting	20%	2	UDSM, NIT
Maintenance Inspections	30%	3	UDSM, NIT, AQRB
Highway Design and Traffic Engineering	50%	5	UDSM, ARU, NIT, BICO, ERB, AQRB

It is important to note that the courses reported being offered by the University of Dar es Salaam (UDSM) are offered as part / in partial fulfillment of the long-term undergraduate degree programme training in Civil Engineering and not as stand-alone courses.

The respondents also recommended the following additional road infrastructure related courses:

- Road sign allocation guidelines
- Standard allocation of bus bays
- Road speed control infrastructure standards and guideline
- Drivers' training in road safety
- Fleet Management
- Road Crash Rescue Program

In terms of capability, 6 out of 10 institutions reported having 0 experts for providing training in most of road safety courses. Only 3 institutions reported having 1 to 4 and 1 institution having 10 to 19 training experts. The top three challenges reported by institutions in providing trainings include:

- Lack of trainers/experts
- Lack of training materials/resources
- Lack of funds

On the other hand, main conclusions regarding the accreditation scheme in Tanzania include;

- Institutional/organisation accreditation is done through the following channels:
 - i. Universities applying through TCU
 - ii. Technical institutions applying through NACTE
 - iii. Organisations/associations/firms applying through ERB using Management Information System (MIS) or AQRB
- The accreditation renewal process follows similar procedure as when first applying for accreditation.

Overall, respondents provided clear and standard procedures in providing accreditation services and not much was reported on the limitations of the procedures to be followed by institutions.

The results of this study brought to attention the existing training, capability, and professional accreditation system in the country. The findings in this report support the establishment of a new national training, accreditation and certification scheme that supports new road safety targets and builds institutional capacity to sustain the National Road Assessment Programme.

6 Recommendations

The findings from this study provided a holistic view of current training, capability, professional accreditation system for road infrastructure safety, and existing gaps in the country. Following these findings, the following recommendations are made in order to adjust and provide efficient and effective training activities on road infrastructure safety.

- Training courses are proposed to be developed and modelled into three levels to cater to different needs and levels of education of professionals: University level – specific for college students in the field of civil engineering and road safety related studies to be ready for implementing the skills in the industry; Technical, higher level – for professionals from the industry in road safety to include emerging, advanced and mature courses catering for the needs in the country and; Vocational, lower level technical – for non-engineers/technical participants but work in road infrastructure safety area.
- The type of courses to be included in the training program should consider the existing courses offered by iRAP, PIARC, and other platforms dedicated to students and professionals acting on road infrastructure safety. This is to avoid duplication and repetitive effort of what already exists. Based on this study, 24 courses have been identified. Special focus should be considered on the following training needs and gaps in current training activities in the country; Road Safety Impact Assessment, Road Safety Data System, Road Safety Engineering, Risk Assessment and Mapping, Road Attribute Coding and Star Rating for Design and for Schools.
- Training courses and activities should be tailored based on local needs and regularly adjusted by performing tracer studies to gain feedback from students, alumni, and professionals from the industry.
- All new developed training courses and innovative services are proposed to be implemented using the web-based platform to allow students, alumni, and professionals to have easy access to the courses to get more in-depth knowledge on the needed topics.
- Formal and informal training should be provided regularly and offered both online and in person.
- Training the trainers to increase the number of experts should be one of the main priorities of the program. This is due to a limited number of road safety experts in the country.
- Promotional and workshop events should be organised to get feedback on training activities, invite participants, and promote collaborations within institutions.
- The accreditation scheme should follow the standard procedures developed by TCU, NACTE and ERB.

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TCU. (2021). *List of Approved University Institutions in Tanzania as of 30th April, 2021*. Dar es Salaam: Tanzania Commission for Universities. <https://www.tcu.go.tz/sites/default/files/LIST%20OF%20UNIVERSITY%20INSTITUTIONS%20IN%20TZ%20AS%20OF%2030.04.2021.pdf>

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APPENDIX A – The Questionnaire Survey



The Ministry of Works
and Transport,



A NATIONWIDE SURVEY ON EXISTING TRAINING, ACCREDITATION AND CERTIFICATION

GAP ANALYSIS SURVEY

Welcome to the Gap Analysis Survey

Dear participant,

We kindly invite you to take part in the survey about the capacities and training needs of the institutions within the Country in relation to road infrastructure safety.

This survey is being conducted by the Tanzania Roads Association (TARA) for the Ten Step Plan for Safer Road Infrastructure Pilot Project in Tanzania.

Survey Purpose

The survey is aimed at determining the gap in existing training, capability and professional accreditation schemes within the Country relating to road infrastructure safety. Tanzania is the very first country in the world to implement the Ten Step Plan via a project jointly funded by the Global Road Safety Facility (GRSF) and the United Nations Road Safety Fund (UNRSF). The project is being implemented by a consortium made by the United Nations Economic Commission for Africa (UNECA), International Road Federation (IRF), World Road Association (PIARC), International Road Assessment Program (iRAP) and Tanzania Road Association (TARA) in close collaboration with the World Bank and the Government of Tanzania through the Ministry of Works and Transport, Tanzania National Roads Agency (TANROADS) and Tanzania Rural Roads Agency (TARURA), research institutions, NGOs, and industry stakeholders. The project aims to provide Tanzania with a proven step by step process to build national capacity for safer road infrastructure, and to support UN Global Road Safety Performance Targets 3 and 4. This survey is directed at the Universities and Technical institutions, professional organisations/associations, and engineering registration and accreditation boards.

More information about the Ten Step Plan for Safer Road Infrastructure is available at: <https://www.gtkp.com/themepage.php?themepgid=501>

Survey Results

The gap analysis will be conducted to analyse the training needs that the country has on road infrastructure safety with the use of existing capabilities, people, technology, structure and processes. The results of the survey will be used to develop a training and professional accreditation system with the expected outcomes to establish a national road assessment program (TanRAP) with lasting institutional benefits. All data from this survey will be analysed and presented exclusively for the project.

Survey Instructions

We kindly request your institution to complete the survey by providing information and data valuable for supporting the implementation of the Ten Step Plan for Safer Roads Infrastructure Pilot Project in Tanzania. The questionnaire can be accessed using the following link: <https://www.surveymonkey.com/r/TENSTEP>

Or QR Code



Answers to the survey should be provided by a responsible personality of the institution/department.

The survey should take about 20 minutes to complete.

If you have any questions or need more information about the survey, please contact the Coordinator for Working Group 3, Ten Steps Project, Eng. Swalehe Kassera (snakassera@gmail.com cc jackiejr87@yahoo.com) or call through +255688904887). We thank you in advance for your participation!

PART 1: BACKGROUND INFORMATION

1. Please provide the name and contact information for the primary individual providing information for the questionnaire.
 - Full Name:
 - Title/Position:
 - Department:
 - Institution/Organisation:
 - Years working within the institution:
 - Address:
 - Telephone Number:
 - Email Address:
2. Which of the following best describes your institution/organisation?
 - Public University
 - Private University
 - Public Technical Institution
 - Private Technical Institution
 - Professional Organisation/Association
 - Consulting Firm
 - Professional Registration (and Accreditation) Board
 - Other (please specify)
3. If you want this survey sent to another person in your organisation, please provide their names and email addresses.
 - Full Name:
 - Email:

PART 2: STATE OF PRACTICE

The following questions will be used to collect information on current training, procedures, and practices on road infrastructure safety.

4. Please indicate if the following courses are being offered or have been accredited by the institution and respond to the questions below.

	Does the institution currently provide training or accreditation in this area?	How many staff/experts does the institution have trained or accredited in this area	How do you rate the average level of expertise of trainers in this area?	What type of certification does the institution provide after completing this course?	Does the institution plan to provide training or accreditation in this area in the coming years?	How do you rate the need of this course at the institution?
Road Infrastructure Safety Management Tools & Methods:						
Blackspot Analysis and Treatment						
Route/Corridor Analysis and Treatment						
Network/Area Analysis and Treatment						
Maintenance Inspections						
Road Safety Inspections						
Road Safety Assessment						
Road Safety Impact Assessment						
Work Zone Safety Guidelines						
Road Safety Data System						
Road Safety Audit (RSA)						
Road Safety Engineering:						
Road Safety Engineering Basic Principles						
Traffic and Crash Data Collection						
Risk Assessment and Mapping						
Highway Design and Traffic Engineering						
Speed Management						
Safe System Approach						
Economic Appraisal and Funding						
Monitoring and Evaluation						
IRAP Accredited Courses:						
Road Survey						

	Does the institution currently provide training or accreditation in this area?	How many staff/experts does the institution have trained or accredited in this area	How do you rate the average level of expertise of trainers in this area?	What type of certification does the institution provide after completing this course?	Does the institution plan to provide training or accreditation in this area in the coming years?	How do you rate the need of this course at the institution?
Road Attribute Coding						
Road Analysis and Reporting						
Star Rating for Design and for schools						
Design Standards for the safety of pedestrians/cyclist – World Road Association Road Safety Manual (RSM)						

5. Are there any other courses that institution offer or has provided not mentioned in the table above? If yes, please mention them:
6. Please propose other topics or courses which are needed in the country to ensure safer road infrastructure.
7. How does the institution/organisation deliver its training? Select all that applies
 - In-person structured training
 - Live webinars
 - Webinars available to take at-your-own-pace
 - Online workshops
 - Dissemination presentations
 - Annual meetings, seminars & workshop
 - Study tours
 - N/A
8. What is the range of duration of courses provided by the institution.
 - Less than a week
 - 1- 2 months
 - 3- 6 months
 - 6 months to a year
 - More than a year
 - N/A

9. How many times are courses being provided in a year?
- Once
 - Twice
 - More than twice
 - N/A
 - Other (please specify)
10. For the past five years, how many people in your institution have participated in training related to road safety?
- 1-9
 - 10-49
 - 50-249
 - 250-999
 - 1000+
 - Unknown
11. How does the institution get trainers/ facilitators for training? Please check all that applies
- In-house staff/experts
 - External experts
 - Volunteers
 - Other (please specify)
12. How does the institution get a new course added to the training program curriculum? Please explain the procedure briefly.
13. How does the institution get their course accredited?
14. What are the challenges or barriers limiting the institution's ability to provide training on road infrastructure safety? Please check all that applies.
- Lack of experts
 - Lack of funds,
 - Lack of training materials/ resources
 - Lack of time
 - other, please specify.
15. Would you like to clarify or elaborate on any institutional challenges and barriers in providing training on road infrastructure safety?
16. Does the institution have the following registered professionals?

	Number of registered professionals
Road Safety Engineer	
Road Safety Auditor	

17. During the establishment of the Tanzania Road Assessment Programme (TanRAP) we will develop numerous educational and research projects and establish innovative and collaborative road safety training programs for academic and professional organisations. Would you like to be part of this programme which will be created as a result of the Ten Step project, where you can collaborate with national and international experts and organisations?
- Yes
 - No
 - I am already involved in the Ten Step Project

PART 3: ADDITIONAL/GENERAL COMMENTS

In this section, please provide any additional insights on road safety training that might assist in performing gap analysis accurately.

Please send any documents with the list of trainings/ curriculum provided by the institution for the past five years to jackiejr87@yahoo.com.

PART 4: ACCREDITATION SYSTEM

This section includes questions to provide insight into the accreditation system in the Country.

Does the institution/board provide accreditation services?

- Yes
- No

1. What are the types of accreditation services institution/provided by the board?
2. What are the steps to be taken by the institution/individual to receive accreditation?
3. What are the eligibility criteria for accreditation?
4. What is the range of fees associated with receiving accreditation and providing training?
5. What are the requirements to receive CPD Course Accreditation?
6. What are the facilitator qualifications to provide an accredited CPD course?
7. What are the criteria for evaluating and approving PDUs?
8. What are the accreditation renewal procedures?
9. How many people are accredited by the board?
10. How many people/institutions have been accredited by the board to provide road safety services through the board?

APPENDIX B – List of Survey Recipients / Respondents

No#	Institution	Name	Title
1	UDSM	Siya Paul Rimoy	Head, Department of Transportation and Geotechnical Engineering (TGE)
2	ARU	Geophrey J Mbatta	Lecturer, Department of Civil Engineering
3	SJUIT	Adauth Kombe	Lecturer, Department of Civil Engineering
4	DIT	Silipius Mbawala	Head, Department of Civil Engineering
5	NIT	Prosper Nyaki	Head, Department of Transport Engineering and Technology
6		Omari Mashi	Head, Regional Centre of Excellence of Road Safety (RCoE)
7		Honesta Msaki	Lecturer
8	IET	Ipyana Moses	Executive Secretary
9	ACET	Deogratus Mugishagwe	President
10	BICO	M.J.Manyahi	Manager
11	ERB	Erick Nestory	Registration Officer
12	CRB	Gloria Mushi	Research Officer
13	AQRB	Edwin NNunduma	Registrar
14	OSHA	Frank Paul Mnyanyi	Training Officer



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