

# ROAD TRAFFIC INJURY IN TANZANIA: DEVELOPMENT OF A LOCAL GOVERNMENT ROAD SAFETY PROGRAMME

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## Abstract

The DFID-funded Improving Rural Access in Tanzania programme (IRAT) is improving rural roads by removing 'bottlenecks' – stretches of road which are impassable during the rainy season.

However, improved roads also result in increased traffic and often in higher speeds, which can create safety risks.

Over 1.2 million people are killed on the world's roads each year, and a further 20 to 50 million are injured. Low- and middle-income countries are hardest hit, losing up to an estimated 5% of GDP as a result of crashes<sup>i</sup>.

Africa has the world's most dangerous roads, with a death rate of 26.6 per 100,000 of the population. This is despite the fact that Africa is the least motorised of the world's regions: Africa has only 2% of the world's vehicles but 16% of the world's road fatalities<sup>ii</sup>.

Research carried out in Tanzania has shown that 95% of rural road crash victims are either the driver or passenger of a motorcycle, the severity of injuries suffered in crashes involving motorcycle is greater than those suffered in crashes involving other modes, and road user behaviour, road design, road surface condition and construction techniques all contribute to rural motorcycle crashes<sup>iii iv v</sup>.

This paper discusses the development of a road safety programme for local government authorities in Tanzania.

**Key words:** *community development officers, district engineers, local government, motorcycle crashes, road traffic injury, rural road safety.*

## Introduction and Background

There are more people living below the poverty line in Tanzania today than there were ten years ago. Most of these people are living in rural areas. Evidence suggests that this is because rural populations are not physically well-connected to the growth process. As of 2013, around three-quarters of Tanzania's rural population were estimated to be poorly connected to local markets, administrative centres, health care, education and the national transport network. This was because of the poor condition of a large part of the country's rural road network.<sup>vi</sup>

The DFID-funded Improving Rural Access in Tanzania programme (IRAT) is being implemented through the Division of Infrastructure Development (DID) of the President's Office for Regional Administration and Local Government (PORALG). The programme involves around GBP 25 million being spent on improving rural accessibility from 2013 to 2017, with almost 90% of this spent on physically repairing and improving rural roads. The focus of IRAT is on removing 'bottlenecks' – stretches of road which are impassable at certain times of year, such as during the rainy season, leaving communities unable to access services.

However, as well as promoting development, improved roads also result in increased traffic and often in higher speeds, which can create safety risks. Therefore, as roads are improved, it is important that the potential benefits are not offset by an increase in road deaths, injuries and crashes and the associated negative economic and social consequences.

Sub-Saharan Africa has the most dangerous roads in the world, with a road fatality rate of 26.6 per 100,000 people, while the global average fatality rate is 17.4 per 100,000 people. Africa has 2% of the world's vehicles but accounts for 16% of the world's road fatalities<sup>ii</sup>.

Official figures from the Tanzanian Traffic Police show that the number of road deaths has fallen in recent years, from 4,002 in 2013 to 3,760 in 2014 and to 3,468 in 2015. Similarly, injuries are shown to have fallen from 20,689 in 2013 to 14,530 in 2014 and to 9,383 in 2015<sup>vii</sup>.

However, the World Health Organization (WHO) classifies Tanzania as a 'country without eligible [RTI] death registration data', and provides its own estimates for the number of road deaths. For 2013, this estimate was 16,211 – more than four times the official number. This WHO estimate puts Tanzania's road fatality rate at 32.9 per 100,000 people, which is higher than the average for Africa<sup>i</sup>.

One of the reasons for the discrepancy between the official numbers and the WHO estimates is the difficulty of collecting data on crashes and injuries in rural areas. Traffic police presence is low in rural areas, and many road users – in particular motorcyclists – do not have licences or insurance, so are disinclined to report crashes to the authorities.

However, since 2012 the Africa Community Access Partnership (AFCAP) has supported Amend to carry out various research studies into road traffic injury on rural roads in Tanzania, and through this an understanding of the issues has been gained. This research is summarised below.

## **Prior Research**

### ***Identification of Rural Road Safety Issues according to District Engineers***

Through a survey of District Engineers in 28 different districts of Tanzania, the following issues have been identified:

- Pedestrians are considered to be the most common user of low-volume rural roads. Motorcyclists are considered to be the most common type of motorised user
- Pedestrians are considered to be those at greatest of being injured. Of motorised road users, motorcyclists are considered to be at greatest risk
- Motorcyclists are considered to be the most likely to cause injury
- Road user behaviour is considered to be the greatest risk factor

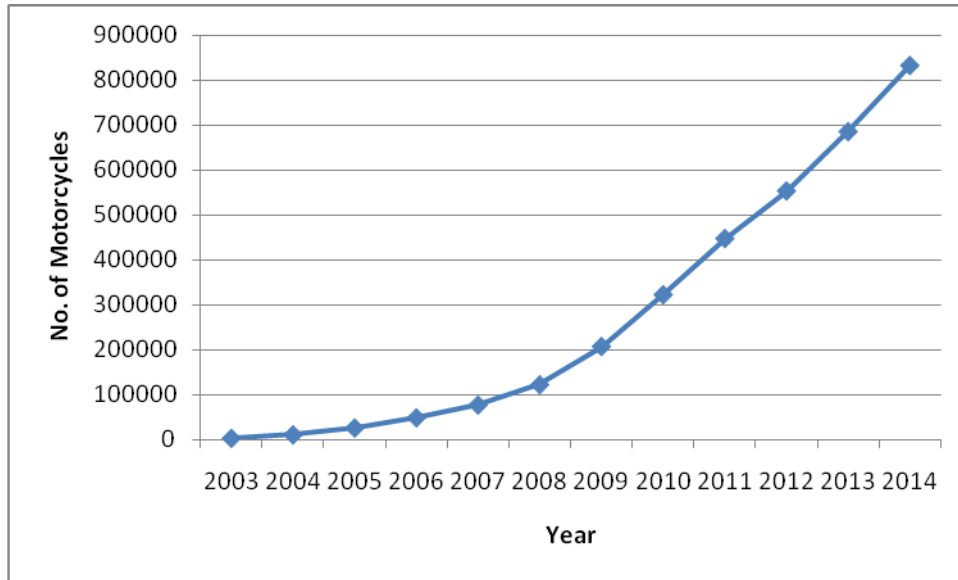
***The Magnitude and Characteristics of Road Traffic Injury on Rural Roads in Tanzania***

Studies involving road user surveys and household surveys to understand the magnitude and characteristics of road traffic injury on rural roads have been carried out in three districts of Tanzania: Bagamoyo District, Kilolo District and Siha District.

A summary of the findings of these studies is <sup>iii v</sup>:

- Motorcycles are by far the most common form of vehicle using the roads in the study areas, representing around 90% of all motorised vehicles
- In over 95% of crashes, the victim had been on a motorcycle – either as driver or as passenger – at the time of the crash
- Up to almost one-quarter of motorcycle drivers surveyed had been involved in a crash in the previous three-month period
- The severity of injuries suffered in crashes involving motorcycles is greater than those suffered in crashes involving other modes
- Only around 20% of crashes were reported to the police
- The vast majority of motorcycle drivers have received no formal training and have no driving licence

Figure 1 below shows the rapid increase in the number of registered motorcycles in Tanzania, from 1,884 in 2003 to a total of 832,149 at the end of 2014 (data provided by Tanzania Revenue Authority).



*Figure 1. Number of motorcycles registered in Tanzania, 2003 to 2014*

### ***Causes of Motorcycle Crashes on Rural Roads in Tanzania***

Studies into the causes of motorcycle crashes on rural roads have been carried out in Bagamoyo District and Siha District, involving detailed investigations of the magnitude and characteristics of crashes and observations of road user behaviour and through carrying out interviews with motorcycle drivers, passengers and other road users.

A summary of the findings of these studies is<sup>iv</sup>:

- Road user behaviour, including that of motorcycle drivers and other road users, is the most common contributory factor in motorcycle crashes on low-volume rural roads
- The design, surface condition and construction methodology of low-volume rural roads are also common contributory factors
- Motorcycle drivers understand what constitutes risky behaviour, and understand actions that they can take to reduce risks, but many continue to drive dangerously

Table 1 below shows the contributory factors of the crashes investigated in these crashes.

| <b>Contributory Factor</b> | <b>Number of Crashes</b> | <b>% of Crashes</b> |
|----------------------------|--------------------------|---------------------|
| Road user behaviour        | 39                       | 46%                 |
| Road design and condition  | 26                       | 31%                 |
| Environmental conditions   | 10                       | 12%                 |
| Animal                     | 5                        | 6%                  |
| Vehicle defect             | 4                        | 5%                  |

*Table 1. Contributory factors of rural road crashes in Bagamoyo and Siha districts*

## **Development of a Local Government Road Safety Programme**

As part of the IRAT programme, a local government road safety programme is being developed, with the intention that it will be implemented by local government authorities.

### ***Alignment with Policy***

The development of the local government road safety programme is in line with Tanzania's National Road Safety Policy<sup>viii</sup>. Specifically:

- It will address at least two of the four areas of measures specified in the policy's Mission: 'To stop and reverse the increasing trend in the number of road crashes, number of deaths and number of injuries through comprehensive measures covering engineering, enforcement, education and emergency care' (para. 4.3 of the National Road Safety Policy). The programme addresses engineering and education, and further development may also address enforcement and delivering simple emergency care on rural environment
- It will address the identified issue of 'inadequate attention to safety in planning and designing new road networks, safety defects in existing roads, etc' (para. 5.2.1 (a))
- It will enable PORALG to meet its responsibility to 'Encourage and support local authorities to promote road safety and to design, build and maintain their roads in a safety-conscious manner' (para. 7.1 (c) (vi))
- It will enable local government authorities to meet their responsibilities to 'Design, build and maintain their roads in a safety-conscious manner, undertaking safety audits where necessary' (para. 7.1 (c) (vii)) and to 'Monitor the safety of their roads and take corrective action when safety problems are identified' (para. 7.1 (c) (vii))
- It will address the identified issues of 'poor road-user behaviour' (para. 5.2.4 (a))
- It will enable local government authorities to meet their responsibilities to 'Promote road safety through local campaigns and initiatives' (para. 7.1 (c) (vii))
- It will enable PORALG to meet its responsibility to 'Create capacity in order to provide the necessary expertise to implement road safety measures' (para. 7.1 (c) (vi))

### ***Focus Areas***

The results of the survey of District Engineers and the detailed research into rural road safety issues provide strong justification for the local government road safety programme to focus on motorcycles: motorcycles are the most common type of motorised vehicle; they are involved in the vast majority of crashes identified through research; and they are considered by District Engineers to be the most likely type of road user to cause a crash.

Road user behaviour has been identified by Amend's previous research as the primary contributory factor in crashes, and so behaviour-change efforts are a core component of the road safety programme. However, it is recognised that behaviour-change can be a slow process.

As road design and road condition have also been identified by Amend's previous research as contributory factors in motorcycle crashes, the opportunity also exists for District Engineers to improve road safety in rural areas, and so an engineering component is also included in the road safety programme.

The focus of the overall IRAT programme is on improvements to low-volume rural roads – roads which often carry less than 1 million equivalent cumulative standard axle loads per year. The focus of the road safety programme, and much of the research that has informed its development, is therefore on such rural roads.

However, road safety is far from being exclusively a rural issue. Tanzania also faces serious road safety challenges in urban and peri-urban areas, as well as on highways, and it is recognised that the road users targeted through this road safety programme will use all different types of roads. The mechanisms of implementing the local government road safety programme have been developed recognising this.

PORALG is responsible for local government in all Tanzania Mainland, which includes District Councils covering rural areas, as well as City and Municipal Councils covering urban areas.

### ***Implementation through Existing Local Government Structure***

Investigations have been carried out at seven District Councils to identify opportunities for implementing the road safety programme through the existing local government structure, without the need to revise existing structures or systems.

These investigations identified the following:

- Road Act, 2007 [No: 13 of 2007] Part V, section 31 to 34 places the issue of road safety to the road authority in which any council in Tanzania is a road authority but it was revealed that within the councils there is limited specific responsibility for road safety. Engineers are responsible for road construction and road maintenance, which includes road safety measures such as road signs and speed humps, but this is the extent of the councils' road safety efforts
- Road safety is generally considered by council officials to be the exclusive responsibility of the Traffic Police
- Motorcycle safety is a concern among officials, with increases in the numbers of motorcycles in all areas of the country, in particular motorcycles used as taxis which charge a fare for transporting passengers or goods

- Road safety education and awareness-raising activities could be carried out by Community Development Officers (CDOs). CDOs have proven ability to convince the community on issues of behaviour change, and have potential to allocate some of their time to road safety tasks
- Technicians in the councils' engineering departments could also have time to undertake road safety-related activities, in particular during the rainy season when there are few construction projects taking place
- The instruction for any council staff to work on road safety activities will need to come from the District Executive Director, with approval from the District Commissioner. The District Commissioner will need to liaise with the police's Officer Commanding District to ensure that the Traffic Police are aware and can provide advice and guidance
- Any council staff working on road safety activities will need to be adequately trained, and those providing education to communities will need road safety materials
- Some councils – although certainly not all – have shortages of equipment, staff and finance, including vehicles, drivers and money for fuel. These shortages will need to be addressed for council staff to be able to access rural areas and rural communities

### **Component 1: Behaviour Change**

A key component of the local government road safety programme will involve efforts to improve road user behaviour. This is in line with both the National Road Safety Policy and the findings of research showing that road user behaviour is the most common contributory factor in rural motorcycle crashes.

Examples of dangerous behaviours that are common among motorcycle drivers in rural areas include:

- Non-use of protective equipment such as helmets, gloves and closed shoes, resulting in increased severity of injuries in the case of a crash
- Not slowing down in settlements and other areas with many pedestrians
- Driving at speeds inappropriate for road conditions
- Driving erratically, including zigzagging and using the wrong side of the road, and accelerating fast and braking hard

- Overloading the motorcycle, both with multiple passengers and with excessively heavy loads
- Poorly attaching loads
- Failing to keep both hands on the handgrips
- Being easily distracted, for example using mobile phones while driving
- Coasting down hills with the engine off
- Failing to use the front brake

***Providing Road Safety Awareness through Community Development Officers***

The investigations of seven district councils found that councils' Community Development Officers (CDOs) are best-placed to deliver road safety-related education and awareness-raising. Such activities are similar to the tasks they undertake on a day-to-day basis, through which they address other social and developmental issues, meaning that they have the basic skills required to engage communities and promote behaviour change.

Each district council has a team of CDOs, led by the Head of Community Development. Most councils have one CDO based in each of the district's wards, and also a small number of CDOs based in the district office – although some districts have been found to have fewer than this.

The responsibility of CDOs is to deliver education and awareness on issues facing communities, working directly in communities. They do so in line with a monthly plan which they prepare and submit to the Head of Community Development for approval. The kinds of issues that CDOs currently address include:

- Entrepreneurship among youth
- HIV / AIDS
- Sanitation

Investigations have found no districts in which CDOs currently address road safety. However, in discussions with CDOs, Heads of Community Development and District Executive Directors, they commonly identify road safety as an issue that needs to be addressed and that has the potential of being addressed by CDOs.

CDOs will need to be trained to enable them to address the specific road safety issues in their districts, and will need teaching materials to complement the messages that they will deliver to communities.

The primary target audience for CDOs' road safety activities will be motorcycle drivers, in particular motorcycle taxi drivers. A secondary target audience will be communities living alongside rural roads, including children in schools.

As part of the local government road safety programme, a document entitled 'Advice for Community Development Officers: Provision of Road Safety Awareness in Rural Communities' has been developed. The document includes:

- An introduction to rural road safety in Tanzania
- The background to the local government road safety programme
- Advice on how CDOs can identify road safety issues locally and whether they should be addressing road safety through their activities
- Advice on how CDOs can raise road safety awareness among motorcycle drivers
- Advice on how CDOs can raise road safety awareness among communities living alongside improved rural roads
- Descriptions of a number of real-life crashes on rural roads from which lessons can be learned

The document is designed to be practical and easy to use.

It includes examples of the messages that may need to be taught, and of materials that could be used. It also refers CDOs to other materials that may be of use, for example the Ministry of Works, Transport and Communication's 'Endesha Salama' booklet.

While the suggested messages and sample materials are aimed at users of rural roads, the mechanism of providing road safety awareness to communities through CDOs would certainly also be applicable in urban and peri-urban areas.

## **Component 2: Engineering**

The local government road safety programme will enable District Engineers to plan, design, construct and maintain safe rural roads. This is in line with both the National Road Safety Policy and the findings of research showing that the design and condition of rural roads are common contributory factors in rural road crashes.

Examples of dangerous road design and condition which can currently be witnessed in rural Tanzania include:

- Narrow carriageways that do not allow vehicles travelling in opposite directions to pass each other safely. This is a particular concern for motorcycles, which are often forced to leave the carriageway when encountering a four-wheeled vehicle
- Lack of road shoulders, or road shoulders in poor condition
- Potholes, standing water, slippery mud and loose material
- Lines of sight obscured by vegetation
- Lack of speed control in areas with high volumes of pedestrians
- Lack of signage warning of hazards

***Improving Road Safety through the work of District Engineers***

Alongside the development of the local government road safety programme, the findings of the AFCAP-supported research into road safety issues in rural areas have contributed to the production of a ‘Manual for the Provision of Low-Volume Roads’, which has been led by Tanzania’s Ministry of Works, Transport and Communication. This contribution has ensured that motorcycles should be given serious consideration by engineers as they plan, design, construct and maintain rural roads.

As well as contributing to the manual, a document entitled ‘Advice for District Engineers: Motorcycle Safety on Low-Volume Rural Roads’ has been developed as part of the local government road safety programme. The document includes:

- An introduction to rural road safety in Tanzania
- The background to the local government road safety programme
- Guidance on how to ensure that the width and geometric design is safe for motorcycles with reference to the Roads Geometric Design Manual, 2011
- Guidance on how to ensure that the road surface is safe for motorcycles with reference to Pavement Materials Design Manual, 2009
- Guidance on how to provide a ‘forgiving’ roadside environment
- Guidance on how to encourage appropriate speeds
- Guidance on the provision of road signs to warn of hazards and restrictions
- Descriptions of a number of real-life crashes on rural roads from which lessons can be learned

The document is designed to be practical and easy to use.

## **Conclusions**

Studies have found high rates of road traffic injury on rural roads. And through the development of the Local Government Road Safety Programme, high levels of recognition among local communities and district council officials of the need to improve road safety on rural roads have been identified.

Systems for the management of road safety are constantly evolving and improving. Today, the Safe Systems approach is accepted by the global road safety community as the most appropriate approach in guiding the management of road safety. The aim of the Safe Systems approach is to ensure that all components of road transport – the driver, the vehicle, the road – are managed to reduce the risk of a crash and minimise the impact when a crash does occur.

The Safe Systems approach incorporates the ‘Three Es’ of road traffic injury prevention: Education, Engineering and Enforcement.

To date, the development of the Local Government Road Safety Programme has focussed on education and awareness-raising, through the work with Community Development Officers, and on engineering-related interventions, through the work with District Engineers. Both of these core components of the road safety programme have been developed to the point where they are ready for piloting and evaluation.

However, the programme currently has no component relating to enforcement of laws on rural roads.

Levels of formal enforcement of traffic laws in rural areas are very low. The Traffic Police and regulatory authorities do not have strategies or resources for enforcement in rural areas.

However, there are two potential methods of enforcement for rural areas, which are implemented at a community level: self-regulation within motorcycle taxi associations, and community policing.

## **Recommendations**

### ***Piloting and Evaluation***

It is recommended that phased pilots of both the behaviour change component and the engineering component be undertaken.

During the first phase of piloting, the components should be subjected to process evaluations to enable the activities and materials to be refined and improved.

A population-based control study should then be carried out during a second phase of piloting, to understand the impact of the road safety interventions in terms of injury reduction. Population-based control studies are the ‘gold standard’ of evaluations of public health interventions, and such a study would determine with scientific robustness whether the road safety programme has the potential to reduce injuries.

The control study will need to be carried out in at least two districts – one as the ‘programme’ district and the other as the ‘control’ district, and the population covered by the study would need to be of a significantly large size to provide statistically significant results.

If the evaluations prove the effectiveness of the road safety programme, this will provide justification for scaling the programme up nationwide.

### ***Enforcement***

It is recommended that a component of community enforcement be developed and incorporated into the Local Government Road Safety Programme, to support the education and engineering components.

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<sup>i</sup> WHO, 2015. *Global Status Report on Road Safety*. Geneva, Switzerland. Available at: [http://www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2015/en/](http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/)

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<sup>iii</sup> Amend, 2013. Three studies into road traffic injury on rural roads in Tanzania. AFCAP, UK. Available at: [http://afcap.org/Document%20Library/AFCAP\\_GEN-060-G\\_AmendFinalReport%20v1.2\\_final\\_12%20Jun%202013.pdf](http://afcap.org/Document%20Library/AFCAP_GEN-060-G_AmendFinalReport%20v1.2_final_12%20Jun%202013.pdf)

<sup>iv</sup> Amend, 2014. A study to determine the causes and circumstances of motorcycle crashes on low-volume rural roads. AFCAP, UK. Available at: [http://www.amend.org/docs/AFCAP\\_AMEND\\_Causes%20of%20MC%20Crashes\\_Final%20Rpt\\_25Sep2014.pdf](http://www.amend.org/docs/AFCAP_AMEND_Causes%20of%20MC%20Crashes_Final%20Rpt_25Sep2014.pdf)

<sup>v</sup> Amend, 2015. The magnitude and characteristics of road traffic injury in Kilolo District, Tanzania. AFCAP, UK. Available at: <http://www.research4cap.org/Library/BishopETAL-Amend-Tanzania-2015-KiloloBaseline+Annexes-AFCAPTAN2015B-v150616.pdf>

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<sup>vii</sup> Tanzania Traffic Police, 2015. Statistics available directly from Traffic Police Headquarters, Dar es Salaam, Tanzania

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