

# Improving Road Safety: Extended Measures and Role of Private Toll Operators in Uganda

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## Abstract

*Road safety remains a global issue, with the low and middle-income countries (LMICs) bearing the heaviest burden of road traffic accidents, which are the number one killer of children and youth aged between 5 to 29 and the eighth leading cause of deaths across the world. This article conceptualizes roads as a mobility asset, connecting goods and persons to markets, jobs and opportunities. The study acknowledges that roads as assets have turned into a liability. Existing studies indicate that investments in transport to improve mobility have increased over years. Yet along with the increase in transport investments, road fatalities have increased. To reduce this trend, governments have focused on initiatives associated with man, manpower and money. Existing studies have focused on man, machine and money as key dimensions for improving road safety.*

*The study adopted a qualitative design. Based on a review of scholarly articles and interviews with a purposively selected sample of respondents from the transport sector, this study concludes that while road safety and road traffic injuries have focused on the initiatives of man, money, machine and motorway, they are no longer sustainable as highways revert to private operators under public private partnership arrangements.*

*This study recommends additional measures that incorporate the role of private operators managing highway toll roads. This outcome is important as it provides policy implications that can be implemented to reduce deaths due to road traffic accidents that are currently on the rise.*

**Keywords: Road safety, Public Private Partnerships, Road traffic injuries**

## Introduction

Globally, transport-related investments are on the rise. This trend has been associated with country ambitions for rapid industrialization and economic growth (Quigley et al., 2012). As investments have increased, road traffic accidents (RTAs) have in tandem taken an upward shift (World Bank, 2013; Reagan, 2017).

Deaths by road traffic accidents (RTAs) and road traffic injuries (RTIs) in low and medium-income countries (LMICs) are the highest in the world, accounting for 93% of global deaths caused by RTAs and RTIs.

Deaths in developing countries are three times higher than in developed countries (WHO, 2018). On average, RTAs cause an estimated 1.35 million deaths and 20 to 50 million disabilities worldwide annually (WHO, 2018). The reasons for the spike in accidents and associated death has been attributed to several reasons: driver behaviour, drunk driving, poor mechanical condition of roads and limited investments in road transport safety (WHO, 2018). On the contrary, Short and Peralta (2010) argue that in developing countries, rapid motorization has not matched the investment in road safety.

While WHO (2018) indicates that RTIs are a major cause of deaths among children and youth, other studies reveal that RTIs are a major killer of all age groups and not just the young across the world (Nævestad et al., 2019). It is further revealed that RTAs and RTIs are the eighth cause of deaths globally (WHO, 2018).

RTIs come along with increase in road accidents, with motorcyclists, pedestrians and cyclists most affected (WHO, 2018). While such trend was traditionally associated with developed countries like the USA, Australia and others, it has shifted to emerging and low-cost economies (Quigley et al., 2012). Tripodi et al. (2012) reveal that India and Brazil posted some of the largest number of road traffic injuries (RTIs) among emerging economies for the period 2006 to 2012.

In Europe, Norway experiences the least road accidents, with an average of 20 deaths recorded in 2017, while Greece contributes most to road accidents with 60 deaths recorded in the same period (Nævestad et al., 2019).

In Uganda, RTAs are ranked among the top ten causes of mortality for all ages alongside malaria, respiratory infection, anemia, meningitis, tuberculosis and HIV/AIDS, to mention but a few (MOH, 2013). Road safety remains of concern in Uganda since roads remain the major means of transport. In addition, road transport accounts for over 90% of cargo freight and passenger movement, and the transport sector contributes 2.8% to total Gross Domestic Product (GDP)(MOWT, 2018). Road safety statistics put Uganda as the topmost country with unsafe use of roads in East Africa. In Uganda, it is estimated that 10 deaths per day are recorded due to road traffic crashes and this is the highest fatality rate in East Africa (UPF, 2016).

Worldwide, governments have made efforts to reduce RTAs and associated RTIs (Vaezipour & Delhomme, 2017). It is argued that strategies that have been developed have traditionally focused on a 4Ms approach-man, machine, motorway and money (Short et al., 2010). Investments in man have included driver training testing, monitoring driving speed using police patrols or automatic speed detectors and signalling to police control, while investment in machine has included pre-import vehicle inspection and national mandatory training. Money has included budgets for investments in transport but more specifically for improving road safety for motorists, infrastructure and pedestrians (Solanki et al., 2016; Vaezipour et al., 2017; Stilgoe, 2018; Dhillon, 2016).

In an effort to enhance road safety, the Government of Uganda through the Ministry of Works took significant steps to institutionalize a robust regulatory transport framework whose implementation, however, leaves a lot to be desired. Among the initiatives which face implementation gaps are: the National Road Safety Policy, the Driver Testing Regulations of 2012, the drivers instructors' curricula of 2004, the driver examiner training programmes of 2008, Motorcycle, PSV and HGV Curricula and Manuals of 2014, the Lower Primary (P1-P4) road safety education curriculum of 2003, the mandatory third party motor vehicle insurance scheme, the technical inspection of all motor vehicles, the RCDS programme (NCDC, 2014). Though challenges in institutional implementation have been identified to compromise road safety in Uganda, the road safety problem is yet to be clearly understood particularly with

regard to the critical gaps in implementation of the initiatives characterizing a robust road safety framework. Despite the existence of institutional structures and a regulatory framework for road safety, implementation remains beset with challenges.

On the other hand, the Uganda Police Force (UPF), in partnership with other road safety stakeholders, has consistently implemented several measures to improve road safety including deployment of traffic police and Integrated Highway Police along the highways (*Fika Salama*), public sensitization campaigns on road safety and security; joint coordination teams comprising police, Ministry of Works and Transport (MoWT), bus owners, bus drivers, passenger protection bodies and the media, training of traffic officers, effective involvement of the public, private and civil society organizations, enhanced Traffic Alert squad operations and expedited rollout of the Road Crash Data System (UPF 2015; 2016; 2017; 2018). The objective is to ensure safety of all road users, compliance of motorists with traffic regulations, building capacity for handling the ever increasing crime challenges, elimination of corrupt traffic officers, beefing up the monitoring system availing reliable data for effective road safety programming, enhancing road safety coordination and management, inspection of all vehicles and testing learner drivers and those seeking class extensions (UPF, 2015, 2016, 2017,2018).

Despite the commendable progress in designing, passing and implementing the above measures, the achievement realized with regard to their impact on road safety is yet to be documented. This study sought to explore existing gaps in implementing road safety regulatory measures and assessing the impact of road safety measures implemented in the last five years in Uganda through such strategy dimensions. By answering these questions, the study was able to derive extended solutions towards reducing RTAs and RTIs in Uganda and other developing countries.

## Methodology

Findings of the study were drawn mainly from qualitative data collected from key informants purposively selected across the institutions engaged in road safety. Baxter and Jack (2008), Berg (1989) and Crotty (1998) recommend the adoption of qualitative study in order to gain deeper insights from sensitive environments of public interest. Consistent in this approach and in line with Lincoln and Denzin (2003), the study purposively sampled and interviewed 35 participants. The participants of the study included drivers, assistant commissioners, and pedestrians.

Twenty-six participants were purposively selected from Uganda Police Force (3), Ministry of Works and Transport (2); Ministry of Finance, Planning and Economic Development (3), Ministry of Education and Sports (2), National Roads Council (2), and the Uganda Road Safety Network (2). Additionally twelve drivers were involved, three of whom drove haulage trucks, 4 drove buses while 3 drove mini bus taxis and 2 drove salon cars. Three pedestrians were interviewed. Respondents in institutions were engaged in management of road safety measures either by way of enforcement of road safety traffic regulations, road safety sensitization and engineering. Key informants were selected using theoretical sampling, putting into consideration the need to get diverse views until point of saturation. By virtue of their engagement in road safety, they were expected to provide deeper understanding of road

safety measures, their implementation and challenges. A standard interview guide was used alongside documentary review to map out the achievements and impact of implementation of road safety measures. The review also included the annual crime reports for the period 2015-2018 accessed from the Uganda Police Force website. Secondary data on nature and number of traffic offences was gathered and analysed using simple descriptive statistics, thematic and content analysis.

## Results and Discussion

### Road Safety Measures

Based on a review of scholarly literature and documents, several approaches are identified as primary focus for reducing RTAs and RTIs. After identification, approaches were grouped in respect to the man, machine and money perspectives

**Table 1: Road Safety measures being implemented in Uganda**

Rs dimension	Popular responses on road safety measures implemented	Source of findings
Man	<ul style="list-style-type: none"> <li>● driver training</li> <li>● regulation of professional drivers</li> </ul>	Uganda Police Report, 2016,2017,2018; Elvik, Høye, Vaa & Sørensen (2009); Anjuman et al. (2020); Wanume et al. (2019); Harms et al. (2016)
	<ul style="list-style-type: none"> <li>● driving simulators to support driver training</li> </ul>	Harms et al (2016); Campbell et al. (2016)
	<ul style="list-style-type: none"> <li>● safety campaigns to change driver behaviour</li> </ul>	Das et al. (2020); Uganda Police Report, 2016,2017,2018;Bichicchi et al. (2020); Jomnonkwao (2020);
	<ul style="list-style-type: none"> <li>● well-designed infrastructure to make walking environment friendly while promoting non-motorized transport</li> </ul>	Basbas et al. (2020)
	<ul style="list-style-type: none"> <li>● instituting legal proceedings on drivers without permits</li> <li>express fine penalties</li> </ul>	Uganda Police Report, 2016,2017,2018
	<ul style="list-style-type: none"> <li>● traffic safety education material for the future drivers</li> </ul>	Lee et al. (2020)
	<ul style="list-style-type: none"> <li>● Speed limit compliance campaigns</li> </ul>	Harms & Brookhuis (2016)
	<ul style="list-style-type: none"> <li>● familiarity with routes by drivers</li> </ul>	Intini et al., 2018; Intini et al., 2019; Intini et al. (2020); Charlton, S. G., Starkey, N. J. (2018); Colonna, P., Intini, P., Berloco, N., Ranieri, V. (2016).

Machine	Pre vehicle inspection Mandatory vehicle testing	Uganda Police Report, 2016, 2017,2018
	Variable and dynamic speed limits	Harms & Brookhuis (2016) Hoogendoorn et al. (2012)
Motorway	Perception, change detection and utilization of roads using dynamic information	Harms & Brookhuis (2010); Harms, I. M. (2011)
	Road signs	Johansson & Rumar (1966) Jo- hansson & Backlund (1970)
		Uganda Police Report, 2016, 2017,2018
Money	Budgets for transport infrastructure and furni- ture	
Other road safety initia- tives in Road Toll environ- ment		
Structuring of Revenue under Toll Roads	Bonuses and penalties to foster the contractor to provide the optimal quality levels in terms of several factors such as availability, state of the pavement, safety, etc.	Vassallo (2007) Rangel et al. (2012), Rangel et al. (2013)
Design of performance targets	Performance-based indicators tied to quality aspects like queuing in toll plazas, congestion, state of the pavement, safety, and satisfaction of the users are ultimately fulfilled.	Rangel et al.(2012), Rangel et al. (2013)
Extension/ Renewal of concession	Regarding safety, the PPP contractor can be granted an extension of the contract if safety indicators remain below an accident bench- mark for similar highways. For this purpose, the government measures on a yearly basis the Risk Index (RI) and Mortality Index (MI) of the highways and compares them with other highways with similar characteristics in terms of alignment and traffic flow.	Rangel et al. (2012), Rangel et al. (2013)

Source: Analysis of literature and documents (2020)

According to Table 1, it can be argued that various measures have been implemented by government including those aimed at reducing RTAs. The focus has been primarily on man, machine, motorway and money. Earlier studies cited road signs as a measure of reducing RTAs (Johansson & Rumar, 1966; Johansson & Backlund, 1970).

This study reveals that over time, measures geared at reducing RTAs have evolved. According to Harms et al. (2016) and Harms (2011), governments have adopted variable speed limits and simulator training as part of the road safety measures. Dynamic and various speed limits have been adopted based on road conditions (Hoogendoorn et al., 2012; Harms

et al, 2016). Other studies indicate that regulation of driver behaviour and driver training have been implemented to reduce accidents (Elvik et al., 2009; Harms et al., 2016; Uganda Police Report, 2016, 2017, 2018; Anjuman et al., 2020; Wanume et al., 2019).

Basbas et al. (2020) and Wanume et al. (2019) promote non-motorized measures to reduce RTAs. It is opined that such measures include roads designed to pull off pedestrian traffic and promote other non-motorized transport modes. Uganda Police Force uses express fines, instituting legal proceedings on drivers without permits have been alongside impromptu checkpoints. Route familiarity is argued to be one of the road safety measures. Dicke-Ogenia (2012) and Intini et al. (2020) and Harms (2010) opine that drivers who frequent the same may easily detect blind spots and changes on the road and avoid RTAs. Other initiatives have included providing simulator driving lessons to drivers of the future.

### Figure 1: Vehicle learning simulator facility



Source: Harms et al. (2016)

In Figure 1, Harms et al (2016) and Campbell et al. (2016) argue that by simulating drivers into a real driving environment, they can gain familiarity on the road before they drive, which can reduce RTAs.

Other studies acknowledge that RTAs and RTIs have been common and burgeoning on highways (Yang & Gupta, 2005; Baloye & Palamuleni, 2017; Ichkitidze, et al. 2017; Detho et al., 2018; Detho et al., 2019). Increasingly, new trends are emerging with highways reverting to private sector toll management (Vassalo, 2007). Given the characteristics of public private partnerships, the extension of the traditional role of government to support citizen mobility is understandable but what remains in mystery is how approaches to reduce RTAs and RTIs are conceptualized for implementation when roads revert to private sector toll management practice.



While existing studies have retrieved measures undertaken to reduce RTAs and RTIs on traditional roads that are owned and operated by governments and associated agencies, few authors recognize measures adopted on roads that have reverted to private toll management. Consistent with such findings, this study reveals that none of the study participants were aware of RTA approaches that can be implemented by private toll managers with many suggesting the toll roads are a new development in Uganda's transport sector. Participants, majorly from the Ministry of Transport and Works and the national roads agency argue that such are critical issues that research studies should inform. While enthusiasm exists on how to structure approaches to reduce RTAs using toll management concessions, knowledge on how this can be done was found to be lacking on the ground. While this enthusiasm was evident in form of yearning for positive inquiry, drivers and pedestrians were not aware of such initiatives and appeared disinterested in such inquiry.

Despite this gap, considerable effort has been made by scholars in sharing experiences on how RTAs can be mitigated and reduced in a road toll environment. Studies by Vassallo (2007) and Rangel et al.(2012) suggest that bonus payments and penalties can be designed to be linked with a requirement that the road toll manager achieves quality performance measures such as state of pavements, safety and availability. Rangel et al. (2012), in agreement with Vassallo (2007), opine that performance indicators may be enhanced to include RTA reduction performance targets such as the reduction of queues on tolls and satisfaction of users. Additional approaches include, allowing the toll road manager to increase toll road fees to an agreed level depending whether the manager has met safety targets as an incentive (Rangel et al., 2012). It is further noted that requirements for renewal of concession should include fulfilment of safety targets set by the client.

According to Vassallo (2007) and Rangel et al. (2012), highways where RTAs occur majorly have in most cases reverted towards a new manager and operator in the private sector. In such cases, governments have not disowned their role of reducing and seeking to eliminate RTAs and RTIs but rather extended their role within concessions signed up and implemented with private road toll managers. Empirical findings from 26 interviews and available literature confirm that the measures by Government of Uganda to improve road safety have been instituted.

Minority responses from 8 out of 26 participants indicate other road safety improvement initiatives, like zebra crossing, painting of street and highway driving lanes, offshoots, and street lighting in the city of Kampala. While zebra crossings and street lighting are meant to serve more the safety interests of the pedestrians, none of the pedestrian participants who were interviewed cited such road safety initiatives.

Twenty-three (23) out of 26 indicated that road safety improvement measures have been aimed at reducing drunk driving practices, over-speeding and driving without permits as target traffic crimes. Over-speeding was cited most by traffic officers and ministry officials while responses that related to permits were common among drivers and officials from the transport ministry. Drunk driving was common across responses of all participants of the study.

Participants from the national roads agency, UNRA, indicate that while government has done well, new models of managing highways with the use of tolls operated by private

operators are emerging and government is adopting public private partnership (PPP) models. Earlier review of literature confirms that governments worldwide, and in Uganda, are adopting PPPs in managing highways (Nuwagaba, 2019) where RTAs are common (WHO, 2019). While studies by Rangel et al. (2013) indicate approaches for including road safety targets in concessions for highways transiting to private toll management, this study found that while such trends are popular, they have not been considered in Uganda's road sector that is set to adopt PPPs.

## Impact of RTA reduction Initiatives

Twenty-one (21) of the 26 participants indicate that the road safety improvement strategies in Uganda have delivered impact. From such responses, it is revealed that drivers are now more cautious and desist from driving without permits especially on long journeys, hence deterring unauthorized drivers from the roads.

Theoretical and empirical findings reveal that while a range of initiatives have been implemented to reduce RTAs and RTIs, some have delivered impact while others have not. For instance, critical analysis of reports (UPF 2015-2018) indicates that impromptu traffic police checks have been effective in the initial periods of implementation. Over time, drivers get familiar with such stops and are able to align speed to avoid being found driving above speed limits.

Views from a section of stakeholders indicate that impromptu traffic police checkpoints have been initiated with some impact the most recent being *Fika Salama*.

In 2016, the Ministry of Works and Transport, Uganda National Roads Authority and the Uganda Police Force combined efforts and came up with a joint operation plan code named *Fika Salama* in march 2016 to help curb the rising number of fatalities on Ugandan Roads. In terms of mode of operation, checkpoints manned for 24 hours/ 7 days a week are mounted along major highways in places carefully selected. The checkpoints are strategically placed at intervals to ensure that the most dangerous spots along a particular highway are attended to. Kampala – Masaka – Mbarara highway has a total of 11 check points that were set up at the following locations:-St Lawrence (Buddo), Mpigi, Kamengo, Buwama, Kayabwe, Lukaya, Masaka, Kinoni, Kyazanga, Lyantonde, and Sanga. Enforcement of *Fika Salama* was enhanced through establishing check points throughout the country. This will continue in the following years.

[Official, Ministry of Works &Transport, 2019]

The reported achievements that construe impact are cited to have included improvement in compliance of offenders issued with Express Penalty Scheme (EPS):

... improved response to accident scenes; reduced presentation of forged driving permits, enhanced operations targeting motorists who violate traffic regulations, enhanced sensitization of the public on road safety and security; increased arrests of traffic officers who are found extorting motorists." [Traffic Police Officer Road Police Station, 2020]



It is, however, noted from the pedestrians' perspective that while such initiatives are implemented and are impactful in the short term, drivers become familiar with the checkpoints and comply as they approach them.

[ Taxi Operator, Kampala-Jinja Highway, 2019]

In terms of output, *Fika Salama* has registered an increase in cases. While this could reflect the effectiveness of *Fika Salama* operations, it may on the other hand signify an increasing trend of non-compliance with the traffic regulations. The most common offences committed and charged include: speed, careless driving, DMCs, and driving a motor vehicle without a valid driving permit.

Table 2 below presents a trend of offenses registered during *Fika Salama* operations.

**Table 2: Road safety cases registered 2016-2018**

Types of RTA offences reported	Period			Total
	2016	2017	2018	
Dangerous mechanical condition	4231	794	10,005	15,030
Careless driving	3798	8589	11,989	24,376
Driving without permit	2325	4085	2630	9,040
Over-speeding	1416	3842	7995	13,253

Source: Analysis of Statistics from Uganda Annual Crime reports 2016-2018

As illustrated in Table 2, cases of dangerous mechanical condition reduced in the year 2017 but increased by more than 50% in the year 2018 while registered cases of careless driving increased with a higher margin between 2016 and 2017. By 2018, registered cases of careless driving increased but at a reducing level. For instance, while RTAs increased by 4,791 from 2016 to 2017 representing an increase of 126%, the period 2017 to 2018 registered an increment of 3400 (40%) but at a declining rate compared to the percentage increase in the period 2016 to 2017. In the same period (2016 to 2017), registered cases of driving without permits increased by 45% but reduced to 2630 in 2018 from 4085 in 2017, representing a 35% reduction in registered cases. From a driver's perspective on such trends, it is noted that the significant reduction is attributable to increased impromptu roadblocks mounted on highways in 2017 and 2018. While initiatives were in place to reduce over-speeding such as sensitization campaigns by UNRA, traffic police officers and drivers indicate that familiarity with check points by drivers would make them lower speed as they approach and then over-speed after passing such spots. However, traffic officers reveal that between 2017 and 2018, the impromptu spot checks on highways resulted into reduction of RTAs.

Officials from UNRA mentioned a campaign initiative aimed at reducing driving vehicles in dangerous mechanical condition (DMC). In Table 2, it can be deduced that initiatives implemented such as express fines for traffic crimes and checkpoints like '*Fika Salama*' may have been effective in reducing the number of persons driving without driving permits and driving of vehicles in dangerous mechanical condition from 2016 to 2017. However, vehicles in DMC state increased from 794 to 10,005. Cases of over-speeding doubled from 3842 in 2017

to 7995 in 2018. Findings from Traffic police officers suggest that due to driver familiarity with the location of traffic police points, cases of over-speeding increased as drivers over-spiced as soon as they passed such spots. By commencing impromptu mobile roadblocks and spot checks, many errant drivers were apprehended. Existing studies note that express fines are usually less impactful in reducing over-speeding traffic crimes but can assist the implementers to raise revenue (Pennay, 2006). Consistent with this view, requiring over-speeding drivers to pay fines has been found ineffective in reducing the vice since it rarely secures effect. Fines for over-speeding have been critiqued on grounds that the vice is socially acceptable and fines represent greed from government. In line with such views, the practice of fining over-speeding drivers requires that governments handle these beliefs first (Hoekstra & Wegman, 2011).

It is noted from a review of the Annual Crime Report (2017, 2018) that express fines were introduced and operationalized in such a way that drivers fined on the road would pay within the mandatory days. However, according to traffic police officers and officials from the MOWT, the majority of defaulters would not voluntarily make payment of fines.

Traffic police officers interviewed said that road safety interventions were reported to have registered reduced presentation of forged driving permits majorly a result of acquisition of Galaxy Tabs by Face Technologies (U) Ltd. which enabled Traffic officers to check the authenticity and validity of the permit on the spot; and sensitize the public on road safety and security through road safety campaigns and security awareness. Findings from interviews with drivers indicate that the practice of scanning drivers' permits to assess authenticity has deterred unlicensed drivers from the roads. This could be responsible for the reduction of cases of driving without permits from 4085 in 2017 to 2630 in 2018. While this approach has been effective, studies such as the Castillo-Manzano and Castro-Nuño (2012) and WHO (2018) assert that measures to reduce over-speeding should include payment of fines and cancellation of drivers' permits.

However, based on Table 1, despite initiatives including a road safety campaign with the theme "Speed excites but kills", the trends cited indicate that over-speeding crimes kept on increasing from the year 2016 to 2018 (Uganda Police, 2017, 2018). This contradicts earlier findings by White et al. (2000) that road safety campaigns reduce RTAs. Consistent with White (2000) on road safety campaigns, Wegman (2019) acknowledges that while road safety campaigns can raise awareness and prevent road crimes, this is only possible when design, channel and frequency of messages are aimed at changing human behavior and human behaviour is influenced by rationality and associated payoffs that then influence the decisions they make at any point in time. Logically, penalties imply to road users that certain behaviours are dangerous to their lives and come with retributive consequences (Bargh & Morsella, 2008; Hoekstra & Wegman, 2011).

## **Impact of Road Safety Measures**

Arising from implementation of road safety measures earlier highlighted in the introduction to the study, analysis of data on accidents or crashes reveals mixed evidence on the impact to road safety. On one hand, commendable impact has been registered with regard to reduction in magnitude of both minor and serious crashes.

Despite the decrease, fatal accidents increased by 42% between 2015 and 2018 as shown in Table 3 below.

**Table 3: Number and nature of RTAs**

Period (Years)	Number and nature of RTAs			Total
	Fatal	Serious	Minor	
2018	3914	6085	3526	13525
2017	3051	6530	3663	13244
2016	2995	7403	4355	14753
2015	2749	9422	6324	18495
2014	2845	13516	1417	17778
Total	15554	42956	19285	77795

Source: Annual Crime Report (UPF, 2014, 2015, 2016, 2017, 2018)

Table 3 provides a summary of the number and nature of registered RTAs for the period 2014 to 2018 in Uganda. From the analysis, RTAs reported were to a great extent rated as serious while fatal cases were ranked lower. Generally, reported cases of RTAs reduced from 2015 to 2018. Based on this trend, initiatives aimed at reducing RTAs and RTIs such as public awareness campaigns, *Fika Salama*, *Tembeya* and Express Fines may have been effective. However, while assessment of trends of number and nature of RTAs is vital, it is also important to review the accident severity index that is calculated as number of deaths per 100 accidents in a given period.

Table 4 provides a summary of the accident severity index for the period 2015 to 2018 in Uganda.

**Table 4: Number of people who died per 100 road accidents (Years 2015 to 2018)**

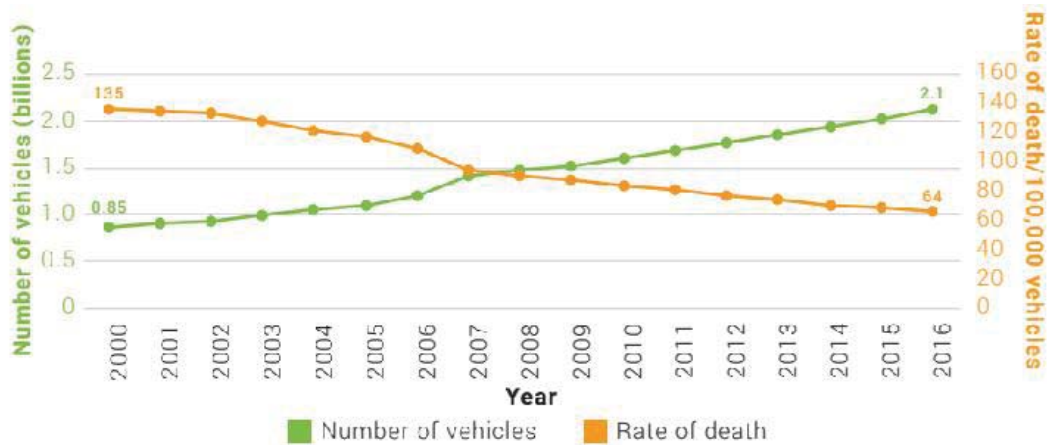
Period (Years)	Accident Severity Index (Number of people who died per 100 road accidents)
2018	29
2017	24
2016	21
2015	17

Source: Annual Crime Report (UPF, 2014, 2015, 2016, 2017, 2018) (2020)

In Table 4, the accident severity index in Uganda for the period 2015 to 2018 is highlighted. From the analysis provided in Table 2, while the number of RTAs reduced, the accident severity index increased. In the year 2015 ASI was 17, and it had risen to 29 representing an increase of 70% by the year 2018. The increase in ASI could be associated with the increase in cases of over-speeding as cited in Figure 1. This conclusion is consistent with existing studies (Hong et al., 2020; Ngoc & Thanh, 2020; Obiri-Yeboah et al., 2020 and Jamal et al., 2020) that associate over-speeding with high severity indices.

Existing data indicate that globally, the number of deaths due to RTAs is reducing (WHO, 2018). This is illustrated in Figure 2.

**Figure 2: Number of motor vehicles and rate of road traffic death per 100,000 vehicles: 2000–2016**



Source: World Health Organisation (WHO) 2018

While it has been asserted in Uganda that the increase in the number of vehicles on the road has led to an upward shift in RTAs (UPF, 2017; 2018), the global trends for the period 2007 to 2016 as cited in figure 2, RTAs increased with fatalities such as death when number of vehicles declined (WHO, 2018). Data from interviews reveals that the cause of the increase in RTAs has majorly been due to a mismatch between investment in transport infrastructure and population of vehicles (Uganda National Roads Authority, 2020). This view is consistent with earlier empirical studies by Wanume et al., (2019) that argue that limited investment in roads and associated infrastructure in Uganda has remained one of the major causes of RTAs and associated fatalities.

### Challenges to Implementation of Road Safety Regulatory Measures

All the participants interviewed acknowledged that the implementation of road safety improvement initiatives has been faced with challenges. Such a view is consistent with findings from documentary reviews. While empirical findings such as the annual crime reports (UPF, 2017; 2018) indicate that RTAs have reduced, deaths due to RTAs and associated RTIs in Uganda are increasing at a rate higher than the global average (WHO, 2018).

It is opined by traffic officers that inadequate funding and commitment to finance some road safety priorities has been a major challenge. Conversations with participants revealed that there exist funding constraints in the implementation of road safety initiatives. They highlight that *Fika Salama*, a popular speed control initiative, is failing due to constraints in paying allowances for police officers deployed on the roads. Findings reveal that based on such constraints, deployments have reduced and perhaps this could be responsible for the increased rate of traffic offences and deaths on the roads, especially on highways connecting the city

to other parts of the country. Due to budgetary constraints, the necessary infrastructure such as walkways, adequate lighting, crime detection, trace and track infrastructure such as speed hand detectors have remained deficient.

Findings from the annual police crime reports reviewed (UPF, 2017 & 2018) point to corruption among traffic officers. By taking bribes from motorists in breach of traffic rules, some police create an environment for drivers to breach rules and get away with it. This view is consistent with Wagner and Hout (2019), Kunkel (2019) and Transparency International (2017, 2018) that argue that the integrity of police is usually compromised, rendering policing ineffective. Highways are undergoing a revolution in terms of financing development, operation and maintenance. Government of Uganda is reverting to its traditional role of financing development, leaving operation and maintenance to private developers. While the mentioned roles have been opened to private operators, road safety has not been transferred to them.

### **Policy Implications for reducing RTAS and RTIS in Uganda**

While existing approaches to improve road safety have been implemented in Uganda to a great extent, this study provides additional considerations for improving road safety while reducing RTIs.

There is need to increase and ring-fence funding for entities that enforce road safety measures such as UNRA and the Police. By availing such funding, activities associated with improving road safety can be implemented with ease.

To reduce the accident severity index, traffic calming strategies such as speed governors, raised crosswalks and safety islands among others can help to control speed and regulate traffic. Such measures have been deemed effective in countries like Saud Arabia (Jamal et al., 2020). To enhance the reduction of the accident severity index, there is need to locate and segment crash points with the objective of installing signals to alert drivers of such crash points. Katteler (2020) recommends mandatory driver assistance technology with in-built speed control systems. While drivers have a choice to adopt them or not, such systems have proven helpful to governments in reducing the over-speeding problem by drivers (Marrel & Westin, 1997; Katteler, 2020).

There is need to improve the integrity of traffic police officers. Benchmarks from the region may be explored. For instance, practices such as “name and shame” campaign can be explored coupled with investigating the corrupt. For example, such practices have been implemented in Rwanda where after being convicted, the corrupt are published in national newspapers citing case details, reason for conviction, when crime was committed, age, names, father and mother, sentence period, sentence date and date when sentence period will end. By implementing such a practice, among others, Uganda can deliver road safety initiatives while improving the country’s corruption index rating.

There is need to allocate a specific percentage of the transport sector budget for road safety interventions. This can help to reduce the financial constraints associated with implementation of road safety measures.

As the highways continue to revert to toll management under public private partnership arrangement, it is important that the private investors' roles extend to road safety. This can be implemented by including road safety targets as part of the concession annual performance targets. Incentives for road safety should be designed for the private operators. For example, a clause for renewal of concession tenure could include a requirement for achieving road safety targets while allowing the private operator to increase tariffs within agreed limits upon achieving annual performance road safety targets. Such targets may include construction of sidewalks for passengers, investment in lighting infrastructure, warning signs.

While governments remain constrained in providing the necessary road safety infrastructure, the study argues that such a challenge can be reduced by translating such investment as part of investment targets for toll managers. While such initiative can deliver impact in toll roads environment where state-owned or public roads exist, government should ensure that road furniture in form of waiting sheds, zebra crossing, drainage channels is incorporated in concessions with private operators. Where severe constraint in funding exists, government can explore calls for corporate social responsibility actions for the general public to contribute towards acquiring such road infrastructure. Road furniture can enable road users to stay in their lanes at all times, hence reducing their vulnerability to accidents.

## **5.0 Conclusion**

This article concludes that road traffic accidents and injuries are on the rise and the trend continues to cause concern not only for users but for public administrators and policy makers as well. The most important RTA and RTI approaches have focused on man, machine, motorway and money initiatives. While these have played their role, this study notes that existing approaches are not effective and new measures should be undertaken to reduce RTAs and RTIs. While most responses on additional recommendations focused on increased funding, a number of dynamic interventions from literature are suggested. The dynamic measures mostly relate to the management of road safety on highways (where most RTIs and RTAs occur). The main reason for such a way of thinking is that highways have been turned or are likely to be turned to the management of private operators under public private partnership arrangements. By including control measures in the performance framework of the private operators, RTAs and RTIs can be minimized.



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