

# TRANS-SAFE

## TRANSFORMING ROAD SAFETY IN AFRICA

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Radical improvement of road safety in low- and medium-income countries in Africa

### D1.3: A best practice toolkit for mitigating crashes in Africa

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## LIST OF ABBREVIATIONS

Acronyms	Full meaning
BAC	Blood Alcohol Concentration
BRT	Bus Rapid Transit
CHW	Community Health Worker
CNSR	National Road Safety Committee
DBE	Department of Basic Education
DHET	Department of Higher Education Training
DOH	Department of Health
DOJ	Department of Justice
DVLA	Driver Vehicle Licensing Authority
EU	European Union
FRSC	Federal Road Safety Corps
GRSF	Global Road Safety Fund
GRSP	Global Road safety Partnership



IRAP	International Road Assessment Programme
ITDP	Institute for Transportation and Development Policy
ITS	Intelligent Traffic Management System
JAES	Joint EU - Africa Strategy
MOH	Medical Officer of Health
MT	Motorised Transport
NACTO	National Association of City Transportation Officials
NRSA	National Road Safety Authority
NRSC	National Road Safety Commission
NRSS	National Road Safety Strategy (2016 - 2030)
NMT	Non-motorised Transport
RDA	Road Development Agency
RoW	Right of Way
RTMC	Road Traffic Management Corporation
RTSA	Road Transport and Safety Agency

SAPS	South African Police Service
SDG	Sustainable Development Goals
SSATP	Africa Transport Policy Program
UN- Habitat	United Nations Human Settlement Programme
UNDA	United Nations Decade of Action for Road Safety 2011-2020
UNEP	United Nations Environment Programme
WB	World Bank
WHO	World Health Organisation
ZRST	Zambia Road Safety Trust

## EXECUTIVE SUMMARY

This toolkit for mitigating road safety crashes reviews the current road safety policies in four African countries: Rwanda, Ghana, Zambia, and South Africa. It aims to identify a set of proven policies, strategies, and best practices that impact the safety of all street users, as well as to identify and highlight the gaps noticed through the evaluation of these different policies. The study found a number of gaps including ineffective road safety management, a lack of safe streets, inadequate user education, and presence of unsafe vehicles.

To address these issues, this report presents a best practice checklist to address road safety challenges. First, countries should adopt, review, and enforce standards for street design that supports complete streets. Complete streets are designed for all users, including bicyclists, pedestrians, users of public transportation, and drivers of private automobiles. They also incorporate street vendors, trees, lighting, street furniture, and other amenities. Conversely, urban motorways result in high speeds, low occupancy rates, stressful travel, low walkability, neighbourhood severance, segregation, and climate change. Building complete streets instead of urban motorways makes cities safer, healthier, more prosperous, and more sociable. The street design guidelines adopted at the national and city levels should reflect these principles.

Effective road safety requires coordination across multiple sectors and stakeholders. Typically, a lead agency performs this coordination, having the authority and resources to oversee the implementation of a national road safety policy. Stakeholder engagement is essential when creating a long-term vision, strategy, and specific targets for road safety. The key society sectors, including health, transportation, law enforcement, and non-profits, should be included to ensure that everyone is invested in the strategy's success.



# 1. INTRODUCTION

This toolkit for mitigating road safety crashes aims to identify a set of well-proven policies, strategies, and recommendations to positively impact road safety of vulnerable key road users. The toolkit has been developed from identifying best practices after assessing the existing road safety policies and their gaps in four African countries: Rwanda, Ghana, Zambia, and South Africa.

## About TRANS-SAFE

The TRANS-SAFE project encompasses national, regional, and city-level demonstrations aimed at testing various innovative and integrated Safe System solutions. These demonstrations are complemented by a comprehensive toolbox, capacity development initiatives, policy support, and replication activities. To maximize impact, the project brings together a consortium consisting of highly committed cities, road safety agencies, and experts from both Europe and Africa. Drawing on the synergies of multiple projects, networks, and the extensive technical expertise of its partners, the consortium aims to promote road safety policies and practices.

The project aligns with the recommendations of the Road Safety Cluster of the African-EU Transport Task Force, adopted in 2020. The consortium members possess experience and expertise in Africa-related research as well as development-related research in collaboration with local actors across various African countries and at multiple levels. Ultimately, the project aims to contribute to the Joint EU-Africa Strategy (JAES) and advance countries' progress towards the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). TRANS-SAFE leverages existing partnerships to collaboratively design sustainable interventions that seek to fundamentally transform road safety systems in Africa.

# 2. BEST PRACTICE: ROAD SAFETY POLICIES AND STRATEGIES

In this chapter, we elaborate on the best practices in road safety, focusing on safe infrastructure, education, enforcement, and post-crash care. These practices aim to achieve safer speeds, promote safety among road users, ensure safer vehicles, and improve post-crash care. We recognize that adopting a multisectoral approach in road management is essential for the continuity of road safety progress.

## 2.1. SAFE INFRASTRUCTURE



Safe road infrastructure is fundamental to improving road safety outcomes. Countries should adopt, regularly revise, and enforce street design guidelines that promote complete streets. Complete streets are designed for all users, including pedestrians, cyclists, public transport passengers, and personal motor vehicles, as well as street vending, trees, street furniture, and more.

Designing safe, sustainable infrastructure requires shifting the planning paradigm from providing urban highways to providing complete streets and urban roads that incorporate more space to walking, cycling, and public transport, reducing the space allocated for private vehicles and the dependency on private cars. Lesser spaces for private vehicles will also allow for allocating more public space to parks, playgrounds for children and other leisure uses. This should be reflected in the design guidelines adopted at both national and city levels (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2018).

Some of the current guidance found on urban design manuals takes good consideration of road safety priorities within complete streets. As seen in table 2, design speeds are capped to a minimum, to avoid the short reaction times and most severe impacts from crashes. Additionally, slower speeds are proven to improve liveability of urban areas (Transport for London, 2022). Similarly, the carriageway lanes are as reduced as possible, making space for the dedicated NMT facilities – footpaths and protected cycle tracks (Abu Dhabi Urban Planning Council, 2017; Global Designing Cities Initiative, 2023).

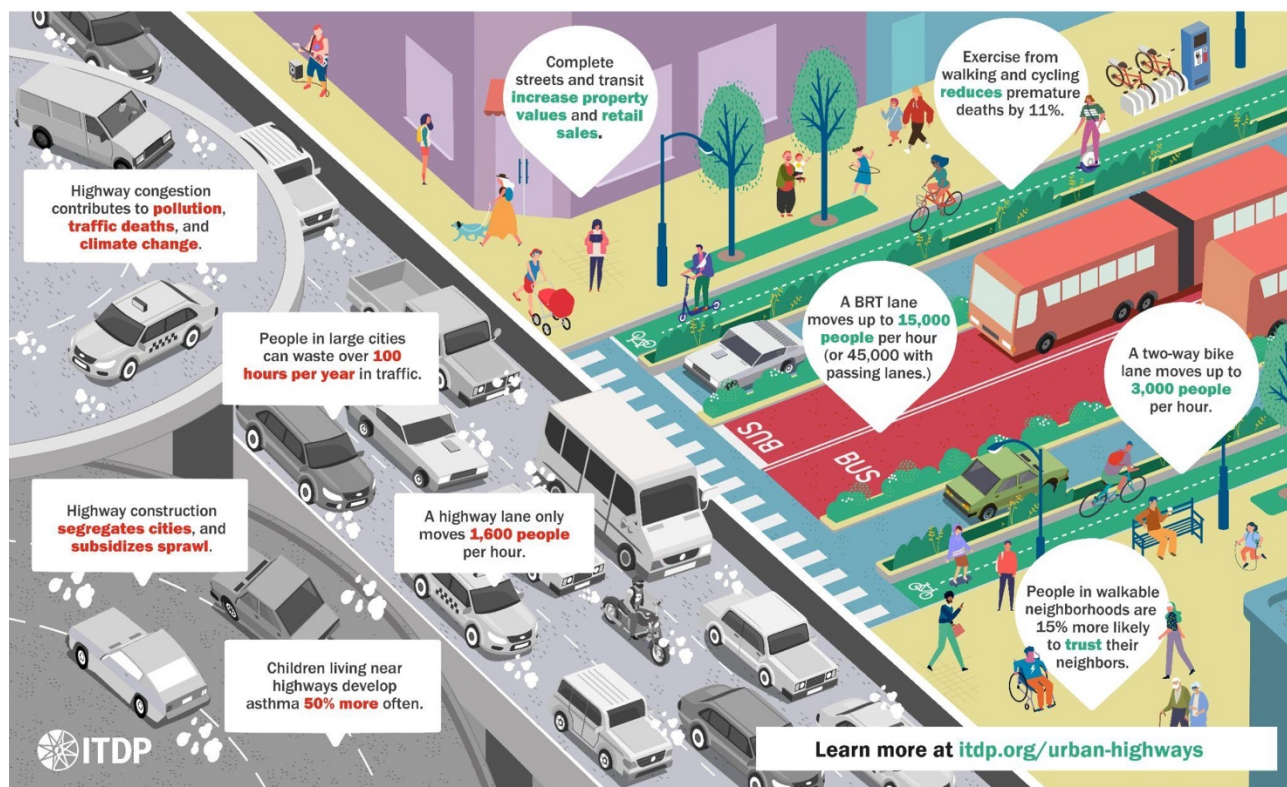
Table 1. Street elements and recommended parameters for safe streets

Street element	Transport for London Streets Toolkit	GDCI Global Street Design Guide	Abu Dhabi Urban Street Design Manual
Recommended design speed	32 km/h	40 km/h	40 km/h
Carriageway lane	3.0 m	3.0 m	3.3 m
Footpath width	2.0 m	2.0 m	2.3 m
Cycle track width: unidirectional	2.5 m	2.0 m	2.0 m
Cycle track width: bidirectional	4.0 m	3.6 m	2.5 m

Figure 1. Urban highways vs. Complete streets. (Institute for Transportation & Development Policy, 2023)

**URBAN HIGHWAYS VS. COMPLETE STREETS:**  
**Cities can build streets for people instead of for cars.**

*The expert consensus is clear. Complete streets are healthier, more productive, more sustainable, more equitable, and move more people than highways.*



The adopted national street design manuals should aim to mainstream the best-practice street designs to improve safety for vulnerable road users and support sustainable modes of transport, particularly public transport, pedestrians, and cyclists. The coordinating agency should foresee and plan for the implementation challenges, including the necessary communication strategies, enforcement, and capacity building actions (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022).

Table 2. Street design standards: issues identified in the national guidelines.

Street design standards	Issues identified in the national guidelines					
Location and guidelines	Lack of road safety priorities	Lack of NMT & PT priorities	Focus on urban highways	Not up-to-date or regularly revised	Not context-specific	Lack of implementation potential

<b>Zambia</b> SATCC: Standard Specifications for Road and Bridge Works (1998 - reprinted 2001)	Allows excessive speeds in urban area	Does not cater to pedestrian and cyclist movement	Lacks distinction between rural roads and urban streets	Last revision in 1998	Does not reflect local streets and settlements character	No implemen- tation discussion
<b>South Africa</b> 'Red Book': The Neighbourhood Planning and Design Guide, Part I & Part II, Chapter 'I' (2019)	Allows excessive speeds in urban area	Discusses NMT infrastructure but unclear specs	Urban, peri- urban, and rural settlements discussion	Last revision in 2019	Embedded in Neighbour- hood planning and design guide	Discusses participation and implemen- tation context
<b>Rwanda</b> Rwanda Standards: Feeder roads, Part 1 - Guidelines for Design (2015)	Allows excessive speeds in urban area	Does not cater to pedestrian and cyclist movement	Discusses both, but unclear features for each	Last revision in 2015	Does not reflect local streets and settlements character	No implemen- tation discussion
<b>Ghana</b> Manual for Low Volume Roads, Part A - Policy, Geometric Design and Road Safety (2019)	Allows excessive speeds in urban area	Discusses pedestrian infrastructure , but not cycling	Urban, peri- urban, and rural settlements discussion	Last revision in 2019	Embedded in Neighbour- hood planning and design guide	Discusses key implemen- tation actions, maintenance, and governance

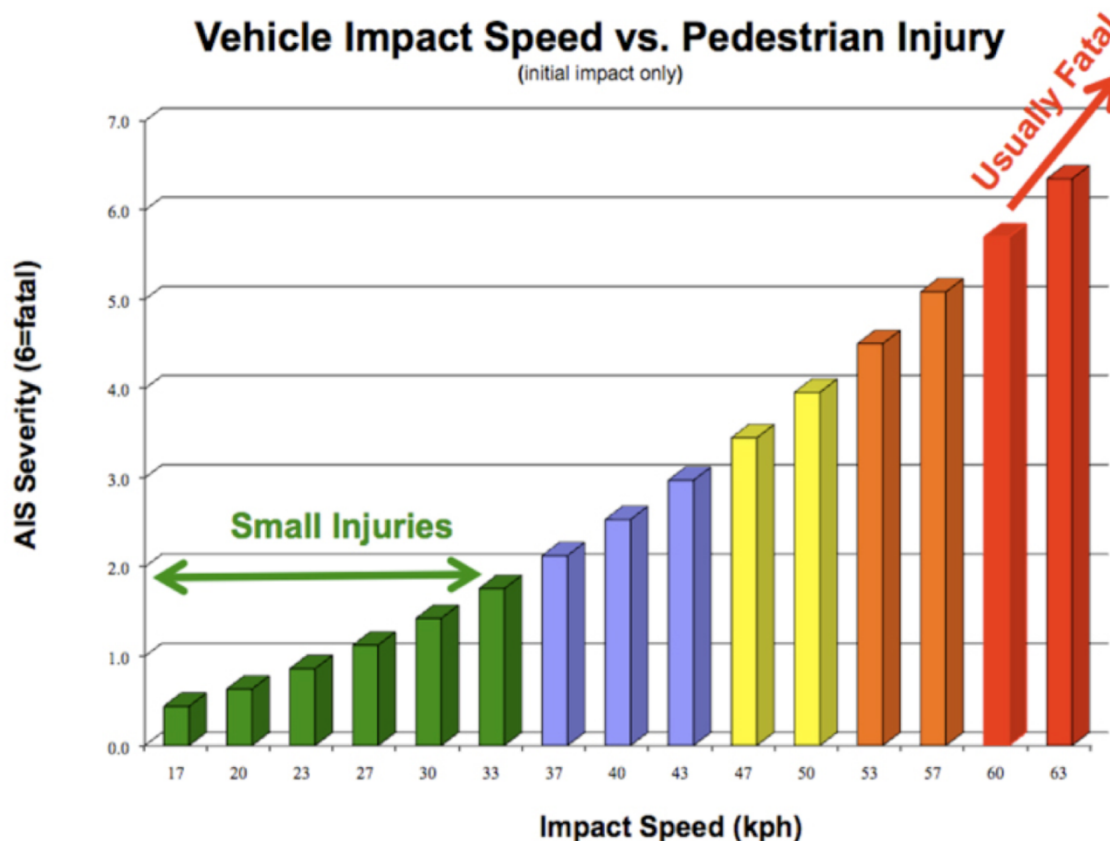
### 2.1.1 Designing for safety

As seen in tables 2 and 3 prior, excessive speeds are a cross-cutting issue in road design practice in Zambia, South Africa, Rwanda, and Ghana, despite current recommendations and best practice. When designing for road safety, keeping vehicle speeds low is crucial. In a collision, the impact severity varies based on vehicle speed, with higher speeds representing a much higher chance of severe injuries or death. At speeds below 30 km/h, drivers can easily see their surroundings and avoid potential conflicts with pedestrians, cyclists, or other motor vehicles.

With higher motor vehicle speeds, not only are collisions more likely, but the driver's field of vision also narrows. This hinders the driver's ability to respond to sudden incidents or changes to the roadway, such as a child running into the street or an intersection.



Figure 2. Vehicle impact speed vs. pedestrian injury severity. (Chellman *apud* Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022)



Slower vehicles make for a safer and more comfortable pedestrian realm, which can encourage more walking and cycling trips. Prioritising non-motorised modes of transport as viable and convenient requires rebalancing street space and accommodating all modes of transport. Two main approaches are possible for this: systematic traffic calming and physically separated NMT infrastructure.

In a systematic traffic calming approach, smaller streets have safe zones for mixing pedestrians, cyclists and other modes (e.g., shared lanes). Motor vehicle speed is intentionally kept low with signage, enforcement, street design elements such as chicanes, raised intersections, tabletop crossings and ample provision for pedestrian amenities - seating, trees, shade and other furniture elements.

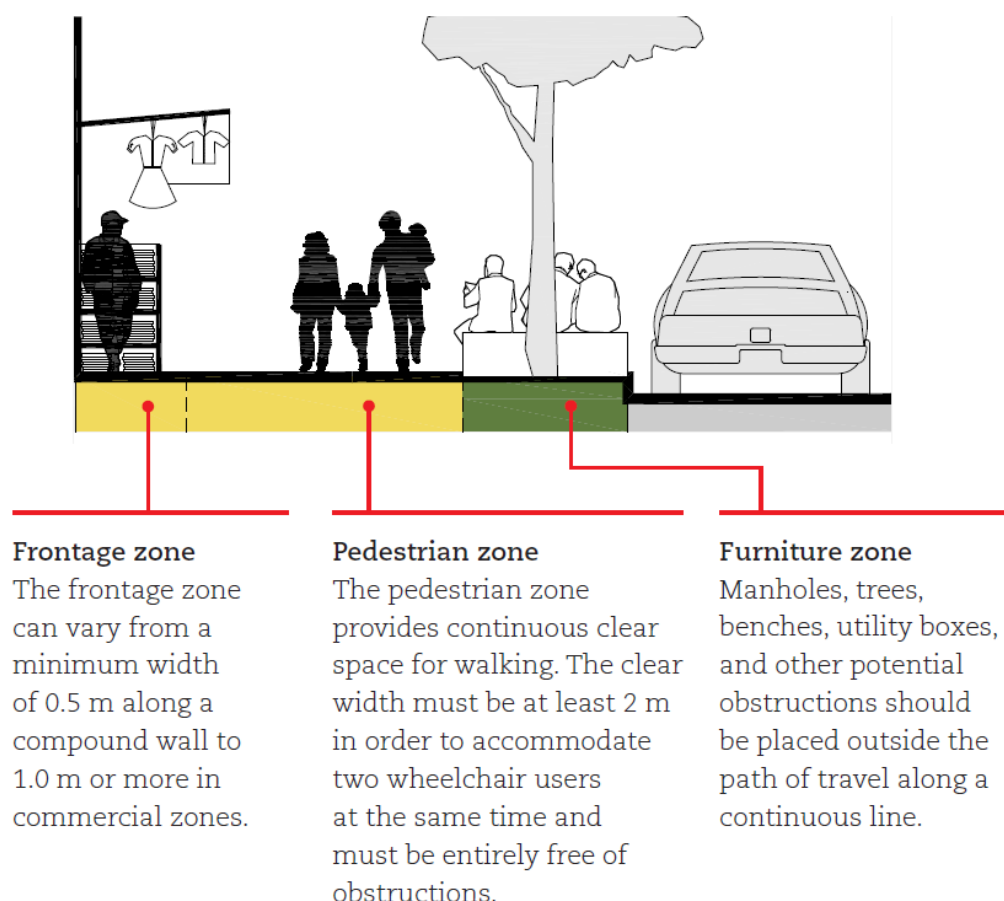
In a physically separated infrastructure approach, footpaths and cycle tracks are raised from the carriageway level or have other clear physical barriers separating motor vehicle traffic from pedestrians and cyclists. Footpaths should be designed to provide a clear space for walking, a zone for furniture and a frontage zone that interacts with building access and shopfronts. The dedicated cycle tracks are ideally raised to footpath level, completely separate from the carriageway. Safe crossings should be provided for pedestrians and cyclists at regular intervals (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2018). Each of these street elements can be detailed in the country's design guidelines for safer streets.

## Safe walking infrastructure: footpaths and pedestrian crossings

Well planned footpaths provide continuous space for walking. They also support other activities, such as street vending and waiting at bus stops without compromising pedestrian mobility. The success of a footpath depends on the integration of multiple elements in a coherent design.

Comfort, continuity, and safety are the governing criteria for the design and construction of safe pedestrian facilities. The footpaths fulfil three main functions, shown here in zones: the frontage zone, the pedestrian zone, and the furniture zone.

Figure 3. Footpath zones. (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2018)



**Frontage zone**  
The frontage zone can vary from a minimum width of 0.5 m along a compound wall to 1.0 m or more in commercial zones.

**Pedestrian zone**  
The pedestrian zone provides continuous clear space for walking. The clear width must be at least 2 m in order to accommodate two wheelchair users at the same time and must be entirely free of obstructions.

**Furniture zone**  
Manholes, trees, benches, utility boxes, and other potential obstructions should be placed outside the path of travel along a continuous line.

To ensure safety, formal pedestrian crossings should be a requirement wherever there is a concentrated need for people to cross the street (e.g., at a bus stop, at an entrance to a shopping mall, or where a path intersects the street). In dense areas, the crossings must be provided in short intervals. They can be signalled or, preferably, raised to footpath level (tabletop). The approach to a crossing should be treated to reduce vehicle speeds and all design features should emphasise the presence of the crosswalk.

Also critical for pedestrian and cyclist's safety is recommending the priority of at-grade crossings against pedestrian foot overbridges or tunnels. Pedestrians dislike having to climb a stairway to cross the street, so they are likely to avoid it and will cross at grade as they please. This preference makes costly overbridges and tunnels, an unwise use of limited resources, and an additional road safety risk (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2018).

Figure 4. Safe crosswalk in Dar Es Salaam. (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022)



### Safe cycling infrastructure

In order to encourage more cycling trips, street design standards should incorporate parameters for the design of cycle tracks. The preferable layout is comprised of two unidirectional cycle tracks, running alongside the footpath and in the same direction of travel as mixed traffic, with appropriate pavement material, markings, and physical buffers between the NMT infrastructure and motor vehicles, as seen below. Cycle tracks should comprise part of a complete and coherent network, allowing cyclists to safely navigate the city and reach the main attraction areas for jobs, education, services, and mass transit.

Figure 5. Safe protected cycle track in Dar es Salaam. (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022)



### Safe access to public transport

A lack of sufficient public transport options and rapidly increasing ownership of private cars leads to daily congestion and higher more crashes and fatalities. Besides transforming public transport services, including streamlined informal services, a bus rapid transit<sup>1</sup> (BRT) network, has the potential to dramatically improve safety conditions for pedestrians and cyclists. Many BRT passengers will arrive on foot; thus, corridor designs should promote safe access for non-motorised transport (NMT) users. Corridors will require footpaths that are unobstructed, continuous, shaded, and well-lit. BRT corridors also require high-quality facilities for cyclists, such as the example in figure 5 (Institute for

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<sup>1</sup> Bus Rapid Transit (BRT) is a bus-based mass transport system that provides fast, comfortable, and cost-effective services at metro-level capacities. It includes dedicated bus lanes and distinctive stations, typically aligned to the centre of the right-of-way, off-board fare collection, and fast and frequent services (Institute for Transportation and Development Policy, 2023).

Transportation & Development Policy & United Nations Human Settlements Programme, 2022; Institute for Transportation and Development Policy, 2020).

## Safe intersections

Intersection design must manage conflicts to promote safety for pedestrians, cyclists, and all street users, while allowing for through movement of all vehicles. The best way to minimise the outcomes of those conflicts is in fact through speed management. Signalised intersections are the preferred configuration for urban intersections of major streets with large volumes of pedestrians and cyclists, while mini roundabouts can improve safety on smaller streets. Stop-controlled intersections and roundabouts are appropriate for moderate traffic volumes, with the added consideration that compact intersections are the ideal for road safety, connectivity, and walkability (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022; Mitra, et al., 2021).

Figure 6. Example of compact intersection and features (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022)

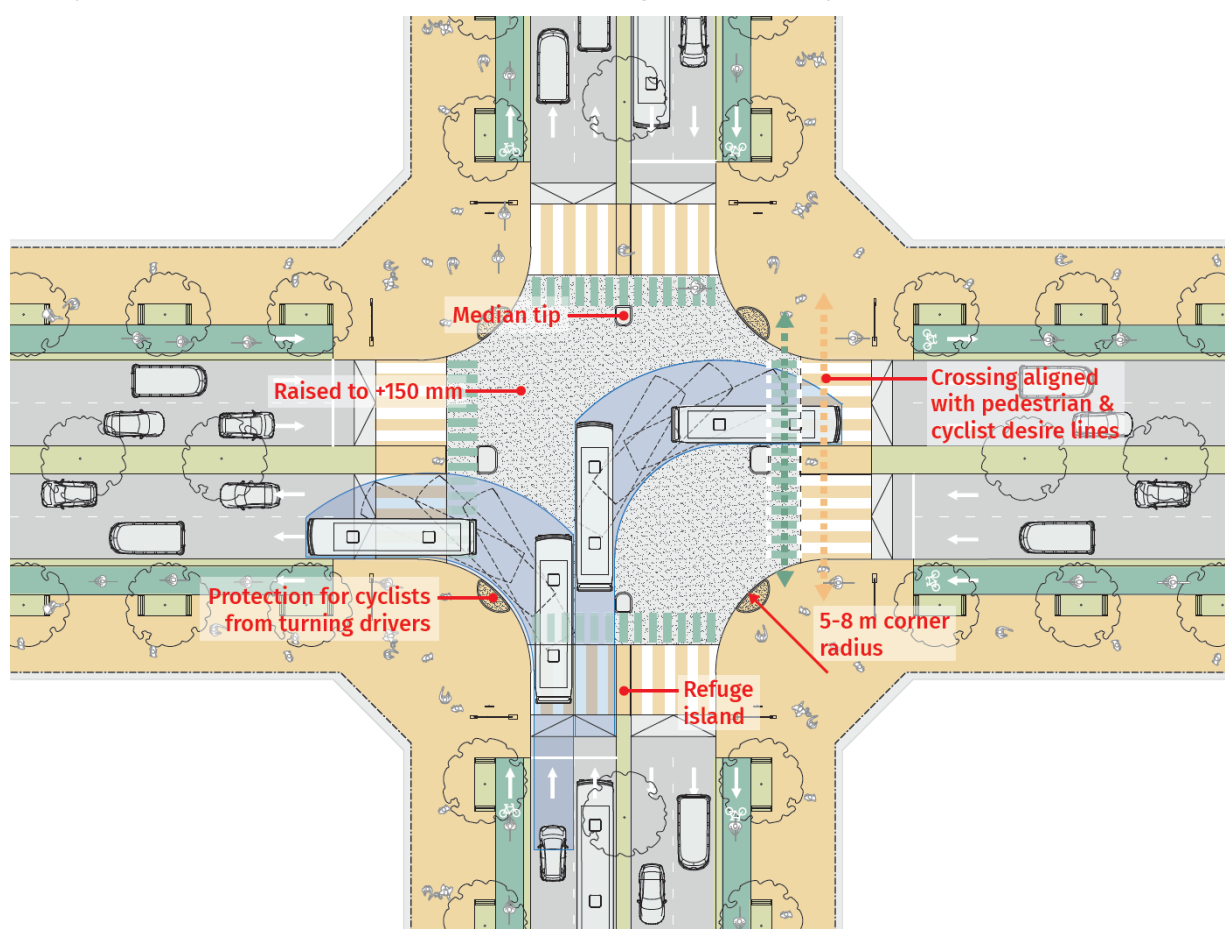
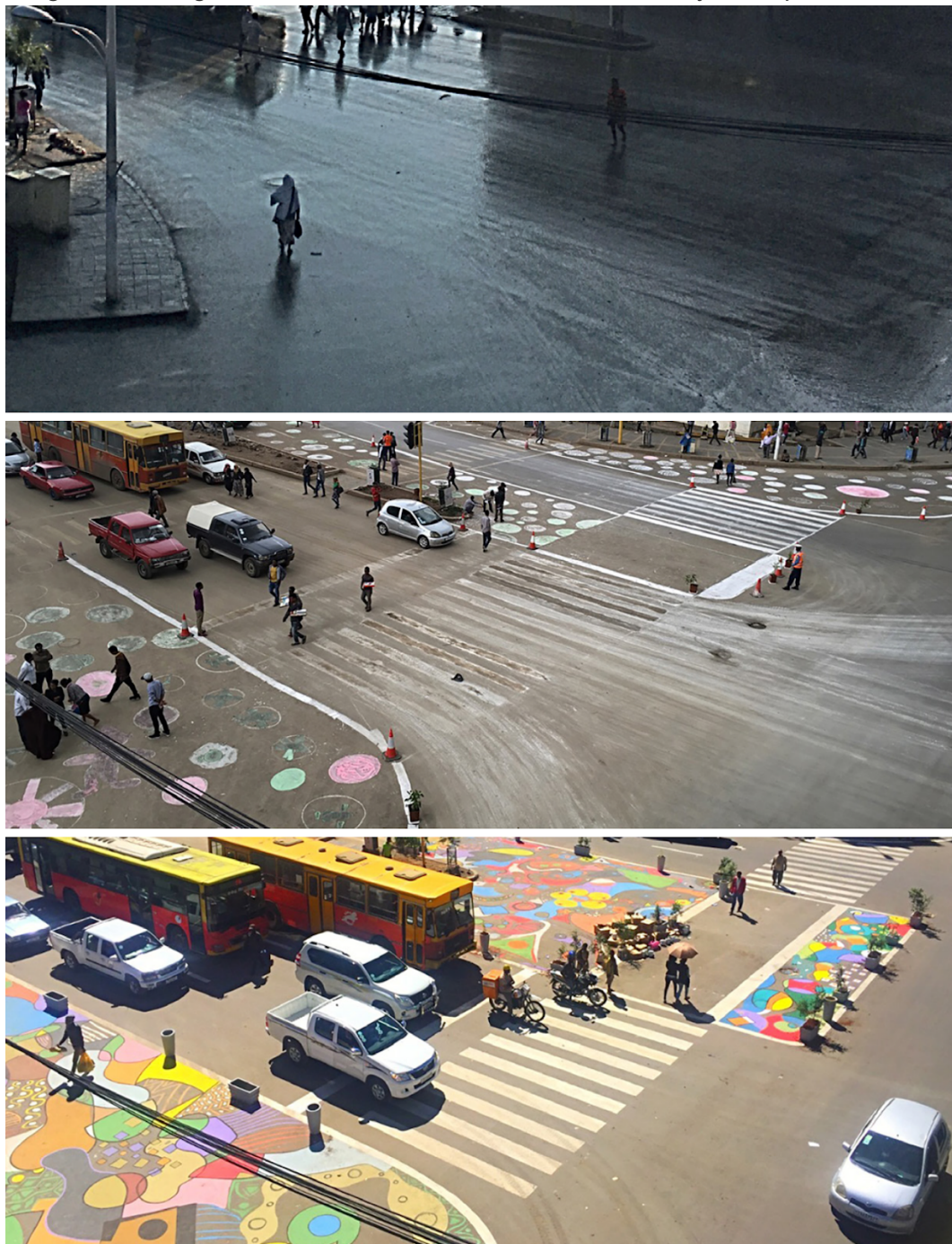


Figure 7. Addis Ababa intersection retrofit at La Gare. (Addis Ababa City Government Transport Programs Management Office & National Association of City Transport Officials, 2018)



## 2.1.2 Street design & planning process

For good ownership of the public space, the street design process should follow a participatory approach, including local residents, businesses, shop owners, transport service providers, and other stakeholders. The planning process should include diverse groups of citizens at all planning and implementation stages, considering the views of women, children, the elderly, and persons with disabilities. Consultations can lead to a positive engagement between government authorities and local stakeholders (Global Designing Cities Initiative, 2023; Okyere, et al., 2023). For example, engaging with local street vendors can create awareness of the need to make clear space for foot traffic, while regulated vending can improve the security, vibrancy, and economic activity of the local area.

In a participatory and cost-effective approach, using tactical urbanism, planners can make temporary interventions to test out new street designs before they are built. Following consultations with the stakeholders, the trials can be started by using traffic cones and barriers to reclaim pedestrian and cyclist space. Over time, semi-permanent pedestrian islands can be created, using bollards, planter boxes, benches, and other street furniture. Once the intervention is validated with use, the new design can be implemented permanently, with a detailed design for the new kerb line, footpaths, crosswalks, cycle tracks, and refuge islands as needed. Tactical interventions tie in well with sustainable mobility events that close streets to motor vehicles and create space for placemaking activities such as street painting and cycling events (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2022; Global Designing Cities Initiative, 2022).

Through a participatory process, stakeholders will recognise the key challenges associated with a project and then formulate a common vision for it, including measurable, time-bound goals as solutions. The stakeholders can develop a plan for funding the street design improvements, possibly including sources such as parking fees, congestion charges, and private sector sponsorships. Over time, the local authorities can track the success of the project by collecting regular data on travel behaviour, road safety, and air quality (Institute for Transportation & Development Policy & United Nations Human Settlements Programme, 2018; Global Designing Cities Initiative, 2023).

## 2.1.3 Street design assessment

Table 3. Summary of street design best practices.

Street designs: best practice examples	
City, Country	Description

<p>Addis Ababa, Ethiopia  (United Nations Environment Programme &amp; United Nations Human Settlements Programme, 2022)</p>	<p>Tactical intervention at LaGare intersection: the wide carriageway space was adjusted with a tactical redesign, including participation from students from the Fine Arts and Civil Engineering schools in the city. The project reclaimed pedestrian street space, expanding the central median and pedestrian refuge, shifting the crosswalks to match desired lines and adding planters and colourful patterns. The intervention was evaluated based on activity metrics before and after the changes, and the local retailers were included in the process for awareness and ownership of the public space. This project featured a wider Transport Systems Improvement Project alongside over 100 other junction improvements across the city.</p>
<p>Kigali, Rwanda  (Malonza, 2022)</p>	<p>In Kigali, the Imbuga Walk &amp; Biryogo car-free zones, alongside other pedestrianised streets, allow residents to safely meet, shop, and have leisure activities. Next to the Imbuga City Walk is in the central business district, while Biryogo sits in a traditional and vibrant neighbourhood of the city. In addition, open streets for children and flexible car-free zones that are closed to traffic on the weekends, in a densely populated district. Rwanda has also adopted car-free days twice a month and periodic night runs, promoting streets as 24-hour urban public spaces to improve liveability and raise awareness of critical road safety issues.</p>
<p>Dar es Salaam, Tanzania  (Institute for Transportation &amp; Development Policy &amp; King, M., 2022)  (Kazaura, 2021)</p>	<p>The Dar es Salaam Bus Rapid Transit (BRT) system provides an efficient, good quality public transport service. The corridor designs feature safe tabletop crossings for pedestrians accessing the stations, and feeder buses access high-quality terminals. On streets with speed limits of 40-50 km/h, the city provides physically separated cycle tracks and footpaths. Traffic calming and/or signalisation also make the approach to the pedestrian crossings safer. With BRT, there is a potential to improve road safety from the aspect of formalising the public transport services, regulating vehicles more effectively, and providing the dedicated road space for buses. Supporting measures, especially for pedestrians and drivers, include raising awareness on safe behaviour at crossing points and intersections and enforcing safe driving speeds.</p>

<p>Accra, Ghana  (United Nations Environment Programme &amp; United Nations Human Settlements Programme, 2022)</p>	<p>Ghana is tackling the N1 highway, a 14-lane corridor that cuts through the city and accounts for circa 60% of all crashes in the capital. In this intervention, signage and traffic lanes were updated based on the issues highlighted by the data. A new pedestrian walkway was provided, and additional time was given to pedestrians crossing the road. In parallel, the city has been working on the air pollution levels, to better prioritise sustainable modes and reduce up to 5500 premature deaths in 35 years.</p>
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## 2.2. SAFE SPEEDS

While many countries have adopted policies to encourage walking and cycling, there is a concern that these are not being followed by additional safety measures, particularly concerning speed reduction, which could result in more dangerous roads. Currently, most countries have a national speed limit law however, very few meet the best practice criteria on speed legislation in urban areas, which are:

1. To have a national speed limit law
2. The maximum urban speed limit should be below or equal to 50 km/h
3. Local authorities should be allowed to modify the local speed limits

Enforcement of speed regulation is important to ensure compliance with speed limits. Automated enforcement (such as fixed camera and mobile in-vehicle fitted devices) systems are cost-effective and useful in low-resource settings. However, many nations continue to use manual speed enforcement.

Table 4. Summary of speed regulation best practices.

Speed regulation: best practice examples	
City, Country	Description
<p>Dar es Salaam, United Republic of Tanzania (World Health Organization, 2018)</p>	<p>In Tanzania, the best practice criteria: the presence of a national speed limit law, a limit of 50 km/h in urban areas, and local authorities can modify limits are met. The predominant type of enforcement is manual, rated at an 8.</p>

<p>Sweden (European Commission, 2021)</p> <p>(Swedish Transport Administration, 2020)</p>	<p>Managing speed is particularly important to protect vulnerable road users like children. Amend's School Area Road Safety Assessments and Improvements (SARSAI) programme improves child safety around primary schools in towns and cities in several African countries, including Dar es Salaam, United Republic of Tanzania. SARSAI assesses the areas around the city's 360 public primary schools, identifies measures to improve road safety, and implements those measures with the support of relevant authorities. This includes improvements in infrastructure, such as speed bumps, footpaths, signage and bollards to delineate pedestrian areas. By introducing these modifications to the school infrastructure, the programme helps ensure safety by reducing vehicle speeds to 30 km/h or less and providing safe walking spaces. The programme is proven to be effective: a recent case-control impact study on road traffic injury rates showed a 26% absolute reduction in road traffic injuries among children. The study also demonstrated that for every 286 children whose school is part of the SARSAI programme, one road traffic injury is prevented every year.</p>
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## 2.3. SAFE ROAD USERS

Better user behaviour can be achieved through education, awareness creation, and stricter enforcement, with enforcement currently being the weakest link. The current levels of enforcement are often insufficient for the success of road safety laws. Enforcement is vital to enforce laws relating to the five key behavioural risk factors: speed, drunk driving, motorcycle helmet use, seat-belt use and child restraint systems. Road user behaviour in these five key risks improves when road safety legislation and the education and promotion of road safety are supported by strong and sustained enforcement.

Currently, enforcement is measured subjectively as respondents rate the perceived level of enforcement. In the WHO 2018 study, data on enforcement was extracted from a questionnaire and legislative analysis (World Health Organization, 2018). Respondents were asked, as individuals, to rate the effectiveness of enforcement of various elements of national road safety legislation based on their professional opinion or perception. The responses – on a scale of 0 to 10, where 0 is "not effective" and ten is "highly effective".

Enforcement has been proven to be more effective if laws are strongly promoted in the community in terms of their safety value and if communications are adopted that increase general deterrence, such as promoting a high level of detection, the unpredictability of enforcement and genuinely deterring unavoidable penalties (The World Bank, 2020). In countries that do not have particularly visible and high levels of enforcement, it is necessary to persuade the public that breaking the law in the future may result in a penalty.



### 2.3.1 Drunk-driving regulations

To reduce the incidence of road traffic crashes involving drunk-driving, it is important that the national drunk-driving law is based on breath or blood concentration and uses the recommended blood alcohol concentration (BAC) limit. Best practice criteria for drunk driving laws include:

1. The presence of a national drunk-driving law.
2. Drunk driving laws should be based on blood alcohol concentration limits of no more than 0.05g/dl for the general population.
3. The BAC limit for young and novice drivers should not exceed 0.02g/dl (source).

Enforcement of drunk driving limits should include publicity as well as high visibility police enforcement and the fitment of alcolocks in commercial and public transport vehicles. Enforcement should also include random breathing testing strategies as it is more effective than targeted testing during certain times and in certain areas. Further data collection is required in many countries to fully understand the extent of the problem, as currently, many estimates are based on crash reports which generally underestimate the problem.

Table 5. Summary of drink-driving regulation best practices.

Drink-driving regulation: best practice examples	
City, Country	Description
Addis Ababa, Ethiopia (United Nations, 2020)	Drunk driving enforcement is well-implemented in Addis Ababa largely due to the Bloomberg Road Safety Initiative implemented since 2015. An assessment conducted in Addis Ababa indicates a significant reduction in drunk driving, from 9.7 percent in 2015 to 1 percent in 2019. This impressive achievement might also be due to a consistent media campaign complemented by enforcement using a roadside random check.
France (European Commission, 2007)	In 2004 France ran a pilot programme for a voluntary alcohol interlocks (alcolocks) process rather than prosecution for driving offenders caught with a BAC of 0.8 to 1.6 mg/ml. The results of the pilot were that there was no case of recidivism one year after the completion of the programme and participants expressed a high level of support for the measure.

### 2.3.2 Motorcycle helmet regulations

Motorcycle helmet regulations are important as motorcycles are less visible than other motorised vehicles, and there are virtually no protective features of a motorcycle, unlike a car. It is crucial that nations place a mandate on wearing motorcycle helmets as this can reduce the risk of death by almost



40% and the risk of severe injury by 70%, as most motorcycle injuries are head injuries (World Health Organization, 2006). Better enforcement of motorcycle laws can increase helmet-wearing rates and reduce head injuries.

Best practice criteria for motorcycle helmet laws should include:

1. The presence of national motorcycle helmet law
2. Laws that apply to both drivers and passengers
3. Laws applying to all road and engine types
4. Laws that stipulate helmets to be properly fastened
5. Laws referring to/ specifying the quality of helmets worn.

Table 6. Summary of helmet regulation best practices.

Motorcycle helmet regulations: best practice examples	
Location	Description
Kigali, Rwanda (Small & Addo-Ashong, 2021)	Motorcycle taxi management is an important tool to tackle the road safety dangers that arise regarding motorcycles. Motorcycle taxis are concentrated in Kigali, with 20,000 of the 34,000 taxis that exist in Rwanda being based in Kigali. The motorcycle cooperatives in Rwanda, which are composed of 100 taxis in operation, are managed by various stakeholders with well-defined responsibilities. The cooperatives are just one stakeholder, however, they are vital for road safety because they have a safety and security committee, as well as officers who carry out a daily inspection to check compliance with security and safety regulations. They ensure each motorcycle rider has a helmet for both them and another for the passenger, always wears a reflection gilet, and does not carry oversized luggage. This high level of cooperation has led to successful compliance rates in Kigali, with a survey finding 98% of riders and 91% of passengers in Kigali wearing helmets, compared to averages of 64% and 16% in the other cities.

### 2.3.3 Seatbelt regulations

Strong and sustained enforcement of seat-belt legislation effectively increase seatbelt wearing rates. This is crucial as wearing a seatbelt reduces the risk of fatality among drivers: front-seat occupants by 45-50% and up to about 25% among rear-seat occupants (European Road Safety Observatory, 2022). Other efforts to better enforce seat-belt regulation include police leadership in focused public promotion campaigns, and strict vehicle inspection of imported vehicles to reduce the number



without effective seatbelts (The World Bank, 2020). Primary enforcement laws are the most effective, they allow police officers to stop a vehicle solely because the occupants are not wearing seatbelts, increasing primary enforcement may involve an increase in police presence to find violators of the law or the introduction of seat-belt checkpoints.

Best practice criteria for seat-belt law include:

1. The presence of a national seatbelt law
2. The law applies to both front and rear-seat occupants.

Table 7. Summary of seatbelt regulations best practice

Seatbelt regulations: best practice examples	
Location	Description
Accra, Ghana (Small & Addo-Ashong, 2021)	Many projects were undertaken as part of the road safety strategy for the Accra Metropolitan Assembly, including training 550 enforcement personnel on the key safety risks and how to enforce them. This led to significant new numbers of speed, alcohol, and seat-belt checkpoints being conducted, and violations issued. This was by local mass communication activities to reinforce a behaviour change towards safety.
Ireland (RSA, 2023)	Ireland has been heralded for its use of educational campaigns and initiatives to improve road user behaviour both in schools and to adults in the community. The seatbelt campaign ( <a href="https://youtu.be/T3nLPU-bUGw">https://youtu.be/T3nLPU-bUGw</a> ) aimed to encourage drivers to ask their passengers to wear a seatbelt which can be linked to the 2018 survey that revealed one of the main reasons adults under 35 were not wearing a seatbelt is because they forgot. This depicts the imports of collecting surveys and research on attitudes towards various road safety measures to ensure targeted campaigns.
Tunisia (Small & Addo-Ashong, 2021)	In 2002 Tunisia introduced a law mandating seatbelts for all drivers and front seat passengers. This law was not enforced very well and there were very few fines. However, Tunisia showcased that with political will results can improve. The Tunisian government started to encourage this law in 2017 using a publicity campaign and a police checkpoint. A year later there was an 8.8% reduction in fatalities and 99% of cars stopped at the checkpoint were found to be observant of the law.

### 2.3.4 Child restraints regulations

National legislation should be in place to protect young children. Restrained children are less likely to be killed or injured than children in adult seatbelts. As well as enforcing appropriate restraints for children, policies should also maintain that young children should be sat in the rear which is safer than them sitting at the front.

Best practice criteria for child restraint legislation include:

1. The presence of a national child restraint law
2. A requirement for children to use a child restraint at least until ten years of age or 135cm in height
3. Restrictions for children under a certain age or height from sitting in the front seat
4. Reference to or a specification of a standard for child restraints.

## 2.4. SAFE VEHICLES

Table 8. Summary of vehicle regulations best practice

Vehicle regulations: best practice examples	
Location	Description
Togo (The World Bank, 2020)	The World Bank through GRSF undertook a joint project with Comité International de l'Inspection Technique Automobile (CITA) to assess Togo's vehicle inspection processes and provide contextualised recommendations to improve vehicle inspection station and the overall administrative structure. The project used Assessment of Vehicle Inspection Systems (AVIS) a new analysis tool that provides professional experts on the status of vehicle inspections.

## 2.5. POST-CRASH TREATMENTS

The post-crash response includes the series of events that provide effective care for the injured to reduce the severity of the injury. This begins with the activation of the emergency care system, the emergency care provided at the scene, the transport to a health facility and the subsequent treatment

provided at the facility. Ideally, countries should designate a lead government agency with the authority to set system-wide standards and to coordinate prehospital and hospital-based care for the injured.

### 2.5.1 Emergency care at the scene

Many countries lack professionally trained providers to deliver emergency care and quickly transport victims to a health-care facility using designated vehicles. Universal access numbers are often lacking however partial measures including simple mechanisms to advise patients on the nearest facility and transport options can facilitate access. This includes using mobile phones and targeted training of key lay groups (community leaders, police, and professional drivers) so they can provide basic interventions to improve outcomes.

It is recommended that severely injured victims should be placed in an advanced trauma care facility within one hour of the incident, but this is not the case in many countries. Therefore, more infrastructure is needed in terms of designated vehicles, street design, and systems to quickly transport victims to hospitals.

### 2.5.2 Health-care facilities

Currently there are many improvements that countries need to tackle the challenges currently faced in the trauma care facilities including protocols and checklists to ensure a systematic approach to every injured patient. Improvements should be targeted towards the lack of infrastructure within healthcare facilities, the lack of vital medical equipment for diagnosis and treatment of injuries, the lack of medical staff with trauma training, the lack of research on the nature of trauma in developing countries, and the lack of adequate funding for the development of fully functional trauma centres.

To tackle the current inadequacies (The World Bank, 2020):

- Quality improvement programs should be implemented to provide dedicated trauma care training for hospital staff and retain staff who are skilled in trauma care. To achieve this, accredited courses on trauma care should be implemented for doctors and nurses in hospitals receiving a high volume of trauma victims.
- Implementation of a trauma registry is required. This will improve the effectiveness of the trauma registry system and provide critical data to inform better development and implementation of quality improvement programs.

Table 9. Summary of healthcare facilities best practice

Health-care facilities: best practice examples
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Location	Description
Uganda  (World Health Organization, 2018)	<p>In Uganda, there are multiple national emergency care access numbers (999 for police and 112 for ambulance), some facilities are on the trauma registry, formal certification for prehospital providers is not required but there is a national assessment of emergency care systems.</p> <p>Improved emergency services can be provided at low-cost. Uganda's Ministry of Health scaled up a WHO pilot intervention that halved the number of hospital deaths from emergency conditions (road traffic injuries, childhood diarrhoea, pneumonia, asthma, and postpartum haemorrhage). In this case we can see the intervention targeted road traffic injuries alongside other health priorities. This is where stakeholder engagement is crucial to identify where road safety initiatives can fit into other sectors. The pilot only cost US\$ 3500 per hospital, which included WHO basic emergency care training for hospital staff, the introduction of simple WHO emergency unit protocols (including checklists and triage) and identifying and organising a simple resuscitation area with existing resources. In addition, Uganda has undertaken pilot implementation of the WHO Global Registry for Emergency and Trauma Care at regional hospitals around the country. The registry's automated reporting functions allow data to be used to improve the quality of clinical care as well as to inform policy and planning.</p>
Cape Town, South Africa  (Small & Addo-Ashong, 2021)	<p>In 2011 an Emergency First Aid Responder (EFAR) system was established to offer a community-based volunteer training program in first aid. Existing community groups including neighbourhood watch and those involved in HIV/AIDS awareness helped to make the program more effective by identifying the most frequent and severe categories of medical and traumatic emergencies in the community and how EFAR would best address these issues. Volunteers included road users and other groups and were trained in basic emergency first aid skills, managing emergency scenes, and supporting victims. Competency of the volunteers increased from 28 per cent before training to 78 per cent after training, and this was maintained at 71 per cent after four months.</p>

## 2.6. ROAD SAFETY MANAGEMENT AGENCIES

As discussed in the previous chapter, there is a clear need within the studied countries for the road safety agencies to work in an integrated manner, to have clear roles and responsibilities on their

deliverables, and to incorporate multiple road safety stakeholders into the agencies' boards. The following are the government agencies identified in each country:

- Rwanda Lead Agency: National Road Safety Committee (CNSR) which is funded in the national budget and has a road safety strategy that is partially funded - The functions of the agency include coordination, legislation and monitoring and evaluation of road safety strategies.
- South Africa Lead Agency: Road Traffic Management Corporation (RTMC), Department of Transport, which is funded in the national budget, and has a road safety strategy that is partially funded - The functions of the agency include coordination, legislation, and monitoring and evaluation of road safety strategies.
- Zambia Lead Agency: Road Transport and Safety Agency
- Ghana Lead Agency: National Road Safety Commission (NRSC), Ministry of Transport which is funded in the national budget and has a road safety strategy that is partially funded - The functions of the agency include coordination, legislation and monitoring and evaluation of road safety strategies.

Effective road safety efforts require coordination across multiple sectors and stakeholders. Coordination is usually fulfilled by a lead agency that has the authority and resources to coordinate the implementation of national strategy. In some countries the lead agency is a designated stand-alone agency whereas in others it is situated within a government ministry.

Stakeholder engagement is also vital when developing a long-term vision and strategy for road safety, and clear objectives to achieve the goals within a specified time frame. All relevant sectors should be involved including health, transport, police, and non-governmental agencies to ensure all are invested in the success of the strategy.

Table 10. Summary of road safety management best practices

Road Safety Management: best practice examples	
Location	Description
Argentina (Global Road Safety Facility, 2016)	Following a Global Road Safety Facility and World Bank project in 2010 that aimed to strengthen Argentina's institutional framework and management capacity for road safety, Argentina showcases that empowering the lead agency can be successful in reducing road traffic injuries, crashes, and fatalities. The key impact of the project was a 35% reduction in of road traffic fatalities in selected pilot corridors between FY2010 and FY2015 and a 36% increase of national seat belt use from 2011-2014, while national motorcycle helmet rates increased from 39% to 62%. The project focused on institutional capacity building, demonstration corridors and an incentive fund

	<p>program and a road safety monitoring and evaluation system within the National Road Safety Observatory. Since the inception of the lead agency, the National Road Safety Agency in 2008 the agency has created a national driver's licence, a national education plan, a national monitoring plan and developed the National Road Safety Observatory.</p>
<p>Nigeria (Global Road Safety Facility, 2016)</p>	<p>The World Bank through GRSF in Nigeria build their enforcement capacity by developing the Federal Road Safety Corps (FRSC) which is the lead agency for road safety management in Nigeria. This included training, capacity-building and vehicle and equipment procurements for the FRSC and a safe corridor demonstration program targeting interventions around infrastructure safety improvements, road safety management, enforcement, education and awareness, and emergency services. The project was particularly successful as in 2011 the government increased the budget for road safety from \$6 million to \$20 million after being convinced of the importance of life-saving road safety interventions. The ability to conjure political will to improve road safety is crucial in achieving the safe system approach.</p>
<p>Africa (Global Road Safety Facility, 2023)</p>	<p>To improve the reliability and availability of road safety and traffic data the GRSF alongside other international partners launched the African Road Safety Observatory (ARSO), with the first annual assembly in South Africa in 2019. The Road Observatory provides government representatives to share and exchange road safety data and experience to reduce traffic injuries across countries in the region. Since inception over 40 countries have joined, and there is an initial work plan for 2019-2021.</p>

## 3. TOOLKIT FOR ROAD SAFETY POLICYMAKING

The following table describes the checklist recommendations for pre-crash and post-crash policy interventions in each of the following areas: road safety management, safer streets, safe speeds, safe school zones, safe road users, safe vehicles, road and street improvements/ redesign, emergency care, and health facilities.

## 3.1. PRE-CRASH POLICY MEASURES

Table 11. Pre-crash policy measures.

<b>Road Safety Management</b>	
Set up an institution as a lead agency, legally mandated to handle road safety matters in the country.	<ul style="list-style-type: none"> <li>• Include representatives of stakeholders at various levels of governance, educational institutions, and civil society</li> <li>• Coordinate all funding, implementation, monitoring and evaluation activities on road safety</li> <li>• Foster accountability and capacity building on road safety</li> </ul>
<b>Safer Streets</b>	
Safer street designs – Implement streetscape features that protect pedestrians, cyclists, and vulnerable road users and promote safe, sustainable modes.	<ul style="list-style-type: none"> <li>• Cohesive street network and street hierarchy</li> <li>• Dedicated walking &amp; cycling infrastructure</li> <li>• Car-free zones</li> <li>• Public transport infrastructure</li> <li>• Safe intersection design and operation</li> <li>• Participatory planning</li> <li>• Implement physical speed reduction measures such as lane narrowing, vertical deflection, horizontal reflection, and access restrictions</li> <li>• Redesign of black spot locations</li> </ul>
Development of urban street design manuals - Adopt and enforce national street design guidance that demands safe, complete urban streets and that distinguish urban, peri-urban and urban settings	<ul style="list-style-type: none"> <li>• Design standards for design speeds, street elements, and intersection design for urban streets</li> </ul>
<b>Safe Speeds</b>	
Speed limits - Establish and enforce national speed limits.	<ul style="list-style-type: none"> <li>• Set safe speed limits</li> <li>• Evaluate the areas around schools and implement 30 km/h zones</li> </ul>
<b>Safe Road Users</b>	

<p>Enforcement - Develop an enforcement strategy to mitigate the key behavioural risk factors, including police checkpoints.</p>	<ul style="list-style-type: none"> <li>• Establish best practice guidelines for drunk driving, motorcycle helmet, seatbelt, and child restraint regulations</li> <li>• Use ITS to enforce speed limits by recording speed offenders in real-time.</li> <li>• Traffic police in static operations to enforce drunk driving, seatbelt, motorcycle, and child restraint regulations with spot penalties</li> <li>• Communication to road users of key enforcement principles.</li> <li>• Set maximum age of imported vehicles</li> <li>• Inspection of imported vehicles with respect to safety regulations (brakes, steering and suspension, tyres, seatbelts etc)</li> <li>• Periodic inspection of vehicles to ensure roadworthiness.</li> <li>• Data collection on vehicles involved in crashes to improve inspection parameters</li> </ul>
<p>Education and awareness – Promote safe road user behaviour in schools and widely through adverts, campaigns and training.</p>	<ul style="list-style-type: none"> <li>• Revise school curriculum to educate the school community on safe user behaviour</li> <li>• Training sessions in schools that promote and demonstrate the correct way to use helmets, and seatbelts to ensure safety</li> <li>• Community-based programs to challenge unsafe road user behaviour</li> <li>• Regular road safety courses for drivers, including public transport and private vehicles</li> <li>• Media partnerships to raise awareness on drinking and driving and NMT priority</li> <li>• Car-free days and open street events</li> </ul>

## 3.2. POST-CRASH AND ONGOING POLICY MEASURES

Table 12. Post-crash and ongoing policy measures.

Post-crash and ongoing policy measures	
Emergency care - Invest in community training, reducing response times, and transportation to trauma-care facilities.	<ul style="list-style-type: none"> <li>• Development of emergency medical response systems, including a single universal access number and emergency ambulance services</li> <li>• First-aid courses</li> <li>• Prehospital transport</li> <li>• Good samaritan laws to protect bystanders that assist at the scene from lawsuits</li> </ul>
Health facilities - Invest in facilities, equipment and training of health care professionals.	<ul style="list-style-type: none"> <li>• ROAD crash clinics</li> <li>• Quality improvement programs for trauma care</li> <li>• Implementation of a trauma registry</li> </ul>

While not exhaustive, this checklist can support decision-makers in addressing the present gaps in road safety policy and the overall planning environment for each of the studied countries.

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## 5. APPENDICES

### 5.1. INTERVIEW HIGHLIGHTS

Highlights from the discussions held with individual stakeholders from each of the studied countries, belonging to the University of Cape Town, Zambia Road Safety Trust, Institute for Transport and Development Policy (Rwanda) and the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development. These were held between May and July 2023, online, and had guiding questions but allowed for open discussions around the topic.

#### South Africa – University of Cape Town

##### **What challenges do we have with the road safety data?**

*Geo-coding of the crash data although all the other attributes have remained the same.*

##### **Whose responsibility is it to implement road safety interventions?**

*The National government is responsible for Road Safety strategy (RTMC) under the Department of Transport. Each metropolitan area (9 of them) has their own plan, although they adopt the main strategy from the National government.*

##### **Are there targeted campaigns on road safety?**

*There have been road safety campaigns from big cooperates such as Pick and Pay, but Western Cape government has had a number or got involved in Road Safety campaigns.*

##### **How is road safety funding done?**

*There is no specific budget for road safety, but each road owner is responsible for implementing road safety interventions. E.g SANRAL is responsible for highways.*

##### **Does each municipality have its design manual, or is it done nationally and then adopted by the municipalities?**

*There are national guidelines for motorized transport mainly and they have been adequately adopted throughout the country but for NMT is almost ignored by the municipalities. They are however here and there adopted and changed to fit different contexts of the municipalities. This talks to why there is increased pedestrian fatalities in South Africa.*

##### **Additional resources and links:**

<https://journals.co.za/doi/abs/10.10520/EJC178610>

<https://repository.up.ac.za/handle/2263/57727>



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## Zambia – Zambia Road Safety Trust

### General context of road safety in Zambia

- Roads are made for cars. People who are driving is not as representative of the population
  - 40 m wide ROW with 2 m-wide footpaths
- Speeding and drunk driving leading to crashes in most cases. Corruption in some instances, no priority of budget within the government budget. Implementation is minimal
  - Resources are often diverted to urgent areas like healthcare or education
- Challenges faced on enforcement; lack of resources allocated. Overall, a lack of priority from the government's side for road safety.

### Existing interventions, e.g., AMEND school zones - which other initiatives?

- Successful interventions include the propagation of Safer journeys to school (Zambia Road Safety Trust) and constructing safer road infrastructure around school zones. 35 schools across the country. Focus on pedestrian safety.
  - Speed bumps implemented, traffic lights, speed signage and promotion of road safety awareness campaigns
  - 2019: hand in hand with the stakeholders for policy advocacy for speed reduction. Progress in advocacy.

### Zambia Draft National Road Safety policy: was it adopted? Were the interventions linked to the draft?

- Before 2020, there was no specific law. In 2019 the advocacy became more specific on which policy instruments were needed (speed reduction around target areas, markets, schools, and hospitals).
- The original draft was most likely not entirely rectified signed in, but it led to the signed law number 7/2020. Final amendments to the draft policy are also pending from the government's side.

### Was the Safe Systems approach guiding the draft, or did it occur afterwards?

- The organisation is advancing the approach focused on safe speeds and safer infrastructure mainly.
- The Road Safety Authority is not a central agency, and there are fuzzy lines in the responsibilities of it and other government agencies (ministry of transport, road development agency). There is no Central body of government to take concrete decisions for road safety. Each organ of government directs responsibility to the other.
  - RTSA - acts more like a partner to NGOs in the field of road safety, for enforcement and road safety awareness. If it were empowered to make autonomous decisions, and received better budgeted, that would be an improvement.

### What are the results from the various campaigns to reduce drunk driving and raise awareness, so far?



- At the moment, there are lots of enforcement toward drunk driving and seatbelts.

**General commentaries on post-crash care, besides the emergency number? Were there improvements?**

- There is very minimal effort in that, where there are not enough resources to provide post-crash care. It's limited to traffic enforcement; data are collected only from the officers availing of the information on site. Other than that, it's difficult to access the information, there is no priority from the government's side on funding. The procurement of ambulances and other resources is too limited, this issue has not been prioritised by planners - there is no funding allocated to post-crash emergency services.

**Decade of road safety action**

- Most of the signed commitments were not likely implemented (personal opinion - no concrete involvement from the interviewee)

**NMT policy**

- Has been signed and passed, but the implementation stage is challenging. The pilots, which are part of the strategy, have been started on but the government has not fully moved to the implementation stage, and it lacks so many steps.

Ghana - Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development

**Guiding questions**

- What are the most prominent road safety concerns? Are there any interventions worldwide that you believe would be extremely beneficial in Ghana?
- How well is road design incorporating road safety so far? Are there any challenges and what are the reasons for those?
- How well are speed limits enforced? Are there adequate measures to monitor speed or interventions to improve speed awareness?
- Has road safety been well implemented into curriculums yet and are there safety awareness programs for the community as well? What sort of campaigns have worked thus far?
- Are there any incentives that you believe would improve enforcement or road user behaviour?

Rwanda – Institute for Transportation and Development Policy

**Road safety issues in Rwanda**

- Speeding; driver distractions particularly from phones and other bad driver behaviour in general
- infrastructure improvements are needed in Kigali



- potholes - trying to avoid them can end up causing crashes
- pedestrians don't have dedicated footpaths, causing many crashes
- trying to stop importing old vehicles, but still a big issue

### Road safety management

- The Ministry of Infrastructure (MININFRA) has the MoU, and their implementing agency is the Rwanda Transport Development Agency
- City of Kigali work with the MININFRA but in policy, but they don't always have the time to ensure street designs properly ensure safety

### Safe roads

- Big issue: finding data to justify the blackspots interventions is difficult due to inadequate data collection
- Currently people know where blackspots are, but police are recording crashes in terms of the districts so cover a very large area rather than very specific localised incidents
- There are published papers showing GIS mapping to find blackspots, but data from the police could not be found to be considered
  - 2016 & 2020/21 Author compared data he collected himself on road crashes vs. that which he got from the police and there were discrepancies
- Current infrastructure projects
  - Informal settlement upgrade, interviewee did a review of project to make sure it is useable for road safety; as well as for a highway corridor that would not allow BRT access in the future.

### Safe road users

- Speed cameras and speed governors are mitigating speeding offences
  - public transport was travelling at very high speeds and speed governors are mitigating this, but are not entirely effective yet
  - issue with speed camera was that people were memorising locations, so they included hidden cameras - this appears to be effective in some cases as it is changing attitudes around speeding meaning less enforcement is necessary
  - recommended speed to 40 km/h instead of 60 km/h but seems to have been issues with approval
  - fines for speeding are around \$25, increased to \$50 if you go over 80 km/h
  - fine information for example is usually through police announcements rather than a road safety document
- They have tried to include traffic calming as well such as speed bumps
  - Speed issues currently are now left to negligence/ignorance, some road users (those in big cars for example) may have a very *laissez faire* mindset and disregard other road users; need more sensitisation
- Kigali city is working on awareness
  - Campaign - National Police raised a campaign mainly on school zones hire people to help children cross the streets safety (*Gerayo Amahoro*) started in 2019 - from Ministry



of Infrastructure but through the police, they also teach students how to cross the road, and how to use the road, churches are also joining used as a location to disseminate information

- Police are also teaching people how to use traffic lights, how to cross safely
- Police feature road safety videos on Rwanda Television
- Sundays on the radio - police release an emission and people call the police to come and explain how to use the streets safely.

