

DEFINING SUITABLE SAFE SYSTEM PROJECTS IN AFRICA

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Abstract

When dealing with road safety in Africa, one should bear in mind that road safety problems in Africa must be seen in their own context as the solutions proposed to address them. While it is relevant to take into account international good practices, African stakeholders should become owners of the interventions addressing their problems and take the responsibility for developing and implementing the appropriate solutions, taking advantage of suitable technical assistance, if needed. Based on these considerations, in this paper a presentation is made of the process used in the European research project *SaferAfrica* to define suitable Safe System projects in Africa. *SaferAfrica* aims at supporting policy makers and stakeholders with evidence on critical risk factors, related actions and good practices drawn from high quality data and knowledge. In the project, road safety and traffic management capacity reviews at the country level were carried out in five countries (Cameroon, Burkina Faso, Tunisia, Kenya, and South Africa), following the World Bank guidelines. After conducting such a capacity review, these guidelines recommend the preparation and implementation of Safe System projects, “*stand-alone, multisector initiatives targeting high-risk corridors and areas, with outcomes large enough to be reliably measured.*” In *SaferAfrica*, this approach aims at facilitating the implementation of Safe System projects in the considered countries, by identifying detailed short-term improvement plans, and producing contextualized Terms of Reference for a number of interventions per selected country. These interventions are remedial in nature, they address high-priority concerns and demonstrate the viability of high potential gains within current administrative and legislative frameworks. In order to design interventions suitable to the existing context, the *SaferAfrica transferability audit* was adopted within a “participative” process, involving all possible interested parties, from the institutions to NGOs. Results from the process are presented and discussed.

Keywords: Road Safety; Safety System; Vision Zero; Africa; Road Safety Management

1. Introduction

Road safety is a major health concern in society. In fact, around 1.35 million people die and 50 million are injured in road crashes every year (World Health Organization, 2018). Road traffic crashes are estimated to be the ninth leading cause of death and projections reveal that it will be the third leading cause of death by 2020 (Peden et al., 2004). Relative to their level of motorization, Low- and Middle-income countries (LMICs) bear a disproportionately high burden of road deaths, when compared to more motorized high-income countries. Approximately 90% of the related deaths resulting from road traffic crashes (RTCs) occur in LMICs, while these countries account for 82% of the world's population and their level of motorization stands at only 54% of the world's registered vehicles (World Health Organization, 2018). In the same way, the accident risk (number of accidents per traffic exposure, such as vehicle-km) is generally higher in developing countries, with far more severe consequences, as well (Nordfjærn & Rundmo, 2009; Sobngwi-Tambekou, Bhatti, Kounga, Salmi, & Lagarde, 2010).

Africa is the worst performing continent in road safety. In 2013, the mortality rate in this Continent (26.6 fatalities/10⁵ population) was almost three times that of Europe, where the number of road fatalities represented 31% of the relevant global picture (World Health Organization, 2015). However, the most disturbing concern is the fact that the disparity in road safety results seems to be increasing. Specifically, according to the WHO (World Health Organization, 2018), fatality rates increased in Africa from 26.1 per 100,000 population in 2013 to 26.6 per 100,000 population in 2016.

In any case, progress has been made by some countries in mitigating the number and severity of road accidents (Adminaite, Jost, Stipdonk, & Ward, 2016), but the situation in most LMICs is alarming and worsening (Tony Bliss & Breen, 2012). Overall transport policies in LMICs are often poorly designed and implemented. Infrastructure investments are lagging and price instruments are rarely used (Foster & Briceño-Garmendia, 2009). In Africa, several actions are already ongoing and important high level documents are already in place, paving the way for road safety improvements, such as the African Road Safety Action Plan 2011-2020 (African Union & United Nations Economic Commission for Africa, 2011), a result from the common effort of the African Union (AU) and the United Nations Economic Commission for Africa (UNECA).

Europe could play an important role in supporting African countries to improve their road safety and traffic management performance, due to the improvements achieved in this area. These considerations are addressed through the *SaferAfrica* project; a joint effort of 17 partners from Africa and Europe, aiming to create favorable conditions and opportunities for the effective implementation of road safety and traffic management actions in the African countries, by setting up a Dialogue Platform between both continents (Mavromatis, Laiou, Yannis, Tripodi, & Persia, 2018).

In order to improve road safety performance in African countries, many barriers must be overcome (Mavromatis et al., 2018). The adoption of the Safe System approach to road safety will be a valuable tool to implement effective countermeasures that may significantly improve road safety in Africa. In fact, the Safe System approach to road safety has been successful in a number of countries (Mooren, Grzebieta, & Job, 2011) and has been adopted in the United Nations Plan for the Decade of Action for Road Safety 2011-2020 (World Health Organization, 2011).

Towards this direction, the objective of the present paper is to outline the results of the process used in the *SaferAfrica* project to define Safe System projects in the five

mentioned African countries (Cameroon, Burkina Faso, Tunisia, Kenya, and South Africa), which are suitable to their existing contexts.

2. Safe System approach

The *Safe System approach* evolved from the visions that emerged in Sweden and The Netherlands in the mid-1990s (Tingvall, 1998). In Spring 1995, work on the development of a safe system approach started within what was formerly the Swedish Road Administration. The results of this development work were documented in a memorandum entitled 'Vision Zero – An idea for a road transport system without unrecoverable health losses' (Vägverket, 1996). Vision Zero entails a shift in the road safety planning paradigm. Instead of starting from an existing problem situation, Vision Zero departs from an absolute state of the future – safe road traffic (Belin, Tillgren, & Vedung, 2012). In the Netherlands, a similar policy was developed in the 1990s by the Dutch Institute for Road Safety Research (SWOV) in an effort to promote "inherently safe road traffic". This vision was named "Sustainable Safety" (International Transport Forum, 2016).

At the time, scientists and policy makers began to question the prevailing view that the safety of road users was, in the last instance, a matter of their own responsibility, and that the task of road safety policy was thus primarily to influence road users' behaviour so they would act safely at all times. As the decades-long decreases in the number of road fatalities and severe injuries were levelling out, it became clear that a predominant focus on education, information, regulation and enforcement was no longer delivering progress.

The Safe Systems approach represents a "paradigm shift" (International Transport Forum, 2008; Reznitzer & Grzebieta, 1999; Tingvall, 1998) in road safety. The shift is from treating road injury factors as notionally equal with the underlying assumption that there will always be injury risks inherent in road travel, to conceptualising and pursuing the development and management of a road traffic transport system that is inherently safe for human users. The Safe System approach calls for road, vehicle, cyclists, pedestrians and management design parameters consistent with human fallibility and vulnerability, and places both human biomechanical injury tolerance criteria and consideration of human fallibility as the central governing principles underpinning all road safety policy decisions (Mooren et al., 2011).

The Safe System approach is an effective way to achieve the vision of zero road fatalities and serious injuries, and requires the road system to be designed assuming and accommodating human errors. A Safe System has the following characteristics:

- It recognises that prevention efforts notwithstanding, road users will remain fallible and crashes will occur.
- It stresses that those involved in the design and operation of the road transport system need to accept and share responsibility for the safety of the system, and those that use the system need to accept responsibility for complying with the rules and constraints of the system.
- It aligns safety management decisions with broader transport and planning decisions that meet wider economic, human and environmental goals.
- It shapes interventions to meet the long term goal, rather than relying on "traditional" interventions to set the limits of any long term targets.

The basic strategy of a Safe System approach is to ensure that in the event of a crash, the impact energies on human beings remain below the threshold likely to produce either death or serious injury. This threshold will vary with the crash scenario, depending on

the level of protection offered to the road users involved (International Transport Forum, 2008).

The concept of a Safe System emerged in countries that have been most successful in reducing road trauma in past decades but saw progress becoming more and more difficult to achieve. Yet it is highly relevant too for LMICs and fast-growing cities, that see increased numbers of road deaths and injuries in the wake of rapid motorisation. Unlike many other public health issues, strong economic growth correlates not with less road crash injuries but, often enough, with more victims. Safe System thinking offers LMICs and cities that face a deteriorating road death and serious injury epidemic an opportunity to take a bold step forward, towards convergence with performance in pioneer countries (International Transport Forum, 2016).

In fact, it is recommended that all countries, regardless of their level of road safety performance, adopt the Safe System approach to road safety. This approach builds on existing road safety interventions but reframes the way in which road safety is viewed and managed by the community. It addresses all elements of the road transport system in an integrated way, with the aim to ensure crash energy levels are not sufficient to produce unrecoverable injuries. It requires acceptance of shared system safety responsibilities and of accountability between system designers and road users. It stimulates the development of innovative interventions and of the new partnerships necessary to achieve ambitious long term targets (International Transport Forum, 2008).

Safe System projects are stand-alone, *multisectoral initiatives targeting high-risk corridors and areas, with outcomes large enough to be reliably measured*. These projects should address three broad components, namely: 1) institutional capacity strengthening priorities, 2) targeted interventions in high-risk corridors and areas, and 3) policy reforms where weaknesses have been identified. Moreover, consideration of safety performance monitoring in these projects and the evaluation of their results are also recommended (Tony Bliss & Breen, 2009).

Finally, the framework of road safety countermeasures is rather articulated. In fact, they can be addressed towards different targets like users, vehicles, infrastructures, governance, emergency system and the initiatives cover different field of application. In this way, the investigation of the funding of the road countermeasures as a whole is then a complex task (Alfonsi, Persia, Antonino, & Usami, 2016).

3. Methodology

This section gives an overview of the methodology used for defining suitable safe system projects in selected African countries (figure 1).

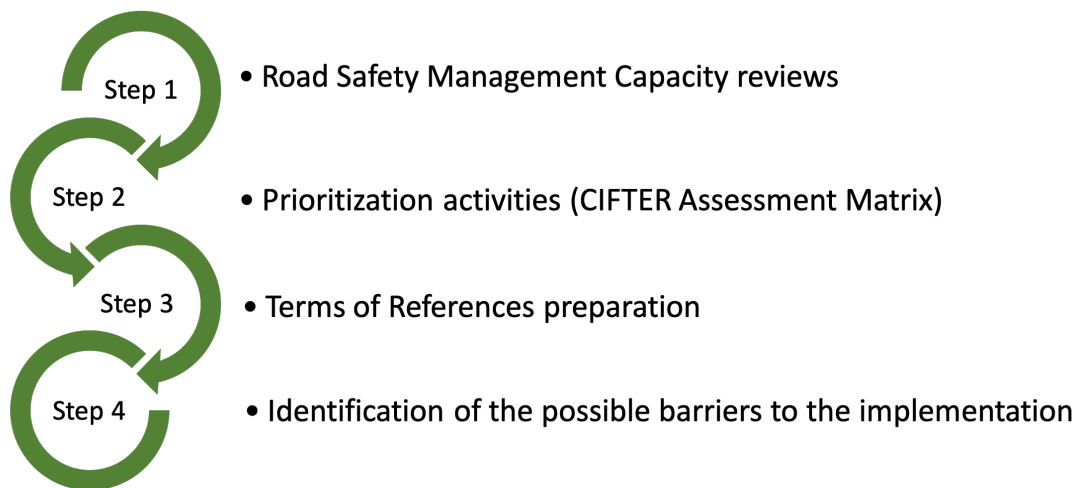


Fig. 1. Methodology

The process started with a Road Safety Management Capacity Review (RSMCR) in each of the five countries (Cameroon, Burkina Faso, Tunisia, Kenya, and South Africa), that were selected as representing different UN geographic areas of Africa.

Based on the findings of the capacity reviews, a list of desirable road safety intervention projects was developed for each country and these was prioritised on the basis of a number of criteria such as ease of implementation, as well as costs and time to implementation.

Next, for each selected project a Terms of Reference (ToR) list was compiled, and, finally, in order to design interventions suitable to the existing context, a SaferAfrica Transferability Audit Tool (González-Hernández, Meta, Persia, Usami, & Cardoso, 2020) was adopted within a “participative” process, involving all possible interested parties, from the institutions to NGOs. The tool will indicate which immediate enabling actions are required to overcome legislative, regulatory, organisational, institutional and other barriers that may prevent measures or actions from being implemented.

3.1. Road Safety Management Capacity Reviews (RSMCRs)

Road Safety Management Capacity Reviews (RSMCR) were conducted by reviewing and analysing (the development of) road safety and traffic management in the five selected countries and on-site interviews with high level major road safety stakeholders.

Dedicated review teams were drawn from the *SaferAfrica* project partners and assisted by two internationally recognised experts (Martin Small and Jeanne Breen). To ensure that the reviews would follow international best practice, this task was explicitly based on the World Bank guidelines (Tony Bliss & Breen, 2009), and attended, as well, the ISO 39001:2012 (ISO, 2012) and the policy frameworks as set by Sustainable Safety (F C M Wegman & Schermers, 2005; Fred C M Wegman & Aarts, 2006) and Vision Zero (Tingvall, 1998), known generically as Safe System (International Transport Forum, 2016). Furthermore, recommendations on road safety management provided by important EC-funded projects (such as DaCoTa) were considered. Importantly, international experiences and, specifically, experiences related to the institutional framework of policy making and the relationship between road safety policy and science, were also considered in this process.

The overall objectives of a road safety and traffic management capacity review, based on engagement with senior management of the key agencies, were the following:

- systematically assess the state of road safety and traffic management;

- summarise the strengths and weaknesses of institutional capacities to significantly improve road safety results;
- reach consensus amongst the key agencies about next steps, and sustainable activities;
- fundamentally improve road safety and traffic management by proposing a long-term headline Safe System strategy and a project concept for activity to launch it.

This last objective is intended at developing a qualitative and long term investment strategy covering the three traditional product development stages: establishment; growth; and consolidation phases (Tony Bliss & Breen, 2009).

3.2. Prioritisation activities

Based on the results of the RSMC reviews, this step served to prioritise and develop specific future implementation projects for each of the selected countries, taking into account the project concept defined in those reviews. These projects are intended to help accelerate the transfer of road safety knowledge and strengthen the capacity of local road safety stakeholders.

To assess the feasibility of further developing these project components and their related enabling projects, a number of approaches, not strictly related to road safety, were explored to look for further criteria that could be included in the transferability tool. Various of these approaches have a different scope, the most frequent one is *project complexity* used to understand the difficulty of managing a specific project. One of these is the tool called CIFTER (*Crawford-Ishikura Factor Table for Evaluating Roles*) which identifies seven factors that affect the management complexity of a project (Table 1). Each factor is rated from (1) to (4) using a natural values scale which expresses a qualitative metric as a quantitative value. These values are then totaled to produce a *management complexity rating* for the project (GAPPS, 2007).

Table 1
CIFTER Assessment matrix (GAPPS, 2007).

Factors	Quantitative values			
1. Stability of the overall project context	Very High (1)	High (2)	Moderate (3)	Low (4)
2. Number of distinct disciplines, methods, or approaches involved in performing the project	Low (1)	Moderate (2)	High (3)	Very High (4)
3. Magnitude of legal, social, or environmental implications from performing the project	Low (1)	Moderate (2)	High (3)	Very High (4)
4. Overall expected financial impact (positive or negative) on the project's stakeholders	Low (1)	Moderate (2)	High (3)	Very High (4)
5. Strategic importance of the project to the organization or organizations involved	Very Low (1)	Low (2)	Moderate (3)	High (4)
6. Stakeholder cohesion regarding the characteristics of the product of the project	High (1)	Moderate (2)	Low (3)	Very Low (4)
7. Number and variety of interfaces between the project and other organizational entities	Low (1)	Moderate (2)	High (3)	High (4)

3.3. Terms of References preparation

For each selected project a list of terms of reference was compiled, following SMART (Specific; Measurable; Achievable; Realistic and Time bound) project objectives and criteria.

Following the World Bank guidelines (T Bliss & Breen, 2013; Tony Bliss & Breen, 2009), the terms of reference prepared, include the following sections:

- The objectives of the required technical assistance services
- The outputs of the required technical assistance service
- The scheduling of the required technical assistance services
- Professional skills and experience required

3.4. *Identification of the possible barriers to the implementation*

The success of a road safety intervention is influenced by many factors. The specific context in which an intervention is applied plays a crucial role for its applicability. Experience shows that the successful application of a road safety intervention in a given country or region does not ensure that its implementation will be equally successful in a different context.

Therefore, in *SaferAfrica*, a method for ex-ante evaluation of the applicability of proposed interventions had to be developed, namely to identify and understand potential barriers influencing the results and effects of the proposed. This type of assessment is based on a range of data, but mainly on interviews with local stakeholders. Therefore, for each project a detailed analysis of the barriers for the implementation needs to be carried out, providing the stakeholders of relevant information about the project.

The method adopted is based on the concept of Road Safety Space proposed by King (2005) to organize the factors influencing a road safety intervention (figure 2). According to King (2005), in a given country each road safety issue exists in a three-dimension space defined by economic, institutional, and social and cultural conditions of the country they are applied to and which factors which influence it. The dimensions include both broad and specific influences. The position of a road safety issue in that space is unique and varies from country to country, although some dimensional factors may be shared across road safety issues or across countries (King, 2005).

Within *SaferAfrica* WP7 “Sharing of good practices”, a Problem Priority Matrix (PPM) was adopted to assess the transfer process (i.e. mainly the *applicability*) of international road safety good practices to an African country. To some extent this entails improving road safety outcomes, but the main objective is to improve the transfer process in the expectation that better outcomes will follow. The tool is based on the methodology adopted in SaferBrain project where the transfer process of interventions improving vulnerable road user safety were assessed for India and Brazil (Appelt & ... et al, 2011).

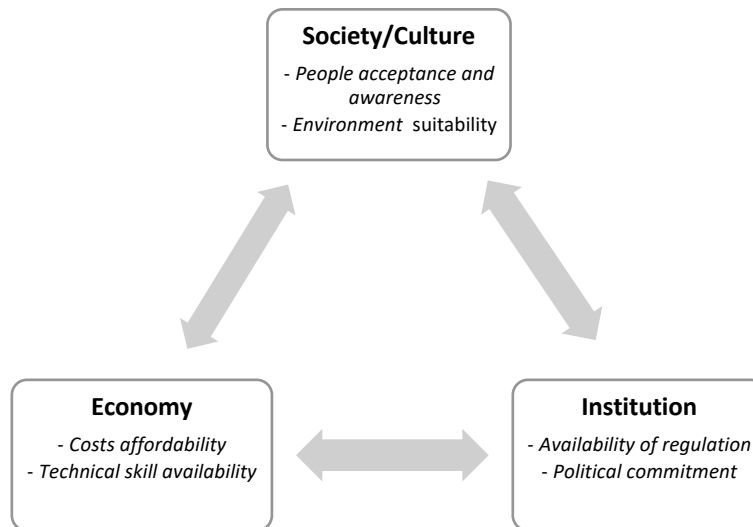


Fig. 2. Model of the road safety space (King, 2005).

The basic task is to assess whether a given road safety intervention may contain a problem within one (or more) of the assessment dimensions provided by the Road Safety Space (i.e. Society/Culture, Economy and Institution) describing the receptor context.

To this aim, six factors are proposed in SaferBrain related to the three main road safety space dimensions. Namely these are: People; Environment; Availability of regulation; Political commitment; Design, implementation and maintenance costs affordability; and Technical skill availability (

Table 2). A number of possible questions related to each factor were derived from existing literature to help assess the applicability of a road safety intervention (Appelt & ... et al, 2011).

The transferability evaluation of each measure was made using a matrix in which country stakeholders rated each factor according to its difficulty (if the implementing the intervention is challenging from that factor perspective) and weight (if the factor is important for the implementation of the intervention in the country). A final aggregated score was then produced for each road safety intervention, which allows serializing the transferability of the analysed interventions (González-Hernández et al., 2020).

Table 2

Questions addressing intervention transferability (Appelt & ... et al, 2011).

Component	Factors	Questions to assess a factor
Society/Culture	<i>People</i>	Would the general public and the targeted population accept this intervention? Does any aspect of the intervention go against local social norms? Is it ethically acceptable? Can the contents of the intervention be tailored to suit the local culture? Does the target population in the local setting have a sufficient educational level to comprehend the contents of the intervention? Is the target population aware of the road safety problem?
	<i>Environment</i>	Is it possible to change the built environment in order to accommodate the proposed practice?
Institution	<i>Availability of regulation</i>	Legislation relevant to the transferability of the intervention available (standards of service and safety, ...)
	<i>Political commitment</i>	Does the political environment of the local society allow this intervention to be implemented? Is there any political barrier to implementing this intervention?

Economy	<i>Design, implementation and maintenance costs affordability</i>	Are the essential resources for implementing this intervention available in the local setting? (list of essential resources would help answer this question)
	<i>Technical skill availability</i>	Does the provider of the intervention in the local setting have the skills to deliver this intervention?

4. RESULTS

4.1. Summary of the key findings from the RSMCR

The five RSMCS (Baja & Usami, 2018; Cardoso, Kluppels, & Vandemeulebroek, 2018; Carnis, Yerpez, & Bouhamed, 2018; Schermers, Omari, & Aketch, 2018; Schermers, Small, & Niekerk, 2019) highlighted both existing issues and provided recommendations at the three levels of the road safety management system model (i.e. Institutional management functions, Interventions, Results). Based on these, it was possible to define strategic priorities to be undertaken during the three development phases (establishment, growth and consolidation phases) of a road safety management implementation plan. For the selected African countries the challenges in building capacity in road safety management have been initiated and the initial steps to establish the organisational structures and procedures have been taken. However, as was evident in countries in Europe, this process will take time. Moreover, as recommended by the World Bank guidelines (Tony Bliss & Breen, 2009). it is crucial that the political will is channelled into long term investment in road safety improvements across all sectors.

In the following the main evidence from RSMCR are reported together with examples of the recommended priorities for the establishment phase.

4.1.1. Results focus at system level: leadership, goal and target-setting

There are relevant differences in how road safety is planned and managed at local and central levels in each country. Considering the framework adopted for undertaking road safety management capacity reviews within *SaferAfrica* project, a road safety lead agency should be mandated to promote road safety, set strategies and targets for road safety improvement, and perform the seven institutional management functions that produce road safety interventions: Results focused approach, Coordination, Legislation, Funding and resource allocation, Promotion, Monitoring and evaluation, Research and development.

Availability of reliable and complete data on fatalities and serious injuries is a major issue for the definition of quantitative targets and strategies. According to the RSMCRs, a national road safety strategy has been adopted in four of the five countries, namely: Burkina Faso, Cameroon, Kenya, and South Africa. However, it can be said that a lead road safety agency, if established, is frequently missing the legal power and/or dedicated financial and human resources to be effective in defining a comprehensive national road safety strategy and coordinating responsible stakeholders for its implementation.

4.1.2. Interventions

Safe roads and roadsides. Factors affecting infrastructure safety can be related to road planning and design, construction (e.g. work zone) and maintenance procedures. In all the addressed countries most of the roads are not paved and, in some countries, like Cameroon and Tunisia, the paved roads are in poor condition. The existent of these problems, together with the lack of maintenance, signage, lighting and design errors, imply that in these

countries the roads are not safe and characterized by a high risk of road accidents. Though speed limits are set for all roads, the levels of non-compliance to speed limits are not being measured and documented.

Safe Vehicles. There is in general a high percentage of powered-two-wheeled vehicles (ranging from 35-40% in Kenya to more than 80% in Burkina Faso) but a little proportion of them is insured (10% in Tunisia). Some countries (Kenya, Burkina Faso and South Africa) have regulations on the safety standards of the vehicles in use, but the standards are limited, and the regulations are weakly enforced. Mandatory vehicle inspections are present in all countries however, these seem not to be carried out periodically (as established by law) and in some cases, not all vehicles are required to be submitted to them.

Road users. According to WHO (2018), there are five main behavioural risk factors for road traffic injuries: speed, driving under the influence, failure to use motorcycle helmets, seat-belts and child restraints. Regarding speed limit laws, these are present in all the 5 countries (with related limits) but drivers rarely respect them and rather speeding is one of the main causes of road accidents. Regarding the driving under the influence of alcohol or drugs each of the 4 countries has a law regulating it with their respective limits; only Burkina Faso does not have a law that regulates driving under the influence of drugs. Finally, regarding the laws of helmet, seat belts and child restraints each of the 5 treated countries has a law that regulates these aspects, except for child restraint law, which is present only in Burkina Faso.

Emergency services and post-crash care. The quality and coverage of the existing medical services are one of the biggest obstacles to an adequate post-crash care. Recommendations to improve emergency care can include the development of a digital trauma registry, the introduction of trauma training for healthcare workers and the development of trauma teams.

4.1.3. Institutional management functions

Coordination. Weak horizontal and vertical coordination.

Legislation. There exists an abundance of road safety legislation (laws, decrees and circulars) some of which need revision (e.g. Vehicle registration, licensing and roadworthiness, Driver licensing and penalties, Vehicle safety regulations). In Burkina Faso Laws are not adapted to the local situation.

Funding and resource allocation. In some countries there is a sustainable source of funding (e.g. the Road Fund in Cameroon). However, there is a lack of resources for implementation and resource allocation procedures are missing.

Promotion. Promoting was evaluated as being ineffective compared to international best practice. Statistics on institutional outputs are not published and made available to stakeholders.

Monitoring and evaluation. Sustainable systems are not operational to collect and manage data on road crashes and mobility. Even if the majority of countries regularly investigate and record road accidents, road accident data are likely to be underestimated. A critical aspect for road safety management in Africa is the lack of a reliable data collection system and the problem of underreporting. This is confirmed by all the RSMCRs. Accident data are often incomplete, and it is unknown what proportion of road accident have been reported and recorded in the official databases used. Modernizing the road safety data collection process seems to be a high priority to enable effective and efficient monitoring and evaluation of road accidents.

Research and development and knowledge transfer. There is very little existing research capacity in road safety has limited research capability in the area of road safety and this capacity will need to be built or sourced from other (international) organisations

4.1.4. Summary

Based on the previous evidences, a list of common issues/opportunities is reported in Table 3.

Table 3
Summary of common issues/opportunities in existing countries

Project Component	Improvement projects
Governance and leadership	Strengthening of institutional management functions of lead agency Capacity building and training
Road Safety Management information	Improved crash registration systems (forms, procedures, capturing) Vehicle/driver registration (roadworthiness) Linkages and supporting data (traffic, mobility, ambulances) Safety Performance Indicators
Road infrastructure / traffic management	Observational surveys Institutional outputs Road safety audit/inspection Safety standards Pedestrian/VRU (management) plans and infrastructure provision Classification and speeds
Speed management	Limits; setting and posting standards Enforcement
Road safety education	Safe schools and routes Helmets and road use
Strengthening supporting legislation	Vehicle registration, licensing and roadworthiness Driver licensing and penalties Vehicle safety regulations
Enforcement	Equipment, standards, protocols, strategies (training and capacity building) Penalty systems Corruption
Post-crash	Training and capacity building Resource management Emergency centres and numbers

4.2. Safe System Projects for Cameroon

In the following it is reported a description of application of the proposed methodology to Cameroon.

4.2.1. Road Safety Management Capacity Reviews (RSMCRs) Prioritisation activities

Based on the results of the road safety management capacity review (RSMCR) undertaken in Cameroon (Baja & Usami, 2018), it is reported that Cameroon's road safety management system is in a lower phase of development. Drivers, vehicles and roads are generally of low standard and a lack of enforcement and supporting road safety infrastructure, all contribute to a declining road safety situation.

The RSMCR allows the development of a strategic action plan in which the strategic priorities are highlighted per development phase. The RSMCR of Cameroon identified the following projects for the establishment phase (Table 4):

Table 4

Examples of Level 1 priorities defined for the Establishment phase in Cameroon

Results focus at system level	Interventions	Institutional management functions
Review and strengthen appropriate lead agency functions, organizational structures and processes	Establish road infrastructure safety management procedures on a selected high-risk corridor and in the two main cities of Yaoundé and Douala	The new accident data collection and analysis system should be rendered operational in the two main cities and in the selected corridor(s)
Manage, monitor and evaluate road safety results in the two major cities Yaoundé and Douala and on a selected inter-urban corridor	Review and internationally benchmark safety policies and interventions and commence implementation of reforms	Set quantitative targets for the two main cities
Define institutional roles, responsibilities and accountabilities for the national goal		
Define annual provision for road safety expenditure in budgets of local governments of Yaoundé and Douala		
Establish an appropriately resourced road safety strategy unit		

A project concept is defined to address weaknesses in the key institutional arrangements at the national levels. The overall objective of the project is building road safety management capacity through institutional reform and accelerating knowledge transfer through “learning by doing”. The focus is to hasten the process of shifting from a weak to a strong institutional management capacity to govern the evolution of improved road safety results.

The project will encourage agencies to work together constructively to deliver and evaluate a set of well-targeted, best practice multi-sectoral interventions. The successful implementation of the project will hinge on the transfer of road safety knowledge, strengthen the capacity of the participating partners and stakeholders, and rapidly produce results in the country that will provide benchmarks to apply to the next stage of investment.

The project is structured in 16 improvement projects organised in four main components (Table 5):

- Project leadership and management,
- Multi-sectoral interventions in demonstration corridors,
- Monitoring and Evaluation System,
- Policy reviews.

Table 5

Cameroon project components and related improvement projects

Project Component	Improvement projects
Project leadership and management,	Create and clearly define governmental road safety roles Training programs for road safety institutions Institutional arrangements Project promotion

Multi-sectoral interventions in demonstration corridors	Infrastructure safety improvement Enforcement program Publicity and awareness campaign Post-crash care improvement
Monitoring and Evaluation System	Project performance targets definition Survey for project performance measuring Accident data collection operational in Yaoundè, Douala and selected corridor(s) Analysis and reporting
Policy reviews	Road planning and design standards against Safe System principles Police action on speed and drinking driving against best practice deterrence principles Legislative, regulatory and data system needs Institutional delivery by the ministry of transport/lead agency and its partners of the necessary key interventions to achieve road safety results

4.2.2. Assessment methodology and draft Terms of References preparation

A CIFTER scale was used to determine the most viable improvement projects in the country. Each project was assessed by the RSMCR team considering the seven factors CIFTER criteria. In order to select those projects to be considered for a further assessment by the stakeholders, two criteria have been considered.

The first criterion is the total score gained by each project, given by summing all the points across the seven factors. According to CIFTER methodology higher scores identify complex projects, especially in terms of management, so priority should be given to those projects with the lowest rates.

The second criterion is related to the overall scope of the group of selected projects. To this aim, the group of projects should possibly cover the four project component categories: Demonstration projects in targeted high-risk corridors and areas, Policy reviews, Project leadership and management and Monitoring and evaluation systems.

The CIFTER ratings have indicated that the majority of projects are rated either as highly complex or complex. It will therefore be essential that skilled project teams led by experienced road safety project managers are appointed in the execution phase. Based on the results of the assessment the following projects were considered for Cameroon:

1. Create and clearly define governmental road safety roles
2. Enforcement program
3. Project performance targets definition
4. Survey for project performance measuring
5. Analysis and reporting
6. Accident data collection operational in Yaoundé, Douala and selected corridor(s)
7. Enforcement review.

A detailed description of the selected projects has been prepared in the form of a Terms of Reference, including the following sections (Bliss and Breen, 2009):

1. The objectives of the required technical assistance services
2. The outputs of the required technical assistance service
3. The scheduling of the required technical assistance services
4. Professional skills and experience required

4.2.3. Identification of the possible barriers to the implementation and ToRs refinement

A stakeholders' consultation to further assess the feasibility of the selected projects was undertaken. A checklist with possible barriers to project implementation was prepared

based on the transferability audit tool (González-Hernández et al., 2020) defined in WP7 of SaferAfrica project. Six stakeholders from the government, NGOs and research were involved. Each interviewed stakeholder received the used the checklist to assess any possible social, cultural, institutional, economical factor representing an obstacle to the selected projects.

Society/Culture related barriers. Some of the proposed interventions (projects N° 1, 2, 6) could be accepted with some resistance by the general public due to low awareness of the possible impact of the projects on the population. The potential solution to this will be to create a period of sensitization and awareness within which the importance and impact of the project will be made known to the target population.

The target population (especially for project N° 3) is aware of the road safety problem but might not have enough educational level to comprehend the contents of the intervention, as such there should be awareness raising and sensitization tailored to their level of education to enable clarity and comprehension of the contents of the interventions.

Institution related barriers. In project N° 1, Create and clearly define governmental road safety roles, there is conflict of interest among key stakeholders resulting from lack of clear definition of roles. For example, on the roads the Ministry of Transport and the Ministry of Defence are not working in synergy. The gendarmes are supposed to be there for enforcement while the operational staff should be from the Ministry of Transport but that is not the case. Each Ministry functions independent of the other.

The legislation relevant to the implementation of project N° 2 is partially available, because legislation is available for Police action on speed and drink driving, however, the roles of the key players are not clearly defined; agreements or memoranda should be considered at the design stage of the intervention.

Economy related barriers. Weak capacity was highlighted for a number of projects (N° 3, 5, 6). This has been explained by shortage of trained personnel (e.g. human resource to manage data collection), lack of motivation for the gendarmes and police on the roads, insufficient equipment available (e.g. radars to control speeds).

The skills are dispersed and need coordination. There is need for synergy and coordination to have the right people working at the right departments. Skill exist in dispersed ranks and need synergy and coordination for efficiency. More police officers need training. For definition of roles, the capacity of stakeholders in the local setting need to be reinforced to meet up with the roles. The skills are dispersed and need coordination. Lack of clarity with respect to who is responsible for financing the project

5. Discussion and Conclusions

This paper has presented the results of the process used in the *SaferAfrica* project to implement Safe System projects in the five African countries: Cameroon, Burkina Faso, Tunisia, Kenya, and South Africa, which are suitable to their existing contexts. Its applicability in a context like the Africa region, make the procedure very attractive for Low- and Middle-income countries (LMICs). This process included the Road Safety Management Capacity Reviews (RSMCR), prioritisation activities according to CIFTER tool, Terms of References preparation and identification of the possible barriers to the implementation.

The effective implementation of the Road Safety Management Capacity Review must be supported by recognized road safety specialists with successful strategic management experience at country and international levels (Tony Bliss & Breen, 2009). In this study, the RSMCR were conducted by recognised international experts who are part of the partners of the *SaferAfrica* project, assisted by two internationally recognised experts (Martin Small and Jeanne Breen). Regarding to this issue, it is very important to build knowledge in the region,

so that later local experts can carry out this kind of work with the support of international experts.

Regarding to the CIFTER scale used to understand the difficulty of managing a specific project, that is to say the project complexity. There is the limitation of depending on the concept and experience of the expert who performs the analysis. The CIFTER is a subjective tool, in this way, ratings on individual factors may vary for the same project.

There is no single pathway for the adoption, establishment and implementation of a Safe System. Moving to a Safe System is a learning-by-doing process best described as a journey which presents opportunities, hazards and challenges along the way. The experiences of the pioneering countries show that each follows its own journey, shaped by the cultural, temporal and local context (International Transport Forum, 2016). Regarding these aspects, it is important to take them into account for the African context.

The methodology was validated in the five African countries: Cameroon, Burkina Faso, Tunisia, Kenya, and South Africa. But nevertheless, this first phase only includes the process to define Safe System projects in this African countries. Therefore, the execution phase is still pending and it will be necessary to take into account other factors not analysed in this study. In any case, this first step allows a great advance in the objective of reducing road traffic crashes and improving road safety in developing countries and especially in the Africa region.

Cameroon, Kenya, South Africa and Tunisia are classified as Middle-income countries, while Burkina Faso belongs to Low-income country. According to RSMCR findings, in all these countries the initial steps to establish the organisational structures and procedures have been taken already. However, a well-defined road safety investment strategy still needs to be developed, to build capacity and move these countries from the early establishment phase *“Focus on driver interventions”* to a long-term consolidation phase *“Focus on system-wide interventions, long-term elimination of deaths and serious injuries and shared responsibility”*.

In Burkina Faso and Kenya, for instance, the RSMCR highlighted a road safety approach focussed *“on driver interventions”*. This was the approach used in high income countries in the period 1950-1960, when safety management was characterized by a set of uncoordinated decisions and actions (Koorstra, Lynam, & Nilsson, 2002) and the emphasis was laid on the errors of road users, leading to preventive measures focused on road user training and education (F. McDermott, 1978; F. T. McDermott & Hough, 1979). This approach deprived the authorities of complete responsibility to road safety and proved of limited value in preventing serious injuries and deaths, especially among non-motorized road users.

Finally, the Safe System approach represent a substantial shift in how road safety problems and solutions are conceived. Strong and sustained leadership to initiate and see through the shift to a Safe System is vital (International Transport Forum, 2016). This requires actions from all fronts: political leaders, leaders of companies and public agencies, policy makers and academics in a position to influence change in a local, regional or national government, corporate or social setting. However, it is too early for a full critical analysis of the successes and failures of the Safe System projects in African countries. Thus, further studies should be carried out in this direction.

CRedit authorship contribution statement

D. S. Usami: conceptualization, methodology, formal analysis, investigation, writing – original draft. **B. Gonzalez-Hernandez:** methodology, formal analysis, investigation, writing – original draft. **L. Persia:** supervision, project administration, funding acquisition. **N. B.**

Kunsoan: formal analysis, investigation. **E. Meta:** formal analysis, investigation. **M. R. Saporito:** formal analysis, investigation. **G. Schermers:** conceptualization, formal analysis, investigation, funding acquisition. **L. Carnis:** formal analysis, investigation, funding acquisition. **J. Yerpez:** formal analysis, investigation. **N. Bouhamed:** formal analysis, investigation. **J. Cardoso:** formal analysis, investigation, writing – review & editing, funding acquisition. **L. Kluppels:** formal analysis, investigation, funding acquisition. **F. Vandemeulebroek:** formal analysis, investigation.

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