# SPECIFICATION OF SAFE SYSTEM PROJECTS: KENYA

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<td>Report authors:</td>
<td>G Schermers, PP Omari, S Aketch</td>
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Table of Contents

1 Introduction ............................................................................................................ 5
  1.1 The Decade of Action for Road Safety 2011-2020 ................................................. 5
  1.2 Outline of the Safe systems approach ................................................................... 5
  1.3 Overview of Saferafrica WP5 ............................................................................. 6
2 Defining safe systems projects ............................................................................. 6
  2.1 Prioritisation activities ....................................................................................... 6
  2.2 Assessment methodology .................................................................................... 7
  2.3 Terms of Reference preparation ......................................................................... 9
  2.4 Identification of possible barriers to the implementation .................................. 11
3 Summary of the key findings from the Kenya RSMCR ........................................ 14
  3.1 Institutional management functions ................................................................. 15
  3.2 Interventions ..................................................................................................... 18
  3.3 Results ............................................................................................................... 20
  3.4 Key projects emanating from the RSMCR ......................................................... 22
    3.4.1 Project Component 1: In depth review of the NTSA and related institutional
        setting .................................................................................................................... 22
    3.4.2 Project Component 2: Legislative and operational reviews ....................... 23
    3.4.3 Project component 3: Capacity building and training in road safety
        management ........................................................................................................ 27
    3.4.4 Project component 4: Intervention strategy and implementation projects 28
4 Selecting and prioritising key projects .................................................................. 29
  4.1 Project component 1: In-depth review of the NTSA and related institutional
      setting ....................................................................................................................... 31
    4.1.1 Review of the structure and function of the road safety lead agency ........ 31
    4.1.2 Coordination, policy and funding for NTSA ............................................... 32
    4.1.3 Review of National road safety strategic plan against global best practice 32
    4.1.4 Enabling legislation to provide NTSA the mandate to act as lead agency . 33
    4.1.5 Road safety management data .................................................................... 34
  4.2 Project component 2: Legislative and operational reviews ............................... 36
    4.2.1 Legal framework ....................................................................................... 36
    4.2.2 Driver training and road user standards ..................................................... 38
    4.2.3 Vehicle standards ...................................................................................... 40
    4.2.4 Road classification, road design and maintenance standards .................... 41
    4.2.5 Traffic law enforcement ............................................................................ 43
    4.2.6 Post-crash care .......................................................................................... 43
  4.3 Project component 3: Capacity building and training in road safety management 45
  4.4 Project component 4: Intervention strategy and implementation projects ..... 46
4.4.1 Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi ................................................................. 47
4.4.2 Conduct a Value of Statistical Life study for Road Safety in Kenya .......... 48
4.4.3 Hazardous Materials Safety and Transportation ...................................... 50
4.4.4 Mombasa –Uganda Highway Rest Center .............................................. 51
4.4.5 Model Road Safety Planning And Design .............................................. 53
4.5 Summary of project ratings ........................................................................ 54

5 Terms of reference for the various projects components ............................ 57
5.1 Project Component 1: In depth review of the NTSA and related institutional setting ............................................................................................ 57
    5.1.1 Objectives ......................................................................................... 57
    5.1.2 Outputs ............................................................................................ 58
    5.1.3 Professional skills and experience required ....................................... 59
5.2 Project component 2: Legislative and operational reviews ....................... 59
    5.2.1 Objectives ......................................................................................... 59
    5.2.2 Outputs ............................................................................................ 62
    5.2.3 Scheduling of tasks ......................................................................... 62
    5.2.4 Professional skills and experience required ....................................... 63
5.3 Project component 3: Capacity building and training in road safety management 63
    5.3.1 Objectives ......................................................................................... 65
    5.3.2 Outputs ............................................................................................ 65
5.4 Project component 4: Intervention strategy and implementation projects ...... 68
    5.4.1 Objectives ......................................................................................... 68
    5.4.2 Outputs ............................................................................................ 70
    5.4.3 Scheduling of tasks ......................................................................... 70
    5.4.4 Professional skills and experience required ....................................... 71
6 References .................................................................................................... 73
1 Introduction

1.1 The Decade of Action for Road Safety 2011-2020

Recognising the international road safety problem resulted in the United Nations taking a leading role and calling for action through the introduction the Decade of Action (DOA) for road safety. The concept of a Decade for road safety was formalised at the First Global Ministerial Conference on Road Safety in 2009 in Moscow. The 2009 Moscow Declaration on road safety called for the implementation of the action programme outlined in the WHO 2004 World Report on Road Traffic Injury Prevention (Peden et al., 2004) and called on the United Nations General Assembly to declare 2011 - 2020 as a decade of action for road safety. At its meeting on 2 March 2010 the UN General Assembly adopted this call and produced the Global Plan for the Decade of Action for Road Safety (United Nations, 2011). An associated planning document was prepared by the WHO inviting member countries to prepare country specific strategies.

UN resolution A/RES/64/255 sets the goal for the Decade "to stabilize and then reduce the forecast level of road traffic fatalities around the world by increasing activities conducted at the national, regional and global levels." Through this resolution all Member States are expected to set road safety targets which should be achieved during the period covered by the Global Plan. Consequently many African countries have adopted the Global Plan and developed country specific strategies outlining the road safety targets and actions plans to achieve this. Also the African Union (AU) has embraced the UN Decade of Action and together with the United Nations Economic Commission for Africa (UNECA) has defined the African Road Safety Action Plan 2011-2020.

In line with the UN Decade of Action, the Africa Action Plan is built around in five pillars each with its own specific objectives:

- **Road safety management.** To build institutional capacity, improve capacity building at the local government level and develop local research and road safety monitoring.
- **Safer roads and mobility.** To properly consider road safety in infrastructure development and to introduce and/or improve facilities for pedestrians and other vulnerable road users.
- **Safer vehicles.** To review safety standards for vehicles and safety equipment.
- **Safer road users.** To review standards and rules for the provision of licenses to private, commercial and public transport drivers and to strengthen law enforcement.
- **Post-crash response.** To improve capacities in terms of on-site care, trauma care and transport of the injured to appropriate medical facilities.

1.2 Outline of the Safe systems approach

The core strategy of a Safe System Approach is to ensure that in the event of a crash, the associated impact energies remain below the threshold likely to produce either death or serious injury even though such threshold would vary from crash scenario to crash scenario, depending on the level of protection offered to the road users involved.
A Safe System Approach is considered appropriate for countries at all levels of road safety performance, with specific interventions likely to differ from country to country. The elimination of all deaths and serious injuries represents a long term goal that can be combined with specific interim interventions to achieve immediate and intermediate safety benefits.

The safe system model that supports most if not all visions towards zero fatality is built on four key principles of: (1) an understanding of the trend and involved risks; (2) effective enforcement of the prevailing rules of the road; (3) effective education of the road user; (4) effective regulatory system for admittance onto and exit from the road traffic system.

1.3 Overview of Saferafrica WP5

WP5 of the SaferAfrica project involves capacity reviews of road safety and traffic management at the country level (SaferAfrica Consortium, 2016). The aim is to systematically assess the state of traffic and road safety management in five selected countries and to propose sustainable remedial programs and actions to fundamentally improve traffic and road safety management in those countries. The WP5 outputs will contribute to fine tuning the activities of other WPs, particularly WP4 and WP6 (see http://saferafrica.eu/) whilst it provides key inputs to WP3 in which further reaching plans for road safety improvement in Africa are being prepared for discussion in the Dialogue Platform (WP2). To achieve this, 5 tasks will be carried out namely:

- Task 5.1: Scoping of road safety actions and legislation (completed)
- Task 5.2: Road safety and traffic management capacity reviews (completed)
- Task 5.3: Specification and selection of Safe System Approach projects (this report forms part of this task)
- Task 5.4: Studies on National Road Safety Agencies
- Task 5.5: Studies on the standardisation of vehicles and road infrastructures

This report deals with Task 5.3 and then specifically specifying safe systems projects for Kenya.

2 Defining safe systems projects

2.1 Prioritisation activities

Based on the results of the RSMC reviews, Task 5.3 will serve to prioritise and develop specific future implementation projects for each of the selected countries, taking into account the project concept defined in the capacity review. These projects will help accelerate the transfer of road safety knowledge and strengthen the capacity of road safety stakeholders.

Task 5.3 will propose detailed short-term improvement plans (in the form of a Terms of Reference) for a number of key projects per selected country (maximum of 10 projects in each of 5 countries). These projects will be remedial in nature, will address high-priority projects and will be able to demonstrate high potential gains within current administrative and legislative frameworks (i.e. projects requiring longer term amendments to standards, legislations and regulations will be excluded). In addition, Task 5.3 will indicate which immediate enabling actions will need to be undertaken in order to overcome legislative, regulatory, organisational,
institutional and other barriers that may prevent measures or actions from being implemented. These will be further developed in Tasks 5.4 and 5.5.

Task 5.3 task entails the following specific activities:

**Activity 5.3a Prioritise and develop (small) improvement projects in selected countries (10/country, only minor barriers)**

The primary input for this activity will come from Task 5.1 and 5.2. Based on the capacity review reports and gap analysis, a list of improvement projects will be developed for each country and (a maximum of) 10 projects will be listed and prioritised on the basis of a number of criteria including potential road safety effect, cost, complexity, maintenance, time scale, planning level and any other relevant criteria that may be developed from within the project.

**Activity 5.3b Prepare terms of reference (remedial projects)**

For each of the most implementable (short term) projects a term of reference will be compiled comprising SMART (Specific; Measurable; Achievable; Realistic and Time bound) project objectives and criteria.

**Activity 5.3c Define legislative; regulatory; organisational; financial; institutional barriers**

For each country the most highly ranked projects (maximum of 10) will be assessed in order to identify potential barriers that may preclude implementation. Although these will, to an extent, have been covered in the prioritization criteria, this activity intends a much more detailed assessment of potential project constraints. These could be legal, financial, organisational, cultural, institutional or regulatory.

**Activity 5.3d Develop short to medium term strategy (input to 5.4 and 5.5) to overcome barriers**

Building on the activity above, for each country and each project, a list of remedial action plans will be developed to overcome identified barriers. Again some sort of prioritisation process will be applied to take into account timing related issues (e.g. If there are legal constraints it may take a number of years before these have been resolved thereby making short term implementation unlikely). This may affect the original project list so an iterative but flexible approach will be needed to result in a list of 10 implementable short projects for each of the countries. Bear in mind that these projects will serve as demonstration projects and must take into account all possible factors given the country and its capabilities.

### 2.2 Assessment methodology

Based on the findings of the capacity review a number of project components were identified. 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 that was developed in WP7. 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 a tool called CIFTER (Crawford-Ishikura Factor Table for Evaluating Roles) which identifies seven factors that affect specifically the management complexity of a project. Each factor is rated from (1) to (4) using a point scale which places a quantitative value to a qualitative metric. These points are then totaled to produce a management complexity rating for the project ((GAPPS), 2007). The total number of points across the seven factors determine whether a project is Global level 1 or 2 or neither and where:

- 11 points or less: projects cannot be used to provide evidence for a GAPPS compliant performance assessment.
- 12 points or more: projects can be used to provide evidence for a GAPPS compliant performance assessment at Global Level 1.
- 19 points or more: projects can be used to provide evidence for a GAPPS compliant performance assessment at Global Level 2.

GAPPS assesses individual competences necessary for effective project management. The higher the score and global level the more competences are required from the project manager or management team. It stands to reason that projects with very high CIFTER scores will require exceptionally talented managers to successfully bring these projects to the desired conclusion.

Among the 7 criteria, criteria 1 (Stability of the project context), 5 (Strategic importance of the project to the organization or organizations involved), 6 (Stakeholder cohesion regarding the characteristics of the product of the project) and 7 (Number and variety of interfaces between the project and other organisational entities) might be considered as additional criteria in the Institution component.

Table 1: CIFTER Assessment matrix ((GAPPS), 2007)

<table>
<thead>
<tr>
<th>1. Stability of the overall project context</th>
<th>Very High (1)</th>
<th>High (2)</th>
<th>Moderate (3)</th>
<th>Low (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
<td>Low (1)</td>
<td>Moderate (2)</td>
<td>High (3)</td>
<td>Very High (4)</td>
</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
<td>Low (1)</td>
<td>Moderate (2)</td>
<td>High (3)</td>
<td>Very High (4)</td>
</tr>
<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
<td>Low (1)</td>
<td>Moderate (2)</td>
<td>High (3)</td>
<td>Very High (4)</td>
</tr>
<tr>
<td>5. Strategic importance of the project to the organization or organizations involved</td>
<td>Very Low (1)</td>
<td>Low (2)</td>
<td>Moderate (3)</td>
<td>High (4)</td>
</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
<td>High (1)</td>
<td>Moderate (2)</td>
<td>Low (3)</td>
<td>Very Low (4)</td>
</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
<td>Low (1)</td>
<td>Moderate (2)</td>
<td>High (3)</td>
<td>High (4)</td>
</tr>
</tbody>
</table>
2.3 Terms of Reference preparation

For each selected project a term of reference will be compiled and comprise SMART (Specific; Measurable; Achievable; Realistic and Time bound) project objectives and criteria. A term of reference should include the following sections (Bliss & Breen, 2009, 2013):

- 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

A sample terms of reference for the procurement of technical assistance services to support the preparation and implementation of Safe System projects is reported as an example below (Breen et al., 2013).
Technical assistance for
Demonstration projects in targeted high-risk corridors and areas

Sample component 1

Safe Road Infrastructure

Objectives
The objectives of the required technical assistance services are to:

- Advise on and support the application of proactive tools and procedures for the identification of hazardous road infrastructure (e.g. International Road Assessment Programme [iRAP] surveys, safety inspections, safety audits) and the design, implementation, maintenance and evaluation of improved infrastructure safety features.

- Train road agency and associated consulting staff, in the design, implementation, maintenance and evaluation of improved infrastructure safety programs in high-risk corridors and areas.

- Support the preparation of a (national) post-project program of infrastructure safety improvements network-wide, based on successful experience in the high-risk corridors and areas.

Outputs
The outputs of the required technical assistance services are as follows:

(a) Advise on and support the application of proactive tools, procedures and programs for improving infrastructure safety in the high-risk corridors and areas.

Outputs

i. Guidelines for the conduct of iRAP, safety inspection and safety audit programs in the high-risk corridors and areas.

ii. Guidelines for the design, implementation and maintenance of innovative mass action programs providing systematic infrastructure safety improvements in the high-risk corridors and areas (e.g. barriers, roundabouts, traffic calming, pedestrian and motorcyclist/cyclist facilities, signs and markings, lighting, etc).

iii. On-the-job support to the application of the guidelines to improve infrastructure safety in the high-risk corridors and areas including preparation of designs for innovative mass action programs and draft bidding documents for civil works requirements.
2.4 Identification of 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 to be applied, plays a crucial role for its applicability. These factors can be referred to the concept of Road Safety Space proposed by King (2005) (Figure 2). According to King (2005), "each road safety issue in a given country exists in a space defined by the economic, institutional, social and cultural factors which influence it. The factors include both

Figure 1: Example of a terms of reference for improving road infrastructure (Bliss & Breen, 2013)
broad and specific influences. The road safety space varies from one road safety issue to another, and from country to country, although some factors may be shared across road safety issues or across countries”.

**Figure 2: Model of the road safety space (King, 2005)**

The focus of Task 5.3 is on the applicability of the proposed interventions and more specifically on the understanding of potential barriers influencing the results and effects of the projects. 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.

Within WP7 “Sharing of good practices” of SaferAfrica project a Problem Priority Matrix (PPM) is 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).

The basic task is to assess whether a given road safety measure/concept may be perceived as a problem within one (or more) of the assessment area(s) provided by the Road Safety Space (i.e. Society/Culture, Economy and Institution) as research layers which describe the receptor context.

To this aim, 6 factors are proposed in SaferBrain related to the 3 main road safety space components. Namely these are: People, Environment, Availability of regulation, Political
commitment, Design, Implementation and maintenance costs affordability, Technical skill availability (Errore. L'origine riferimento non è stata trovata.). A number of possible questions related to each factor/criterion has been derived from existing literature to assess the applicability of a measure/concept (Appelt et al., 2011).

Since the factors are specific to each measure/concept, adequate process and contextual information should be provided to inform about the factors that may contribute to the implementation and effectiveness of the intervention. Moreover, more factors or criteria can be added to a component or the proposed ones can be changed.

Table 2: Questions addressing intervention transferability (Appelt et al., 2009; Wang et al., 2016)

<table>
<thead>
<tr>
<th>Component</th>
<th>Factors/Criteria</th>
<th>Questions to assess Criterion</th>
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<tr>
<td>Society/Culture</td>
<td>People</td>
<td>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?</td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td>Is it possible to change the built environment in order to accommodate the proposed practice?</td>
</tr>
<tr>
<td>Institution</td>
<td>Availability of regulation</td>
<td>Legislation relevant to the transferability of the intervention available (standards of service and safety, ...)</td>
</tr>
<tr>
<td></td>
<td>Political commitment</td>
<td>Does the political environment of the local society allow this intervention to be implemented? Is there any political barrier to implementing this intervention?</td>
</tr>
<tr>
<td>Economy</td>
<td>Design, implementation and maintenance costs affordability</td>
<td>Are the essential resources for implementing this intervention available in the local setting? (list of essential resources would help answer this question)</td>
</tr>
<tr>
<td></td>
<td>Technical skill availability</td>
<td>Does the provider of the intervention in the local setting have the skill to deliver this intervention?</td>
</tr>
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The questions in Errore. L'origine riferimento non è stata trovata. are adopted in task 5.3 as a checklist to identify potential barriers to the implementation of the selected projects.
3  Summary of the key findings from the Kenya RSMCR

For Kenya 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 (G; Schermers, Omari, & Aketch, 2018; G. Schermers & Rodriguez-Palmeiro, 2017). However, as was evident in countries in Europe, this process will take time. Moreover, as recommended by the World Bank guidelines (Bliss & Breen, 2009) it is crucial that the political will is channelled into long term investment in road safety improvements across all sectors. Part of the RSMCR is therefore intended at developing a qualitative and long term investment strategy covering the three traditional product development stages; establishment, growth and consolidation phases (Figure 3).

![Figure 3: Road safety investment strategy (Bliss & Breen, 2009)](image)

The RSMCR of Kenya (G; Schermers et al., 2018) has clearly demonstrated that Kenya currently is still experiencing significant problems across most areas of road safety management. There is an apparent lack of capacity in this area and the fact that road safety targets are not evidence based or driven, that targets are not shared by stakeholders, that road traffic crash numbers are growing, that approaches and remedial programmes are fragmented and underfunded, all suggest that Kenya finds itself very much in the Establishment Phase (Figure 3) of the development cycle. Recognising this allows a strategic action plan to be built up in which there is a logical progression in which strategic priorities in one preceding phase become building blocks in the following phase. In this way it can be ensured that all the vital components
necessary for effective road safety management are in place before driving large scale intervention programmes and associated investments forward.

The RSMCR of Kenya allows the development of a strategic action plan in which the strategic priorities are highlighted per development phase. This also forms the foundation of a proposed long-term road safety investment strategy for road safety which is presented in the next chapter.

3.1 Institutional management functions

The current RSMCR revealed that institutional organisation and leadership in Kenya were established but capacity was weak. Since 2012, the NTSA is the appointed lead agency and is mandated by law to manage road safety in the country. However, many of the institutional management functions have not been developed within the agency nor are they evident in other organisational structures. There is no clear results focus and that is in part attributed to the lack of good road safety management data. Crashes are poorly registered and there are no linkages with other primary data from e.g. the hospitals. Coordination is still fragmented, and structures and procedures need to be strengthened or put in place in order to support road safety activities across and within government structures. The research and development, monitoring and evaluation, and funding and resource allocation functions are poorly developed and need building.
Table 3 presents proposals for strategic projects aimed at building institutional management capacity in Kenya over the three phases of the road safety development cycle. An important factor in implementing road safety interventions is that ultimately there is a marked effect on crash numbers, especially reductions in fatalities and serious injuries. However, in order for interventions to be effective there are many issues and aspects that need to be in place to enable these to be effectively implemented and managed. These include ensuring that all the supporting management and related structures are in place to manage this process. The nature of the projects identified for improving the situation in Kenya are all primarily projects that are typical to a country finding itself in the early phases of the development cycle and are essential enabling projects that will facilitate the effective implementation for future projects that directly impact on crash numbers.
**Table 3: Outline of proposed strategic initiatives aimed at improving institutional management capacity in Kenya in the three development phases**

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Growth</th>
<th>Consolidation</th>
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<tbody>
<tr>
<td>Review the current road safety management information capability with focus on establishing a modernised road crash data reporting and recording system (Focus on fatal crashes and availability to all sectors)</td>
<td>Evaluate registration rate and disseminate results on an ongoing basis and provide support and build capacity in crash reporting, recording and analysis. Develop and implement strategies to improve registration of injury crashes</td>
<td>Expand the crash information system to a full safety management information management system linking road geometric data, traffic counting data, crashes, vehicle and driver registrations, critical offences, enforcement inputs and offence registers</td>
</tr>
<tr>
<td>Develop /commission a critical offence/SPI programme defining goals/targets and associated monitoring and evaluation programmes and conduct benchmark surveys</td>
<td>Assess critical offences and evaluate impacts of short to mid-term interventions. Coordinate and strengthen interventions to drive offence rates down</td>
<td>Annual monitoring and evaluation of critical offences and assessment of intervention efficacy. Identify new initiatives and develop monitoring and evaluation programmes</td>
</tr>
<tr>
<td>Build and establish lead agency role with respect to the coordination, research &amp; development; monitoring and evaluation; funding and resource allocation functions</td>
<td>Review performance of lead agency role, conduct RSMCR, strengthen and realign focus and activities to current demand.</td>
<td>Review lead agency role and adapt where necessary (RSMCR). Assess and evaluate performance</td>
</tr>
<tr>
<td>Define overall management structure, roles and responsibilities of stakeholders and develop performance based service contracts with road safety partners</td>
<td>Evaluate and assess partner performance and re-align where necessary. Assess the efficacy of the management structure and determine whether it meets current and future needs</td>
<td>Evaluate and assess partner performance and re-align where necessary. Assess the efficacy of the management structure and determine whether it meets current and future needs</td>
</tr>
<tr>
<td>Review and consolidate the legislative framework governing road safety management, in particular those related to Vehicles; drivers; Roads and Traffic management</td>
<td>Evaluate and fine tune. Introduce amendments as needed</td>
<td>Review legal framework and ensure it meets current needs. Adapt and refine as needed</td>
</tr>
<tr>
<td>Expand and monitor and evaluate driver and vehicle registration systems and review potential to integrate with enforcement</td>
<td>Evaluate periodic testing against critical offence and enforcement checks. Assess enforcement efficacy. Revise driver training and licensing standards to be current</td>
<td>Monitor licensing and testing system to ensure on-going compliance and adjust to achieve optimal performance. Assess enforcement efficacy</td>
</tr>
<tr>
<td>Develop and initiate monitoring and evaluation programmes for 1) Short term action plan 2) Corridor based interventions 3) Final outcomes</td>
<td>Develop long term strategic road safety plan and associated action plans. Monitor and evaluate annual implementation and effect, fine tune</td>
<td>Amend or re-develop long term strategic road safety plan and associated action plans. Monitor and evaluate annual implementation and effect, fine tune</td>
</tr>
<tr>
<td>Develop a programme to determine the cost of road safety in Kenya</td>
<td>Assess the application and relevance. Amend and/or review as needed (1/5years). Provide training and capacity building on application</td>
<td>Assess the application and relevance. Amend and/or review as needed (1/5years)</td>
</tr>
</tbody>
</table>
Interventions relate to activities undertaken to redress road safety problems related to vehicles, roads, road users and post-crash care. These are typically the result of issues identified as part of the focus to reduce the number of serious crashes and related safety performance indicators in order to achieve a safe road traffic environment where crashes are prevented or if they cannot be prevented their outcomes are managed to minimize injury. Interventions are ongoing and include aspects such as road and vehicle standards that support the concept of safe speed limits, ensuring that roads, road users and vehicles using the roads remain compliant to standards and regulations; that post-crash care actively contributes to reducing the severity outcomes of crashes; that vulnerable road users are protected by applying the principles of safe speeds.

In Kenya is has been demonstrated that that roads in urban and rural areas were not compliant to the concept of forgiving designs and safe systems principles. The road design standards are dated and do not adequately provide for the protection of vulnerable road users. There are no systematic road safety checks in the current design cycle nor are existing roads maintained with a view of optimising road safety. The concept of managing for safe speeds is not evident.

Owing to mass consumption of second-hand vehicle imports, vehicles on Kenyan roads are generally not new and imported as second hand vehicles of up to 8 years old (the law has recently been amended to restricting the age to 5 years). These vehicles will generally be on the road for close to 20 years. Control of vehicle standards is far from optimal. Although legislated, periodic (roadworthy) inspections are not carried out and vehicle inspection centres have inadequate capacity to deal with increased numbers of vehicles. The control of vehicles standards in the public transport arena (Public Service Vehicles -PSV, Matatu and Boda-Boda, the latter being motorcycles licensed to transport passengers for a fee) are being improved but are not ideal. The licensing and testing procedures have been revised and partially implemented but are not monitored and evaluated to see if implementation is proceeding smoothly and if the intervention’s effect is positive.

There are limited standards and regulations for other vehicles (bicycles and regular motorcycles) but these are quite weak and poorly regulated. The wearing of helmets on motorcycles is compulsory but neither complied to nor enforced. Standards of the helmets themselves are also variable. The commonly used helmet does not comply with international standards, yet they bear the mark of quality from the Kenya Bureau of Standards. The wearing of reflective jackets is compulsory but again poorly enforced or adhered to. The country has no motorbike standards.

Traffic law enforcement and traffic legislation are in parts not effective so that negative driver (and other road users) behaviour is not deterred. Current standards for driver testing and licensing are as yet not compliant with international standards. The introduction of the new driver’s license (credit card format) is expected to improve matters but whether the introduction of the penalty points systems will have effect needs to be established. However, it is essential that such systems are integrated and comprehensive or their effectiveness will be limited.
The emergency response sector (post-crash care providers) are generally inadequately resourced and equipped to effectively deal with trauma (crash) victims. A thorough review of the sector is needed in conjunction with the development of supporting standards and protocols for improved post-crash care and incident management. Health is a key function of the County governments in Kenya. As such, several county governments have invested in quite a number of ambulances for their counties. Unfortunately, attention in not always paid to equipping the ambulance nor training its personnel, so that the golden hour literally loses meaning in certain cases. The contrary, though marginal, is also true, where the ambulance is well equipped and personnel well trained, to the extent that they exceed level of care provision at the health facility. Again, the golden hour loses meaning, when all gains made to stabilize a patient, end up being watered down at the health care facility.

As with projects related to the institutional management functions (see Bliss & Breen, 2013; G; Schermers et al., 2018), the success of many intervention projects are dependent on solid foundations having been set to enable their implementation. An example of this is legislation, without relevant and current laws to support certain interventions, they are doomed to fail. In the case of Kenya, a number of enabling projects are essential to prepare and to facilitate interventions aimed at injury and crash reductions.

Errore. L’origine riferimento non è stata trovata. proposes a number of interventions that should be undertaken during the establishment, growth and consolidation phase of a road safety management implementation plan. These interventions are certainly not exhaustive and serve as a first step. Follow up reviews and monitoring and evaluating implementation and fine tuning will be essential.

Table 4: Strategic outline of key interventions aimed at improving road safety management in the three development phases in Kenya

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Growth</th>
<th>Consolidation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct a full scale assessment of the driver training, testing and licensing system and benchmark that against international and African best practice</td>
<td>Roll out revised new driver training, testing and licensing systems and evaluate and monitor efficacy. Introduce computer based driver testing</td>
<td>Ongoing revision and fine tuning. Monitor penalty points and critical offence and redress road user behaviour related issues through strategic enforcement and education</td>
</tr>
<tr>
<td>Conduct a full scale assessment of the vehicle licensing, registration and testing systems and benchmark that against international and African best practice</td>
<td>Roll out vehicle licensing and accreditation programme. Develop and implement certification and ongoing compliance testing and screening</td>
<td>Revision and fine tuning. Assess vehicle standards and align to safe systems practices (set high safety standards for imported vehicle)</td>
</tr>
<tr>
<td>Evaluate the 20 highest crash locations and corridors, develop remedial improvement plans and conduct a cost benefit analysis.</td>
<td>Prioritise and implement remedial works. Reassess network safety performance and identify new improvement corridors Introduce safety performance</td>
<td>Ongoing network assessment and remedial works improvements. 5 year network evaluation/inspection; proactive programmes of remedial works.</td>
</tr>
<tr>
<td>Evaluation (SPI such as iRAP)</td>
<td>Revise safety policies and standards so that interventions and new measures are driven by international/African best practice (E.g. mandatory RSA/RSI etc)</td>
<td>Revise safety policies and standards so that interventions and new measures are driven by international/African best practice. Ongoing review of design practice</td>
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</tr>
<tr>
<td>Revise road geometric design standards and incorporate safe systems design principles for urban roads, rural roads and rural freeways</td>
<td>Develop implementation plan to re-engineer existing roads to be compliant with categorization and new design standards</td>
<td>Further roll out of programme</td>
</tr>
<tr>
<td>Develop road categorization plans based on safe systems principles</td>
<td>Develop capacity building and training programmes, Set up monitoring and evaluation programmes, set standards for personnel and equipment</td>
<td>Set up monitoring and evaluation programmes, review and amend standards for personnel and equipment</td>
</tr>
<tr>
<td>Review the current post-crash and trauma care management in the Kenya and develop improvement projects</td>
<td>Roll out protocol and training to lower level authorities and emergency responders</td>
<td>Roll out protocol and training to lower level authorities and emergency responders</td>
</tr>
<tr>
<td>Review the transportation of hazardous materials and develop a routing and incident management policy and protocol</td>
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### 3.3 Results

The most important and fundamental requirement for effective management of results is the availability of good road safety management information. At the very least reliable registrations of fatal and serious injury crashes should be available. The data should be obtained and validated from various sources including the registering authority (usually the Police), the hospitals and the state coroner. Preferably all crash data should be collected and registered and the insurance sector could be a partner. Crash data are not the only important data and also critical offences should be monitored and reported as should be the rates of enforcement and resource input. Data related to exposure (traffic volumes and road network length) are also vital for exploring and explaining changes over time and in assessing the levels of risk to user groups, roads, vehicles of other. Such data are vital for not only the setting of reduction targets for the number of fatalities or seriously injured, but also for setting for instance response times targets for post-crash care, setting seat belt wearing rate targets for drivers and passengers, setting targets for enforcement agencies to reduce the number of speeding motorists etc.

In Kenya this level of road safety management information is considered poor and the NTSA has little such information at its disposal to set and steer national targets. NTSA furthermore does not have the ability to set out specific targets in performance agreements for its potential service providers (roads agencies, police, health care services etc.)
Table 5 sets out a number of strategic priorities to enhance management by results. Once again, the nature of these projects is in the first instance enabling and these are essential to provide the necessary platform on which to build effective road safety management in Kenya and to better manage results once the road safety management system is up and running in the country. These projects are vital for defining evidence based targets and developing remedial implementation plans for road safety. They will ultimately allow the delivery of reductions in fatal and serious injury road crashes.

### Table 5: Priorities to enhance results

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Growth</th>
<th>Consolidation</th>
</tr>
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<tbody>
<tr>
<td>Review the current crash data recording and registration systems and establish whether this meets the needs of end users. In partnership with all stakeholders (re)define needs and develop system specification and implement pilot to test and fine tune</td>
<td>Roll out new road safety traffic information system, facilitate and/or provide capacity building and training. Monitor and evaluate the systematic collection and recording of fatalities and serious injury data by gendarmes, police and health facilities.</td>
<td>Monitor and evaluate the systematic collection and recording of fatalities and serious injury data by gendarmes, police and health facilities.</td>
</tr>
<tr>
<td>Set final and intermediate outcome targets</td>
<td>Monitor, evaluate and report national and regional trends in respect to targets. Identify priority or focus areas for policy</td>
<td>Promote national targets at all level of government and develop the setting and monitoring of local targets and programmes</td>
</tr>
<tr>
<td>Identify the most relevant critical offences, set targets, develop a monitoring and evaluation plan</td>
<td>Implement the monitoring programme and report critical offence rates, develop long term intervention programme</td>
<td>Implement the monitoring programme and report critical offence rates, develop long term intervention programme</td>
</tr>
<tr>
<td>Develop and establish a national traffic counting programme</td>
<td>Roll out the implementation of the counting programme. Annual reporting of traffic counting data. Investigate the building and national, regional and metropolitan land use planning models</td>
<td>Expand the counting programme to all roads of strategic importance, reporting and monitoring</td>
</tr>
<tr>
<td>Assess the service provider roles and develop performance based targets and performance agreements</td>
<td>Monitor and evaluate, refine and expand service providers</td>
<td>Monitor and evaluate, refine and expand service providers</td>
</tr>
</tbody>
</table>
3.4 Key projects emanating from the RSMCR

Given the objectives, the following project components were proposed (G; Schermers et al., 2018):

1) In-depth review of the NTSA and related institutional setting
2) Legislative and operational reviews
3) Capacity building and training in road safety management
4) Intervention strategy and implementation projects

To facilitate planning a global estimate of costs for the various projects will be made in the next section. To improve the chances of success it is strongly urged that the NTSA engage all partners in the process of developing these projects further. NTSA has already embarked on communicating its proposals toward improved coordination. These channels and structures should be deployed in communicating both the results of the RSMCR and the proposed projects.

3.4.1 Project Component 1: In depth review of the NTSA and related institutional setting

The RSMCR has revealed that the current functioning of the NTSA needs to be strengthened. Since its inception in 2012 the NTSA has effectively taken over the responsibilities of vehicle and driver testing and registration and with that setting controls for vehicle and driving testing at testing centres. Initially much focus was devoted to enforcement activities in these sectors. NTSA has concentrated its management functions on primarily these operational aspects and has neglected to develop a clear focus on results, particularly reducing the number of serious crashes and fatalities.

An operational audit (review) of the NTSA within the current institutional framework and setting is required to fully understand the current functions and responsibilities of the NTSA as compared to what it has been mandated to do and what is considered best practice.

Best practice for lead agencies is described in a number of sources (Bliss & Breen, 2009; Breen & Small, 2017; Howard, Breen, Bliss, & Corben, 2010; Small & Runji., 2014) and has been briefly mentioned in this report. It is intended that the review follow these procedures and the outcome will be a SWOT based analysis of institutional management capabilities complemented by a gap analysis which will reveal strengths and weaknesses across all sectors of road safety management as well as identify threats and opportunities for NTSA to optimize its performance in the given environment.

This will form the basis of a strategic plan for the NTSA in which its goal and vision is formalized, the intended functions are stipulated (with clearly a focus on becoming results focused and driven), structures are proposed to manage and co-ordinate these, and a budget to carry out the functions is proposed. Given its current role and mandate, the plan will include...
options for a management structure for the NTSA so that it can take responsibility for the following primary functions (Bliss & Breen, 2009; Small & Runji., 2014):

- Leading jurisdictional road safety projects/programs/strategies
- Horizontal inter-governmental coordination of road safety matters
- Vertical coordination of road safety activities with lower levels of government
- Coordination of necessary delivery partnerships between government partners, the professional, nongovernmental and business sectors and Parliamentary groups and committees dealing with road safety related matters
- Ensuring a comprehensive legislative framework for road safety
- Securing sustainable sources of annual funding and a rational framework for resource allocation in road safety management
- High-level promotion of road safety strategy across government and society
- Periodic monitoring and evaluation of road safety performance
- Direct road safety research and development and knowledge transfer

In close consultation with stakeholders, the process of setting up and supporting coordinating structures as being undertaken by NTSA will be continued but along the lines proposed by the strategic plan. Since the implementation of this plan is largely dependent on the input of stakeholders, often in the form of service providers, an outline of performance based contracts will need to be prepared and agreed upon with the stakeholders.

1. Road safety management data

A pressing current need of the NTSA is effective road safety management data. The current crash recording and registration system must be reviewed and revised. As part of that process, a complete needs analysis must be conducted to determine which base information is necessary to facilitate effective road safety management in Kenya. The current Traffic Information Management System (TIMS) fulfills a part of that need but is not fully operational and does not provide information related to, for example, traffic volumes and critical offences. A review needs to be conducted to determine data needs across the stakeholders and a specification be drafted to develop this.

3.4.2 Project Component 2: Legislative and operational reviews

The RSMCR revealed a number of problems that are associated with a weak or outdated legal framework and policies supporting road safety in Kenya. Policy and legal reviews, aligned with international best practice and taking into account specific Kenyan (and African) needs, will reveal where road safety management can be strengthened and aligned to address current needs. A number of domains have been identified as problematic and the most important of these are discussed below.

1. Legal framework

The Road Traffic Act (Chapter 403, 1953, as amended 2017) and Section 24 of the National Police Service Act, 2011 and the NTSA Act (Act 33 of 2012, Legal Notice No. 23 of 2014) are three primary laws affecting road safety management in Kenya. Especially the RTA is dated and
does not fully meet current needs. A complete review of the legal framework should be considered in order to consolidate the legal framework by removing redundant provisions, ensuring that current provisions are adequate and not contradictory in other legislation, that provisions are relevant, can be enabled and enforced, etc. During the consultation process with Kenyan stakeholders, the following issues were identified as problematic and are indicative of the need to conduct a full review of the legislation governing road transport in general and road safety in particular:

- Currently the level of fines is relatively high and because of affordability motorists have taken to offering bribes to traffic law enforcers. Relatively low salaries make these officers vulnerable to temptations of this nature.
- The retro-fitting and modification of vehicles without further testing for compliance to safety standards is not supportive of a systems approach to road safety.
- Driving hours and transport of dangerous goods are not well regulated.
- Driving schools are not regulated.
- Professional drivers are not retested nor are punitive measures imposed if these are found guilty of (serious) offences.
- The import of older foreign vehicles with lower safety features remains a problem.
- Vehicle roadworthiness and driver licensing and fitness requirements are not supportive of a safe systems approach. Vehicle standards in particular need to be strengthened and certain practices must be legally prohibited.
- There are no minimum requirements for vehicles, equipment, staff etc. set for ambulances.
- Seat belts in rear seats are not compulsory if not fitted.

A recent study conducted as part of the Tripartite Transport and Transit Facilitation Programme (TTTFP) made a baseline evaluation among 19 member (African) countries of the Tripartite agreement, including Kenya (Fischer, Bosman, Botha, & Heikens, 2017). In this study individual country performance was measured against a number of baseline requirements (Enabling legislation; Standards; Training; Testing facilities; Computerised registers and systems; Vehicle load management; 3rd Party Insurance; Voluntary compliance; Law enforcement; Exchange of information) and Kenya was found to be compliant with a number of these although not fully with respect to the institutional and legal framework.

The TTTFP developed model legislation and this should be used in the legislative review to assess to which extent Kenya is compliant and where strengthening and change are required.

2. Driver and road user standards

Although a new drivers licensing system, incorporating credit card style licences and a penalty points system, is currently being phased in, there remains overwhelming evidence of poor driver practices compounded by largely ineffective training, ineffective law enforcement and other related issues. Obtaining a drivers’ licence is rudimentary by international standards. A review of the current system is required in order to improve driver licensing standards, driver testing standards and also to strengthen ongoing compliance, training and awareness. Specific attention is needed for drivers of public service vehicles (matatu’s), motorcycle riders (boda-bodas) and heavy goods vehicles. The review also needs to address standards and provisions for
other road user groups, specifically with a focus on issues such as the (mandatory) wearing of safety equipment (helmets/vests on motorcycles, seat belts, retroreflective vests at night etc.), safe cycling and walking behaviour (crossing violations, risky behaviours, visibility, speed perception etc.). The review will lead to recommendations for more effective driver training and testing, improved standards for driver testing centres; improved certification and ongoing compliance procedures for driving testing centres, more effective and centralised driver registration, education/training and awareness programmes for road users, recommendations for strengthening legal provisions in these areas and other relevant issues.

3. **Vehicle standards**

As with drivers, many vehicles in Kenya are generally in a poor and un-roadworthy state. Most vehicles are imported second hand and because of the higher age have lower safety standards than new vehicles. Safety standards for used vehicles in Kenya are reputedly far from ideal and requirements for safety features are lagging behind international best practice. Due to a lack of safety performance standards (such as NCAP ratings) new vehicles generally are manufactured to a lower safety specification. Although roadworthy testing is compulsory, it is not carried out or enforced. Vehicles are not scrapped and the registry is therefore not always current. Standards for PSVs have recently been introduced but many vehicles do not meet these requirements nor is clear how these will be met and tested in future. There is ineffective control on the import of car parts (new and second hand). Safety standards for motorcycles, cycles and safety equipment are also lagging behind best practice and require revision.

A review of the current vehicle registration, licensing and annual roadworthy inspection system is required. The review will assess the registration system, the vehicle standards and legislation and regulations (all vehicles), the testing centres and their accreditation procedures, the testing and roadworthy procedures and capabilities, ongoing compliance issues and any other matters of relevant to improving the safety performance of road going vehicles in Kenya. Another important issue that will be assessed is the use and compliance of vehicle based safety equipment such as tachographs, speed limiters, etc. Specific attention to roadworthiness and roadworthiness testing and monitoring will form part of the review, particularly related to Heavy Goods Vehicles (HGV) and PSVs.

4. **Road classification, road design and maintenance standards**

Roads in Kenya are of varying design standards and generally there are inadequate provisions for vulnerable road users ((motor)cyclists and pedestrians). The classification of roads is not based on functions and there is little evidence of the concept of safe speeds and credible speed limits. Mixed road use is evident and a primary cause of (severe) conflicts between high speed motorised traffic and low speed pedestrians etc.

Discussions with stakeholders revealed a need for developing road design and maintenance practices based on safe systems philosophies. It is proposed to conduct a complete review of road design, construction and maintenance practices in Kenya with a view to develop appropriate geometric and road safety design guidelines for urban and rural Kenyan roads. Not only will the design review assess current practice and propose improvements but will critically examine capabilities, procedures and capacity to conduct safe and good practice road design.
Integral to this will be the role of instruments such as road safety audit, road safety inspection, network safety management and road safety impact assessments in the quality assurance process. The role of safety performance indicators (e.g. iRAP) for ensuring a pro-active and ongoing approach to providing safe road infrastructure will also be discussed.

The output of the review will be a status quo analysis comparing current practice and what is considered best practice. Recommendations will be developed to address shortfalls and problems so that road safety will form an integral part of the road design cycle. An integral output will be the development of new geometric design guidelines and standards. It will provide a capacity building framework and indicate which specific training is required in the current and future situations. The review will provide policy inputs to ensure that quality assurance for safe road design and operation is given a place both in legislation and in the working procedures of organisations involved in this domain, including funders such as the Kenya Roads Board.

5. Traffic law enforcement

According to key informers interviewed during the RSMCR, traffic law enforcement is largely ineffective due to issues such as corruption, lack of resources given other legislated tasks related to traffic management, inadequate equipment, inadequate training, lack of targeted programmes, lack of management information and other related issues. Adding to this ineffectiveness are that driver, vehicle and insurance information is not available online to enforcement personnel. Traffic offences have not been decriminalised placing a burden on the judiciary (administrative versus legal processing). Many fines that are issued are not paid or dismissed in court for various technical reasons.

A number of these issues will be addressed by the review of the legal and regulatory framework and also the reviews of the driver and vehicle domains. However, a better understanding of current operational procedures needs to be developed and compared to best practice. Given that a penalty points system is being introduced this review must critically assess the needs and capabilities of the traffic police in using and supporting such a system. The review must gain insight into aspects such as resource deployment procedures, measures of effectiveness, enforcement programming and targets, training and capabilities, equipment, budgets and allocation of funding, etc.

6. Post-crash care

A safe systems approach requires effective post-crash care to reduce the number of fatalities and also the severity of long-term injury outcomes. The faster a victim is treated, stabilised and transported to a suitably equipped hospital offering specialised trauma care, the higher the chance of survival. The ambulance and hospital services in Kenya deal with traffic crash victims and the RSMCR revealed serious shortcomings in the provision of post-crash care services in both the rural and urban areas. Many of the problems are related to inadequate resources, low levels of training, low funding levels, inability of victims to pay for services, poor co-ordination between government and private service providers, lack of a centralised number and related issues. Furthermore, there is relatively little coordination between the Department of Health and the Department of Transport on matters relating to road safety, particularly post-crash
care but also in areas such as first aid, safety culture (Occupational Health and Safety) and other proactive issues.

This review will conduct an audit of the state of post-crash services in Kenya. It will assess the number of ambulances, the state of ambulances, numbers of drivers and ambulance personnel and their training, number of hospitals, clinics and emergency care centres and their capabilities in dealing with trauma patients etc. The review will examine issues relating to response protocols, deployment strategies and prioritisation procedures, response monitoring, response times etc., and provide insight into admittance procedures and protocols at hospitals. Based on the outcome, policy inputs will be provided to steer future post-crash care based on realistic performance based targets and procedures.

3.4.3 Project component 3: Capacity building and training in road safety management

All stakeholders interviewed indicated that Kenya has a serious skills shortage when it comes to road safety professionals. There are many trained engineers but most with little or no specific training or experience in road safety engineering or road safety in general. Similarly, there are few, if any, practicing traffic road safety psychologists and neither are there many trained road safety specialists active in policing, crash data management and statistics, transport planning, public transport or other related areas of transport.

The RSMCR revealed that there is a clear need to build capacity in all areas related to traffic safety management. Traditionally specialised courses and training have been offered but these have not provided a sustainable skills base. Individuals attending the training move in other domains or are promoted and the skill is lost. This has to do with the fact the current road safety management structures have not defined functional job descriptions for such staff nor have road and other authorities recognised the need for specialised road safety expertise.

It is proposed to use the outputs from Project Component 1 plus output from the legislative and operational reviews to develop minimum qualification and skill sets for technical staff responsible for road safety at the lead agency, the roads authorities, research organisations and universities, government departments or ministries developing policy and/or strategies and any other organisation directly dealing with road safety matters (such as consulting engineers, contractors etc.). To fill the gap between required and actual skills will be links to recommended training programmes and courses including those developed in SaferAfrica and courses such as the Delft Road Safety Course. This will be done in close consultation with local universities. An output of this capacity review will be to organise and provide a number of training opportunities for key NTSA and other government staff that will be tasked with road safety (management) duties. The costs for attending the courses will be based on share funding, 50% via the project and 50% via the employer/course attendant. All course will be presented in Kenya.

In addition to providing guidance with job descriptions and training requirements and opportunities, the capacity review will provide a policy framework for developing and sustaining critical mass in road safety skills within the lead agency (NTSA) and supporting service providers and road authorities.
3.4.4 Project component 4: Intervention strategy and implementation projects

The increased use of RSMCR worldwide has revealed that problems related to road safety management are often complex and cannot be always dealt with effectively in the short term. However, to ensure that change is brought about, generally by starting with the appointment of a responsible body to introduce changes such as instituting a lead agency and setting up coordinating structures, it is vital that a country’s leadership demonstrates its will to redress the growing road safety problem. This is best achieved through developing and implementing visible and high impact projects in which all relevant road safety role players and stakeholders have an active role. The concept of an integrated approach to dealing with complex road safety problems must be prominently demonstrated. The success of these invariably result in upscaling of projects or initiating similar projects.

Generally, these high impact projects are selected on the basis of benefits (generally in terms of crash reduction as final outcome measure) being evident in the relatively short term (within a few years of implementation). Locations with sustained high crash concentrations lend themselves to this type of implementation project because short term benefits can be relatively quickly attained through a multi-disciplinary remedial implementation plan. A corridor based approach selects roads that carry high volumes of mixed motorised over long distances (e.g. between two major urban centres or even country borders), which traverse both urban and rural environments, and which have high number of crashes. An area based approach selects a geographic rural or urban (or mixed) area displaying high crash rates, mixed traffic volumes and mixed road use.

Projects involving area wide or corridor based interventions are preferable since they can demonstrate the effect and benefit of the safe systems approach on a small scale (i.e. as opposed to large country wide or provincial projects). They are multi-disciplinary and integrate facets relating to engineering (road design, traffic management, safety engineering), enforcement (speed, behaviour, roadworthiness, overloading, driving times etc.), education and awareness, monitoring and evaluation.

Although other smaller scale and very focused interventions also have the potential to demonstrate the benefits of a results focussed approach, the scale and nature of these may increase the risk of encouraging a fragmented approach to road safety management. For example, focussing an intervention on only enforcement will not have lasting long-term effects nor will it necessarily demonstrate a well-coordinated and integrated approach to problem solving. Short term successes may limit the overall potential for adopting a safe systems approach in the long term. It is therefore recommended that an informed short-term intervention implementation strategy be developed in which both the corridor or area wide based demonstrations and the building blocks to a complete safe systems programme are developed. Where possible, this strategy must take into account the current road safety action plan of the NTSA (NTSA, 2018). The building blocks should include the roll out of the infrastructure safety improvement plan and the enforcement programme, and focus on critical offences, the driver and road user education and awareness programme and the monitoring and evaluation programme. Improving supporting services, building capacity through specialised training programmes, targeted education and enforcement campaigns, establishing
training and testing centres and other vital building blocks will be an integral part of the strategy.

The selection criteria for interventions at corridor or area level should be established in consultation with relevant road authorities and the NTSA but could include corridors/areas with comparatively high numbers of crashes and traffic volumes, and cover both rural and urban environments, representing both mono-functional and mixed use as typical of Kenya. The nature of the problems and the associated interventions should not be unique and represent situations which allow the deployment of fairly standard treatments with known effects (unique and location specific problems and solutions cannot be applied elsewhere limiting roll out potential).

The corridors/areas would support multi-sectoral interventions and are accessible/have access to all support services (hospitals, police etc.). There is traffic (crashes, volumes etc.) and related data (road geometry, iRAP) available or these can be relatively easily obtained.

At the time of the RSMCR there were insufficient data available to make an informed selection of candidate intervention projects and it is recommended that this be included in the development of the short term intervention implementation strategy which in turn must take into account the current draft proposed road safety action plan (NTSA, 2018). Likely candidate projects for the multi-sectoral road safety intervention projects include:

- Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi
- Conduct a Value of Statistical Life study for Road Safety in Kenya
- Hazardous Materials Safety and Transportation
- Mombasa –Uganda Highway Rest Centre as part of a road safety project along the Northern corridor or the worst sections of it: Mombasa-Nakuru – Uganda Border
- Garissa model road safety plan and design
- Model driver training school – showcasing the global best practice

The further development of the intervention projects will depend on the selected area or corridor and therefore budgets to finance these projects can only be prepared as global estimates. However, since the interventions must demonstrate a multi-disciplinary approach, the budget (and further proposal development) provides for estimates for planning and co-ordination, infrastructure related interventions, enforcement support, education and awareness, post-crash support, monitoring and evaluation and roll-out strategy.

4 Selecting and prioritising key projects

The proposed activities under WP5.3 for Kenya are based on the outputs from the Kenya’ RSMCR of May 2018. It is envisaged that these activities and the report will contribute to fine tuning the activities of other WPs, particularly WP2, WP3 and WP6.
It is hoped that the outcome of the individual projects will contribute to the overall project goal of making the continent safer.

WP5 involves capacity reviews of road. The proposed activities under WP5.3 for Kenya are based on the outputs from the Kenya’s RSMCR of May 2018. It is envisaged that these activities and the report will contribute to fine tuning the activities of the other WPs, particularly WP2, 3 and 6.

The Kenya’s RSMCR identified four project components which could potentially be implemented in the short term as initial building blocks to re-dress the growing road safety (management) problems in the country. These project components and important related themes or enabling projects within each were:

1. **Project Component 1: In depth review of the NTSA and related institutional setting**
   a. Review of the structure and function of the lead agency for road safety
   b. Coordination, policy and funding for NTSA
   c. Review of the strategic plan for road safety
   d. Enabling legislation to provide NTSA a mandate to manage
   e. Road safety management data

2. **Project Component 2: Legislative and operational reviews**
   a. Legal framework
   b. Driver and road user standards
   c. Vehicle standards
   d. Road classification, road design and maintenance standards
   e. Traffic law enforcement
   f. Post-crash care

3. **Project Component 3: Capacity building and training in road safety management**
4. **Project Component 4: Intervention strategy and implementation projects**
   i. Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi
   ii. Conduct a Value of Statistical Life study for Road Safety in Kenya
   iii. Hazardous Materials Safety and Transportation
   iv. Mombasa –Uganda Highway Rest Centre
   v. Garissa model road safety plan and design

A CIFTER scale was used to determine the most viable projects in the country. Scores are assigned to a practice depending on the difficulty to transfer or adapt it to the receptor country. The more challenging the transfer or adaptation, the higher the score and using the following Likert based scale:

- Very high challenging: score = 4
- High challenging: score = 3
- Moderate challenging: score = 2
- Low challenging: score = 1
4.1 Project component 1: In-depth review of the NTSA and related institutional setting

This component comprises 5 sub-projects, each of which will be described and reviewed separately.

4.1.1 Review of the structure and function of the road safety lead agency

The current and previous board constitutions do not reflect global best practice. The NTSA Board has been claimed to have problems related to competency, tenure and terms of reference for the board members. To date the board is not inclusive of the stakeholders involved in road safety in Kenya.

In addition, the management structure of the NTSA needs to reflect the institutional functions that it should be undertaking and this is currently not the case. The NTSA is focussed on certain tasks and issues that should not necessarily be part of its mandate or function whilst it is not mandated to fulfil others. A structural review of the organisation and its structure is necessary to ensure that all the crucial management functions (co-ordination; legislation; funding and resource allocation; promotion; monitoring and evaluation; research and development and knowledge transfer) are embedded as part of road safety management in the country. The RSMCR indicated potential weaknesses in certain functions and these need to be assessed and strengthened. Errore. L’origine riferimento non è stata trovata. gives the CIFTER scores for this project which rates as global level 2 project (i.e. a complex and challenging project).

Table 6: CIFTER Review of the structure and function of the road safety lead agency

<table>
<thead>
<tr>
<th>Review of the structure and function of the road safety lead agency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
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</tr>
<tr>
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</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<td>3 (High)</td>
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<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
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<td>2 (moderate)</td>
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</tr>
<tr>
<td>5. Strategic importance of the project to the organisation or organisations involved</td>
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<td></td>
<td>4 (Very high)</td>
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</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
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<td></td>
<td>3 (low)</td>
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</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organisational entities</td>
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<td></td>
<td>3 (High)</td>
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</tbody>
</table>
4.1.2 Coordination, policy and funding for NTSA

This task aims to support NTSA in developing a coordination structure that will harmonize/streamline policy, legislation, enforcing and funding. It aims at supporting NTSA develop a 5-year road safety action plan/programme and to lift road safety to be a cross-cutting issue to be adopted by all departments with a coherent strategy and communication plan. This project also rates above 18 and is a global level 2 project (Errore. L’origine riferimento non è stata trovata.).

Table 7: CIFTER review for Coordination, policy and Funding

<table>
<thead>
<tr>
<th>Scores</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
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<td></td>
<td>(very high)</td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<td>(moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
<td>2</td>
<td>(moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
<td></td>
<td></td>
<td>3</td>
<td>(high)</td>
</tr>
<tr>
<td>5. Strategic importance of the project to the organization or organizations involved</td>
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<td>3</td>
<td>(moderate)</td>
</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
<td></td>
<td></td>
<td>3</td>
<td>(low)</td>
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<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
<td></td>
<td></td>
<td>3</td>
<td>(high)</td>
</tr>
</tbody>
</table>

4.1.3 Review of National road safety strategic plan against global best practice

The NTSA has never operated on the basis of a strategic road safety plan. This makes the processes of allocating and administering budgets for road safety programmes less transparent and not output driven. It is of importance to develop a strategic plan aligned to the current road safety problems but being much more results driven and with clear responsibilities, targets and performance evaluations to make the process both transparent and accountable. The current
A national road safety strategic plan needs to be benchmarked against international best practice and assessed to ensure that it aligned to both local needs and to safe systems practices (e.g. Safe Systems Approach, SDGs, African Road Safety Action Plan etc.). Also this project is complex and scores 22, also a complex level 2 project (Table 8).

Table 8: CIFTER review of National road safety strategic plan against global best practice

<table>
<thead>
<tr>
<th>Review of National road safety strategic plan against global best practice</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Stability of the overall project context</td>
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<td>4 (low)</td>
<td></td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<td>3 (high)</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
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<td>5. Strategic importance of the project to the organisation or organisations involved</td>
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<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
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<tr>
<td>7. Number and variety of interfaces between the project and other organisational entities</td>
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<td>3 (high)</td>
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</tbody>
</table>

4.1.4 Enabling legislation to provide NTSA the mandate to act as lead agency

At present the functions of NTSA are limited and there is a need to review and pass legislation which gives NTSA, or any other identified lead agency for road safety, a mandate to fulfil her role as lead agency. A core function is establishing a multi-sectoral coordinating committee at national and county levels and ensuring that these structures are provided with the necessary resources to effectively carry out the tasks assigned to them. Local Coordinating Committees already exist at county level but these mainly operate on a voluntary basis and have not been mandated. No such entity exists at national level unless one considers the Board on NTSA as having this role. However, this is not recommended since the road safety co-ordinating committee has a completely different role, the Board has overall say in the management and functioning of NTSA whereas the national steering committee is responsible for co-ordinating the implementation of road safety plans and programmes. It may be necessary to develop specific legislation to mandate the lead agency and this should be reviewed. Table 9 provides the CIFTER rating for this sub-project which also scores high.
Table 9: CIFTER Legislate NTSA mandate to convene national multi-sectoral road safety committee

<table>
<thead>
<tr>
<th>SCORES</th>
<th>1</th>
<th>2</th>
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</thead>
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<tr>
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<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
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<td>3 (high)</td>
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<tr>
<td>5. Strategic importance of the project to the organisation or organisations involved</td>
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<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
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<tr>
<td>7. Number and variety of interfaces between the project and other organisational entities</td>
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<td></td>
<td>3 (high)</td>
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</table>

4.1.5 Road safety management data

Reliable crash data supported by other traffic data (traffic volumes; speeds; enforcement information; vehicle statistics; safety performance indicators etc.) are essential inputs for effective road safety management. It is important that Kenya identify the specific needs related to the type of data, the quality, the method collected and supplied etc. A thorough review of current road safety management data in Kenya is required and data specifications need to be developed to service future road safety management. Specific attention needs to be given to the crash (and other) data collection process with a aim to improve that. A complete review (possibly through stakeholder workshops) of the data management system and processes should include:

- the registration of vehicles and drivers;
- the testing of vehicles and drivers;
- police data collection process and tools;
- traffic crash data collection, analysis and reporting;
- traffic crash injury registration (expand scope and integrity of data to include all possible sources; coroners, mortuary, hospitals and fast responders’ data);
- ambulance data (response times; calls; fleet; condition etc)
- Traffic volumes, speeds, classes (SPI);
- Road user behaviour data (SPI):
- Road network quality (SPI);
- Traffic law enforcement data;
- Cost of road crashes
- Etc.

Potential outputs could include specific data specifications for each data source; performance agreements between supplier and the lead agency and possibly a pilot data management system which could be developed as a collaboration of the lead agency and perhaps a University.

The pilot should facilitate establishing proper blackspot management programme and recommending improvements of current practice. To summarise a full scale assessment is needed of the current registration systems, identifying needs for effective road safety management, identifying where improvements are needed and defining new system specifications. This must start with crash data but also look at integration with other systems at hospitals, mortuary etc. Other data systems needed for RSM must also be reviewed to see what changes need to be adopted so that these are made available/improved etc. This will include working with NTSA and the traffic police (National Police Service) to improve/develop/design a crash data collection sheet.

A road safety data system could be demonstrated by means of a pilot in a Kenyan city. A first project will be setting up a blackspot management programme (based on current crash data registration and linked to the crash management system). A second linked project would be the development and testing of a revised crash report form.

Essential is that the pilot data management system be reviewed after 12 months and recommendations developed regarding the viability and sustainability of the system. The adoption of a subsequent national system, and where this is housed, would require approval from the Inspector General and backing from the Principal Secretary at the Ministry of Interior.

Table 10 provides the result of the CIFTER rating and improving the crash data capability should be a priority although it will be a complex project.

**Table 10: CIFTER review for improving crash data collection and use in road safety interventions (Black Spot / Haz-loc Management Program)**

<table>
<thead>
<tr>
<th>Improve Crash data collection and use in road safety interventions (Black Spot / Haz-loc Management Program)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
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<tr>
<td>1. Stability of the overall project context</td>
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<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative)</td>
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<td>4 (very)</td>
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</table>
negative) on the project’s stakeholders

<table>
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<tr>
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<tbody>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
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</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organisational entities</td>
<td>3 (high)</td>
</tr>
</tbody>
</table>

### 4.2 Project component 2: Legislative and operational reviews

The RSMCR has revealed that road transport (including road safety) laws and regulations in Kenya may be outdated and in need of systematic review (see Section 3.2.2). Particularly the following aspects require review:

1. Legal framework
2. Driver and road user standards
3. Vehicle standards
4. Road classification, road design and maintenance standards
5. Traffic law enforcement
6. Post-crash care

#### 4.2.1 Legal framework

The legal framework defines from within which the organisations and institutions responsible for road safety must function. It defines the responsibility, accountability, intervention and associated institutional management functions needed to achieve the desired result. The legislative function that the Lead Agency will have to support concerns providing the legal instruments necessary to govern road safety management and to specify the legal boundaries of institutions in terms of their responsibilities, accountabilities, interventions and institutional management functions to achieve the desired focus on results.

As indicated in chapter 3.2.2, the current legal framework governing road safety matters in Kenya is reasonable but fragmented and requires a thorough review with a mind to consolidate legislation. As indicated in Project Component 1, specific attention needs to be given to the legal status of the lead agency and its position and role in regulating road safety matters in Kenya. This project must aim to provide that framework with ultimately the objective of amending current legislation to support a safe systems approach.
Table 11 gives the result of the CIFTER and with a score of 18 this project marginally qualifies as a global level 1 project which suggest a medium complexity and easier to manage/implement.
Table 11: Cifter rating for establishing a legal framework for the lead agency

<table>
<thead>
<tr>
<th>Legal Framework</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
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<td>3 (low)</td>
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<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
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<td></td>
<td>3 (high)</td>
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</table>

4.2.2 Driver training and road user standards

A new credit card style driver licence system is being phased in but there remains evidence of poor driver training and road user behaviour. There is a need to review the entire driver training and licensing system as well as the penalty system for road related traffic infringements, also that of pedestrians. A review is necessary to strengthen driver training and licensing requirements, testing procedures and penalties. The review should result in recommendations for system changes and provide a model framework for implementing a model driver training centre as a demonstration project for future roll out or up scaling. Such centres can also function as a road safety centre providing road safety support and training for both practitioners and road users.

The centre can be a regional centre for training road safety professionals including road safety inspectors, road safety auditors, crash analysts, accident investigators, human and traffic psychologists and first responder among others. Details to set up such a centre would include establishing:

- Costs to establish equipment such as simulators, investigation tools and software and secondment of experts from partner institutions
- A design model of the training school and help create training materials
- Designing and building a driving road/circuit of about 1.5 km length with all the possible arrangements as would be found in a normal road situation
- Work with private investors to create a track with real life features
- Introduce simulators and computerised tests (hazard perceptions and theory courses)
- Train school children through school visitations, offer refresher courses for driving instructors
- Analyse the training needs and knowledge gaps for sector workers and institutions

Table 12 shows the CIFTER rating for this project and at 19 it rates at global level 2.

Table 12: CIFTER rating for establishing a driver training and road user standard incorporating a Road Safety Institute and Model Driver Training Centre

<table>
<thead>
<tr>
<th>SCORES</th>
<th>1</th>
<th>2</th>
<th>3 (moderate)</th>
<th>4 (high)</th>
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</thead>
<tbody>
<tr>
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<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative) on the project's stakeholders</td>
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<tr>
<td>5. Strategic importance of the project to the organization or organizations involved</td>
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<td>3 (moderate)</td>
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<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
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<td>3 (low)</td>
<td></td>
</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
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<td></td>
<td>3 (high)</td>
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</tbody>
</table>
4.2.3 Vehicle standards

A review of the current vehicle registration, licensing and annual roadworthy inspection system is required. The review will assess the registration system, the vehicle standards and legislation and regulations (all vehicles), the testing centres and their accreditation procedures, the testing and roadworthy procedures and capabilities, ongoing compliance issues and any other matters of relevance to improving the safety performance of road based vehicles in Kenya. Another important issue that will be assessed is the acceptance, issuing, use and compliance of vehicle based safety equipment such as tachographs, speed limiters, etc. Specific attention to roadworthiness and roadworthiness testing and monitoring will form part of the review, particularly related to HGVs and PSVs. A final aspect that requires attention is enforcement related to vehicle roadworthiness. A review of current procedures and processes is needed to compare that to what is required to ensure that there are external (police) checks on roadworthiness and compliance with regulations regarding the use of vehicles on public roads. Such an evaluation may take the following form:

a. A situational analysis to understand current legislation/standards and practice, identify problems/risks and areas where improvement is essential and needed, including legislative reviews.

b. Assess specifically the standards applied to retrofitting (PSV and other) vehicles and seeing how these can be improved given the market and political environment in which these vehicles operate.

c. Reviewing roadworthy procedures and practices are also a must. Again this should be a detailed situational analysis supplemented by a review of best and appropriate practices internationally and in Africa/the region. Part would be to test feasibility of privatising testing centres for private vehicles and tightening up control on PSV and goods vehicles. The review of vehicle roadworthy procedures and practices should include recommendations on how to improve current practice in order to get compliance with safe systems requirements.

d. Initiate Public Private Partnerships in vehicle building and inspection by setting standards equivalent to global best practice. This will include reviewing current vehicle building standards against best practices and recommend changes.

e. Review inspection centres against the global best practices.

Table 13 shows the CIFTER rating for this sub-project which scores 20 and rates as a global level 2 project which a high level of complexity.

Table 13: CIFTER rating for reviewing current vehicle standards and inspections

<table>
<thead>
<tr>
<th>Vehicle building and Inspection</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
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<tr>
<td>1. Stability of the overall project context</td>
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<td>3 (moderate)</td>
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</tbody>
</table>
2. Number of distinct disciplines, methods, or approaches involved in performing the project | 2 (moderate)
---|---
3. Magnitude of legal, social, or environmental implications from performing the project | 4 (very high)
4. Overall expected financial impact (positive or negative) on the project's stakeholders | 3 (high)
5. Strategic importance of the project to the organisation or organisations involved | 3 (moderate)
6. Stakeholder cohesion regarding the characteristics of the product of the project | 2 (moderate)
7. Number and variety of interfaces between the project and other organizational entities | 3 (high)

4.2.4 Road classification, road design and maintenance standards

It is proposed to conduct a complete review of road design, construction and maintenance practices in Kenya with a view to develop appropriate geometric and road safety design guidelines for urban and rural Kenyan roads. Not only will the design review assess current practice and propose improvements but will critically examine capabilities, procedures and capacity to conduct safe and good practice road design. Integral to this will be the role of instruments such as road safety audit, road safety inspection, network safety management and road safety impact assessments in the quality assurance process. The role of safety performance indicators (e.g. iRAP) for ensuring a pro-active and ongoing approach to providing safe road infrastructure will also be discussed.

The output of the review will be a status quo analysis comparing current practice and what is considered best practice.

The project could build on the following tasks:

- Conduct a review of road design standards comparing with African and international best practices, establishing how current (up to date) guidelines and standards are and how road safety is stipulated or accounted for.
- Engage the responsible road authorities (e.g. KeNHA; KERRA; KURA) KRB; NTSA and road safety stakeholders to establish procedures and processes adopted in the design, construction, operation and maintenance of roads and supporting road infrastructure in Kenya with a specific focus on how road safety is provided in that. This will include determining how Road Safety Audit (RSA), Road Safety Inspections (RSI), Blackspot Mapping etc. are dealt with.
- Through stakeholder workshops bringing together roads agencies, ministry of transport (including county roads departments, treasury, planning), non-governmental agencies, and universities, and others to discuss and agree on the technical aspects of customising global best practice procedures for local conditions.
• Produce standard road design procedures and guideline documents (draft modern Design Manuals and Road Audit manuals).
• Engage the political class and the judiciary in coming up with legislation which will, among other things, empower NTSA to legally review and critique road designs for safety.
• Engage the Ministry of Transport to come up with policies to operationalise the legislation and making RSA and related practices compulsory.
• Establish a training programme and certification procedures for Road Safety Auditors and related skills.
• Develop and design an implementation plan in collaboration with road authorities and NTSA to conduct an IRAP study of all primary rural roads, developing a road safety improvement remedial programme. The iRAP Star Rating Program is especially recommended for adoption on roads close to schools. The tool proposes various treatment options for the various sections of the road inspected. One has the option of picking an intervention with the highest positive result. The model works on the approach that the minimum star rating for roads around schools in 3 stars.

This project score 24 on the CIFTER rating (Table 14) and will be challenging to implement from a project management perspective.

Table 14: CIFTER rating for reviewing road design, RSA and RSI standards and specifications

<table>
<thead>
<tr>
<th>Road design, Road Safety Audits and Inspection</th>
<th>1</th>
<th>2</th>
<th>3 (moderate)</th>
<th>4 (very high)</th>
</tr>
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<tbody>
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<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
<td></td>
<td></td>
<td>4 (very high)</td>
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</tr>
<tr>
<td>5. Strategic importance of the project to the organization or organizations involved</td>
<td></td>
<td></td>
<td>4 (High)</td>
<td></td>
</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
<td></td>
<td></td>
<td>4 (very low)</td>
<td></td>
</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
<td></td>
<td></td>
<td>3 (high)</td>
<td></td>
</tr>
</tbody>
</table>
4.2.5 Traffic law enforcement

A number of law enforcement related problems will be addressed by the review of the legal and regulatory framework and also the reviews of the driver and vehicle domains. However, a better understanding of current operational procedures needs to be developed and compared to best practice. Given that a penalty points system is being introduced this review must critically assess the needs and capabilities of the traffic police in using and supporting such a system and also the possible new systems coming from the other reviews. The review must gain insight into aspects such as resource deployment procedures, measures of effectiveness, enforcement programming and targets, training and capabilities, equipment, budgets and allocation of funding, etc. Specific attention must be given to developing an (pro)active enforcement programme aimed at informed, targeted and systematic enforcement of critical offences (SPI’s).

Enforcement scores 22 on the CIFTER rating indicating that it will be a fairly complex project to implement and manage (Table 15).

Table 15: CIFTER rating for enforcement project

<table>
<thead>
<tr>
<th>enforcement</th>
<th>1</th>
<th>2</th>
<th>3 (moderate)</th>
<th>4 (very High)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stability of the overall project context</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
<td>3 (high)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
<td></td>
<td>4 (High)</td>
<td></td>
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</tr>
<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
<td>2 (moderate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Strategic importance of the project to the organisation or organisations involved</td>
<td></td>
<td>4 (High)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
<td></td>
<td>3 (low)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organisational entities</td>
<td></td>
<td>3 (High)</td>
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</tbody>
</table>

4.2.6 Post-crash care

A review or audit of the state of post-crash services in Kenya will be carried out. It will assess the number of ambulances, the state of ambulances, numbers of drivers and ambulance personnel and their training, number of hospitals, clinics and emergency care centres and their capabilities in dealing with trauma patients etc. The review will examine issues relating to
response protocols, deployment strategies and prioritisation procedures, response monitoring, response times etc., and provide insight into admittance procedures and protocols at hospitals. Based on the outcome, policy inputs will be provided to steer future post-crash care based on realistic performance based targets and procedures. An essential component will be to determine whether cooperation between the Ministry of Health (MoH), hospitals and clinics and NTSA is viable and what form this should take. In any event it is important that coordination structures between these organisations are formally organised to ensure that road safety targets and goals are set taking into account agreements and possibilities of the emergency (trauma) care sector. Linked to this is exploring the possibilities of developing and entering into service delivery type performance agreements between NTSA (as potential co-funder) and the health sector (as service provider).

The following tasks could form part of such a project:

- Conduct a thorough national situational analysis of the structure, the capacity and integrity of the post-crash care system in Kenya and define its role in road safety management. Included may be:
  - identifying current operators, review standards adopted, review the guidelines, review the protocols, the skills levels, success and challenges.
  - Engage government and stakeholders with the view to legislate the sector setting out legal requirements, responsibilities and access to first aid (eliminate cases where private hospitals refuse to treat victims until a deposit is paid) and set guidelines for domestic, work place and public spaces.
  - Upscaling the first aid courses and emergency treatment protocols to certain sectors of the public sector and even private sector.
  - Work with MoH to establish a minimum requirement for ambulance staff and equipping of ambulances. This is especially crucial with counties buying several ambulances which turn out to be taxis. For the longer term, initiate discussion to upgrade/establish trauma care centres that ensure proper treatment of road crash victims.
  - Work with NTSA and the Police on development of a structure for accident investigations.

The Post-crash care component scores 21 (Global level 2) on the CIFTER rating and will be complex and difficult to manage (Table 16).

Table 16: CIFTER rating for post crash care

<table>
<thead>
<tr>
<th>Post-crash care</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Stability of the overall project context</td>
<td></td>
<td>2 (moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
<td></td>
<td></td>
<td>3 (high)</td>
<td></td>
</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental</td>
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</tbody>
</table>
4.3 Project component 3: Capacity building and training in road safety management

The RSMCR revealed that there is a clear need to build capacity in all areas related to traffic safety management. Traditionally specialised courses and training have been offered but these have not provided a sustainable skills base. Individuals attending the training move in other domains or are promoted and the skill is lost. This has to do with the fact the current road safety management structures have not defined functional job descriptions for such staff nor have road and other authorities recognised the need for specialised road safety expertise.

It is proposed to use the outputs from Project Component 1 plus outputs from the legislative and operational reviews to develop minimum qualification and skill sets for technical staff responsible for road safety at the lead agency, the roads authorities, research organisations and universities, government departments or ministries developing policy and/or strategies and any other organisation directly dealing with road safety matters (such as consulting engineers, contractors etc.). To fill the gap between required and actual skills will be links to recommended training programmes and courses including those developed in SaferAfrica and courses such as the Delft Road Safety Course. This will be done in close consultation with local universities. The following courses should (where necessary be developed and) be implemented in the short term:

- General road safety course as developed by SaferAfrica WP6 and offered by Delft Road Safety courses (DRSC) through the Global Road Safety Facility.
- Specialised road safety courses on Road safety audits; Road safety inspections; Crash data analysis and statistics; Safety driven geometric design of rural roads and highways; Road safety engineering; Traffic safety data and data management
- Developing a uniform training manual and curriculum for the transportation of all manner of hazardous materials being transported on Kenyan roads. This must be closely coupled to the legislative review.

Capacity building score relatively low (15) on the CIFTER scale and will be easy to implement and manage (Table 17).
Table 17: CIFTER rating for capacity building component

<table>
<thead>
<tr>
<th>CAPACITY BUILDING AND TRAINING IN ROAD SAFETY MANAGEMENT</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCORES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Stability of the overall project context</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
<td>2</td>
<td>(moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Strategic importance of the project to the organization or organizations involved</td>
<td>2</td>
<td>(moderate)</td>
<td>3</td>
<td>(moderate)</td>
</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
<td>2</td>
<td>(moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
<td>2</td>
<td>(moderate)</td>
<td></td>
<td></td>
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</tbody>
</table>

4.4 Project component 4: Intervention strategy and implementation projects

At the time of the RSMCR there were insufficient data available to make an informed selection of candidate intervention projects and it is recommended that this be included in the development of the short term intervention implementation strategy which in turn must take into account the current draft proposed road safety action plan (NTSA, 2018). Likely candidate projects for the multi-sectoral road safety intervention projects include:

1. Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi
2. Conduct a Value of Statistical Life study for Road Safety in Kenya
3. Hazardous Materials Safety and Transportation
4. Mombasa–Uganda Highway Rest Centre
5. Garissa model road safety plan and design

The further development of the intervention projects will depend on the selected area or corridor. It is therefore recommended that these projects are treated as potential projects for discussion purposes with stakeholders. They will require further detailing in order to gauge the scope, the cost and the benefits, particularly in terms of road safety casualty reduction potential. However, since the interventions must demonstrate a multi-disciplinary approach, the budget (and further proposal development) provides for estimates for planning and co-
ordination, infrastructure related interventions, enforcement support, education and awareness, post-crash support, monitoring and evaluation and roll-out strategy.

4.4.1 Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi

From the review it was established that KURA is building a control centre along Mombasa road. A total of 100 intersections were identified for signalisation. To date 60 intersections have been signalised and the rest are subject to securing additional funding. There is a necessity to conduct a full scale traffic study to establish the need for an urban traffic control system for the central area of the city in which traffic signals in the network are co-ordinated and interdependent.

There has been much discussion on decongesting the city of Nairobi. This includes a proposal to gazette 2 days of the week where private cars will not be allowed into the city. However, the effect of this proposal has not been assessed and the impact will require studying as part of an overall strategy to reduce congestion and improve accessibility to the city centre (including provision of public transport). Nairobi, being the most motorised city in Kenya, also registers the highest number of pedestrian deaths and injuries countywide.

An ITS intervention would have a major traffic management component within the Central Business District (CBD) in the form of Traffic police and Traffic Management engineers for controlling and restricting traffic especially within the CBD. This would be the pilot that would lead up to a full fledged Urban Traffic Control Centre run by traffic engineers from an intelligent traffic management and control system such as SCOOT.

Ideally, the city should move to a full Urban Traffic Control Centre run by traffic engineers operating a full intelligent traffic management and control centre. This will release traffic police to focus on enforcement rather than physically control traffic as they do at the present time.

This intervention would also have an advocacy component targeting motorists, pedestrians, enforcement agents, on traffic lights (e.g. Traffic lights are must be respected by all road users)

The intervention would introduce a shift in culture that is partially supported by policy such as fines for crossing at undesignated area. However, currently jay walking is not an offence. For this law to be enforced, government would have to install and maintain safe crossing for all roads.

Although the Kenya Traffic Act (Cap 403) has gone through many revisions over the years (most recently 2012, 2017 and some changes have been proposed for 2018), the most profound disappointment is that the changes are quite superficial (short term) and each time amendments address only one or two elements. A total review based on the Safe Systems approach and taking into account the safety pillars is highly recommended and perhaps Safer Africa project could prioritise this as one of the 10 projects.
- The success of this project requires cooperation from KURA, Traffic Police, Public and the National Transport and Safety Authority (NTSA).

This project scores as a medium complexity project (17 points, Table 18).

**Table 18: CIFTER rating for the KURA ITS project**

<table>
<thead>
<tr>
<th>Work with KURA on Intelligent Transport Systems (ITS)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCORES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Stability of the overall project context</td>
<td>2 (high)</td>
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<td></td>
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<tr>
<td>2. Number of distinct disciplines, methods, or</td>
<td>2 (moderate)</td>
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<tr>
<td>approaches involved in performing the project</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental</td>
<td>2 (moderate)</td>
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<td></td>
<td></td>
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<tr>
<td>implications from performing the project</td>
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<tr>
<td>4. Overall expected financial impact (positive or</td>
<td>3 (high)</td>
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<tr>
<td>negative) on the project's stakeholders</td>
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<tr>
<td>5. Strategic importance of the project to the</td>
<td>3 (High)</td>
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<tr>
<td>organisation or organisations involved</td>
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<tr>
<td>6. Stakeholder cohesion regarding the characteristics</td>
<td>2 (moderate)</td>
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<tr>
<td>of the project</td>
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<tr>
<td>7. Number and variety of interfaces between</td>
<td>3 (high)</td>
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<td>the project and other organizational entities</td>
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</table>

4.4.2 **Conduct a Value of Statistical Life study for Road Safety in Kenya.**

Kenya has not conducted any national statistical cost of road accidents. Information about social costs of life is important for evidence based policy making and also informs health and infrastructure related costs.

It presents both economic and social costs and burdens brought about by road accidents. Cost benefit analysis and the benefits accruing from road safety measures can only be arrived at if a country has a baseline study on the costs of road crashes.

It is therefore proposed that the very first and thorough such study be conducted.

This study scores quite low in complexity (14) and should be relatively easy to implement and manage.
Table 19).
Table 19: CIFTER rating for VOSL study

<table>
<thead>
<tr>
<th>Conduct a Value of Statistical Life study for Road Safety in Kenya</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stability of the overall project context</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
<td></td>
<td>2</td>
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<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
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<td>2</td>
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<tr>
<td>4. Overall expected financial impact (positive or negative) on the project's stakeholders</td>
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<tr>
<td>5. Strategic importance of the project to the organization or organizations involved</td>
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<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
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<td>2</td>
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<tr>
<td>7. Number and variety of interfaces between the project and other organizational entities</td>
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4.4.3 Hazardous Materials Safety and Transportation

At the moment there are pieces of regulations and policies that need to be consolidated (See also project component 2). Some are with the Ministry of Transport, others with the transport agencies. Overall they are lacking both on relevance and depth going by the global best practice. A review with the intentions of improving the scope and operation/enforcement will contribute a lot in improving the current situation.

The idea is to have a uniform training manual / curriculum for all manner of hazardous materials being transported on Kenyan roads. Ideally the training should cascade to traffic police who are expected to manage the transport of these goods on the roads, including dealing with incidents.

The development of a training manual/curriculum will be preceded by a review of the rules and regulations governing transportation and procedures related to the routes used by hazardous goods transporters. Risk management plans and protocols would also need to be developed to give guidance on how to handle such incidents should they occur.

It is also necessary to work with the respective road officials to designate roads/ timing on roads for ferrying of such hazardous goods. This is especially because Kenya currently is in a situation where hazardous goods are to be found on all roads including residential roads. This heightens the chance of injuries, death and destruction of property because of the proximity to densely populated areas. Also this project scores high in complexity (Table 20).
Table 20: CIFTER rating for Hazardous Materials Safety and Transportation

<table>
<thead>
<tr>
<th>Hazardous Materials Safety and Transportation</th>
<th>1</th>
<th>2</th>
<th>3 (high)</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCORES</strong></td>
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<td></td>
</tr>
<tr>
<td>1. Stability of the overall project context</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of distinct disciplines, methods, or approaches involved in performing the project</td>
<td></td>
<td></td>
<td>3 (moderate)</td>
<td></td>
</tr>
<tr>
<td>3. Magnitude of legal, social, or environmental implications from performing the project</td>
<td></td>
<td></td>
<td>3 (high)</td>
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</tr>
<tr>
<td>4. Overall expected financial impact (positive or negative) on the project’s stakeholders</td>
<td></td>
<td></td>
<td>2 (moderate)</td>
<td></td>
</tr>
<tr>
<td>5. Strategic importance of the project to the organisation or organisations involved</td>
<td></td>
<td></td>
<td>3 (moderate)</td>
<td></td>
</tr>
<tr>
<td>6. Stakeholder cohesion regarding the characteristics of the product of the project</td>
<td></td>
<td></td>
<td>3 (low)</td>
<td></td>
</tr>
<tr>
<td>7. Number and variety of interfaces between the project and other organisational entities</td>
<td></td>
<td></td>
<td>3 (High)</td>
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</tbody>
</table>

4.4.4 Mombasa–Uganda Highway Rest Center

The Mombasa-Uganda (Northern Corridor) is a highly trafficked highway serving both Kenya and much of traffic to eastern Africa countries. This corridor records the highest number of road crashes in the region.

The road is the only major corridor ferrying goods from the Mombasa port to landlocked countries such as Uganda, Southern Sudan, Rwanda, Burundi and Democratic Republic of Congo.

The Inter-Governmental organisation, the Northern Corridor Transit and Transport Coordination Authority (NCTTCA), has a mandate from East African governments to develop the RSS (Northern Corridor Road Side Station) technical support and guidelines. This has been ongoing since 2016 but is yet to be rolled out (http://www.roadsidestations.org).

The main functions of the RSS will include such amenities as Restaurants, Shops, Health clinic, Bank/Bureau office, Car workshops: In roadside stations dedicated to cars, Trucks Cleaning repairs and inspection services, Fuelling Petrol station, Public information area/Administrative services, local community, markets for crafts& local produce, Service for trucks (repairs), Supermarkets, parking spaces providing secure parking yards for transit vehicles as well as rest
facilities, restaurants, information centres, and outlets for amenities needed by truck crews, long distance passengers and, in some cases, the local communities.

It is expected that RSSs that will accommodate trucks for long stops including overnight stays will attract more attention. However, the importance of short-stop RSSs also needs to be accorded due attention. Some leading transporters already require their drivers to stop to rest every two to three hours but this is hindered by lack of roadside facilities including parking space and security.

The road driving experience and challenges was flagged by the RSMCR in 2018 (G; Schermers et al., 2018) and therefore is a relevant intervention.

Why now?

- Many interventions are needed but this is a quick win and long overdue.

Why would this succeed where others have failed?

- The chances of success are higher if a private company is involved right from land acquisition, securing funding and running it in a sustainable money through a business model

Private sector involvement will ensure the sustainability challenges facing similar projects globally (Federal Rest Areas facilities in the USA) in other countries do not happen

Objective/goals

- A model Road Side Rest centre
- A centre that would be run sustainably but at affordable charges
- Safe roads management practices are introduced
- Support the drive for Safer Drivers
- Save lives

This will contribute to Safe System Approach and Road Safety Pillar 4 (Safer Road Users) & Pillar 3 (Safer Vehicles) as vehicles will be checked and serviced more frequently.

The rest centre rates as global level 1 (medium complexity, Table 21).

Table 21: CIFTER rating for Mombasa –Uganda Highway Rest Centre

<table>
<thead>
<tr>
<th>Mombasa –Uganda Highway Rest Centre</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1. Stability of the overall project context</td>
<td>1 (very high)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
2. Number of distinct disciplines, methods, or approaches involved in performing the project: 2 (moderate)

3. Magnitude of legal, social, or environmental implications from performing the project: 2 (moderate)

4. Overall expected financial impact (positive or negative) on the project’s stakeholders: 2 (moderate)

5. Strategic importance of the project to the organisation or organisations involved: 2 (low)

6. Stakeholder cohesion regarding the characteristics of the product of the project: 3 (low)

7. Number and variety of interfaces between the project and other organisational entities: 2 (moderate)

4.4.5 Model Road Safety Planning And Design

The RSMCR 2018 for Kenya (G; Schermers et al., 2018) proposes the establishment of a road safety planning project for Nairobi or any other county with plans for creating major infrastructure programmes.

Garissa county indicated their interest in getting assistance with a road safety master plan for their county. In case they are not ready then Makueni County can be approached.

The selection of this site was done because Nairobi already has many competing funders and other stakeholders which run the risk of duplication and secondly due to its larger than normal status, it will need more money than a small city in a rural county.

It is proposed that a proposal be produced that will include phased Terms of References. The TOR shall, among others, include:

1) Survey and produce star rating maps for all paved roads within Garissa County
2) Collect crash data, traffic flow and speed data for the Garissa road network
3) Produce a list of all road attributes
4) Produce a detailed technical report on traffic patterns (traffic model)
5) Develop a Garissa Road Assessment Programme including training of County staff
6) Support the setting of design standards
7) Support the setting of design standards

This project score as a medium complexity project with 17 (Table 22).

Table 22: CIFTER rating for Garissa Road Safety Planning And Design

<table>
<thead>
<tr>
<th>Garissa Road Safety Planning And Design</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
1. Stability of the overall project context | 3 (moderate)

2. Number of distinct disciplines, methods, or approaches involved in performing the project | 2 (moderate)

3. Magnitude of legal, social, or environmental implications from performing the project | 2 (moderate)

4. Overall expected financial impact (positive or negative) on the project’s stakeholders | 2 (moderate)

5. Strategic importance of the project to the organisation or organisations involved | 3 (high)

6. Stakeholder cohesion regarding the characteristics of the product of the project | 2 (moderate)

7. Number and variety of interfaces between the project and other organisational entities | 3 (high)

### 4.5 Summary of project ratings

In summary the following project components and their sub projects have been rated using the CIFTER procedure. The developed scores are based on assessment of the project team with limited follow up consultations with local stakeholders in Kenya. Once the Terms of Reference for these projects have been developed they will be discussed in more detail with local stakeholders in order to finalise the projects and to seek alternatives to fund these projects.

1. Project Component 1: In depth review of the NTSA and related institutional setting
   a. Review of the structure and function of the lead agency for road safety
   b. Coordination, policy and funding for NTSA
   c. Review of the strategic plan for road safety
   d. Enabling legislation to provide NTSA a mandate to manage
   e. Road safety management data

2. Project Component 2: Legislative and operational reviews
   a. Legal framework
   b. Driver and road user standards
   c. Vehicle standards
   d. Road classification, road design and maintenance standards
   e. Traffic law enforcement
   f. Post-crash care

3. Project component 3: Capacity building and training in road safety management

4. Project component 4: Intervention strategy and implementation projects
   a. Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi
   b. Conduct a Value of Statistical Life study for Road Safety in Kenya
   c. Hazardous Materials Safety and Transportation
   d. MOMBASA –UGANDA HIGHWAY REST CENTRE
   e. Garissa model road safety plan and design
A summary of the CIFTER ratings for all the project components and their sub-projects is provided below.

**Table 23: Safe Systems project components and their respective CIFTER ratings**

<table>
<thead>
<tr>
<th>Sample project</th>
<th>Project factor</th>
<th>management complexity</th>
<th>Total Score</th>
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<tbody>
<tr>
<td></td>
<td>1 Stability</td>
<td>2 No of methods/disciplines</td>
<td>3 Implications</td>
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<tr>
<td>Project component 1: In depth review of the NTSA and related institutional setting</td>
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<tr>
<td>a. Review of the structure and function of the lead agency for road safety</td>
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<tr>
<td>b. Coordination, policy and funding for NTSA</td>
<td>4</td>
<td>2</td>
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<tr>
<td>c. Review of the strategic plan for road safety</td>
<td>4</td>
<td>3</td>
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<td>d. Enabling legislation to provide NTSA a mandate to manage</td>
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<tr>
<td>e. Road safety management data</td>
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<td>Project Component 2: Legislative and operational reviews</td>
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<td>a) Legal framework</td>
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<td>b) Driver and road user standards</td>
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<td>c) Vehicle standards</td>
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<td>d) Road classification, road design and maintenance standards</td>
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<td>e) Traffic law enforcement</td>
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<td>f) Post-crash care</td>
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<td>Project component 3: Capacity building and training in road safety management</td>
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<td>Project component 4: Intervention strategy and implementation projects</td>
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<td>a) Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi</td>
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<td>Conduct a Value of Statistical Life study for Road Safety in Kenya</td>
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5 Terms of reference for the various projects components

5.1 Project Component 1: In depth review of the NTSA and related institutional setting

The RSMCR of Kenya has revealed that the current functioning of the NTSA needs to be strengthened. Since its inception in 2012 the NTSA has effectively taken over the responsibilities of vehicle and driver testing and registration and with that setting controls for vehicle and driving testing at testing centres. Initially much focus was devoted to enforcement activities in these sectors. NTSA has concentrated its management functions on primarily these operational aspects and has neglected to develop a clear focus on results, particularly reducing the number of serious crashes and fatalities.

An operational audit (review) of the NTSA within the current institutional framework and setting is required to fully understand the current functions and responsibilities of the NTSA as compared to what it has been mandated to do and what is considered best practice for a lead agency tasked with road safety management. Such a review must reveal which structure is best suited to the country to ensure that all the relevant management functions are performed and safeguarded.

5.1.1 Objectives

The overall objective of the project is to improve the standard of road safety in Kenya. The project in particular is intended to produce a significant change in the management of road safety with the view to achieve a systematic implementation of interventions that will lead to measurable reductions in the number of road crashes, fatalities and severity of road traffic injuries. The indicator for the success of the project will be the existence of a new legislative and organisational setup with adequate capacity to respond and deliver on the road safety mandate with a clear line of accountability and transparency in the reporting processes and procedures. Specific objectives include:

1) To review the institutional management capabilities of NTSA and parties responsible for road safety management in Kenya and deploying procedures outlined by the World Bank
2) To identify strengths, weaknesses, opportunities and threats in the short to long term for road safety management in the country
3) To develop action plans to facilitate the implementation of an effective road safety management plan and its monitoring
4) To develop a strategic framework outlining the vision and goals of the lead agency and the organizational structures necessary to support and co-ordinate effective road safety management in Kenya
5.1.2 Outputs

A SWOT based analysis of institutional management capabilities of the NTSA complemented by a gap analysis which will reveal strengths and weaknesses across all sectors of road safety management. It will also identify threats and opportunities for NTSA to optimize its performance in the current and future road transport environment.

This will form the basis of a strategic plan for the NTSA in which its goal and vision is formalized, the intended functions are stipulated (with a clear focus on becoming results focused and driven), structures are proposed to manage and co-ordinate these, and a budget to carry out the functions is proposed. Given its current role and mandate, the plan will include options for a management structure for the NTSA so that it can take responsibility for the following primary functions (Bliss & Breen, 2009; Small & Runji., 2014):

- Leading jurisdictional road safety projects /programmes/strategies
- Horizontal inter-governmental coordination of road safety matters
- Vertical coordination of road safety activities with lower levels of government
- Coordination of necessary delivery partnerships between government partners, the professional, nongovernmental and business sectors and Parliamentary groups and committees dealing with road safety related matters
- Ensuring a comprehensive legislative framework for road safety
- Securing sustainable sources of annual funding and a rational framework for resource allocation in road safety management
- High-level promotion of road safety strategy across government and society
- Periodic monitoring and evaluation of road safety performance
- Direct road safety research and development and knowledge transfer

The project is targeted at creating a fully capacitated road safety lead agency capable of coordinating all road safety activities in the country. Equally important is that structures and systems are put into place in which accountability for performance targets is measured and monitored and where needed sanctions are introduced for non-compliance.

The Consultant shall assist developing a new legislative framework for road safety management in the form of a blue print on an appropriate organisational structure supported by a legal road safety Bill or similar.

In close consultation with stakeholders, the process of setting up and supporting coordinating structures as being undertaken by NTSA will be continued but along the lines proposed by the strategic plan. Since the implementation of this plan is largely dependent on the input of stakeholders, often in the form of service providers, an outline of performance based contracts will need to be prepared and agreed upon with the stakeholders.

Other Outputs:

i. International good practice benchmarking of strategic management structures and processes in road safety management, including results focus, coordination and monitoring and evaluation functions.
ii. Recommended improvements to results focus, coordination and monitoring and evaluation functions, to improve the efficient and effective delivery of interventions

iii. On the job support to the implementation of improved strategic management structures and processes

The scheduling of the required technical assistance services is as follows:

- Phase 1: Conduct a complete institutional management appraisal of NTSA including the supporting data systems.
- Phase 2: Development of SWOT and Gap analysis.
- Phase 3: Develop strategic plan for the NTSA including an implementation and monitoring programme
- Phase 4: Develop a management and organisational framework for the lead agency assigning clear responsibilities and tasks with the organization and external to it. This will include drafting framework performance agreements with suppliers to the lead agency (eg, organisations responsible for vehicle registrations, enforcement, driver testing and licensing etc.)
- Phase 5: Drafting a road safety data management plan and road safety Bill to support the future functioning of the lead agency

The project will be completed in a 12 month period.

5.1.3 Professional skills and experience required

Road Safety Management Specialist

An internationally recognised road safety management specialist with at least 15 years’ experience in road safety management at the highest level and with the development and implementation of national road safety strategies. Demonstrated success in working with wide range of safety-related government agencies is essential and with relevant experience in conducting road safety management capacity reviews.

5.2 Project component 2: Legislative and operational reviews

The RSMCR (G; Schermers et al., 2018) has revealed that road transport (including road safety) laws and regulations in Kenya may be outdated and in need of systematic review with particularly the following aspects requiring attention

1. Legal framework
2. Driver and road user standards
3. Vehicle standards
4. Road classification, road design and maintenance standards
5. Traffic law enforcement
6. Post-crash care

5.2.1 Objectives
1. Legal framework

The current legal framework governing road safety matters in Kenya is reasonable but fragmented and requires a thorough review with a mind to consolidate legislation. As indicated in Project Component 1, specific attention needs to be given to the legal status of the lead agency and its position and role in regulating road safety matters in Kenya. This review must aim to provide that framework with ultimately the objective of amending current legislation to support a safe systems approach to road safety management.

2. Driver and road user standards

A new credit card style driver licence system is being phased in but there remains evidence of poor driver training and road user behaviour. There is a need to review the entire driver training and licensing system as well as the penalty system for road related traffic infringements, also that of pedestrians. A review is necessary to strengthen driver training and licensing requirements, testing procedures and penalties. The review should result in recommendations for system changes and provide a model framework for implementing a model driver training centre as a demonstration project for future roll out or up scaling.

To facilitate establishing such a centre the following enabling objectives are anticipated:

- To establish needs and to develop an appropriate design for such centres and its facilities
- To establish the costs to construct, operate and maintain the centre and its facilities including such equipment as simulators, investigation tools and
- Designing and building a driving road/circuit of about 1.5 km length with all the possible arrangements as would be found in a normal road situation
- Work with private investors to create a track with real life features
- Introduce simulators and computerised tests (hazard perceptions and theory courses)
- Train school children through school visitations, offer refresher courses for driving instructors
- To analyse the training needs and knowledge gaps for sector workers and institutions

3. Vehicle standards

A review of the current vehicle registration, licensing and annual roadworthy inspection system is required. The review will assess the registration system, the vehicle standards and legislation and regulations (all vehicles), the testing centres and their accreditation procedures, the testing and roadworthy procedures and capabilities, ongoing compliance issues and any other matters relevant to improving the safety performance of road based vehicles in Kenya. Another important issue that will be assessed is the issue (including authorisation and homologation), use and compliance of vehicle based safety equipment such as tachographs, speed limiters, etc. Specific attention to roadworthiness and roadworthiness testing and monitoring will form part of the review, particularly related to HGVs and PSVs. A final aspect that requires attention is enforcement related to vehicle roadworthiness. A review of current procedures and processes is needed to compare that to what is required to ensure that are
external (police) checks on roadworthiness and compliance with regulations regarding the use of vehicles on public roads. The review has as potential objectives:

f. To conduct a situational analysis to understand current legislation/standards and practice, identify problems/risks and areas where improvement is essential and needed, including legislative reviews.

g. To assess specifically the standards applied to retrofitting (PSV and other) vehicles and seeing how these can be improved given the market and political environment in which these vehicles operate.

h. To review roadworthy procedures and practices. Again this should be a detailed situational analysis supplemented by a review of best and appropriate practices internationally and in Africa/the region. Part would be to test feasibility of privatising testing centres for private vehicles and tightening up control on standards for licensing and using PSV and goods vehicles. The review of vehicle roadworthy procedures and practices should include recommendations on how to improve current practice in order to get compliance with safe systems requirements.

i. To initiate Public Private Partnerships in vehicle building and inspection by setting standards equivalent to global best practice. This will include reviewing current vehicle building standards against best practices and recommend changes.

j. To review inspection centres against the global best practices.

4. Road classification, road design and maintenance standards

It is proposed to conduct a complete review of road design, construction and maintenance practices in Kenya with a view to develop appropriate geometric and road safety design guidelines for urban and rural Kenyan roads. The review will assess current practice and propose improvements but will also examine capabilities, procedures and capacity to conduct safe and good practice road design. Integral to this will be defining the role of instruments such as road safety audit, road safety inspection, network safety management and road safety impact assessments in the quality assurance process. The role of safety performance indicators (e.g. iRAP) for ensuring a pro-active and ongoing approach to providing safe road infrastructure will also be an objective.

5. Traffic law enforcement

A better understanding of current operational traffic law enforcement procedures needs to be developed and compared to best practice. A primary objective is to review the current system of traffic law enforcement, from the enabling legislation through enforcement, adjudication and monitoring and evaluation. Given that a penalty points system is being introduced this review must critically assess the needs and capabilities of the traffic police in using and supporting such a system and also the possible new systems coming from the other reviews. The review must gain insight into aspects such as resource deployment procedures, measures of effectiveness, enforcement programming and targets, training and capabilities, equipment, budgets and allocation of funding, etc. Specific attention must be given to developing an (pro)active enforcement programme aimed at informed, targeted and systematic enforcement of critical offences (SPI's).
6. Post-crash care

The primary objective of this task is to review or audit of the state of post-crash services in Kenya. It will assess the number of ambulances, the state of ambulances, numbers of drivers and ambulance personnel and their training, number of hospitals, clinics and emergency care centres and their capabilities in dealing with trauma patients etc. The review will examine issues relating to response protocols, deployment strategies and prioritisation procedures, response monitoring, response times etc., and provide insight into admittance procedures and protocols at hospitals. Based on the outcome, policy inputs will be provided to steer future post-crash care based on realistic performance based targets and procedures. An essential component will be to determine whether cooperation between the Ministry of Health, hospitals and clinics and NTSA is viable and what form this should take.

5.2.2 Outputs

The legislative and operational reviews will produce at least the following primary outputs:

i. A review of the current legal system governing road transport and particularly road safety in Kenya and proposals for amendments to ensure that the adoption of a safe systems approach to road safety management is supported by legislation.

ii. International good practice benchmarking of current vehicle standards, registration and licensing practices as compared to accepted best practice and including proposals to ensure vehicle safety standards are optimized in Kenya, including roadworthiness and periodic testing. This applies to regulating all vehicles making use of public roads and ensuring that these comply to safety standards throughout their operational life. Attention will be given to de-registration and scrapping of vehicles not fit for purpose.

iii. Recommended short-term and long-term improvements to the current and planned practices for driver training, testing and licensing, and action plan for improvement program.

iv. On-the job support to the driver training, testing and licensing improvement program.

v. A status quo analysis comparing current practice regarding road planning, design, operation, maintenance to what is considered best practice on the continent and internationally.

vi. A review of current traffic law enforcement and comparison with international and regional best practices including the development of a management plan outlining strategic objectives for law enforcement including the setting, monitoring and evaluation of enforcement goals for critical offences.

vii. A review of the post-crash care system in Kenya insofar relevant to road traffic with specific attention to current and future coordination structures and co-operation between agencies on matters related to road safety. The review will assess the current performance and capability of these services and recommend an action plan to develop a post-crash care system supportive of a safe systems approach to managing road safety.

5.2.3 Scheduling of tasks
The legislative and operational reviews can be scheduled to run in parallel although it is recommended that the legislative review (1) first be carried out to provide essential input into the operational reviews of vehicle, driver, road and post-crash care systems. The proposed scheduling could therefore be as follows:

Year 1: Legislative review

Year 2: Review of vehicle and driver regulatory and operational systems

Year 3: Review of road planning, design and operational standards and of the post-crash care system

Each of the phases/years will produce post-project programmes and guidelines for implementing and operating the systems. The implementation phase will fall outside of this ToR.

5.2.4 Professional skills and experience required

Specialists with at least 10 years’ experience in each of the respective elements of the project, namely road traffic legislation; motor vehicle standards, registration and testing; driver training, testing and licensing; traffic law enforcement; road design and safety engineering and post-crash care, incident management and hazardous materials in a national jurisdiction. A thorough knowledge of international best practice in these respective areas is essential. Previous experience in the provision of advisory services to a national agencies in a developing or transitional country is desirable.

Registry Management Specialist: A specialist with about 10 years’ experience with the management of modern registry systems for drivers and vehicles and related business procedures and technology. Extensive experience working at a senior management level in a national registry is essential. Previous experience working with a national registry in a developing or transitional country is desirable.

For all team members, a demonstrated ability to work with and gain the trust of senior government officials and professional peers is essential.

5.3 Project component 3: Capacity building and training in road safety management

The RSMCR revealed that there is a clear need to build capacity in all areas related to traffic safety management. Traditionally, specialised courses and training have been offered but these have not provided a sustainable skills base. Individuals attending the training move in other domains or are promoted and the skill is lost. This has to do with the fact the current road safety management structures have not defined functional job descriptions for such staff nor have road and other authorities recognised the need for specialised road safety expertise.

It is proposed to use the outputs from the legislative and operational reviews to develop minimum qualification and skill sets for technical staff responsible for road safety at the lead
agency, the roads authorities, research organisations and universities, government departments or ministries responsible for developing policy and/or strategies and any other organisation directly dealing with road safety matters (such as consulting engineers, contractors etc.).

To fill the gap between required and actual skills will be links to recommended training programmes and courses including those developed in SaferAfrica and courses such as the Delft Road Safety Course (DRSC). This will be done in close consultation with local universities.

In Kenya there is not only a need to train staff in road safety management and also in more specialised areas of road safety, but there is also a distinct need to build road safety expertise and capacity among researchers and tertiary institutions in the country with a view to build up a critical mass of local experts capable of providing future training. This necessitates a twin pronged approach where two levels of training are provided, one for employees at all levels of government and the second at future trainers (via a train the trainer approach).

This project will be carried out over a 3 year period, concluding with an evaluation and an action plan aimed at addressing future training needs and maintaining critical mass in road safety management in Kenya.
5.3.1 Objectives

The objectives for this three-year project are:

1. To build road safety expertise among middle to senior level government officials in Kenya
2. To develop train the trainer programmes in road safety management in Kenya
3. To facilitate the adoption of specialised (where necessary, customised) road safety training programmes in all facets of road safety management and using the programmes developed in Saferafrica WP6 as basis
4. To encourage and stimulate formal training programmes in road safety management at tertiary level institutions in Kenya
5. To develop and implement a monitoring and evaluation programme to assess the efficacy of training in RSM

5.3.2 Outputs

The outputs of the required technical assistance services are per project objective as follows:

Objective (a) Building road safety expertise among all levels of middle to senior level government officials.

Outputs

i. Preparation of a five day road safety management training programme based on the Saferafrica WP6 Module 1 and 2 and DRSC-Africa outlines
ii. Recruitment and training of 5 local lecturers
iii. Presenting 3 five day road safety management courses for middle to senior management
iv. Development of a pre-and post-test exam to assess the impact of training
v. Evaluation of the course and its content
vi. Recommendations for improvement and future training needs and programmes
vii. Developing a support network among course attendants for on-the job support following the training

Objective (b) Developing train the trainer programmes in road safety management.

Outputs

i. Development of an advanced road safety training programme for post graduates, lecturers and other training professionals in presenting road safety management training
ii. Presenting 2 local train the trainer programmes for 5-10 persons/course
iii. Course evaluation
iv. Selection of suitable trainers
Objective (c) Developing specialised training programmes in road safety

Recruiting from students of the road safety management course and the train the trainer course, local lecturers will be trained in each of the specialised courses, firstly by attending (and passing) a course presented by an international expert in the relevant area followed by acting as a support course lecturer, then as a lead lecturer under supervision and finally as course presenter. This model will also apply to the train the trainer programme discussed in (d).

Outputs

Development and implementation of at least two of the following specialised road safety courses per year with 15-20 students/course:

- Road safety audits;
- Road safety inspections;
- Crash data analysis and statistics;
- Safety driven geometric design of rural roads and highways;
- Road safety engineering;
- Traffic safety data and data management

Development of a uniform training manual and curriculum for the transportation of all manner of hazardous materials being transported on Kenyan roads. This must be closely coupled to the legislative review.

Objective (d) Developing formal training programmes in road safety management at tertiary level institutions

Outputs

The project proposes to start with Universities in Kenya and will explore how to include road safety in current curricula of faculties and tertiary institutions focussed on Engineering, Public Health and Social Sciences. Lecturers and professors that have shown an interest in road safety will be contacted and options to include road safety in a future curriculum explored. If agreement can be reached, it is proposed to train lecturers and to help them to develop a road safety curriculum. The primary output will be a road safety training curriculum for tertiary level institutions.

Objective (e) Development and implementation of a monitoring and evaluation programme to assess the efficacy of training in RSM

This will produce an evaluation report describing the training and its elements and an assessment of the impact the training has had on road safety management in Kenya directly and on road safety indirectly. In addition a future needs action plan will be produced outlining a strategy ensuring that capacity in vital areas can be sustained.
5.3.3 Scheduling of tasks

The scheduling of the required technical assistance services is as follows:

- **Year 1:** Development of training course and first train the trainer courses followed by one RSM course for government officials, 2 specialised training course, development of tertiary curriculum
- **Year 2:** 2 RSM courses, 2 Specialised courses, 1 train the trainer course and development, introduction of Road safety as a tertiary level subject at relevant institutions/universities
- **Year 3:** 2 RSM courses, 2 specialised courses and project evaluation and action plan.

5.3.4 Professional skills and experience required for realising project component 3

**Road safety specialist**

An internationally recognised road safety management specialist with at least 15 years’ experience in road safety management at the highest level and with the development and implementation of national road safety strategies. Demonstrated success in working with wide range of safety-related government agencies is essential and with relevant experience providing training in road safety management generally and other specialized road safety areas specifically.

**Required:**

- Bachelor’s degree in public health, engineering, transport planning, law, or a related road safety field
- Minimum 10 years’ experience in road safety management
- Specialised experience in providing and evaluating professional road safety education

**Responsibilities/competences include:**

- Organizing 5 day road safety management course for middle to senior management levels, including exam testing and independent course evaluation, recommendation for future programs
- Developing an advanced road safety training programme for post graduates, lecturers and other training professionals in presenting road safety management training, including
- 2 local train the trainer programmes for 5-10 persons/course and course evaluation
- Developing and implementing specialised road safety courses for student groups (15-20)
- Developing road safety training curriculum for tertiary level institutions.
- Preparing and performing an evaluation that describes the training and its elements, and assesses the possible impact of the training on road safety management in Kenya
directly and on road safety indirectly, including a future needs action plan for further training.

Road safety

For all team members, a demonstrated ability to work with and gain the trust of senior government officials and professional peers is essential.

5.4 Project component 4: Intervention strategy and implementation projects

At the time of the RSMCR there were insufficient data available to make an informed selection of candidate intervention projects. It is recommended that this be included in the development of the short term intervention implementation strategy and taking into account the current draft proposed road safety action plan (NTSA, 2018). Likely candidate projects for the multi-sectoral road safety intervention projects have been identified as:

1. Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi
2. Conduct a Value of Statistical Life study for Road Safety in Kenya
3. Hazardous Materials Safety and Transportation
4. Mombasa–Uganda Highway Rest Centre
5. Garissa model road safety plan and design

The further development of the intervention projects will depend on the selected area or corridor. It is therefore recommended that the projects described below are treated as potential projects for discussion purposes with stakeholders. They will require further detailing in order to gauge the scope, the cost and the benefits, particularly in terms of road safety casualty reduction potential. However, since the interventions must demonstrate a multi-disciplinary approach, the budget (and further proposal development) provides for estimates for planning and co-ordination, infrastructure related interventions, enforcement support, education and awareness, post-crash support, monitoring and evaluation and roll-out strategy.

5.4.1 Objectives

5.4.1.1 Work with Kenya Urban Roads Authority (KURA) on Intelligent Transport Systems (ITS) in Nairobi

From the review it was established that KURA is building a control centre along Mombasa road. A total of 100 intersections were identified for signalisation. To date 60 intersections have been signalised and the rest are subject to securing additional funding. There is a necessity to conduct a full scale traffic study to establish the need for an urban traffic control system for the central area of the city of Nairobi in which traffic signals are in the network are co-ordinated and interdependent.

There has been much discussion on decongesting the city of Nairobi. This includes a proposal to gazette 2 days of the week where private cars will not be allowed into the city. However, the
effect of this proposal has not been assessed and the impact will require studying as part of an overall strategy to reduce congestion and improve accessibility to the city centre (including provision of public transport) Nairobi, being the most motorised city in Kenya, also registers the highest number of pedestrian deaths and injuries countywide.

An ITS intervention would have a major traffic management component within the Central Business District (CBD) and would aim to manage and control traffic in the CBD and surrounding areas. A pilot involving the CBD should be initiated in which a fully-fledged Urban Traffic Control system is deployed which at a later stage could be expanded to cover the entire CBD. Such a UTC system will be run from a central traffic control centre manned by traffic engineers and using ITS technology such as SCOOT as the backbone for controlling the signalised junctions in the pilot area.

The aim is to demonstrate that efficient traffic control significantly reduces congestion and air pollution levels whilst improving road safety and general road user behaviour. In addition it eliminates the need for manual traffic control and releases scarce traffic police resources to perform their core task of traffic law enforcement in support of the pilot UTC system.

5.4.1.2 Conduct a Value of Statistical Life study for Road Safety in Kenya.

Kenya has not conducted any national statistical cost of road accidents. Information about social costs of life is important for evidence based policy making and also informs health and infrastructure related costs.

It presents both economic and social costs and burdens brought about by road accidents. Cost benefit analysis and the benefits accruing from road safety measures can only be arrived at if a country has a baseline study on the costs of road crashes.

The aim of this task is to establish the economic costs of road crashes in Kenya, based on Kenyan economic and related data.

5.4.1.3 Hazardous Materials Safety and Transportation

Regulation and laws governing the transport of hazardous materials as well as matters relating to the management of events involving such materials are fragmented in Kenya and need to be consolidated. It is the aim of this task to provide a summary of relevant regulations and to propose consolidation of this as an input to the project dealing with reviewing legislation. In addition, a thorough review aimed at improving the scope and operation/enforcement of the transport of hazardous materials will contribute a lot in improving the current situation. Such a review must consider the allocation of routes, assess the regulations and policies regarding the transporting of such materials, the labelling and handling requirements, incident management and materials handling aspects etc. This must provide the basis on which to conduct a comparative analysis with recommended practice and to develop guidelines and protocols for the transportation of hazardous materials.
To support the introduction of these guidelines and protocols, specialised training courses for transport companies, enforcement agencies and emergency service personnel will be developed and implemented. The development of a training manual/curriculum will be preceded by a review of the rules and regulations governing transportation and procedures related to the routes used by hazardous goods transporters. Risk management plans and protocols would also be developed to give guidance on how to handle such incidents should they occur.

Specific attention will be paid to developing a designated hazardous materials transport route network backed by an efficient system for issuing transport permits and monitoring these.

5.4.2 Outputs

The outputs of the required technical assistance services are as follows:

(a) **ITS Nairobi**

**Outputs**

i. Traffic management plan for Nairobi CBD
ii. Proposal for a pilot UTC application in Nairobi CBD
iii. Pedestrian management plan for the Nairobi CBD
iv. Road Safety management plan for Nairobi CBD
v. Medium term traffic management and road safety improvement implementation plan

(b) **The economic cost of crashes in Kenya and the Value of a Statistical Life**

**Outputs**

i. Economic appraisal of the cost of crashes in Kenya including calculation the VOSL.

(c) **Transportation of hazardous materials study in Kenya**

**Outputs**

i. Guidelines and protocols governing the transportation of hazardous materials.
ii. Hazardous materials incident management protocol for emergency services
iii. Proposal for harmonizing laws and regulations governing the transport of hazardous materials
iv. Hazardous materials routes, permit requirements and policies
v. Training programme for transport of hazardous materials
vi. On-the job support to the commercial driver health and safety improvement program.

5.4.3 Scheduling of tasks

The scheduling of the required technical assistance services is as follows:
• Duration of project: Development and implementation of the three project tasks.
• Final year of project: Development of supporting medium term action plans and strategies

5.4.4 Professional skills and experience required

Traffic engineers

An experienced traffic engineer with at least 15 years’ experience in urban traffic control and with particular experience with ITS applications involving real time traffic control utilizing systems such as SCOOT or similar applications. The traffic engineer must be able to demonstrate that he has worked in complex environments dealing with multiple stakeholders at all levels of government and have exceptional communicative and management skills and be able to manage complex projects.

A road safety specialist/engineers

An internationally recognised road safety management specialist with at least 15 years’ experience in road safety management at the highest level and with the development and implementation of national road safety strategies. Demonstrated success in working with wide range of safety-related government agencies is essential and with relevant experience in aspects related to road safety engineering, crash analysis, traffic engineering, development and implementation of complex traffic management plans etc. An additional requirement is that they have experience in training and capacity building.

Safety Legislation Specialist

A specialist with about 10 years’ experience in transport sector legislation, with specific knowledge of traffic safety legislation and sanctions in a national policing jurisdiction. Knowledge of international legislative developments in general deterrence enforcement models is essential. Previous experience with road safety legislation in developing or transitional countries is desirable.

Transport Economist

A transport economist with at least 10 years’ experience in the road transport sector and with a particular affinity to calculating the costs of road safety, either through relatively simple CBA or more complex economic impact assessments following large scale traffic management or pricing interventions. An added advantage is that the economist can demonstrate their involvement in doing an economic assessment of crash costs or in determining the VOSL.

Hazardous materials and commercial Vehicle Safety Specialist

A specialist with about 10 years’ experience in the area of transport of hazardous materials and commercial vehicle driver health and safety and commercial vehicle safety standards. Extensive experience working with commercial transport operators in the provision of safety assurance programs and related training is essential. The specialist has extensive knowledge of the types
of hazardous materials, the risks, safety requirements, handling etc. and has extensive experience in risk assessment.

For all team members, a demonstrated ability to work with and gain the trust of senior government officials and professional peers is essential.
6 References


Howard, E., Breen, J., Bliss, T., & Corben, B. (2010). *Road safety management capacity review—Western Australia* (Final report). Retrieved from Perth:


