ROAD SAFETY INTERVENTIONS INITIATIVES

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1. Executive Summary

According to the Global Status Report on Road Safety 2018 (WHO, 2018b), the number of road traffic injuries claimed 1.35 million lives in 2016. Based on the WHO regions, road traffic fatality rates are increasing in the African region from 26.1 fatalities per 100,000 inhabitants in 2013 to 26.6 fatalities per 100,000 inhabitants in 2016. Therefore, the African region is the worst performing WHO region. Over the same period, there was an improvement in road fatality rates in the WHO Europe region. Road traffic injury in Africa is even expected to worsen further, with an increasing of 55% in road traffic fatalities over the period from 2016 until 2030 (WHO, 2018c).

SaferAfrica project aims at establishing a Dialogue Platform between Africa and Europe focused on road safety and traffic management issues. It will represent a high-level body with the main objective of providing recommendations to update the African Road Safety Action Plan and the African Road Safety Charter, as well as fostering the adoption of specific initiatives, properly funded.

The first main objective of work package 3 is to assess the implementation of the Action Plan 2011–2020 (AU-UNECA, 2010). This assessment has been supported by SWOT and PESTEL analysis completed at different geo-political scales (continental, regional economic communities/corridors and country) and is described in deliverable 3.1. The second main objective of work package 3 is to define initiatives for different topics (i.e., road safety policies, road safety and traffic management, capacity building and other road safety interventions). Those initiatives are designed to foster the implementation of the Action Plan and to contribute to a better situation in terms of road safety. The final aim is to prepare information to support the discussions with the Dialogue Platform Management Board. This deliverable deals with the operational dimension of the "Level/Layer" matrix and more specific, the elaboration of initiatives about road safety interventions.

Hereby, road safety interventions have been defined as actions designed to target consciously chosen safety improvement objectives within the road safety system (Wilpert & Fahlbruch, 2002). The categorisation of the road safety interventions is made based on the traditional five pillars used by the UN (2011). The road safety interventions in this report were selected based on the needs described in the capacity reviews of WP5, the applicability to the African continent and the concreteness of the road safety intervention.

The described road safety interventions in this report serve as a guideline for the implementation of some concrete initiatives within the pillars of safer roads and mobility, safer vehicles, safer road users and post-crash response. Of course, they will need some specific adaptations and adjustments to the characteristics of the country or region where they would be implemented.

2. Introduction

2.1 Background

According to the most recent *Global Status Report on Road Safety 2018* (World Health Organization, 2018b), the number of road traffic deaths is still increasing. In 2016, the number of road traffic deaths worldwide was 1.35 million and has never been so high before. Whereas road traffic injury was seen as the 9th leading cause of death for all age groups in 2010, the most recent estimates of 2016 show that road traffic injury is the 8th leading cause of death worldwide (WHO, 2018a). Furthermore, the leading cause of death for children and young adults between 5 until 25 years is now road traffic injury.

The risk of a road traffic death has a strong association with income level. The share of road traffic deaths in relation to the population and registered motor vehicles is disproportionally high in low-income countries and to a lesser extent in middle-income countries compared to high-income countries. Middle income-countries are accountable for 76% of the world's population and 59% of the total registered vehicles, but 80% of the road traffic deaths occur in these countries. Only 1% of the total registered vehicles and 9% of the world's population are from low-income countries, but 13% of the road traffic deaths are occurring in low-income countries. These disproportionalities are visually shown in figure 1.
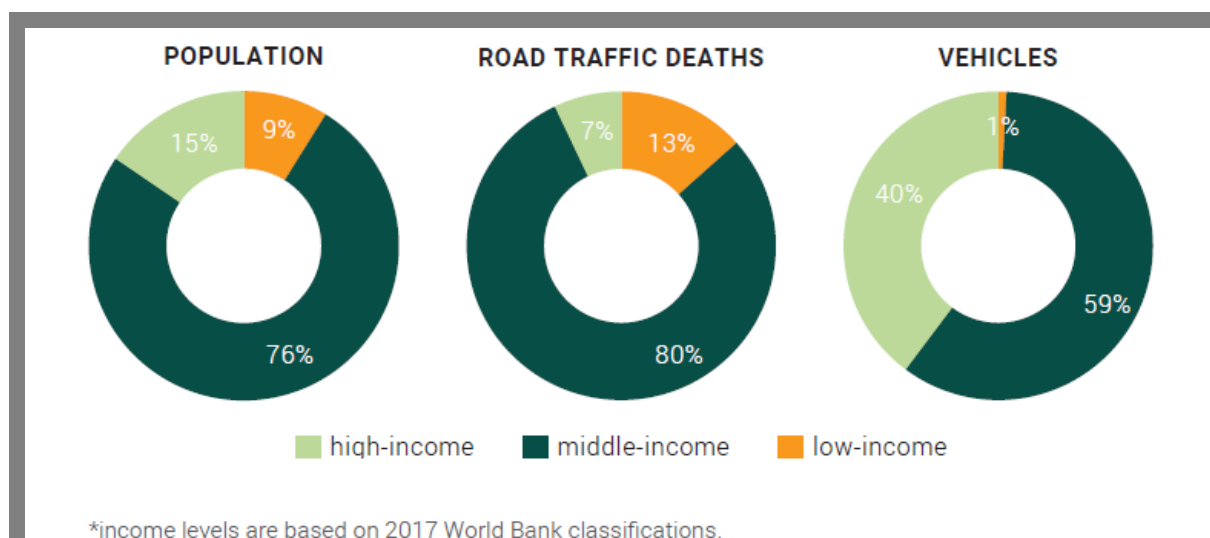

Figure 1 – Proportion of population, road traffic deaths and registrered vehicles, by country income status (WHO, 2018b)

Also a regional effect of the risk of a road traffic death is remarkable. The African region has the highest rate of death in 2016 with 26.6 per 100,000 population. This rate increased compared to 2013, when the African region had a rate of 26.1 deaths per 100,000. Road traffic injury is expected to further increase in the African region by 55% over the period from 2016 until 2030. Hereby, road fatalities are expected to overtake malaria fatalities in the same period in the African region (WHO, 2018c). In contrast to the European region the rate of death decreased from 10.4 per 100,000

population in 2013 to 9.3 per 100,000 population in 2016. These data contribute to the increasing inequality in road safety between Africa and Europe. An overview of the evolution between 2013 and 2016 for the different regions worldwide according to the WHO can be seen in figure 2.
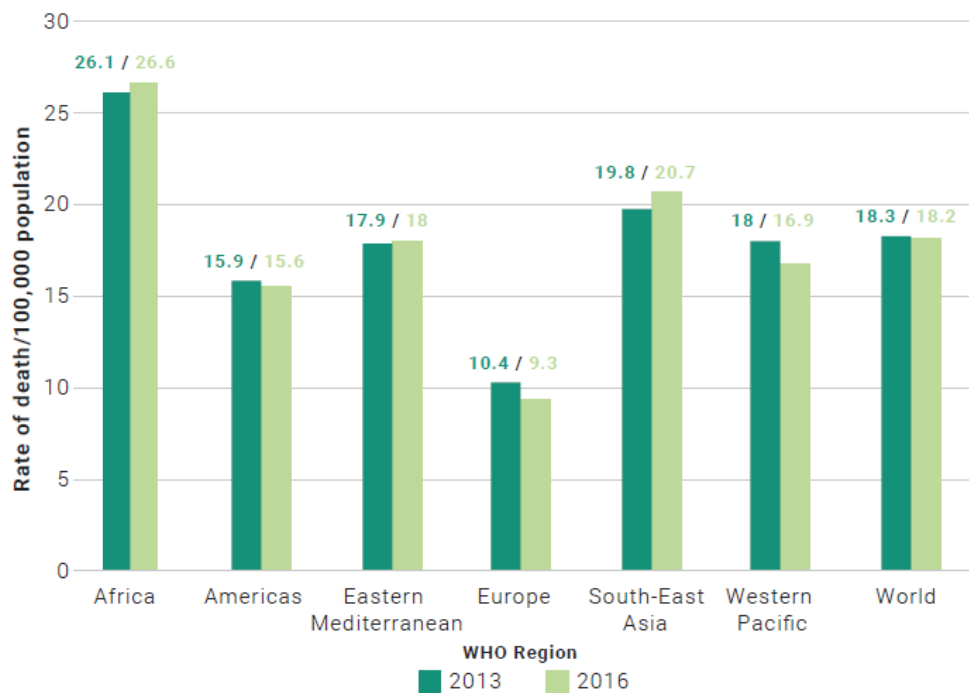

Figure 2 – Rates of road traffic death per 100,000 population by WHO regions: 2013, 2016 (WHO, 2018b)

The high number of road fatalities in the African region can be related to a number of factors. Some of these causes are the national laws on key behavioural risks that do not meet best practice, the enforcement of these laws that is weak, the UN (United Nations) priority vehicle standards that aren't applied, road traffic fatality data is underreported and there is a low report of data on road user behaviour (e.g., helmet wearing rates, seat belt wearing rates,...) (WHO, 2015). Next, capacity reviews of road safety management reveals that institutional management activities at the regional, national and corridor levels are fragmented and insufficient targeting key road safety problems (Breen, Humpreys & Melibaeva, 2013).

Several actions are already on-going and important policy documents are already in place in Africa. The African Union (AU) and United Nations Economic Commission for Africa (UNECA), on the basis of the UN "2011-2020 a Decade of Action for Road Safety", defined the "*African Road Safety Action Plan 2011-2020*" (ARSAP), organized on the basis of five pillars with specific objectives:

1. **Road safety management**: to build institutional capacity, improve capacity building at local government level, develop local research and road safety monitoring.
2. **Safer roads and mobility**: to properly consider road safety infrastructure development and introduce or improve facilities for pedestrians and other vulnerable road users.
3. **Safer vehicles**: to review safety standards for vehicles and safety equipment.
4. **Safer road users**: to review standards and rules for the provision of license to private, commercial and public transport drivers and strengthen the law enforcement.

5. **Post- crash response**: to improve capacities in term of on-site care, transport of the injured to appropriate medical facilities and trauma care.

In 2015, UNECA conducted a Mid-term Review of the Action Plan in order to assess the progress made by each country. The "*Roadmap for accelerating the implementation of the African Road Safety Action Plan*", which is the result of the review that identifies four main challenges to be addressed with higher priority by policy makers in order to facilitate the implementation of the actions identified in the Action Plan and reach the UN 2020 target:

- Data Collection, Analysis and Reporting
- Funding Road Safety
- Road Safety and Traffic Management
- Capacity Building and knowledge transfer

As highlighted by SSATP (Small and Runji, 2014), too often low capacity levels in Africa lead to strategy tasks being outsourced, without a dedicated process allowing the transfer of sufficient knowledge and the development of critical road safety management expertise in a country.

2.2 General scope and context of the Safer Africa project

In this previously described context, European experience in Road Safety and willingness of African countries for Road Safety, suggest that Europe could play an important role for supporting African countries in improving their road safety and traffic management conditions to achieve better performance.

In this respect, the general objective of *SaferAfrica* consists in creating favorable conditions and opportunities for effective implementation of actions on road safety and traffic management in African countries, by setting up a Dialogue Platform between Africa and Europe. An additional project objective is to increase the awareness of African stakeholders and end users on road safety by means of an African Road Safety Observatory (http://www.africanroadsafetyobservatory.org). The African Road Safety Observatory is a web portal and allows users to easily access the Road Safety Knowledge Centre. The aim of the Centre is to support policy makers and stakeholders with the evidence of critical risk factors and related actions and good practices on the basis of high-quality data and knowledge.

The *SaferAfrica* project has four focus areas, those areas are:
- Road Safety knowledge and data
- Road Safety and Traffic Management Capacity review
- Capacity building and training
- Sharing Good Practices

Fostering Dialogue on Road Safety and Traffic Management can be seen as an additional focus area and is probably the most important focus area. This report contributes to fostering the dialogue by sharing and discussion of the results presented in this report with the Dialogue Platform through the web portal of the African Road Safety Observatory.

The Dialogue Platform is at the heart of *SaferAfrica* Project, aiming to involve experts in a Dialogue. The Dialogue Platform is operating through periodic meetings and also online, thanks to a web tool that represents the modern key of the project. According to the Platform Statute (Deliverable 2.1) the Platform is made by a decision-making level comprising a **Management Board** of prominent institutions (WHO, UNECA, IRU, FIA, PIARC, IRF, IRTAD, WB, AfDB) and by a technical/operational level which comprises a **Working Group** with government institutions (both European and African), international institutions, research institutions (both European and African) and representative organizations of African Stakeholders. Those not involved in the project as partners will constitute the **Stakeholder Group**. Thus, the objectives of the Dialogue Platform are to produce knowledge; to influence road safety funding, policies and interventions in Africa; to encourage and facilitate a constructive engagement and dialogue of policy makers, researchers and other stakeholders on road safety in Africa.

SaferAfrica, through the implementation of the Dialogue Platform, will create the conditions and opportunities for an effective implementation of actions on road safety and traffic management. Related weaknesses and strengths existing in the continent will be analysed and the criticalities in socio-economic, organisational and operational dimensions will be identified. The analysis will be conducted at different scales (continental, national, local) with the objective of identifying the needs in the most effective way. *SaferAfrica* project has been organized into 9 work packages, which interrelations are shown in Figure 3.
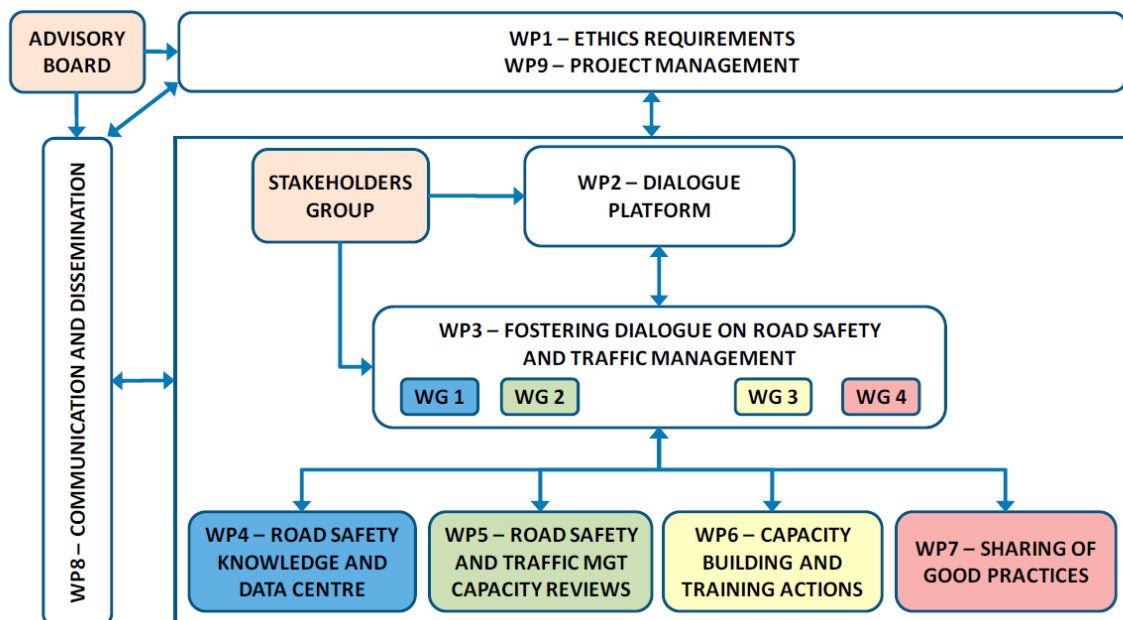

Figure 3 – Interrelationship of SaferAfrica work packages

2.3 Objective Work Package 3

The first objective of work package 3 is to contribute to the assessment of the implementation of Action Plan 2011–2020 and to contribute to the final evaluation of the Action Plan by UNECA. UNECA realized a mid-term, intermediary evaluation of that plan (AU-UNECA, 2015). There is

indeed a need for assessing the efforts accomplished by the countries and taking into consideration the evolution at different levels since the last review. This assessment has been supported by a SWOT and PESTEL analysis completed at different geo-political scales (continental, regional economic communities/corridors and country). SWOT and PESTEL combined analysis make it possible to identify the weakness, the strengths, the assets and the dynamics a country face for the different levels of intervention in the road safety field according to the political, economic, social, technical, environment and legal dimensions. This assessment of the Action Plan and of regional instruments has been described in Deliverable 3.1.

The second main objective is to define initiatives for different topics (i.e., road safety policies, road safety and traffic management, capacity building and other road safety interventions). Those initiatives are designed to foster the implementation of the Action Plan and to contribute to a better situation in terms of road safety. The initiatives will be based on the outputs of WP4, WP5, WP6 and WP7 and will address technical, administrative and economic concerns. The aim is to prepare information to support the discussions with the Dialogue Platform Management Board.

2.4 Task 3.4 Fostering initiatives on capacity building and road safety interventions

Whereas task 3.2 and task 3.3 focused on the institutional and organisational dimension of the "Level/Layer" matrix, task 3.4 of Work Package 3 focusses on the operational dimension of the "Level/Layer" matrix. It will address in particular, the definition of future initiatives regarding a) capacity building and training and b) operational road safety interventions. For this task, the inputs of mainly WP5 (i.e., road safety and traffic management), WP6 (i.e., capacity building and training), WP7 (i.e., the sharing of good practices) are used. The aim of task 3.4 is to develop a set of detailed proposals for future initiatives concerning capacity building and road safety interventions and to define conditions for the implementation of those initiatives. This includes, among other things, technical aspects and estimations of the resources needed for the implementation of the initiatives.

Task 3.4 is divided into two different subtasks, one subtask includes the development of capacity building and training initiatives and the other subtask includes the development of other road safety interventions. This deliverable deals with the elaboration of the last subtask of task 3.4. Deliverable 3.4 deals with the elaboration of the first subtask.

More concretely, the subtask about road safety interventions tries to capture the following objectives:
- Identify where future initiatives of road safety interventions should be realised (based on the needs described in the capacity reviews of WP5);
- Identify priorities for such future initiatives of road safety interventions;
- Develop recommendations for the implementation of future initiatives of road safety interventions (i.e., technical aspects, resources needed,...);
- Prepare information to support discussions of the Dialogue Platform.

3. Methodology

To define the concept of a road safety intervention, the same definition was used as in Deliverable 7.1 and slightly modified. **Road Safety interventions** are actions designed to target consciously chosen safety improvement objectives within the road safety system (Wilpert & Fahlbruch, 2002). These Interventions may concern any part of this system (road users, infrastructures, vehicles and their interactions), cover any stage of an accident (pre-collision, collision and post-collision) or be designed to mitigate one of the unsafety phenomenon components (i.e., exposure, risk, personal injury and property damage).

The road safety interventions within this report will be categorized according to the traditional five pillars of road safety that the World Health Organization recommended in their *Global Plan for the Decade of Action for Road Safety 2011-2020* (UN, 2011):

- Pillar 1: Road safety management
- Pillar 2: Safer roads and mobility
- Pillar 3: Safer vehicles
- Pillar 4: Safer road users
- Pillar 5: Post-crash response.

Hereby, the choice was made to eliminate pillar 1 about Road Safety Management because this pillar is more linked to the organisational level and there would be an overlap with task 3.3 about fostering initiatives on road safety and traffic management. Thus, the road safety initiatives described in this report are fitting in the pillars about safer roads and mobility, safer vehicles, safer road users and post-crash response.

For the further selection of the road safety interventions, three criteria were used:
1) The road safety interventions are an attempt to (partly) fulfil the needs described in the five capacity reviews of Tunisia, Cameroon, Kenya, Burkina Faso and South Africa conducted in WP5;
2) The road safety interventions are based on good practices from low and middle income countries and therefor more applicable to the African continent;
3) Because task 3.4 focusses on the operational level of the "Level/Layer" matrix, road safety interventions should be practical and concrete.

For the description of each road safety intervention that is detailed in the next chapter, the same structure was used. It contains the following elements:

- Background about why the road safety intervention is necessary;
- A plan of action for the implementation of the road safety intervention;
- A description of the different steps of the implementation of the road safety intervention, with the technical aspects that are needed and the organisations that are involved;
- A risk management analysis;

- A description of the different resources that are needed for the implementation of the intervention;
- A description of the minimum requirements for achieving a successful road safety intervention;
- A conclusion with the emphasize on the overall benefit of the road safety intervention.

The last step was to share and discuss the information described in this report with the Dialogue Platform. Therefore, the African Road Safety Observatory was used. The information was shared through the form of webinars. All the webinars, including the questions of the stakeholders afterwards, were recorded and can be find on the website of the African Road Safety Observatory (http://www.africanroadsafetyobservatory.org/road-safety-knowledge/capacitybuilding/saferafrica-webinars/). The handouts used for the four webinars, each treating one pillar (except pillar 1), can be found in Annex 2.

4. Overview of Road Safety interventions initiatives

4.1 Safer roads and mobility

Before the selection of the two road safety interventions within the pillar of safer roads and mobility, the needs of the capacity reviews of Tunisia, Cameroon, Kenya, Burkina Faso and South Africa were analysed. One of the top priorities in Cameroon and Kenya is that speed limits should be aligned with the safe system design principles. The reengineering of the road network according to the hierarchical level of the road is a further elaboration of this recommendation and is below described as second intervention. The first described road safety intervention about creating a forgiving roadside fits into the same "safe system approach" and is effective in preventing road traffic crashes accidents.

4.1.1 Achieving a forgiving roadside network

Table 1 – Intervention 1 safer roads and mobility: achieving a forgiving roadside network

TITLE	*Achieving a forgiving roadside network.*
Background	Collisions with dangerous roadside obstacles are a leading cause of fatalities and serious injuries in interurban roads (and even in urban streets). Roadside safety management aims to provide a forgiving roadside area on both sides of the carriageway that allows drivers to safely recover control of their errant vehicles, by minimizing the likelihood of crashing into dangerous obstacles.
Plan of Action	*The different steps of this intervention are:* STEP 1: Create a road inventory of your country or region, preferably in a digital map STEP 2: Build a geocoded accident database STEP 3: Establish roadside warrants for each road section and node STEP 4: Verify roadside characteristics compliance with warrants and identify and rank deviations across the whole road network STEP 5: Establish a gradual global corrective intervention plan and estimate budget requirements

Content different steps intervention	**STEP 1: Create a road inventory**
	What needs to be done?
	   o Geocoding of the whole road network, or use information available at Openstreetmap.org as a basic solution.
	   o Collect selected road and roadside characteristics for every road, comprising the main road design parameters, clear zone width, roadside obstacles types, speed limit, and road user category access restrictions.
	   o Create a georeferenced database with the inventoried characteristics.
	What are the technical aspects needed?
	   o GPS station, GIS software and experts are needed or

alternatively, open source platforms may be used
- o Relevant variables have to be added to shapefiles
- o The database needs to be updated

Which organization can take the lead (leading agency)?
- o Road administration
- o Municipalities

Which other partners/organizations may be useful to fulfil the step?
GIS companies
- o Road engineering consultants

STEP 2: Build a geocoded accident database
What needs to be done?
- o Collect accident data for every road, including geocoding their locations.

What are the technical aspects needed?
- o GPS station, GIS software and experts are needed
- o Accident variables have to be added to shapefiles
- o The database needs to be updated

Which organization can take the lead (leading agency)?
- o Road administration
- o Municipalities
- o Police
- o Road safety authorities

Which other partners/organizations may be useful to fulfil the step?
- o GIS companies
- o Road engineering consultants

STEP 3: Establish roadside warrants
What needs to be done?
- o Set technical recommendations concerning roadside area characteristics, such as clear zone width per road type and design element, dangerous obstacle characteristics, and road restraint systems.
- o Identify treatment solutions to make roadsides safer, considering the three categories of available solutions:
- o Removing and relocating obstacles
- o Modifying roadside elements
- o Shielding traffic from obstacles
- o Define approach method for new road developments and redesign of existing roads. It is essential that potential hazards are identified and considered as early as possible during the planning and design phases.
- o Define methodology for addressing existing roads, attending to criteria such as traffic volumes and speeds, road geometry, surface properties and the expected severity of crashes.

What are the technical aspects needed?

o Possible treatment solutions have to be added to shapefiles
o The database needs to be updated

Which organization can take the lead (leading agency)?
o Road administration
o Research institute
o University

Which other partners/organizations may be useful to fulfil the step?
o Road engineering consultants

STEP 4: Verify roadside characteristics compliance with warrants and identify and rank deviations

What needs to be done?
o Develop a method for comparing the real and the desired roadside characteristics, depending on the applicable warrants, and for ranking the deviations.
o Ideally, the method would be applied through an automatic algorithm.
o Hazards identified in Step 1 may be ranked by severity, with reference to the collision data collected in Step 2, and by considering traffic volumes, road geometry, surface properties, distance from roadway to obstacles, and the expected severity of crashes (speeds).

What are the technical aspects needed?
o Define a comparison procedure
o Define a ranking method
o Develop a calculating algorithm
o Code a routine in a GIS compatible programming language (e.g., using Python)
o Create a list of the most promising sites for roadside intervention

Which organization can take the lead (leading agency)?
o Road administration
o Research institute
o University

Which other partners/organizations may be useful to fulfil the step?
o GIS companies

STEP 5: establish an intervention plan and estimate budget requirements

What needs to be done?
o List available roadside interventions and make an inventory of their basic attributes (expected costs and effectiveness)
o Define ranking criteria, for each type of interventions (based on feasibility, cost, benefits,…)
o Plan roadside interventions for each site listed in Step 4

What are the technical aspects needed?

	o List of most common roadside interventions o Costs per intervention o Overall road safety and road rehabilitation budget estimates *Which organization can take the lead (leading agency)?* o Road administration at different levels *Which other partners/organizations may be useful to fulfil the step?* o Finance Ministry, for annual budget allocations
Risk management	*What are the difficulties that will arise when implementing the intervention (=barriers)?* o Not enough experts to build the road database o No accident data available o Budget constraints o On site data collection, in case of non-existence *How can these difficulties be prevented?* o With financial support from governments or external organizations o Limiting the scope of the intervention to a selected subset of roads would diminish the budget initially required and allow on-the-job training of a sizable number of experts *What are the synergies that are helpful when implementing the intervention?* o Standardization of road restraint systems
Resources	*The different (human) resources needed for the implementation of the intervention are:* o GIS expert o GPS expert o Technical staff to collect field data and to update the database o Roadside safety expert
Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?* o The most effective roadside intervention can be accomplished with the provision of adequate clear zones. Provision of clear zones can significantly reduce the severity of roadside encroachments by providing drivers of uncontrolled vehicles the room and opportunity to regain control of their vehicles. *What can have an extra positive impact on the results of the intervention but isn't really essential?* o Required clear zones cannot always be provided, due to various reasons, particularly at locations where there are space limitations. In these cases alternative treatments should be considered.
Conclusion	Providing safe roadsides will ensure that fewer roadside encroachments will result in road traffic crashes and that those which originate a crash will be less severe than in the current situation.

4.1.2 Reengineering the road network according to its hierarchical level

Table 2 – Intervention 2 safer roads and mobility: reengineering road network according to its hierarchical level

TITLE	*Reengineering road network according to its hierarchical level.*
Background	Separating traffic elements by function and desired speed, mass and crashworthiness is part of an effective safe system approach. It helps achieving road user behavior consistency (e.g., similar travel speeds and maneuver types), vehicle compatibility (in case of impacts) and matching vehicles with the road infrastructure characteristics. A functional hierarchy of the road network allows proper coordination between the intended travel objectives of road users (function) and infrastructure characteristics (road and roadside), such that appropriate design criteria can be implemented. A road network differentiated according to its function also helps drivers to clearly identify what kind of behavior they should adopt, and thus contributes towards a higher road safety level.
Plan of Action	*The different steps of this intervention are:* STEP 1: Develop the implementation concept for each road category, depending on its function, following the three basic function levels foreseen in safe system: through roads (high speed & high traffic volume), distributor roads (flow and access functions) and access roads (access and residential functions). STEP 2: Perform a road inventory of your country or region, preferably in a digital map, with the collection of main infrastructure design characteristics, speed limit, and road user category access restrictions. STEP 3: Perform a road classification according to the previously defined levels. STEP 4: Compare the characteristics of each road network segment and node with the desirable ones and identify deviations. STEP 5: Rank the deviations and establish a gradual global corrective intervention plan.

Content different steps intervention	**STEP 1: Develop the implementation concept for each road category**
	What needs to be done?
	   o Develop the implementation concept for each road category, depending on its function. The characteristics to consider need to be collected.
	What are the <u>technical aspects</u> needed?
	   o Knowledge about the safe system road hierarchy levels and the main characteristics that can be used to classify them
	Which organization can take the lead (leading agency)?
	   o Road administration
	   o Municipalities
	Which other partners/organizations may be useful to fulfill the step?

o   Road engineering consultants

STEP 2: Perform a road inventory
What needs to be done?
- o   Assess the current situation of the existing road network, regarding the already available set of key road characteristics and perform the collection of the remaining ones.
- o   Geocoding of the whole road network or use, as a basic alternative, the ones available online (e.g., openstreetmap.org).
- o   Make an inventory of all the selected key road and roadside characteristics.
- o   Integrate all data in a database.

What are the <u>technical aspects</u> needed?
- o   GPS station, GIS software commercial or open source (e.g. QGIS)
- o   Road, traffic and geography (GIS) experts
- o   Relevant variables have to be measured and added to shapefiles
- o   The database needs to be updated

Which organization can take the lead (leading agency)?
- o   Road administration
- o   Municipalities

Which other partners/organizations may be useful to fulfill the step?
- o   GIS companies
- o   Road engineering consultants

STEP 3: Perform a road classification
What needs to be done?
- o   Establish warrants for each road category.
- o   Assess actual road functions according to the characteristics of each road.

What are the <u>technical aspects</u> needed?
- o   Define limits for each key road characteristic concerning, geometric design parameters, road signing and marking, as well as roadside characteristics.
- o   Develop an algorithm to automatically classify each road, based on the defined warrants.

Which organization can take the lead (leading agency)?
- o   Road administration
- o   Municipalities

Which other partners/organizations may be useful to fulfill the step?
- o   GIS companies
- o   Road engineering consultants

STEP 4: Compare the characteristics of each road network segment and node with the desirable ones

	What needs to be done? o Develop a method for comparing the real and the desired roadside characteristics, for each road link and node and identify the deviations. *What are the <u>technical aspects</u> needed?* o Define a comparison method, including weighting of benchmark deviations per variable. o Ideally, the method would be applied through an automatic algorithm. o Code a routine in a GIS compatible programming language (e.g., Python) or as a spreadsheet macro. o List the deviations that are detected, per road element (link or node). o Create a list of the most promising sites for road interventions. *Which organization can take the lead (leading agency)?* o Road administration o Research institute o University *Which other partners/organizations may be useful to fulfill the step?* o GIS companies o Road engineering consultants o iRAP (International Road Assessment Programme) **STEP 5: Rank the deviations and establish a gradual global corrective intervention plan** *What needs to be done?* o Define a plan for progressive improvement of the network. o List the available road interventions and make an inventory of their basic attributes (expected costs and effectiveness). o Define ranking criteria, for each type of intervention (feasibility, cost, impact, geographic scope, other…). o Develop an algorithm for matching deviations and relevant road infrastructure interventions. o Plan a roadside intervention for each site listed in Step 4. *What are the <u>technical aspects</u> needed?* o Assess costs and prospective effects per intervention o Develop tools for overall road safety and road rehabilitation budget estimates *Which organization can take the lead (leading agency)?* o Road administration at different levels *Which other partners/organizations may be useful to fulfill the step?* o Road engineering consultants
Risk management	*What are the difficulties that will arise when implementing the intervention (=<u>barriers</u>)?* o Not enough experts to build the database o Budget constraints

	o On site data collection, in case of non-existence
	How can these difficulties be prevented?
	  o With financial support from governments or external organizations
	  o Limiting the scope of the intervention to a selected subset of road links and nodes would diminish the budget initially required and allow for on-the-job training of a sizable number of experts
	What are the <u>synergies</u> that are helpful when implementing the intervention?
	  o Partial characterization of the road network based on characterization already made by other institutions (for instance for academic studies) can be used for this database.

Resources	*The different (human) resources needed for the implementation of the intervention are:*
	  o GIS expert
	  o GPS expert
	  o Road engineer (with safety expertise)
	  o Technical staff to collect field data and to update the database

Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?*
	  o It is absolutely necessary that all roads with the same function have the same type of road environment.
	What can have an extra positive impact on the results of the intervention but isn't really essential?
	  o The availability of traffic counts on all road network links would be a major contribution for the accurate definition of the classification. However, the gathering of this information may be too demanding for countries without a traffic collection system already implemented.
	  o If a road accident database is also available, it could be used for the ranking criteria, prioritizing interventions in the most problematic situations.

Conclusion	Road classification is of major importance. Self-explaining and forgiving roads should be designed for a specific function which reflects the travel distance, level of traffic flow and desired speed. Clear guidelines linking design to function should exist, particularly where different functional levels or different geographical areas are managed by different road authorities. Road users' a priori expectations will be more easily met in a road network with a proper functional hierarchy, leading to lower accident rates and impacts will involve lower energy levels and less powerful energy transfers, leading to fewer severe injuries. The match between driver behavior and road design will be optimized where the road design gives a clear message to road users of the function of the road, and the hazards that are likely to be encountered.

4.2 Safer vehicles

The pillar about Safer Vehicles is mostly linked to the institutional and organizational dimension of the "Level/Layer" matrix. The below described road safety intervention about governmental vehicle fleet requirements for new vehicles is proposed because it is a simpler and more manageable way to introduce technical requirements to new vehicles. A complete programme of vehicle approval involves as well the institutional and organizational dimension and would therefore be beyond the scope of this activity.

4.2.1 Governmental vehicle fleet requirements for new vehicles

Table 3: Intervention 1 safer vehicles – Governmental vehicle fleet requirements for new vehicles

TITLE	*Governmental vehicle fleet requirements for new vehicles.* *Note: this may also be applied to vehicles used by subcontractors*
Background	The target of this initiative is to define and apply the necessary endeavours to ensure that new governmental vehicles fulfil some given technical requirements. The knowledge obtained during the definition and application of these criteria will serve to extend the enforcement of technical requirements to the whole fleet at a later stage.
Plan of Action	*The different steps of this intervention are:* STEP 1: Assessment of the current requirements STEP 2: Overview of the fleet needs STEP 3: Definition of requirements STEP 4: Definition of the enforcement of requirements STEP 5: Implementation and operation of the requirements in the fleet purchase process STEP 6: Follow-up

Content different steps intervention	**STEP 1: Assessment of the current requirements**
	What needs to be done?
	  o This part aims to find out which are the technical requirements for vehicles related to road safety and environmental protection.
	  o Requirements may be applied to any vehicle being registered in the country or specific for the governmental fleet.
	Which organization can take the lead (leading agency)?
	  o Road safety agency
	  o Authorities' procurement department(s)
	Which other partners/organizations may be useful to fulfill the step?
	  o Taxation department
	  o Trade department
	  o Customs department
	
	STEP 2: Overview of the fleet needs
	What needs to be done?

o   This step is targeted to define the need for vehicles:
-   Type of vehicle (cars, vans, buses, public work machinery ...)
-   Amount of vehicles of each type per year
-   Technical features: number of seats, payload, performances, size,...

Which organization can take the lead (leading agency)?
o   The procurement department will take the lead
o   The overview of the fleet needs has to be done by each department requiring the use of vehicles

Which other partners/organizations may be useful to fulfill the step?
o   The Road Safety Agency for advice

STEP 3: Definition of requirements
What needs to be done?
o   This activity aims to define the road safety and environmental requirements of new vehicles.
o   It consists of a realistic review of the recommendation of the UN on standards for new vehicles and the suitability for the country.
o   The reference to already existing international standards should facilitate the development of this activity.

Which organization can take the lead (leading agency)?
o   The definition of requirements has to be led by the department in charge of road safety

Which other partners/organizations may be useful to fulfill the step?
o   Procurement department
o   Customs department
o   Taxation department
o   Energy and environmental protection

STEP 4: Definition of the enforcement of requirements
What needs to be done?
o   The target is to define how to ensure that requirements defined in step 3 are applied.
o   This includes a penalty regime in case of non-compliance.

Which organization can take the lead (leading agency)?
o   Procurement department
o   Road Safety department

Which other partners/organizations may be useful to fulfill the step?
o   Registration authorities
o   Customs department
o   Trade department
o   Taxation department

STEP 5: implementation and operation of the requirements in the fleet purchase process
What needs to be done?

	o Once the definitions of steps three and four are set, the target of this step is to define the arrangements to make them effective.
	 The design shall take into account that requirements may be enhanced in the future.
	 Which organization can take the lead (leading agency)?
	    o Purchase department
	    o Road safety department
	 Which other partners/organizations may be useful to fulfill the step?
	    o Registration department
	
	 STEP 6: Follow-up
	 What needs to be done?
	    o This step aims to ensure that the process is being applied.
	 Which organization can take the lead (leading agency)?
	    o Purchase department
	    o Road safety department
	 Which other partners/organizations may be useful to fulfill the step?
	    o Registration department

Risk management	*What are the difficulties that will arise when implementing the intervention (=<u>barriers</u>)?*
	    o Definition of the technical criteria:
	      Vehicle trade and, if it exists in the country, manufacturing stakeholders may argue that requiring road safety and environmental features to new vehicles may increase prices. Comparisons with countries with an already established scheme of requirements for new vehicles don't show that.
	    o Definition of enforcement:
	      It is not always easy to check technical features of vehicles and in some cases that may require complex facilities..
	    o Operations:
	      It is essential to control the suitability of operations once procedures and criteria are defined.
	 How can these difficulties be prevented?
	    o It is very much advisable to use recognized international standards, since tailored requirements may be complex to implement.
	    o It is possible to define a scheme on a certification basis to prevent complicated checks of vehicles, provided the involvement of car trade and manufacturing sectors

Resources	*The different resources needed for the implementation of the intervention are:*
	    o *Human resources with the following responsibilities:*
	    - *Definition of responsibilities*
	    - *Definition of the requirements*
	    - *Definition of the implementation procedures*

	o *IT Resources:* - *Access to the vehicle registry* - *Access to vehicle information databases*

Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?*
	  o Commitment of authorities
	  o Engagement of stakeholders: vehicles' trade and manufacturing industry
	  o A realistic definition of requirements
	  o The definition of a suitable procedure for checking requirements
	  o The actual application of enforcement
	What can have an extra positive impact on the results of the intervention but isn't really essential?
	  o The reference of already existing international standards
	  o Access to international databases of vehicles' approval data (ETAES, DETA…)
	  o The integration of this activity within the procedures of registration

Conclusion	Introducing requirements for the governmental fleet aims to become the seed to extend that initiative to all vehicle registrations. This initiative provides the knowledge to officers in charge of the admission of vehicles to assess the fulfilment of technical requirements.

4.3 Safer road users

Before the selection of the two road safety interventions about helmet use and drink-driving within the pillar of safer road users, the needs outlined in the capacity reviews of Tunisia, Cameroon, Kenya, Burkina Faso and South Africa were analysed. Especially in the capacity review of Tunisia and Burkina Faso a common need was identified. This is the need for a behavioural change by motorcyclists to use a helmet. This can be obtained through awareness campaigns targeting motorcyclists and a stricter enforcement, whereby police officers are aware of this necessity to wear a helmet and trained to do properly checks along the roads. The same approach can be applied to another risk factor related to safer road users, namely drink-driving.

4.3.1 Increasing helmet wearing rates on powered two and three wheelers

Table 4 – intervention 1 safer road users: increasing helmet wearing rates on powered two and three wheelers

TITLE	*Increasing helmet wearing rates on powered two and three wheelers.*
Background	According to the World Health Organization, the leading causes of death, severe injury and disability for two- and three-wheeled motor vehicle users are head injuries (WHO, 2017). Wearing a standard helmet serves as an important safety equipment to prevent road traffic deaths. When a driver or a passenger of a motorcycle wears a helmet correctly, the risk of death can be reduced by 40% and the risk of a severe injury can be reduced by 70% (WHO, 2016). In some African countries, there is a legislation on helmet use, but only 6 African countries meet all the WHO's standards of best practice in 2015. The main problem is that there is a low compliance to the law and a low public awareness of the consequences of not wearing a helmet. Most motorcycle riders are from the lower middle class and they mostly don't believe that a helmet is effective to prevent head injuries. The main objective of this initiative is to increase helmet wearing rates of drivers and passengers on powered two and three wheelers.
Plan of Action	After the introduction of a mandatory helmet law, a public awareness campaign and stricter enforcement are the two most important elements that should work together to increase helmet wearing rates. *The different steps of this intervention are:* **STEP 1: PUBLIC AWARENESS CAMPAIGN** Setting up a public awareness campaign to increase helmet wearing rates on powered two and three wheelers: A) Defining the reasons of non-compliance B) Defining the target audience

	C) Decide which message will be spread D) Decide how the chosen message will be spread E) Communication about the public awareness campaign F) Evaluation of the public awareness campaign. **STEP 2: ENFORCEMENT** Stricter enforcement of the law on helmet use in order to achieve wide compliance A) Decide the type of penalty B) Inform motorcyclists about the change in enforcement C) Training of policemen D) Increasing police capacity E) Decide the areas of enforcement
Content different steps intervention	**STEP 1: PUBLIC AWARENESS CAMPAIGN** *What needs to be done?* A) Defining the reasons of non-compliance What are the reasons motorcyclists aren't wearing a helmet on powered two and three wheelers? A survey can be used to identify possible barriers why motorcyclists aren't wearing a helmet. Based on a survey in Burkina Faso (2008) some reasons are: o The extreme heat inside the helmet; o The possible obstruction of the view when wearing a helmet; o The price of a good quality helmet is too expensive; B) Defining the target audience, groups that are more resistant to wear a helmet. For the definition of the target audience, the following questions can serve as a guideline: o What kind of age do those people have (e.g., more children aren't wearing a helmet)? o Is there something remarkable at the gender of the people that aren't wearing a helmet? o Are more passengers or drivers not wearing a helmet? o Is it on certain roads that people aren't wearing a helmet? o What is the purpose of the trips people are doing without wearing a helmet? B) Decide which message will be spread The most important characteristics of the campaign message are: o Create a simple and understandable message o Adjust the message to the target group, it can be useful to test different messages in advance by asking the opinion of a small group of the target group. o Adjust the message to the particular cultural characteristics of the country C) Decide how the chosen message will be spread Choose a combination of media channels to reach the

target audience:
- Advertisements on television
- Advertisements on radio stations
- Billboards along the road
- Advertisements on social media

D) Communication about the public awareness campaign
In order to get extra media attention for the public awareness campaign about helmet use, a press conference can be organized at the launch of the campaign.

E) Evaluation of the public awareness campaign
One possible method to evaluate the effect of the public awareness campaign is to measure helmet wearing rates at three different times at different locations:
- One month before the launch of the campaign
- One month after the launch of the campaign
- 6 months after the launch of the campaign to measure the long term effects.

What are the technical aspects needed?
- Communication expert that elaborates the public awareness campaign
- Publicity on radio and television stations
- Publicity on social media
- Billboards along the road with public awareness messages about helmet use

Which organization can take the lead (leading agency)?
- Ministry of Public Health/Ministry of Transport
- Road Safety authorities
- Communication agency to develop the public awareness campaign

Which other partners/organizations may be useful to fulfill the step?
- Collaboration with local non-governmental organizations (NGOs) that are able to spread the campaign and do a follow up of the campaign on a more regional level
- Collaboration with motorcycle rider groups can be useful
- Research institute for the evaluation of the campaign

STEP 2: ENFORCEMENT
What needs to be done?
A) Decide the type of penalty
The type of enforcement should be regulated by the law. If stricter penalties for non-compliance to the helmet law are introduced, it can be considered to double the amount of the fine.

B) Inform motorcyclists about the change in enforcement
Together with the public awareness campaign, motorcyclists can be informed about the stricter enforcement of the helmet use law and the amount of the

	fine for non-users.
	C) Training of policemen Police officers should be aware of the importance of the law and how to enforce the law in a correct manner. This contains: o Knowledge of the law and the penalties o Awareness of the risks when not wearing a helmet o Knowledge about how to set up checkpoints along the road D) Increasing police capacity Strategic planning for intensive enforcement activity. E) Decide the areas of enforcement Enforcement should target specific regions with high non-compliance rates. *What are the technical aspects needed?* o A database with all the offenders of the law and the status of their fines (paid or not) o Trainers to train the policemen o Higher police capacity *Which organization can take the lead (leading agency)?* o Ministry of Public Health/Ministry of Transport o Road Safety authorities o Police traffic commandant *Which other partners/organizations may be useful to fulfill the step?* o Police men
Risk management	*What are the difficulties that will arise when implementing the intervention (=barriers)?* o The lack on financial resources to set up a public awareness campaign. o The lack of financial resources to invest in a higher police capacity for a stricter enforcement is the greatest barrier of the intervention. o The corruption of the police can be a possible barrier for stricter enforcement on helmet use. o Only bad quality helmets are available or good quality helmets are too expensive. o The heat in African countries can be a reasonable barrier why people aren't wearing a helmet. *How can these difficulties be prevented?* o The government or private companies provide affordable, high-quality helmets that are suitable for higher temperatures for all citizens, especially for lower income families. *What are the synergies that are helpful when implementing the intervention?* o The intervention will have a higher chance to succeed if there is a high level of political commitment for the mandatory use of helmets for all type of powered two and

	three wheelers. For example support from the Prime Minster to increase helmet wearing rates can have a positive impact. o Before the launch of the intervention, the use of helmets should be mandatory for all governmental workers and police officers. The workers of these public authorities can serve as a good example for the rest of the citizens.
Resources	*The different (human) resources needed for the implementation of the intervention are:* o Communication expert to elaborate, launch and follow-up the public awareness campaign o Trainers to train the policemen o Policemen for the stricter enforcement o Publicity on radio and television stations o Publicity on social media o Billboards with the public awareness messages about helmet use along the road
Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?* o The launch of a public awareness campaign to encourage helmet wearing rates o Stricter enforcement at all road types and especially the road types were helmet use is low o Political commitment *What can have an extra positive impact on the results of the intervention but isn't really essential?* o Education on primary and secondary schools (embedded in a broader Road Safety education): Schoolchildren should be informed about the risks of head injuries for motorcyclists when not wearing a helmet and about the effectiveness of helmets in preventing head injuries. o Donation of helmets that meet the required standards to low income families by the government. Another possibility is that companies provide free helmets that meet the standards to their employees, in order that they can drive safe from work to their home. o One month before the start of the public awareness campaign, police officers, civil employees and other governmental employees serve as role models by wearing helmets during their employment.
Conclusion	Reaching higher helmet wearing rates for drivers and passengers on powered two and three wheelers will decrease the risk of head injuries and the risk of death for motorcyclists.

4.3.2 Discouraging drink-driving by the reduction of BAC limits and increasing enforcement on drink-driving

Table 5: intervention 2 safer road users: discouraging drink-driving by the reduction of BAC limits and increasing enforcement on drink-driving

TITLE	*Discouraging drink-driving by the reduction of BAC limits and increasing enforcement on drink-driving.*
Background	Driving after the consumption of alcohol significantly increases the risk of being involved in a crash and the severity of that crash (Elvik, Høye, Vaa, & Sørensen, 2009). Drivers who have been drinking can also make the risk higher of other road users of being involved in a crash. More specific, the risk of being involved in a crash significantly increases at a blood alcohol concentration (BAC) ≥ 0.04 g/dl (Compton et al., 2002). At a BAC of 0.08 g/dl, this risk increases exponentially. If the legal BAC level would be limited to 0.05 g/dl instead of 0.10 g/dl, this would result in a reduction of road fatalities by 6% to 18% (Fell & Voas, 2006). In 49% of African countries the legal BAC limit is between 0.06 g/dl and 0.08 g/dl. This isn't in line with the best practice of ≤ 0.05 g/dl suggested by the World Health Organization (WHO, 2015). Moreover, in 2015 only 2.3% of the African countries had a national drink-driving law that meets best practices (WHO, 2016). These best practices are the presence of a national drink-driving law, a BAC limit for the general population not exceeding 0.05 g/dl and a BAC limit for young and novice drivers not exceeding 0.02 g/dl. This last regulation can lead to a risk reduction of being involved in a crash up to 24% (WHO, 2013). The main objective of this intervention is to reduce the legal BAC limit by law and to increase the penalties for offenders, using random breath testing strategies.

Plan of Action	First of all, it is necessary to introduce a new amended law relying on lower BAC levels. Second, a social marketing campaign about the risks of drink-driving can be launched to raise awareness by the general public about the risks of drink-driving. Third, the penalties for offenders should increase. This should be supported by a stricter enforcement using random breath testing strategies.
	
	The different steps of this intervention are:
	STEP 1: INTRODUCTION AMENDED LAW
	The introduction of an enforceable law in congruence with international best practices is a necessary first step to reduce drinking and driving:
	    A) Get a clear overview of the problem and current situation in the country or region
	    B) Adjust the existing law or implement a new law if there isn't one available

	STEP 2: SOCIAL MARKETING CAMPAIGN Setting up a social marketing campaign to discourage drink-driving and to make the public aware of the risks of drink-driving can contribute to a reduction in drink-driving. This effect is only possible to obtain in combination with an increase in stricter enforcement by the use of random breath testing controls. A) Defining the target audience B) Decide which message will be spread C) Decide how the chosen message will be spread D) Communication about the social marketing campaign E) Evaluation of the social marketing campaign **STEP 3: STRICTER ENFORCEMENT** A stricter enforcement using random breath testing strategies is critical to achieve compliance with the law and to prevent drinking and driving. A) Decide the type of punishment B) Inform drivers about the change in enforcement C) Training of policemen D) Increasing police capacity E) Using random breath testing strategies to influence drivers views on the likelihood of being caught
Content different steps intervention	**STEP 1: INTRODUCTION AMENDED LAW** *What needs to be done?* A) Get a clear overview of the problem and current situation in the country or region. To set up an appropriate and effective intervention in order to reduce drinking and driving, it is important to get an overview of the current situation and adjust the chosen intervention to the specific situation in the country or region. Hereby, the following elements can be investigated: o Data on road crashes and injuries involving the use of alcohol should be examined. If these data includes the age and gender of the victim and the type of vehicle involved in the crash, this can guide to specify the target group of a social marketing campaign. o Review the existing drink-driving law in a country: - Is there a drink-driving law available in the country? - Does the law rely on a BAC limit? - Are there different BAC limits for novice and commercial drivers, and for the general population? o The extent to which there is compliance with the existing law. If the compliance with the law is low, the potential reasons of non-compliance should be identified. o The knowledge of the public about the drink-driving law:

- Do people understand the law? Do they know what a BAC limit is (when applied)?
- Do people understand the effect of alcohol on decision-making and the ability to drive a vehicle safely?
- How do citizens estimate the chance of being caught when driving under the influence of alcohol?
- Does the public understand the punishments and consequences of driving impaired by alcohol?
  o Identify the role of alcohol in the social life of the general public and the attitudes of the public towards drinking and driving.
B) Adjust the existing law or implement a new law if there isn't one available. Use hereby the best practices advised by the WHO:
  o Presence of a national drink-driving law
  o This law makes it illegal to drive with a BAC limit for the general driving population exceeding 0.05 g/dl
  o This law makes it illegal to drive with a BAC limit for novice and young drivers exceeding 0.02 g/dl

What are the technical aspects needed?
  o A reliable accident database with as much details about crashes as possible
  o Researchers that investigate the accident data, the existing law on drink-driving, the compliance with the law, the knowledge of the citizens about the law and the social role of alcohol in the country or region.

Which organization can take the lead (leading agency)?
  o Ministry of Public Health/Ministry of Transport
  o Road Safety authorities

Which other partners/organizations may be useful to fulfill the step?
  o Police authorities
  o Research institute

STEP 2: SOCIAL MARKETING CAMPAIGN
What needs to be done?
A) Defining the target audience by describing social groups that are more driving under the influence of alcohol. For the definition of the target audience, the following questions can serve as a guideline:
  o What is the age of people who drink and drive?
  o What is the gender of people who drive under the influence of alcohol?
  o At what times are more people drinking and driving
  o Are there certain locations where drinking and driving mostly take place?
B) Decide which message will be spread
  The most important characteristics of the social marketing

campaign message are:
- o Create a simple and understandable message
- o Adjust the message to the target group, it can be useful to test different messages in advance by asking the opinion of a small group of the target group.
- o Adjust the message to the particular cultural characteristics of the country
- C) Decide how the chosen message will be spread
  Choose a combination of media channels to reach the target audience:
- o Billboards with the campaign message along the road
- o Advertisements on television
- o Advertisements on radio stations
- o Advertisements on social media
- D) Communication about the social marketing campaign
  In order to get extra media attention for the social marketing campaign about drink-driving, a press conference can be organized at the launch of the campaign.
- E) Evaluation of the social marketing campaign
  An evaluation of the campaign can be measured with different approaches:
- o Measure the fatalities and injuries resulting from crashes involving drinking and driving one month before and one month after the launch of the campaign. This evaluation is only possible with a reliable accident database.
- o Measure the prevalence of driving under the influence of alcohol by using random breath testing strategies one month before and one month after the launch of the campaign.
- o Measure the attitudes of drivers towards drinking and driving one month before and one month after the launch of the campaign.

What are the <u>technical aspects</u> needed?
- o Social marketing expert that elaborates the social marketing campaign
- o Publicity on the radio and television stations
- o Publicity in social media
- o Billboards along the roads with messages to discourage drinking and driving

Which organization can take the lead (leading agency)?
- o Ministry of Public Health/Ministry of Transport
- o Road Safety authorities
- o Advertising agency that elaborates the social marketing campaign

Which other partners/organizations may be useful to fulfill the step?
- o Injury prevention specialists

o   Road users organizations (professional drivers, motorcycle associations,…)
o   Collaboration with local non-governmental organizations (NGOs) that are able to spread the campaign and do a follow up of the campaign on a more regional level
o   Research institute for the evaluation of the campaign

STEP 3: STRICTER ENFORCEMENT
What needs to be done?

A)   Decide the type of punishment
     The type of punishment for offenders should be regulated by law according to the measured BAC level. Ideally, the punishment should be higher for reoffenders. The following types of punishment can be used:
o   Monetary fines
o   Withdrawal of driving license
o   Alcohol interlocks for repeated offenders

B)   Inform drivers about the change in enforcement
     Together with the social marketing campaign, drivers can be informed about the adjusted law and the type of punishment for offenders.

C)   Training of policemen
     Police officers should be trained to enforce the law in a correct manner, therefor they should:
o   Be aware of the risks of drink-driving, driving after the use of alcohol impacts decision-making and the ability to drive any vehicle safely.
o   Have knowledge about the adjusted law on drink-driving and the type of punishment for offenders.
o   Have knowledge about how to set up checkpoints along the road in a safe manner.
o   Have the skills to use the breath testers in order to measure the BAC levels of the drivers.

D)   Increasing police capacity
     In order that drivers experience a high chance of being caught for drink-driving anywhere and anytime, checkpoints should be set-up as often as possible at diverse locations, both during day and night. To ensure this intensive enforcement over a long period of time, increasing police capacity is essential.

E)   Using random breath testing strategies to influence drivers views on the likelihood of being caught
     Using random breath tests strategies means that drivers are stopped randomly and are given a breath test. This breath test checks whether the driver, who isn't necessarily suspected of any offence, is above the legal alcohol limit. The random breath testing can take place during road

	block operations or in combination with normal police inspections.
	What are the technical aspects needed?
	  o Random breath testers
	  o A database with all the offenders of the law and the status of their fines (paid or not)
	  o Trainers to train the police men to conduct the random breath testing
	  o Higher police capacity
	Which organization can take the lead (leading agency)?
	  o Ministry of Public Health/Ministry of Transport
	  o Road Safety authorities
	  o Police traffic commandant
	Which other partners/organizations may be useful to fulfill the step?
	  o Police men

Risk management	*What are the difficulties that will arise when implementing the intervention (=barriers)?*
	  o The lack on financial resources to set up a social marketing campaign
	  o The lack of financial resources to invest in a higher police capacity to conduct the random breath tests
	  o The corruption of the police can be a possible barrier during road block operations or police inspections.
	How can these difficulties be prevented?
	  o Collaboration with local NGOs to increase funding
	  o Well trained police men
	What are the synergies that are helpful when implementing the intervention?
	  o The use of a celebrity or famous leader as campaign figurehead, a person with high credibility that gives the message to the public that drinking and driving don't go together.

Resources	*The different (human) resources needed for the implementation of the intervention are:*
	  o Communication expert to elaborate, launch and follow-up the social marketing campaign
	  o Trainers to train the policemen
	  o Policemen for the stricter enforcement
	  o Alcohol breath tests used by the police at the check-points
	  o Publicity on radio and television stations
	  o Publicity on social media
	  o Billboards with the public awareness messages about drinking and driving along the road

Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?*
	  o Strong political commitment to prevent drink-driving
	  o A clear legislation based on BAC levels and corresponding penalties for offenders who drink and drive

	o The launch of a social marketing campaign to make the public aware of the risks of drinking and driving and change their attitudes concerning drinking and driving o Stricter enforcement using random breath testing strategies at all road types and both during day and night *What can have an extra positive impact on the results of the intervention but isn't really essential?* o Law on the prohibition of the sales of alcohol on certain times and locations to make it more difficult to provide alcohol for drivers, for example at gas stations.
Conclusion	The introduction or adjustment of a law on drink-driving relying on BAC limits in combination with a social marketing campaign and a stricter enforcement using random breath testing are the main cornerstones of this intervention. The combination of these three elements will lead to a reduction of the fatalities and injuries involving the use of alcohol. It is important that enforcement activities work closely together with public awareness campaigns over a long period of time, because achieving behavioral change in drink-driving is a difficult and long process.

4.4 Post-crash response

Also within the pillar of post-crash response, the proposed road safety interventions try to partly fulfil the needs outlined in the five capacity reviews of Work Package 5. The training of road safety volunteers in first aid and the purchase of motorcycle ambulances are two concrete interventions that can be fast implemented without an assessment of the entire system of post-crash care in a country or region. The first described initiative tries to enhance capacity building. The second initiative tries to cover the whole territory with emergency care, also the rural areas, by the use of motorcycle ambulance with basic equipment.

4.4.1 Training of road safety volunteers in first aid and emergency care

Table 6 – intervention 1 post-crash response: training of road safety volunteers in first aid and emergency care

TITLE	*Training of Road Safety Volunteers in first aid and emergency care.*
Background	In most African countries, emergency relief is usually delayed and sometimes absent in some locations. There is also evidence that the chance of survival or cure of road traffic injuries depends on the response time of emergency assistance. First aid at the accident site is therefore fundamental. Training in first aid proves to be a vital link in the chain of victim management and medical care. The training of Road Safety Volunteers in first aid and emergency care is part of the rationale for improving emergency relief and medical care for road traffic injuries. It consists of choosing among Civil Society Organizations (CSOs) that regulate traffic in major city crossroads, members to train in first aid and emergency care. These trained people will be the first to rescue road accident victims when waiting for the arrival of emergency services. They must also be equipped with the accident site markers to facilitate their interventions and avoid other accidents.
Plan of Action	*The different stages of this intervention are:* STEP 1: Identification of CSOs to be trained; STEP 2: Organization of the training; STEP 3: Equipping in first aid kits and accident scene markers, CSOs trained in first aid; STEP 4: Development of the deployment plan for trained volunteers.
Content different steps intervention	**STEP 1: Identification of CSOs to be trained** *What needs to be done?* o Select CSO's members to be trained in first aid and emergency care *What are the <u>technical aspects</u> needed?* o An inventory of the CSOs that carry out the traffic control mission and whose members are deployed every day at the crossroads in major urban centers. o The identification of local structures providing first aid

training and obtaining knowledge about their training methods.

Which organization can take the lead (leading agency)?
- o Road safety lead agency

Which other partners/organizations may be useful to fulfill the step?
- o City Municipality
- o Ministry of Health
- o Traffic Police

STEP 2: Organization of the training

What needs to be done?
- o The selection of trainers
- o The development of a training program

What are the technical aspects needed?
- o The preparation of training modules
- o Planning of the training sessions

Which organization can take the lead (leading agency)?
- o Road safety lead agency

Which other partners/organizations may be useful to fulfill the step?
- o City Municipality
- o Ministry of Health
- o World Health Organization
- o Traffic Police

STEP 3: Equipping in first aid kits and accident scene markers, CSOs trained in first aid

What needs to be done?
- o Quantify first aid kits and accident scenes marker equipment.

What are the technical aspects needed?
- o Define the content of the first aid kits
- o Specify the marker equipment

Which organization can take the lead (leading agency)?
- o Road safety lead agency

Which other partners/organizations may be useful to fulfill the step?
- o City Municipality
- o Ministry of Health
- o World Health Organization
- o Traffic Police

STEP 4: Development of the deployment plan for trained volunteers

What needs to be done?
- o Identification of the most accident crossroads

What are the technical aspects needed?
- o Accident database to identify the most accident crossroads
- o Building a team of trained volunteers in first aid on the

	basis of the identified crossroads
	Which organization can take the lead (leading agency)?
	    o Road safety lead agency
	Which other partners/organizations may be useful to fulfill the step?
	    o City Municipality
	    o Traffic Police

Risk management	*What are the difficulties that will arise when implementing the intervention (=barriers)?*
	    o Lack of funding
	    o Lack of sustainability of the intervention
	How can these difficulties be prevented?
	    o The mobilization of funds from international financial partners
	    o The involvement of local financial partners
	What are the synergies that are helpful when implementing the intervention?
	    o The Involvement of the different training structures at the local level
	    o Guidance from European structures

Resources	*The different (human) resources needed for the implementation of the intervention are:*
	    o Trainers to train the participants in first aid and emergency care
	    o Supervisors of the training who also elaborate the training sessions
	    o Participants: Members of CSOs working in the road traffic field
	    o First aid kits and equipment to report accident locations, each with 4 cones and 2 pre-signaling triangles

Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?*
	    o The availability of funding
	    o The existence of CSOs involved in the regulation of traffic
	    o The existence of local structures specialized in first aid training
	What can have an extra positive impact on the results of the intervention but isn't really essential?
	    o The involvement of European experts

Conclusion	Civil Society Organizations (CSOs) involved in the regulation of road traffic at the crossroads of major urban centers, generally assist road accidents without being able to provide appropriate assistance to victims. Training of members of CSOs in first aid and emergency care and equip them in first aid kits and accident site marking equipment will help improve the medical care of road accident victims. This will help improve road safety, because in low-income countries the majority of deaths occur during the pre-hospital phase.

4.4.2 Purchase of motorcycle ambulances for the benefit of health centres located on major interurban highways

Table 7 – intervention 2 post-crash response: purchase of motorcycle ambulances for the benefit of health centres located on major interurban highways

TITLE	*Purchase of motorcycle ambulances for the benefit of health centres located on major interurban highways*
Background	The most serious accidents often occur on interurban roads, due to speeding and sometimes to a poor state of the road. Unfortunately, in many African countries emergency relief is absent in remote locations and where it exists, interventions are usually delayed due to a lack of equipment, including ambulances. However, there is evidence that the chance of survival or cure of road traffic injuries depend on the response time of emergency relief. To solve this situation, and in the absence of ordinary ambulances that are expensive, motorcycles ambulance can be bought and provided to health centres located along major interurban highways.
Plan of Action	*The different stages of this intervention are:* STEP 1: Identification of health centres located along interurban roads; STEP 2: Estimation of motorcycle ambulance needs; STEP 3: Purchase and deployment of motorcycle ambulances.

Content different steps intervention	**STEP 1: Identification of health centres located along interurban roads**
	What needs to be done?
	   o The selection of the most accidental interurban corridors
	What are the <u>technical aspects</u> needed?
	   o Counting of the located health centres on each interurban corridor that is selected
	   o Make a map of the selected health centres
	Which organization can take the lead (leading agency)?
	   o Ministry of Health Material Department
	Which other partners/organizations may be useful to fulfil the step?
	   o Road Safety Lead Agency
	   o World Health Organization (WHO)
	
	STEP 2: Estimation of motorcycle ambulance needs
	What needs to be done?
	   o Make an estimation of the motorcycle ambulance needs of each health centre on each corridor
	What are the <u>technical aspects</u> needed?
	   o Making an inventory of the equipment of each health centre in ordinary ambulances
	   o Estimate the motorcycle ambulance needs of each health centre on each corridor, in order to have an overall

	estimation of the needs for all the corridors concerned
	Which organization can take the lead (leading agency)?
	    o Ministry of Health Material Department
	Which other partners/organizations may be useful to fulfil the step?
	    o Road Safety Lead Agency
	    o World Health Organization (WHO)
	
	STEP 3: Purchase and deployment of motorcycle ambulances
	What needs to be done?
	    o Define the technical specifications of the motorcycle ambulances
	    o Launch the order
	What are the <u>technical aspects</u> needed?
	    o The identification of marketing structures for motorcycle ambulances.
	    o Defining the technical specifications
	    o Launch the order
	Which organization can take the lead (leading agency)?
	    o Ministry of Health Material Department
	Which other partners/organizations may be useful to fulfil the step?
	    o Road Safety Lead Agency
	    o World Health Organization (WHO)

Risk management	*What are the difficulties that will arise when implementing the intervention (=<u>barriers</u>)?*
	    o Lack of funding
	    o Lack of sustainability of the intervention
	How can these difficulties be prevented?
	    o The mobilization of funds from international financial partners
	    o The involvement of local financial partners

Resources	*The different (human) resources needed for the implementation of the intervention are:*
	    o The financial service staff responsible for drafting bidding documents for the purchase of motorcycle ambulances
	    o The motorcycle ambulances

Minimum Requirements	*What is absolutely necessary for achieving an effective intervention?*
	    o The availability of funding
	    o The existence of a motorcycle ambulance assembly company.
	What can have an extra positive impact on the results of the intervention but isn't really essential?
	    o The involvement of European experts

Conclusion	In many African countries there are isolated villages that are not served by accessible roads for cars or trucks. When road accidents occur in these areas, victims cannot be evacuated to health services. The availability of motorcycle ambulances allows timely rescue of

	road traffic injuries. This increases their chance of recovery and thus contributes to an improvement in road safety.

5. Conclusions

As mentioned in chapter 3 road safety interventions are described as actions designed to target consciously chosen safety improvement objectives within the road safety system (Wilpert & Fahlbruch, 2002). These Interventions may concern any part of this system (road users, infrastructures, vehicles and their interactions), cover any stage of an accident (pre-collision, collision and post-collision) or be designed to mitigate one of the unsafety phenomenon components (i.e., exposure, risk, personal injury and property damage).

This report serves as a guideline for the implementation of road safety interventions within pillar 2 about safer roads and mobility, pillar 3 about safer vehicles, pillar 4 about safer users and pillar 5 about post-crash response. The described interventions were selected based on the needs described in the capacity reviews of WP5, the applicability to the African continent and the concreteness of the road safety intervention. Of course, the road safety interventions should be further adjusted to the specific characteristics of the country or region where they would be implemented. A list of the described interventions in this report is provided in Table 8.

Table 8 – Overview of the described road safety interventions in this report

Pillar		Road safety intervention	Reference D3.5
Safer roads and mobility	Safer roads and infrastructure for all road users	Achieving a forgiving roadside network	4.1.1
		Reengineering the road network according to its hierarchical level	4.1.2
Safer Vehicles	Road worthiness of vehicles	Governmental vehicle fleet requirements for new vehicles	4.2.1
Safer Users	Use of helmets	Increasing helmet wearing rates on powered two and three wheelers	4.3.1
	Drink-driving and driving under the influence of other drugs	Discouraging drink-driving by the reduction of BAC limits and increasing enforcement on drink-driving	4.3.2
Post-crash response	Introduce health facilities along main highways	Training of road safety volunteers in first aid and emergency care	4.4.1
		Purchase of motorcycle ambulances for the benefit of health centres located on major interurban highways	4.4.2

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7. ANNEX 1: List of Abbreviations

AfDB   African Development Bank

ARSAP   African Road Safety Action Plan

AU   African Union

BAC   Blood Alcohol Concentration

CITA   International Motor Vehicle Inspection Committee

CSO   Civil Society Organizations

FIA   International Automobile Federation

HI   Humanity & Inclusion

IRF   International Traffic Safety Data

IRTAD   International Traffic Safety Data and Analysis Group

IRU   International Road Transport Union

LNEC   National Laboratory for Civil Engineering

PIARC   World Road Association

SSATP   Sub-Saharan African Transport Policy Programme

UN   United Nations

UNECA   United Nations Economic Commission for Africa

WB   World Bank

WHO   World Health Organization

WP   Work package

8. ANNEX: Handouts webinars

8.1 Webinar Safer Roads and Mobility – *SaferAfrica* proposals
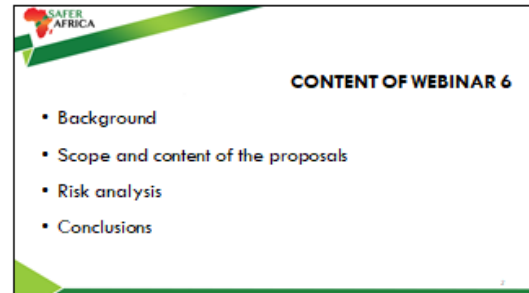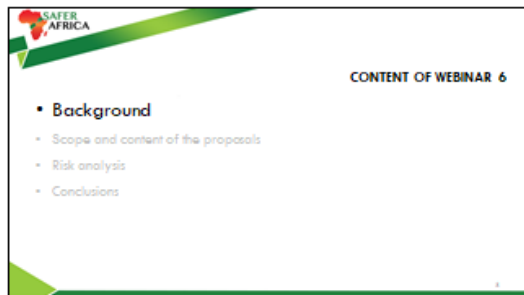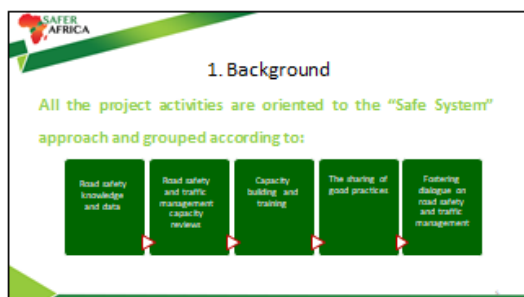
Slide 7

SAFER AFRICA

1. Background

Task 3.4 - Fostering initiatives on capacity building and road safety interventions

Main Goal: Detail road safety interventions that are relevant within the African continent

- Pillar 1 (Road Safety Management)
- **Pillar 2 (Safer Roads and Mobility)**
- Pillar 3 (Safer Vehicles)
- Pillar 4 (Safer Road Users)
- Pillar 5 (Post-crash response)

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Slide 8

SAFER AFRICA

1. Background

Task 3.4 - Fostering initiatives on capacity building and road safety interventions

Pillar 2 (Safer Roads and Mobility)

1. Reengineering the road network according to its hierarchical level

2. Achieving a forgiving roadside network

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Slide 9

SAFER AFRICA

CONTENT OF WEBINAR 6

- Background
- **Scope and content of the proposals**
- Risk analysis
- Conclusions

9

Slide 10

SAFER AFRICA

Driver's expectancy

From the road safety point of view, in any kind of road intervention, **four main concerns or fundamental principles** are relevant:

- the use of the infrastructure must be properly ordered
- the road environment must be adapted to the type of use it is subject to
- the characteristics of the road environment must be adapted to the psychophysiological characteristics of the human being
- conservation and maintenance activities must be performed to ensure that the initial characteristics and safety levels do not degrade in an unacceptable manner

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Slide 11

SAFER AFRICA

Driver's expectancy

The **first 2 concerns** are related to the need of adapting the road environment to the previously expectation of the drivers.

This expectation is built in the driver's life time, it is therefore important to assure:

- a correct hierarchy of the road network
- a proper differentiation of their characteristics

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SAFER AFRICA

Driver's expectancy

The **3rd concern** is related to two premises:

1. It is important to ensure that no demands are made on users which exceed their psychophysiological capacities

2. The driver's *ad hoc* expectation must not be compromised

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Slide 13

Principles for self explaining and forgiving roads

Self-explaining roads are roads on which the driver is encouraged to naturally adopt behaviour consistent with design and function.

Drivers would perceive the type of road and "instinctively" **know how to behave.**

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Slide 14

Self explaining roads

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Slide 15

Reengineering the road network according to its hierarchical level

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Slide 16

Reengineering the road network according to its hierarchical level

Separating traffic elements by function and desired speed, mass and crashworthiness is part of an effective safe system approach.

A functional hierarchy of the road network allows for proper coordination between the intended travel objectives of road users (function) and infrastructure characteristics (road and roadside), such that appropriate design criteria can be implemented.

A road network differentiated according to its function also helps drivers to clearly identify what kind of behavior they should adopt, and thus contribute towards higher road safety level.

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Slide 17

Reengineering the road network according to its hierarchical level
Plan of action

1. Develop the implementation concept for each road category, depending on its function
2. Perform a road inventory of your country or region
3. Perform a road classification according to the previously defined levels.
4. Compare the characteristics of the road network with the desirable ones and identify deviations
5. Rank the deviations and establish a gradual global corrective intervention plan

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Slide 18

Reengineering the road network according to its hierarchical level

STEP 1
Develop the implementation concept for each road category, depending on its function, following the three basic function levels foreseen in safe system

What needs to be done?
Develop the concept for each road category, depending on its function, namely the characteristics to consider, that will need to be collected

What are the technical aspects needed?
Knowledge about the safe system road hierarchy levels, and main characteristics that can be used to classify them.

Which organization can take the lead (leading agency)?
Road administration
Municipalities

Which other partners/organizations may be useful to fulfill the step?
Road engineering consultants

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STEP 2

Perform a road inventory of your country or region, preferably in a digital map, with the collection of main infrastructure design characteristics, speed limit, and road user category access restrictions

What needs to be done?

o Assess current situation of existing road network, regarding the already available set of key road characteristics, and perform the collection of the remaining ones.

o Geocoding of the whole road network or use, as a basic alternative, the ones available online (e.g. openstreetmap.org)

o Inventory of all selected key road and roadside characteristics

o Integration of all data in a database

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STEP 2 (cont.)

What are the technical aspects needed?

GPS station, GIS software commercial or open source (e.g. QGIS)

Road, traffic and geography (GIS) experts are needed

Relevant variables have to be measured and added to shapefiles

The database needs updating

Which organization can take the lead (leading agency)?

Road administration

Municipalities

Which other partners/organizations may be useful to fulfill the step?

GIS companies

Road engineering consultants

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Slide 21

STEP 3 Perform a road classification according to the previously defined levels.

What needs to be done?

Establish warrants for each road category,

Assess actual road function according to the characteristics of each road

What are the technical aspects needed?

Define limits for each key road characteristic concerning geometric design parameters, road signing and marking, as well as roadside characteristics.

Develop an algorithm to automatically classify each road, based on the defined warrants.

Which organization can take the lead (leading agency)?

Road administration

Municipalities

Which other partners/organizations may be useful to fulfill the step?

GIS companies

Road engineering consultants

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Slide 22

STEP 4

Compare the characteristics of each road network segment and node with the desirable ones and identify deviations

What needs to be done?

Develop a method for comparing the real and the desired roadside characteristics, for each road link and node

What are the technical aspects needed?

o Define a comparison method, including weighting of benchmark deviations per variable

o Ideally, the method would be applied through an automatic algorithm.

o Code a routine in a GIS compatible programming language (ex. Python) or as a spreadsheet macro

o List deviations detected, per road element (link or node)

o Create a list of the most promising sites for road intervention

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Slide 23

STEP 4 (cont.)

Which organization can take the lead (leading agency)?

Road administration

Research institute

University

Which other partners/organizations may be useful to fulfill the step?

GIS companies

Road engineering consultants

iRAP

23

Slide 24

STEP 5

Rank the deviations and establish a gradual global corrective intervention plan

What needs to be done?

- Define a plan for progressive improvement of the network
- List available road interventions and inventory their basic attributes (expected costs and effectiveness)
- Define ranking criteria, for each type of interventions (feasibility, cost, impact, geographic scope, other...)
- Develop an algorithm for matching deviations and relevant road infrastructure interventions
- Plan roadside intervention for each site listed in Step 4

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SAFER AFRICA

Reengineering the road network according to its hierarchical level

STEP 5 (cont.)

What are the technical aspects needed?

Assess costs and prospective effects per intervention

Develop tools for overall road safety and road rehabilitation budget estimates

Which organization can take the lead (leading agency)?

Road administration at different levels

Which other partners/organizations may be useful to fulfill the step?

Road engineering consultants

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SAFER AFRICA

Reengineering the road network according to its hierarchical level

Resources

Different human resources needed for the implementation of the intervention:

- GIS expert
- GPS expert
- Road engineer (with safety expertise)
- Technical staff to collect field data and to update de database

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SAFER AFRICA

CONTENT OF WEBINAR 6

* Background
* Scope and content of the proposals
* **Risk analysis**
* Conclusions

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SAFER AFRICA

Reengineering the road network according to its hierarchical level

What are the difficulties that will arise when implementing the intervention (=barriers)?

Not enough experts to build the database

Budget constraints

On site data collection, in case of non existence

How can these difficulties be prevented?

With a financial support from governments or external organizations

Limiting the scope of the intervention to a selected subset of road links and nodes would diminish the budget initially required and allow for on job training of a sizable number of experts

What are the synergies that are helpful when implementing the intervention?

Partial characterization of the road network already made by other institutions (for instance under academic studies) that can be used for this database.

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SAFER AFRICA

Reengineering the road network according to its hierarchical level

Minimum Requirements

- What is absolutely necessary for achieving an effective intervention?

It is absolutely necessary that all roads with the same function have the same type of road environment

- What can have an extra positive impact on the results of the intervention but isn't really essential?

- The availability of traffic counts on all road network links would be a major contribution for the accurate definition its classification. However, the gathering of this information may be too demanding for countries without a traffic collection system already implemented.

- If a road accident database is also available, it could be used for the ranking criteria, prioritizing interventions in the most problematic situations.

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Slide 30

SAFER AFRICA

CONTENT OF WEBINAR 6

* Background
* Scope and content of the proposals
    a) Reengineering the road network according to its hierarchical level
* Risk analysis
* **Conclusions**

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Conclusions

- Self-explaining and forgiving roads should be designed for a specific function which reflects the travel distance, level of traffic flow and desired speed.

- Road users' a priori expectations will be more easily met in a road network with a proper functional hierarchy, leading to lower accident rates and fewer severe injuries.

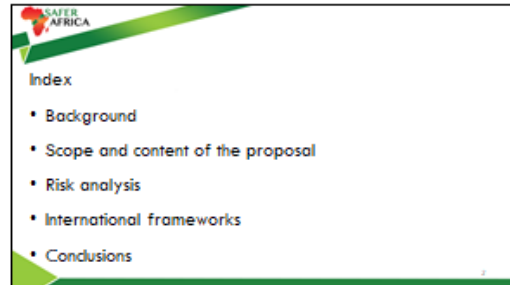31

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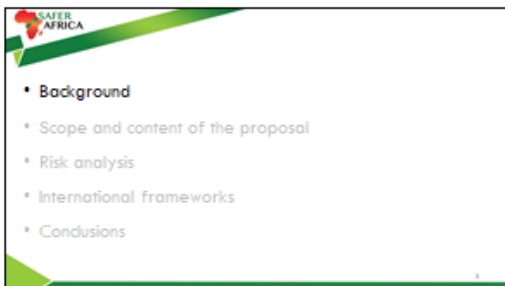Please, send your questions and remarks to:
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8.2 Webinar Safer Vehicles – *SaferAfrica* proposals
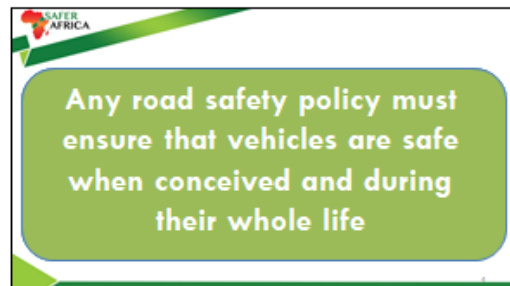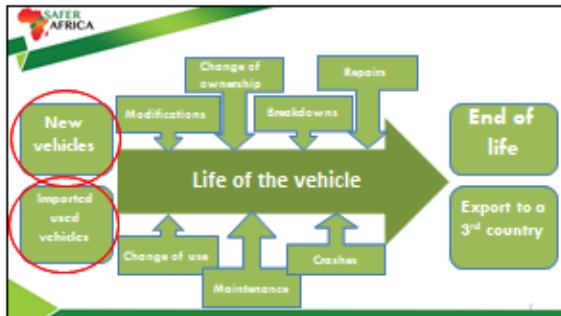
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Slide 7

Life of the vehicle

New vehicles · Imported used vehicles · Modifications · Change of ownership · Repairs · Breakdowns · End of life · Export to a 3rd country · Change of use · Maintenance · Crashes

7

Slide 8

- Background
- **Scope and content of the proposal**
- Risk analysis
- International frameworks
- Conclusions

8

Slide 9

Setting up the scheme to ensure that all new vehicles fulfil safety standards is a complex activity

9

Slide 10

The proposal:
To define and apply the necessary endeavours to ensure that new governmental vehicles fulfil safety requirements

10

Slide 11

The tips of the proposal:
- To focus in the purchase of vehicles for the governmental fleet
- The scope is smaller than for the whole country fleet:
  - Easier to manage
  - Allows to try concepts without bothering the population
  - Allows to set up the scheme and to extend it to all registrations in a lager stage

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Slide 12

Important question:
Does this proposal require to build and manage complex testing facilities?

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Slide 13

Having access to the right documents to know which standards does a vehicle fulfil

Make
Type
Variant
Version

Euro 5J
715/2007*566/2011J

e1*2007/46*0283*05

13

Slide 14

Plan of action
- Step 1: assessment of the current requirements
- Step 2: overview of the fleet needs
- Step 3: definition of requirements
- Step 4: definition of the enforcement of requirements
- Step 5: Implementation and operation of the requirements in the fleet purchase process
- Step 6: follow up

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Slide 15

Resources

Human resources:
- Definition of responsibilities
- Definition of the requirements
- Definition of the implementation procedures

IT Resources:
- Access to the vehicle registry
- Access to vehicle information databases

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Slide 16

Minimum requirements
Commitment of authorities
Engagement of stakeholders: vehicles' trade and manufacturing industry
A realistic definition of requirements
The definition of a suitable procedure for checking requirements
The actual application of enforcement

Additional aspects with a positive impact
The reference of already existing international standards
Access to international databases of vehicles' approval data (ETAES, DETA...)
The integration of this activity within the procedures of registration

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Slide 17

- Background
- Scope and content of the proposal
- **Risk analysis**
- International frameworks
- Conclusions

17

Slide 18

Possible threatens:
Lack of commitment of top decision makers
Lack of collaboration of vehicle brands
Comparison with countries without requirements
Definition of local standards
Application of non-realistic standards
Definition of inefficient procedures
Fraud

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Slide 19

- Background
- Scope and content of the proposal
- Risk analysis
- **International frameworks**
- Conclusions

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Slide 20

Using an already existing framework ensures availability of vehicles at a right price

20

Slide 21

A couple of examples

World Forum
for
Harmonization of Vehicle Regulations (WP.29)

European Union vehicle type approval scheme

21

Slide 22

- Background
- Scope and content of the proposal
- Risk analysis
- International frameworks
- **Conclusions**

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Slide 23

Conclusions

- Good vehicles are essential for road safety
- Setting up requirements for all new vehicles is complex: a good way to start is enforcing the performances of the governmental fleet
- There is no need to invent new standards
- There is no need to invest in testing facilities
- Starting at a smaller scale facilitates the development of a nationwide solution

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Slide 24

Conclusions

- Good vehicles are essential for road safety
- Setting up requirements for a new vehicles is complex: a good way to start is enforcing the performances of the governmental fleet
- There is no need to invent new standards
- There is no need to invest in testing facilities
- Starting a smaller scale facilitates the development of a nationwide solution

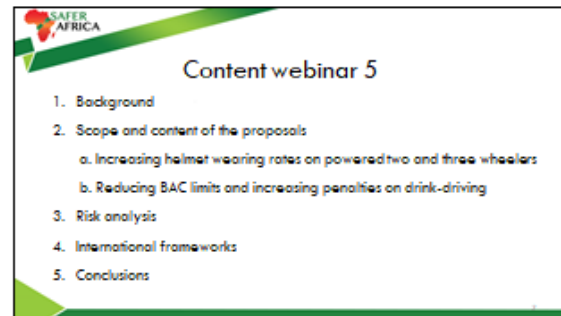And the same concepts apply for the environmental features of vehicles

24
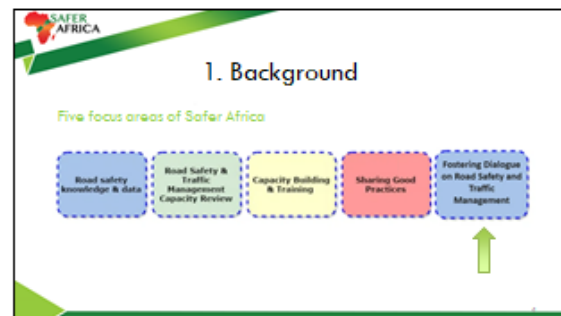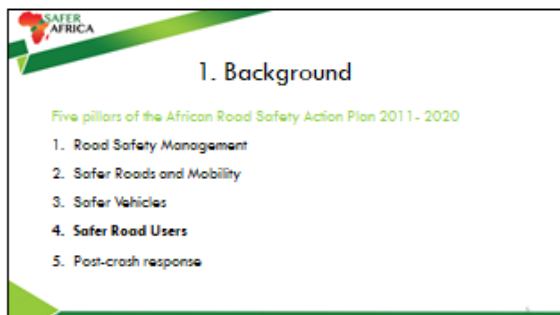
8.3 Webinar Safer Road Users – *SaferAfrica* proposals

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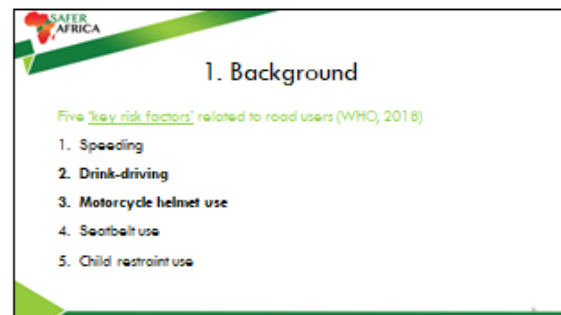

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1. Background

Definition Road User behavior

= The actions of anyone who is travelling from one location to another by any mode of transport, as a pedestrian, driver, rider or passenger.

Human factors have the biggest contribution to accidents

→ Human behavior plays a role in 93% of all accidents

7

1. Background

3 important E's to influence human behavior

1. Enforcement (legislation, control, sanction)
2. Education (sensibilization)
3. Engineering (infrastructure + vehicle)

Engineering

Enforcement ←→ Education

8

2. Scope and content of the proposals

a. Increasing helmet wearing rates on powered two and three wheelers

b. Reducing BAC limits and increasing penalties on drink-driving

9

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Why?

- Head injuries: leading cause death and severe injuries motorcyclists
- Wearing a helmet: important safety equipment to prevent head injuries
- Main problem in Africa: compliance to mandatory helmet law and public awareness

10

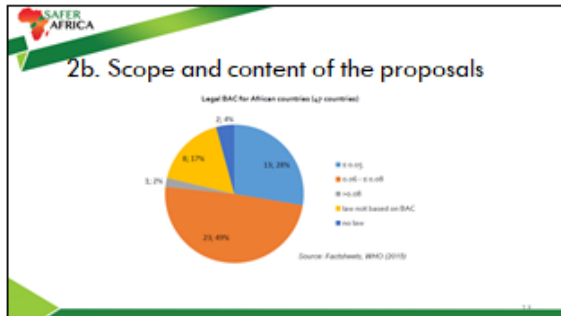## 2a. Scope and content of the proposals

11

2b. Scope and content of the proposals

Reducing BAC limits and increasing penalties on drink-driving

Why?

- Drink-driving increases risk of crash and severity
- Blood alcohol concentration (BAC) limited to 0.05 g/dl instead of 0.10 g/dl
  → reduction of 6% t 18% fatalities
- Best practice suggested by WHO: BAC ≤ 0.05 g/dl

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Slide 13

SAFER AFRICA

2b. Scope and content of the proposals

Legal BAC for African countries (47 countries)

Legend:
- 0-0.05
- 0.05 - 0.08
- >0.08
- law not based on BAC
- no law

Source: Factsheets, WHO (2015)

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SAFER AFRICA

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention **STEP 1 PUBLIC AWARENESS CAMPAIGN**

A. Defining the reasons of non-compliance

B. Defining target audience

C. Decide which message will be spread

D. Decide how message will be spread

E. Communication to raise media attention

F. Evaluate public awareness campaign

Slide 15

SAFER AFRICA

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention **STEP 1 PUBLIC AWARENESS CAMPAIGN**

A. Defining the reasons of non-compliance

- = reasons non-use of a helmet? (Ex. Survey)
- Heat inside the helmet
- Obstruction of the view
- Good quality helmets too expensive

Slide 16

SAFER AFRICA

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention **STEP 1 PUBLIC AWARENESS CAMPAIGN**

B. Defining target audience

= Which kind of people are resistant to wear a helmet?

- Age of non-users?
- Gender of non-users?
- Passengers or drivers?
- Linked to certain roads? Linked to purpose of trips?

Slide 17

SAFER AFRICA

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention **STEP 1 PUBLIC AWARENESS CAMPAIGN**

C. Decide which message will be spread

- Simple and understandable message
- Adjusted to target group
- Adjusted to cultural characteristics country

D. Decide which message will be spread

= Choose a media channel (Ex. Television, radio, billboards, social media,...)

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SAFER AFRICA

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention **STEP 1 PUBLIC AWARENESS CAMPAIGN**

E. Communication to raise media attention

- Organization of a press conference

F. Evaluation public awareness campaign

= Measure helmet wearing rates

- One month before campaign
- One month after campaign
- Six months after campaign (= long term effects)

2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

STEP 1 PUBLIC AWARENESS CAMPAIGN

What are the <u>technical aspects</u> needed?

- Communication expert
- Publicity on radio and television
- Publicity on social media
- Billboards along the road

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

STEP 1 PUBLIC AWARENESS CAMPAIGN

Leading agency?

- Ministry of Public Health or Transport
- Road Safety authorities
- Communication agency

Other Organizations?

- Collaboration with NGO's
- Collaboration with motorcycle rider groups
- Research institute for the evaluation

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention STEP 2 Enforcement

Stricter enforcement law helmet use → compliance

A. Decide type of penalty

B. Informe motorcyclists change enforcement

C. Training of policemen

D. Increasing police capacity

E. Decide regions of enforcement

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention STEP 2 Enforcement

A. Decide type of penalty

- Regulated by the law (Ex. Double the amount of the fine)

B. Informe motorcyclists change enforcement

- Combined with the public awareness campaign

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention STEP 2 Enforcement

C. Training of policemen !!

- Knowledge of the law and penalties
- Awareness of risks non-use helmets
- Knowledge about setting up checkpoints

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

Different steps intervention STEP 2 Enforcement

D. Increasing police capacity

- Strategic planning

E. Decide regions of enforcement

- Target specific regions with high non-compliance rates

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

STEP 2 Enforcement

What are the _technical aspects_ needed?

- Databases with offenders and status fines
- Trainers
- Higher police capacity

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2a. Scope and content of the proposals

Increasing helmet wearing rates on powered two and three wheelers

STEP 2 Enforcement

Leading Agency?

- Ministry of Public Health/Transport
- Road Safety authorities
- Police traffic commandant

Other organizations?

- Police

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3. Risk analysis

Increasing helmet wearing rates on powered two and three wheelers

Barriers?

- Lack financial resources public awareness campaign
- Lack financial resources higher police capacity
- Lack of political commitment
- Corruption of police
- Good quality helmets are too expensive
- The heat in African countries

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3. Risk analysis

Increasing helmet wearing rates on powered two and three wheelers

Overcoming barriers?

- Government or private companies make good quality helmets available

Synergies?

- Political commitment (Ex. Support prime minister)
- Public authority workers serve as good example

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4. International frameworks

Helmets

Drinking and Driving

Powered two- and three-wheeler safety

good practice

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Slide 30

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5. Conclusions

✓ Human factors are involved in almost **90%** of all accidents

✓ **Engineering** of the traffic environment and vehicle can modify human behavior

✓ **Public education** should always be combined with **enforcement**

✓ Higher helmet wearing rates for drivers and passengers of PTW **decreases** the risk of injuries and fatalities

✓ Legal BAC limit of 0.05 g/dl instead of 0.10 g/dl reduces fatalities with 6% to 18%

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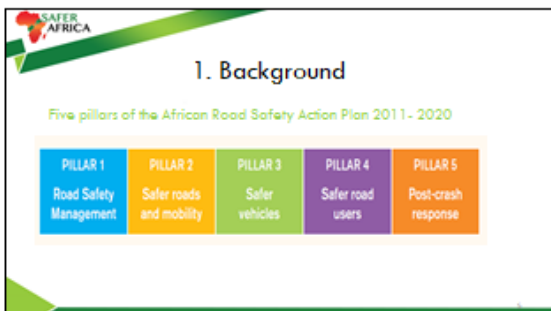## 8.4 Webinar Post-crash response – *SaferAfrica* proposals

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Slide 7
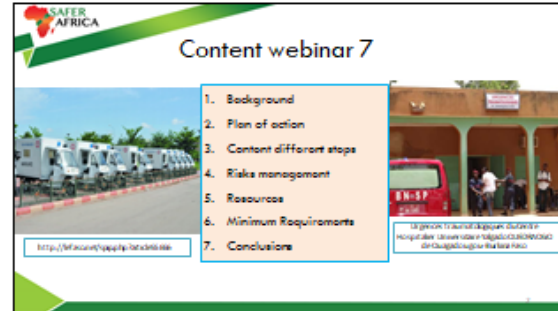
1. Background

Post-crash response

- Chain of rescue include several people.
- witness of the accident is the first link and must protect the wounded and prevent emergency services.
- In the most serious cases first aid must be taken quickly to give more chance of recovery to the wounded.
- In some African countries, road safety association's members regulate traffic. They are potential witnesses of road accidents but don't know the first aid.
- Necessity to train them in first aid and emergency care to improve the care of the wounded

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1. Background

Post-crash response

Mean issues in many Africans countries:
- Occurring of the most serious accidents on interurban roads.
- Lack of emergency relief in remote locations
- Delay of interventions delayed for lack of equipment, including ambulances.

Solution: The Solution can be motorcycles ambulance

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1. Background

1) Road Safety Volunteer's training in first aid and emergency care	2) Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

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Slide 10

2 Plan of action

Road Safety Volunteer's training in first aid and emergency care

- Selection of participants;
- Organization of the training;
- Equipping in first aid kits and accident scene markers, OCS trained in first aid;
- Development of the deployment plan for trained volunteers.

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3 Content different steps

Road Safety Volunteer's training in first aid and emergency care

Step-1: Selection of participants
- Identification of CSOs to be trained: list to be obtain from the road safety lead agency or the Municipality of the City.
- **Main agency:** Road safety lead agency
- **Others partners:** City Municipality, Ministry of Health and Traffic Police.

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3-Content different steps

Road Safety Volunteer's training in first aid and emergency care

Step-2: Organization of the training
- Choose the trainers and to develop a training program
- prepare training modules and training sessions plan
- **Main agency:** Road safety lead agency
- **Others partners:** City Municipality, Ministry of Health, WHO and Traffic Police.

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3 Content different steps

Road Safety Volunteer's training in first aid and emergency care

Step 3- equipping in first aid kits and accident scene markers, the OCSs trained in first aid

- define the content of the first aid kits and to specify the markup
- quantify first aid kits and accident scenes markup equipment
- **Main agency:** Road safety lead agency
- **Others partners:** City Municipality, Ministry of Health, WHO and Traffic Police.

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3- Content different steps

Road Safety Volunteer's training in first aid and emergency care

Step-4- development of the deployment plan for trained volunteers

- identify the most accident crossroads
- build trained volunteer's team for each identified crossroads.
- **Main agency:** Road safety lead agency
- **Others partners:** City Municipality and Traffic Police.

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3- Content different steps

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

- Identification of health centers located along interurban roads;
- Estimation of motorcycle ambulance needs;
- Purchase and deployment of motorcycle ambulances.

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3- Content different steps

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

Step 1- identification of health centers located along interurban roads
- select the most accidental interurban corridor;
- count on each interurban corridor the health centers located there;

Main agency: Ministry of Health Material Department

Others partners: Road Safety Lead Agency and WHO.

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3- Content different steps

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

Step 2- estimation of motorcycle ambulance needs
- make an inventory of the equipment of each health center by ordinary ambulance ;
- estimate the motorcycle ambulance needs of each health center on each corridor;

Main agency: Ministry of Health Material Department

Others partners: Road Safety Lead Agency and WHO.

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3-Content different steps

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

Step 3- purchase and deployment of motorcycle ambulances
- Identify marketing structures for motorcycle ambulances ;
- Define the technical specifications and launch the order.

Main agency: Ministry of Health Material Department

Others partners: Road Safety Lead Agency and WHO.

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4- Risk management

Road Safety Volunteer's training in first aid and emergency care

Obstacles:
- Lack of funding,
- Lack of sustainability of the intervention;

How to overcome these obstacles:
- mobilize funds from international financial partners;
- involve local financial partners.

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4- Risk management

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

Obstacles:
- Lack of funding,
- Lack of sustainability of the intervention;

How to overcome these obstacles:
- mobilize funds from international financial partners;
- involve local financial partners.

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5- Resources

Road Safety Volunteer's training in first aid and emergency care

Human resources: trainers, supervisors and participants (members of OSCs working in road traffic field).

material resources : first aid kits and equipment to report accident locations (each with 4 cones and 2 pre-signaling triangles).

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5- Resources

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

Human resources: financial service staff responsible for drafting bidding documents for the purchase of motorcycle ambulances

material resources : Bidding documents

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6- Minimum Requirements

Road Safety Volunteer's training in first aid and emergency care

Things absolutely necessary: the availability of funding, the existence of CSOs involved in the regulation of traffic and the existence of local structures specialized in first aid training.
Things that may have an additional positive impact: intervention of European experts

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6- Minimum Requirements

Purchase of motorcycle ambulances for the benefit of health centers located on major interurban highways

Things absolutely necessary: the availability of funding; means of communication to reach the emergency services for help requests;
basic health facilities; logistical means necessary for a prompt rescue.

Things that may have an additional positive impact: Existence of motorcycle-ambulance assembly company

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7. Conclusions

The training of road safety CSO's in first aid and emergency care and their equipment in first aid kits and accident site marking equipment will help improve the medical care of road accident victims. This will help improve road safety, because in low-income countries the majority of deaths occur during the pre-hospital phase. The availability of motorcycle ambulances allows timely rescue of road traffic injuries, increases their chance of recovery and thus contributes to an improvement in road safety.

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Questions

Thank you for your attention!

Any suggestions?

Any feedback?

Feel free to send your questions and remarks to:
c.sonon@hi.org

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Next webinar

Safer vehicule"Safer Africa" proposals

Wednesday 9th of May 2019

Eduard FERNADEZ (CITA)

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