D7.2 – TRANSFERABILITY AUDIT

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List of abbreviations

ARSAP  African Road Safety Action Plan
EC    European Commission
EU    European Union
TA    Transferability Audit
PPM   Problem Priority Matrix
RSO   Road Safety Observatory
WHO   World Health Organisation
Executive Summary

According to the Global Status Report on Road Safety 2015 of WHO (WHO, 2015), "road traffic injuries claim more than 1.2 million lives each year and have a huge impact on health and development”. Based on the WHO regions, there has been a deterioration in road fatality rates in the WHO Africa region from 24.1 fatalities per 100,000 inhabitants in 2010 to 26.6 fatalities per 100,000 inhabitants in 2013. Over the same period, there was an improvement in road fatality rates in the WHO Europe region. Road trauma in Africa is expected to worsen further, with fatalities per capita projected to double over the period 2015-2030 (Small and Runji, 2014).

The 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 main objective of work package 7 (WP7) is to analyse good road safety practices realised at country, corridor and regional levels in Africa and to compare these practices with those of other countries and with international experiences. Also included in this WP7, are good practices in road safety management and in the policy-making and integration of road safety with other policy areas (Task 7.1). WP7 includes the definition of a Transferability Audit, tailored to Africa conditions that can be used to assess the suitability of road safety interventions in the context of African countries (Task 7.2). Finally, promising local projects are be identified, that may be implemented in selected African countries (Tunisia, Kenya, Cameroon, Burkina Faso and South Africa), following a positive transferability audit and a detailed concept definition by SaferAfrica participants and local road safety experts (Task 7.3). Furthermore, factsheets on five key challenging African safety issues were developed as synthesised working documents, containing all technical and financial information necessary for understanding the corresponding set of proposed interventions.

This deliverable describes the main activities carried out in Task 7.2. The main outcome of this task is the development of a Transferability Audit tool able to identify barriers to the potential implementation of road safety good practices identified in Task 7.1.

Chapter 1 provides an analysis of factors that may be considered into Transferability. Regarding road safety, they can be referred to the concept of Road Safety Space (King, 2005). According to this concept, each road safety issue in a given country exists in a space defined by the economic, institutional, social and cultural factors which influence it. The road safety space varies from one road safety issue to another and from Country to Country, although some factors may be shared across road safety issues or across countries. Then, an international review of transferability methodology is provided, with a particular focus on the SaferBrain project that represents the base of the Transferability Audit in SaferAfrica.

Chapter 2 describes the adapted methodology applied in the SaferAfrica Transferability Audit. The basic task is to assess whether a given road safety measure/concept may be perceived as a problem within one (or more) of the assessment area(s) provided by the Road Safety Space (i.e. Society/Culture, Economy and Institution) as research layers which describe the receptor context. A Problem Priority Matrix (PPM) has been adopted to assess the transfer process (i.e. mainly the applicability) of international road safety good practices to an African country, where rows represent road safety measures and columns the three Road Safety Space factors (Culture, Society, Economy and Institution). Relationships among rows and columns are scored and weighted by SaferAfrica.
stakeholders, so as to identify which measures would be best placed to address safety issues at country level within Africa.

Chapter 3 describes more in detail the 25 selected road safety interventions from across pillars.

Chapter 4 synthesizes the main results of the Capacity Review undertaken in the 5 selected Countries and analyzes the main TA results. A total of 14 responses were obtained from the 5 Countries for all the pillars showing that there isn't a full coverage of pillars for each Country surveyed.

Chapter 5 provides final conclusions. The transferability ranking has showed that the majority of interventions are medium challenging. Finally, analysing the problem scores across the Countries, the domain “Economy” has shown the highest scores, proving to be the most important barrier for transferability. Conversely, “Institution” is not perceived as a barrier.
The meaning of Transferability

“Transferability” means the quality of being transferable or exchangeable. Transferability refers to the extent to which the outcomes of an applicable intervention evaluated in a primary context, the origin context, could be achieved in another context, called receptor or target context.

The basic assumption behind is “what proved to be effective in a place may confirm to be useful again, in another place” (Appelt et al., 2011), but the translation of the concept into practice is more challenging and, in some cases, even tricky.

The concept is different from the Generalizability of results, which relate on the extent to which the findings of an intervention can be generalized to a wider population (Wang et al., 2006). Generalizability is a sort of requisite for transferability: if an intervention has been appropriately evaluated and its results can be generalised then transferability could be assessed. Generalizability of good practices can be appraised through the quality of the evidence in the primary context.

Another requisite for transferability is applicability, or feasibility, which measures the extent to which an intervention process could be implemented in another context (Wang et al., 2006). Indeed, Transferability is often confused with the selection of measures that could be fit a given situation, that represent a sort of recommendation of best practices; actually, it is a process in which the feasibility of selected measures from an origin context to a receptor one is assessed, that means an evaluation of the efforts and resources required for the measures to succeed, including an analysis of the barriers to overcome. In fact, usually, transferability appraisals integrate applicability or include criteria related to intervention applicability (Schloemer & Schröder-Bäck, 2018; King, 2005).

Consequently, performing a transferability exercise requires not only some discipline in following a suitable methodology but, ultimately, also a wise judgement on its overall fitness (Macario et al., 2010). This statement highlights another key issue, i.e. the proper knowledge of both origin and receptor contexts and the consequent identification of barriers against the successful implementation of a measure.

As reported in the World report on road traffic injury prevention (WHO, 2004), road safety measures developed in high-income countries might not fit well with the safety needs of low-income and middle-income countries, like African Countries, for a variety of reasons, including, among the others, low per capita incomes, the presence of mixed traffic, a low capacity for capital intensive infrastructure, and a different situation as regards law enforcement. Thus, in such Countries, safety should be promoted within existing conditions. Indeed, in high-income settings, new strategies and programs for traffic injury prevention generally require considerable analysis and planning before implementation; in developing countries, though, because of the scarcity of resources, the priority should be the import and adaptation of proven and promising methods from other (developed and low income) nations, and a pooling of information as to their effectiveness in the imported settings among other low-income countries.

1.1 The Road Safety Space

Factors influencing origin and/or receptor contexts generally belong to three different domains:

- the institutional domain (i.e. the totality of legal, regulatory and standardisation tools which authorise the enforcement of a given measure and which may markedly differ from one Country to another);
- the resources availability (i.e. the amount of money, personnel and technical know-how required to implement a given measure);
- the society/culture (i.e. the cultural status which makes a community aware of the need to adopt a given measure and willing to accept it / long term developed traditions and heritage which also influences transport behaviour).

Each domain can affect the others, can have both a local (case study, pilot study, urban area) and a general (state, nation) influence, and may involve more study areas than the usually involved ones (i.e. safety and mobility): from psychology to anthropology, from public health to security, etc. The deeper the three main domains are analyzed, the easier will be the identification of promoters and barriers to support the transfer feasibility.

At the same time, it may be hard to deal with the three domains according to a univocal and quantitative point of view. The problem can be addressed through the elaboration of a kind of "environment" where, theoretically, a Transferability Study can take place and where all the mutual influences among the above-mentioned domains occur.

In particular, factors considered into Transferability can be referred to the concept of Road Safety Space, proposed by King (2005) and illustrated in Figure 0-1. According to this concept, each road safety issue in a given country exists in a space defined by the economic, institutional, social and cultural factors which influence it. The factors include both broad and specific influences. The road safety space varies from one road safety issue to another and from Country to Country, although some factors may be shared across road safety issues or across countries.

![Figure 0-1 – The Road Safety Space, King (2005)](image)

The logical process for the Transferability Study is based on the following steps (Appelt et al., 2009):
• Use the “road safety space” concept to identify the factors belonging to the domains which can affect the safety issue in hand.
• Select which are the effective measures likely to be transferred among those available from the origin context.
• Use the “road safety space” concept to identify the factors which made the transferable measures successful in the origin context.
• Assess whether, according to the target context, the measures to be transferred are likely to be successful as they were in the origin case study or need to be adjusted to the new local situation; the option that they may be of no use (with or without amendments) may be contemplated.

An important point is the analysis of factors which made the transferable measures successful in the origin context. In other terms the transferability should consider not only single road safety measures, but also “the political visions supporting them, which means exporting not only technical know-how but also consensus building and (if necessary) fundraising techniques, along with procedures for the long-term assessment of the transferred measures”. This requires taking into account packages of multitask measures (Appelt et al., 2009).

1.2 International review of transferability methodologies

Examples of transferability of road safety policies and measures are rare, and in several cases, they deal with simple recommendations of best practice to transfer. The literature on transferability of transportation policies is richer, and consolidated results from transferability studies are available, although they mostly concern transfer of policies from/to developed countries.

Among the transferability studies, some relevant EC-funded research projects are worth further analysis:

• TRANSPLUS - TRANSPORT Planning, Land Use and Sustainability.
• LEDA - legal and regulatory measures for sustainable transport in cities.
• CIVITAS Initiative
• SAFERBRAIN - Innovative Guidelines and Tools for Vulnerable Road Users Safety in India and Brazil.

These examples take into consideration the legal and regulatory aspects, the available economic resources and the social issues as factors influencing the transferability process as a whole. However, it is worth to note that all these projects deal with cities and not with Countries.

TRANSPLUS research project EVK4-CT-1999-00009 was supported by the European Commission under the 5FP and contributed to the implementation of the Key Action “City of Tomorrow and Cultural Heritage” within the Energy, Environment and Sustainable Development thematic programme. It aimed at creating a common understanding among European transport and land use authorities, policy makers and practitioners of the best ways to combine policies, neutralising barriers to implementation and realisation of the desired outcomes, ensuring compatibility and transferability between countries and cities, based also on citizens participation in urban & transport planning.
The core of the project was to assess how transportation and land use issues must be integrated to create exportable best practices. Main findings on transferability can be synthesized according to the following key concepts:

- **Compatibility** – It is important to assess not only whether the policy tool itself is exportable to the target city, in terms of technical contents, goals, timeframe, etc. but also how it may be compatible to the target context; hence the need to look for comparable cities in terms of “relationships between institutions and territories”.

- **Scope** – Such relationships call for identification of the level of transferability, which can be considered in terms of:
  - Horizontal transferability, i.e. the translation of a tool at the same scale of generation and application across territorial boundaries.
  - Vertical transferability, that is the case when a given policy may be scaled up or down, according to different degrees.

**LEDA** was a research project aimed at studying legal and regulatory measures to promote sustainable transport in cities. The scope was encompassing measures in the transport sector, but also in related sectors influencing transport demand and supply like environment and land-use planning. The focus is on passenger transport.

One of the main tasks of the project was to assess the transferability of 20 “less well-known but effective measures” to some receptor cities in Europe, selected according to the project evaluator’s expertise.

The transferability study was focused on the transfer of single transport measures, namely under the legal and regulatory points of view. Each measure was eligible to be tested by more than one target city, if possible.

As a pre-requisite to the transferability audit, a study of possible correlations between the two sets of Target / Origin Cities was developed. The profile of Origin Cities was drawn by a questionnaire submitted to the LEDA participants. Questions were created to provide information about drivers and barriers for the transferability audit in terms of Urban structure, Legal framework, Political will, Public acceptance and Role of enforcement. For any answer, responses were based on a 3-point modified-Lickert Scale (-1, 0, 1), where 0 is meant as neutral, i.e. the midpoint.

Finally, transferability scores have been clustered according to the relevance:

- **low scores**: those measures that require some form of restriction or perceived risk to be imposed above and beyond what is “typical”. Consequently, these measures are assessed as creating a problem from either the public acceptability or the political standpoint.
- **medium scores**: those measures that can typically be done under existing powers, but are not perceived as providing significant benefits either publicly or politically, or in respect of the City’s objectives.
- **high scorers**: those measures that can be implemented using existing powers, and which are relatively easily enforceable, and which are perceived to provide benefits for the City or to the public” (Macário and Marques, 2004).
The CIVITAS approach differs from the above-mentioned ones because it was aimed at providing a general methodology for transferability that could be adaptable to different kinds of research projects and the related measures implementation process.

The methodology was based on several steps according to an algorithm that takes into account some of the aspects already analysed in TRANSPLUS and LEDA. The 10 steps are reported in Figure 0-2. The framework identifies the sequence and the interrelationships between the various questions that should be addressed in order to assess the potential for success of a transferable policy. The major assumption of the proposed methodology is that transferability is expressed through the applicability, optimum packaging and community acceptance of the candidate measures.

The advantage of such methodology is that the sequence is flexible enough to be adapted to the scope of the transferability process of SaferAfrica and, in particular,

- start the process either from target countries and looking for candidate origin cities or vice versa;
- jump some steps if needed (for instance step 8 can be skipped in case of poor resources or information).

![Figure 0-2: Transferability algorithm (Macário and Marques, 2004)]
The SAFERBRAIN (Innovative Guidelines and Tools for Vulnerable Road Users Safety in India and Brazil) project was funded in the framework of the FP7 of the European Commission. The project performed a Transferability Audit of several road safety measures for vulnerable road users in Brazil and India.

A matrix of 4 E’s (Engineering, Education, Encouragement and Enforcement), and its combination with the main transferability issues (Society/Culture, Institutions and Economy) gives a comprehensive possibility for creating a model for Transferability Audit. Further, a Problems Priority Matrix (PPM) was. The PPM is a checklist designed in order to allow respondents, i.e. road safety experts in India and Brazil, to fill it in by providing scores and weights for each item listed in the rows.

As a result, the lowest are the total scores per rows, the least challenging are the measures to be implemented (this also means that the most benefited are the non motorised users). The lowest are the total scores per columns, the least affected are the related Road Safety Space components (society/culture – institution – economy).

![Figure 0-3 Example of the SaferBrain Problems Priority Matrix](image-url)
Transferability, within the context of this deliverable, refers to how successful a road safety measure, which has been developed and deployed in one context, can be applied to another context. ‘Context’ includes: the country or region; infrastructure characteristics such as road type; age, gender and nationality of the targeted road user; culture; legal and organisational structure; government policy etc.

For example, a measure that has been successfully used in one country may be less successful when used in another country due to differences in the local context. For a road safety measure developed in Europe to be successfully adopted in an African country, the specific local context needs to be examined and a judgement made about what specific elements of the European measure can be transferred and what needs adaptation. This is the case even when the measure has been developed or used within another African country. It cannot be assumed therefore that a measure successful in South Africa will also have the same effect in Kenya.

1.3 Methodology

The basis for the SaferAfrica Transferability Audit (TA) comes from the methodology adopted in the SaferBrain project where the transfer process of interventions improving vulnerable road user safety were assessed for India and Brazil (Appelt et al., 2009). The process has been adapted and calibrated to the wider context of SaferAfrica and follows the three basic steps:

**STEP A – Collecting road safety concepts to transfer (the lesson from Europe, Africa and elsewhere)**

In Task 7.1 a total of 40 road safety intervention good practice examples were collected and highlighted, from Europe, Africa and the rest of the World (Cardoso et al., 2018). The analysis review was framed around identifying road safety measures that map to outcomes identified across 5 distinct pillars plus cross-cutting issues in the *African Road Safety Action Plan* (ARSAP). These are shown in the table below. Among 40 interventions, 25 well documented examples (see Chapter 3) from across pillars have been analysed in detail and selected for TA.

Table 0-1: Pillars and expected outcomes of the ARSAP

<table>
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<tr>
<th>Pillar</th>
<th>Expected outcomes</th>
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<tr>
<td><strong>Pillar 1: Road Safety Management</strong></td>
<td>1. Established/strengthened Lead Agencies</td>
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<td>2. Improved management of data</td>
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<td></td>
<td>3. Developed/strengthened partnership and collaboration</td>
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<td><strong>Pillar 2: Safer Roads and Mobility</strong></td>
<td>1. Safer road infrastructure for all road users</td>
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<tr>
<td></td>
<td>2. Capacity building and training</td>
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<tr>
<td><strong>Pillar 3: Safer Vehicles</strong></td>
<td>1. Road worthiness of vehicles</td>
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<tr>
<td>Pillar</td>
<td>Expected outcomes</td>
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<td>-----------------------------------------------------------------------------------</td>
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<td><strong>Pillar 4:</strong> Safer Road Users</td>
<td>1. Educated general public (road users)</td>
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<td></td>
<td>2. Use of helmets</td>
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<td></td>
<td>3. Use of seatbelt</td>
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<td>4. Drink-driving and driving under the influence of other drugs</td>
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<td></td>
<td>5. Use of mobile phone while driving</td>
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<td>6. Speeding</td>
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<td><strong>Pillar 5:</strong> Post-Crash Response</td>
<td>1. Improved emergency care</td>
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<td><strong>Crosscutting Issues</strong></td>
<td>1. Rural transport safety</td>
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<td>2. Evaluation of the Decade</td>
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**STEP B – Creating a TA tool**

The tool to analyze Transferability is a Problem Priority Matrix (PPM) where rows represent safety road safety measures for each pillar of the ARSAP and columns the three Road Safety Space factors (Culture, Society, Economy and Institution). Relationships among rows and columns are scored and weighted by SaferAfrica stakeholders, so as to identify which measures would be best placed to address safety issues at country level within Africa. Respondents from selected African Countries were asked to evaluate measures relating to only those issues that are of prevalence in their Country.

**STEP C – Assessing the matrix outcomes**

Final scores and a list of problems arisen from the Problems Priority Matrix are finally assessed.

1.4 **The Problem Priority matrix (PPM)**

The TA tool used is a Problem Priority Matrix - or prioritization matrix - and it is a tool commonly used in project management to prioritize activities. It can help an organization to make decisions by narrowing options down by systematically comparing choices through a number of (weighted) criteria important for the organization. It is used, for instance, to rank problems according to their urgency and their potential impact that an unresolved problem might have on an organization¹.

Within WP7 “Sharing of good practices” of SaferAfrica project a Problem Priority Matrix (PPM) is adopted to assess the transfer process (i.e. mainly the applicability) of international road safety good practices to an African country. To some extent this entails improving road safety outcomes, but the

¹ See for instance: https://en.wikipedia.org/wiki/Priority_Matrix
The main objective is to improve the transfer process in the expectation that better outcomes will follow (King, 2005).

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

To this aim, 6 factors (2 for each domain) were proposed in SaferBrain related to the 3 main road safety space domains. Namely these are:

- For the Society/Culture domain:
  - People
  - Environment
- For Institution domain:
  - Availability of regulation
  - Political commitment
- For the Economy domain:
  - Design, implementation and maintenance costs affordability
  - Technical skill availability.

A number of possible questions related to each factor/criterion has been derived from existing literature to assess the applicability of a measure/concept (Appelt et al., 2009; Wang et al., 2016) and reported in Table 0-2.

Since the factors are specific to each measure/concept, adequate process and contextual information should be provided to inform about the factors that may contribute to the implementation and effectiveness of the intervention.

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

To fill the matrix, for each practice the stakeholders will face the question: Would this safety practice be a problem for? To answer they need to provide a score and a weight for each criterion of the road safety space according to their expertise. Then, the total scores will be the sums of multiplications of scores and weights in rows and columns.

Scores to be assigned to a practice depend on the difficulty to transfer / adapt it to the receptor country. The more challenging is the transfer / adaptation, the higher is the score, according to the following Likert scale:

- High challenging: score = 5
- High-medium challenging: score = 4
- Medium challenging: score = 3
- Medium-low challenging: score = 2
- Low challenging: score = 1

It is assumed that measures with similar challenging scores might differ in terms of level of importance attributed by policy makers/stakeholders to each criterion for a specific measure. Environment suitability might be critical for the successful implementation of e.g. a roundabout but not for an educational measure.

Weights are to be assigned according to the importance of criteria with regards to the successful implementation of the intervention (e.g. are criteria related to population more important than e.g. technical skill availability for road safety campaign measures?) so that the total sum of weights is 100 (e.g. People 30, Environment 10, Availability of regulation 5, Political commitment 5, Design, implementation and maintenance costs affordability 20, Technical skill availability 30).

Scores and weights are to be provided according to the respondent’s expertise on the context where the measures should be designed and implemented.

The final scores will be calculated per rows and columns as the sum of multiplications by scores (s) and weights (w):

For row i (1 to n):

$$\sum_{i=1}^{n} s_i \times w_i$$
Column \( j \) (1 to m)

\[
\sum_{j=1}^{m} s_j
\]

As a result, the lowest are the total scores per rows, the least challenging are the measures to be implemented. The lowest are the total scores per columns, the least affected are the related Road Safety Space components (society/culture – institution – economy).

On the contrary, highest scores reveal measures which, even though theoretically transferable, are very likely to be unsuitable to the cases in hand.
Selected good practices for Transferability Audit

In Task 7.1 a total of 40 road safety intervention good practice examples were collected and highlighted, from Europe, Africa and the rest of the World (Cardoso et al., 2018). Overall that Task aimed at obtaining a representative collection of road safety interventions liable to application in African Countries in their quest for diminishing the burden of the road accident disease. As recognized in the report, the amassed examples are not a comprehensive collection of existing practice.

Good practice in road safety interventions were defined as those meeting several criteria, including a focus on clearly identified road safety problems and knowledge of the active mechanism put in place to mitigate them; the relative size of the safety phenomenon addressed; a quantitative assessment of the likely impact of the intervention; a reported evaluation of effects; results from costs and benefits analysis; acceptance by public and policy makers; and the prospect of long-term effects.

Evidence relating to good practice was gathered from several sources, following a literature search and including related project reports, journal articles, websites, reports from financing projects for transport sector reformation (NGOs and development banks), and expert knowledge among a range of European and African project partners. Work already carried out within other SaferAfrica work packages was also used as a relevant source.

Using the results from the SaferAfrica Road Safety Management Capacity Reviews carried out in Burkina Faso (Kluppels et al., 2018), Cameroon (Baja and Usami, 2017), Kenya (Schermers et al., 2018), South Africa (Small and Niekerk, 2018) and Tunisia (Yerpez and Bouhamed, 2018), a subset of 24 road safety interventions was selected for analysis of their transferability to African countries (Table 0-1). A summary presentation of those interventions is made in the following sections. Thorough descriptions of these interventions are available in Cardoso et al. (2018). As in that document, the interventions are grouped according to the priority areas set up by the African Road Safety Action Plan, corresponding to the five pillars: Road Safety Management, Safer Roads and Mobility, Safer Vehicles, Safer Road Users, and Post-Crash Response.
### Table 0-1: Subset of road safety interventions selected for transferability audit

<table>
<thead>
<tr>
<th>Pillar / sub-pillar</th>
<th>Road safety intervention</th>
<th>Area of example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road safety management</td>
<td>Establish and strengthen Lead Agency</td>
<td>Great Britain</td>
</tr>
<tr>
<td></td>
<td>Department for Transport as Great Britain’s Lead Agency</td>
<td>Nigeria</td>
</tr>
<tr>
<td></td>
<td>Federal Road Safety Corps</td>
<td>Cameroon</td>
</tr>
<tr>
<td></td>
<td>Improved management of data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Traffic accident databases and information system on road safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and strengthen partnership and collaboration</td>
<td>USA</td>
</tr>
<tr>
<td>Safer roads and mobility</td>
<td>Safer road infrastructure for all road users</td>
<td>The Netherlands</td>
</tr>
<tr>
<td></td>
<td>The hierarchical mono-functional road network</td>
<td>Austria</td>
</tr>
<tr>
<td></td>
<td>Infrastructure safety management on Motorways</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Road Safety Audits guidelines</td>
<td>UK</td>
</tr>
<tr>
<td></td>
<td>kiwiRAP</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Safer roads and mobility</td>
<td>Capacity building and training of road safety</td>
<td>Austria</td>
</tr>
<tr>
<td></td>
<td>Education and training of auditors and instructors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delft Road Safety Course</td>
<td>The Netherlands</td>
</tr>
<tr>
<td></td>
<td>Road Safety Master Courses for engineering and economics faculties</td>
<td>European Union; Belarus</td>
</tr>
<tr>
<td>Safer vehicles</td>
<td>Introduction of EuroNCAP star rating in 1997</td>
<td>UK</td>
</tr>
<tr>
<td></td>
<td>Implementation of motor vehicle safety regulations as developed by the United Nation’s World Forum for the Harmonisation of Vehicle Regulations</td>
<td>World wide</td>
</tr>
<tr>
<td></td>
<td>Periodic vehicle inspection</td>
<td>Turkey</td>
</tr>
<tr>
<td></td>
<td>ABS and helmets in two-wheeled vehicles</td>
<td>European Union</td>
</tr>
<tr>
<td></td>
<td>Heavy vehicle overweight control in the Douala-N’Djamena corridor</td>
<td>Cameroun</td>
</tr>
<tr>
<td>Pillar / sub-pillar</td>
<td>Road safety intervention</td>
<td>Area of example</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>Safer road users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of helmets</td>
<td>Introduction of mandatory helmet use and law enforcement</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Use of seatbelts</td>
<td>Enforcement of the law related to mandatory seatbelt use within the front seats in urban areas</td>
<td>Tunisia</td>
</tr>
<tr>
<td>Drink/drug-driving</td>
<td>Reducing BAC limits and increasing penalties on drink-driving</td>
<td>Mexico</td>
</tr>
<tr>
<td>Mobile phone use whilst driving</td>
<td>The ‘Speak Out’ Publicity Campaign</td>
<td>Norway</td>
</tr>
<tr>
<td>Speeding</td>
<td>National speed awareness course for offenders</td>
<td>UK</td>
</tr>
<tr>
<td>Education and Licencing</td>
<td>Graduated driver licensing system: the effect on motorcycle traffic crash hospitalisations</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Post-crash response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Aid courses in driver education</td>
<td></td>
<td>Austria, Bosnia, Estonia, Germany, Hungary, Latvia, Lithuania, Slovakia, Switzerland</td>
</tr>
<tr>
<td>Emergency First Aid Responder System (EFAR)</td>
<td></td>
<td>South Africa</td>
</tr>
<tr>
<td>Establishment of appropriate road user insurance schemes to finance rehabilitation services for crash victims</td>
<td></td>
<td>Kenya</td>
</tr>
</tbody>
</table>

1.5 Pillar 1: Road Safety Management

1.5.1 Department for Transport as Great Britain’s Lead Agency

The Department for Transport’s (DfT) Roads and Vehicles and Standards Directorate is an example of a Transport Ministry as lead department. The DfT is the lead agency for road safety in Great Britain. The organisational structure comprises four divisions: The Road Safety Strategy, the Driver Safety, the Transport Technology and Standards, and the Traffic Management.

The Road Safety Strategy sector is focused on the development and monitoring of strategies and targets and on vulnerable road user safety including motorcycling, local authority liaison, demonstration projects and research.
The Driver Safety sector works on policy and promotion associated with vehicle speed, impairment, driver training and testing, seatbelts, mobile phones, fatigue, work-related road safety and other driver-related issues.

The Transport Technology and Standards is responsible for setting and ensuring compliance with national vehicle policies and construction standards to reduce the likelihood of road crashes and reduce their impact, working closely with the EU, the United Nations Economic Commission for Europe and many UK bodies.

The Traffic Management sector is responsible for policy on traffic regulation and management, street works regulations, traffic signs, cycling and walking.

Road safety in Great Britain is a shared responsibility at governmental level between the European Union (which has key responsibilities in areas such as vehicle safety and driver licensing standards) and national and local government. Several agencies which carry out driver and vehicle licensing, testing and vehicle certification also come under the umbrella of the Department, as does the agency responsible for national roads. The DfT commits to Public Service Agreement targets for road casualty reduction which are the national road safety strategy targets and it works with a wide range of partners to achieve them. Road safety engineering and police enforcement activities are highly decentralised.

Reducing transport casualties is one of DfT’s five main objectives. The DfT works to Public Service Agreement targets for road casualty reduction which are the national road safety strategy targets. The DfT’s Roads and Vehicle Safety and Standards Directorate has the principal responsibility for the development, delivery and monitoring of the national road safety strategy.

The DfT reviews road safety performance in-house and commissions reviews from independent research bodies and experts to monitor progress with the national strategy as well as analyses from its statistical division, responsible for compiling annual police-reported crash statistics. A high-level expert group was set up by DfT in developing the current national strategy for the identification of the most important road casualty problems and solutions throughout the road traffic system on the basis of data analysis, survey and research. The road safety strategy is assessed by the Department every 3 years. Progress can be assessed by the Parliamentary Select Committee on Transport, by the Road Safety Advisory Panel and the new Road Safety Delivery Board.

1.5.2 Federal Road Safety Corps

The Federal Road Safety Corps (FRSC) in Nigeria is one out of a few outstanding road safety lead agencies in Sub-Saharan Africa. It is an example of a stand-alone lead agency in Head of State’s Department. The FRSC proposes, as part of the coming National Road Safety Strategy, to create a high-level national council, with a mandate to manage and monitor road safety performance of all stakeholders. It has considerable human, logistical and financial resources, has a professional management and uses modern technology in its operations. The FRSC work covers the field of all 5 pillars of the UN Decade of Action for Road Safety and of the African Road Safety Action Plan and in particular:

- Pillar 1 – Road Safety Management: research on contributing accidents factors and development cooperation;
- Pillar 2 - Safer roads: recommend maintenance, implementation of appropriate measures on highways;
• Pillar 3 - Safer vehicles: Production of number plates and vehicle licensing;
• Pillar 4 - Safer road users: Issuance of driver licenses, highway codes and regulations, general road safety education, enforcement of mobile phone use regulations;
• Pillar 5 - Emergency response: emergency services and vehicle towing.

FRSC is particularly active in the following fields:
• Enforcement: implementation of biometric measurement of license applicants and security coded number plates;
• Emergency rescue services: set up of call centres, ambulance units, emergency wards and roadside clinics free of charge;
• Involvement of volunteers;
• Promotion of road safety: communication with decision-makers at the highest level, training, conferences seminar and key strategic sessions regularly organised.

The Corps was used as a case study for road safety lead agencies at the conference ‘Steps to the 5 pillars’ in Addis Ababa in November 2012.

1.5.3 Traffic accident databases and information system on road safety

In 2016 a traffic accidents database and an information system were established in Cameroon. Before the implementation of such systems, Cameroon showed a lack of data and tools available to decision makers to support them in identifying road safety problems, assessing the potential effectiveness of the selected measures and to actually evaluate the effectiveness of those measures that were applied. In particular, there was neither a reliable traffic accidents database nor an information system centralizing all accident data based on a National Road Accident Collection Form. Each institution (National Police, Gendarmerie, hospitals) set up its own system for collecting traffic accident, each one revealing specific shortcomings and errors (omissions, lack of accuracy or misinterpretation of variable concepts and definitions).

Thus, the aim of the new tools was to improve the whole accident data collection process in Cameroon enhancing the timeliness, the accuracy and the completeness of data. A quality database on road safety, included in a centralized and integrated information system for accidents data collection, management and analysis has been implemented, in order to drop out paper-based data collection methods. However, their adoption was not completed by all the actors involved in road safety data collection within the project duration. Especially for Police and Gendarmerie the implementation and dissemination of these tools for accident data collection is a gradual process.

Two information systems have been developed, suited to the needs and conditions of Cameroon:

• SFINGE, structured on “primary” databases addressed to National Police, National Gendarmerie, Ministère de Transports (MINT) and Observatoire National de Santé Publique of the Ministère Santé Publique, (ONSP);
• SAFETY MANAGER addressed to the Analysis Centre of École Nationale Supérieure des Travaux Publics (ENSTP).

SFINGE has been integrated and adapted, in order to also process road traffic injuries data collected at hospitals.
The SAFETY MANAGER is an information system organised in two parts:

- the "private" part for data acquisition, management and analysis and for the safety measures planning and selection.
- the "public" part, which is available to all citizens (in the form of a web portal), to carry out communication activities on road safety.

The two information systems are integrated with each other, in order to facilitate data flow between the actors responsible for data collection and management, and those responsible for specialized road safety analyses.

1.5.4 Insurance Institute for Highway Safety

The American Insurance Institute for Highway Safety (IIHS) is an example of business sector involvement in road safety. It is a not for profit organisation funded by motor vehicle insurers with activity concentrated in research and communications. IIHS is a leader in identifying what works and does not work to prevent motor vehicle accidents and reduce injuries in crashes which occur. The Institute's research focuses on interventions aimed at all three factors in motor vehicle crashes (human, vehicular, and environmental) that can occur before, during, and after crashes to reduce losses. The centre, which includes a state-of-the-art crash test facility, is the focus of most of the Institute's vehicle-related research. The Institute's affiliate organisation—the Highway Loss Data Institute—gathers, processes, and publishes data on the ways in which insurance losses vary among different kinds of vehicles.

1.6 Pillar 2: Safer Roads and Mobility

1.6.1 The hierarchical mono-functional road network

The reclassification and re-engineering of the Dutch road network is an example of good practice of self-explaining roads and a practical application of the Sustainable Safety vision. Categorising the road network is a prerequisite for (re)designing roads in such a way that they reflect their function and elicit the desirable traffic behaviour. This increases the consistency and predictability of the road network operation and thereby reduces opportunities for human error and increases safety. Implementation of Sustainable Safety was based in three principles: preventing unintended use of the road; avoiding large differences in speeds, direction and mass at moderate to high travel speeds; and preventing uncertain road user behaviours.

The Dutch road authorities re-categorised their roads into one of three categories, each with its own and exclusive function:

- through roads for the movement of traffic (roads with a traffic flow function);
- access roads providing access to properties and opening up residential areas and rural settlements (roads with a traffic exchange function);
- and distributor roads connecting the two road types.

On access roads motorised vehicles and vulnerable road users have to interact; therefore, vehicle speeds must be low: 30 km/h in built-up areas, 60 km/h in rural areas. On through roads, with grade separated intersections and physical separation of opposing traffic streams and no access to properties or for slow moving traffic, speed limits are 100 or 120 km/h. On the distributor roads
sections, separated pedestrian and bicycle facilities allow vehicle speeds of 50 km/h in urban areas and 80 km/h in rural areas. At intersections on distributor roads, slow- and fast-moving traffic have to merge again, so speeds must be reduced, e.g. by roundabouts or other physical speed control measures. Each road category is clearly recognisable by typical road design characteristics and distinguishing road markings.

An assessment undertaken ten years after the implementation of the reclassification showed that from 1998 through 2007, almost all road authorities designed a categorization plan, and it is estimated that more than 44,000 km of 30 km/h roads and more than 33,000 km of 60 km/h roads were constructed, which means that about 70% of all urban roads have a speed limit of 30 km/h and almost 60% of all rural roads have a speed limit of 60 km/h. It was estimated that 80% of urban and rural roads and streets have an access function. This number implied the redesign of almost 90% of urban and 75% of rural access roads. The related estimated safety effects resulted in a reduction of 50 to 75 fatalities on 30 km/h roads and a reduction of about 60 fatalities on 60 km/h roads in 2018 (Weijermars and Wegman, 2011).

1.6.2 Infrastructure Safety Management on Austrian Motorways

EU Directive 2008/96/EC on road infrastructure safety management was transposed into Austrian national law by adding two articles to the Austrian National Roads Code in 2011. The Code now foresees all tools of the Directive to be applied to the Austrian sections of the Trans-European Road Network (TERN). The Austrian motorway agency ASFNA – an executive agency under the Austrian Ministry of Transport, Innovation and Technology – is responsible for implementing the tools. Although not required by the Directive, ASFNA applies Infrastructure Safety Management on all sections of its network of motorways and expressways (as of 2012), including those that do not belong to the TERN. The whole network is subject to a road toll. The following tools are implemented:

- **Road safety Impact Assessment (RIA)** – According to the Austrian National Roads Code, RIA is a strategic and comparative analysis of the impact of a new – or substantially modified – national road on road safety of the network. RIA is to be applied before new construction of a section exceeding two kilometres length, or before the closing down of a road section. In addition to the requirements of the Directive, the socio-economic costs of crashes are included within the investigation framework and the “zero option” (i.e. “build nothing”) is also assessed.

- **Road Safety Audits (RSA)** – Road safety audits are applied to all construction projects for new sections in four phases (feasibility, preliminary design, detailed design and before opening). Prior to implementing the Directive there were only three stages; the requirement for an additional audit shortly before traffic approval was a new stage introduced in 2011. Audits are also carried out during the roadwork and renovation projects.

- **Road Safety Inspections (RSI)** – RSIs are applied yearly to at least 150 km of the network for thorough analysis, using the Austrian RSI Handbook and its RSI checklists. On this basis, every section of the entire network should undergo inspection by an independent expert around every ten years. The road sections in need of thorough inspection are subject to a distinct prioritisation process (on the basis of crash rates) and deficiencies are to be consistently fixed. In addition, the entire network undergoes regular (usually annual) RSIs by
road surveyors, based on simplified criteria. To further improve the quality of its network ASFINAG invited “ASFINAG Pilots” – a number of dedicated frequent drivers, private or business related – to provide ASFINAG with their observations of the road, e.g. potholes, road cracks, lane grooves, storm and thunderstorm damage, hidden or unrecognizable traffic signs, and deficient signage of roadwork zones.

- **Treatment of High-Risk Sites** – The definition of a High-Risk Site (based on a road section of up to 250 m length or junction) is as follows:
  - At least three similar injury accidents (according to collision type) in three years, at a traffic volume (expressed as the average annual daily traffic, or AADT) of up to 10,700, or at least four injury accidents at an AADT of up to 16,700, five at 22,600, and six at 28,600
  - At least five similar crashes (including damage-only) in one year. ASFINAG decides on adequate treatments for identified sites in the course of a process that also involves representatives from other stakeholders, such as district authorities and the police.

- **Network Safety Ranking** – ASFINAG developed a methodology for safety ranking based on accident cost rates of its network. An annual safety ranking is reported for the approximately 270 sections of the network (usually covering accident data for the three preceding years). The ranking, together with detailed information on accident characteristics, informs the decision on which immediate measures are to be taken on the costliest (in terms of costs to society) of those sections, i.e. those sections with the highest potential for accident reductions.

### 1.6.3 Road Safety Audit guidelines

The first guidance on road safety audits (RSA) of highway schemes was firstly introduced in the UK in the early 1990s. At present, RSAs in the UK are conducted in accordance with GG119 of the Design Manual for Roads and Bridges: Volume 5 (Highways England, 2018). This manual includes:

- Definition of relevant terms used.
- Scope of the audit and definition of the relevant schemes and stages in the design and construction process at which audits shall be undertaken.
- Audit team training, skills and experience.
- Auditing process and the requirement for monitoring highway improvement schemes after opening.
- Checklists and examples of audit reports.

The RSA is defined as a process for checking the safety of highway improvement schemes. There are some key factors that are highlighted in the guidelines: RSA is a formal process carried out systematically throughout the design cycle and it is restricted to road safety matters; the scope of RSA is not a technical check that the design conforms to standards and it does not consider structural safety; they are conducted from the road users’ point of view and carried out by a team independent from road designers and builders.
On UK trunk roads and motorways, RSA are mandatory for all new road and improvement schemes (GG119), while on local UK roads they are recommended as good practice (1988 Road Traffic Act implies a requirement for new roads).

There are four stages within the design and implementation of a highway scheme when a RSA might be undertaken:

- Stage 1: Completion of Draft Design
- Stage 2: Completion of Detailed Design
- Stage 3: Completion of construction (Pre-Opening Stage)
- Stage 4: Monitoring (1-3 years following construction)

The audit team has to be independent of the design team and requires at least two people: An Audit Team Leader and an Audit Team Member (Observers may also join the team to gain experience in RSA). Auditors should have relevant experience and training. For instance, the Audit Team Leader is required to have a minimum of four years accident investigation or road safety engineering experience, to have completed a minimum of five Road Safety Audits, and should have attended at least ten days of formal crash investigation or road safety engineering training.

At all stages the Audit Team prepare a written report, including the specific road safety problems identified, supported with the background reasoning and recommendations for action to mitigate or remove the problems. The audit report details aspects of the scheme design of concern to the Audit Team and their recommendations for addressing these. The designer may choose which recommendations to accept and incorporate in the design and which ones not to accept, as they are the sole responsible entity for the design scheme. However, the designer should provide their response to the RSA recommendations in an Exceptions Report, which has to include justifications for not following some RSA recommendations and for not addressing all issues.

In order to consider the needs of non-motorised users and support efforts to increase safety and accessibility by non-motorised modes, standards for Non-motorised User Audits were introduced in 2005 (HD 42/05). The cost of undertaking a RSA ranges from around £800 for a minor access to a development to £2,000 for a major signal junction (Sustrans, 2011). The Surrey County Council (1994) found that the average number of casualties dropped by 1.25 per year in audited sites while registering a reduction of only 0.26 casualties per year in un-audited sites (from 2.60 to 2.34).

1.6.4 KiwiRAP – Road Assessment Program

The New Zealand’s Crash Analysis System (CAS) has been designed to systematically link accident data with data from New Zealand's road maintenance and management system (RAMM) used by all road authorities in New Zealand by connecting the road data (condition, traffic flow etc.) to maps of the roads. Crash data is also linked to these maps, allowing them to be combined with road data.

Accident, traffic and road data, mainly through CAS, assisted New Zealand’s authorities in applying an extensive Road Assessment Programme, at first on the rural road network, named KiwiRAP. In 2012 this progressed to urban roads with Urban KiwiRAP. The programme is under the umbrella of the International Road Assessment Programme (iRAP), and consists of three protocols:

- Risk Mapping: using historical traffic and accident data to produce colour-coded maps illustrating the relative level of risk on road network sections. Two metrics are mapped as part of KiwiRAP: Collective Risk, based on the average annual number of fatal and serious
accidents occurring per kilometre of State Highway; and Personal Risk, based on the average annual fatal and serious injury accidents occurring per 100 million vehicle-km travelled.

- Star Rating: road inspections to look at the engineering features of a road (such as lane and shoulder width or presence of safety barriers). Road links are awarded one to five stars, depending on the level of safety that is “built-in” to the road.
- Performance Tracking: involving a comparison of accident rates over time to establish whether fewer or more people are being killed or injured and determine if countermeasures have been effective.

In addition to KiwiRAP, as far as intersections are concerned, a High-Risk Intersections Guide provides practitioners with best practice guidance to identify, target and address key road safety issues at high-risk intersections. The guide focuses on identifying intersections with an established or estimated occurrence of fatal and serious injury accidents, as opposed to road accidents that result in less severe outcomes. Similar to KiwiRAP Risk Mapping, this guide defines two main types of risk metric for intersections: The Collective Risk is measured as the total number of fatal and serious accidents or deaths and serious injuries per intersection in a crash period; and the Personal Risk is the risk of death or serious injury to the occupants of each vehicle entering the intersection. If specific criteria about Collective Risk and Personal Risk values are met, an intersection is classified as “high-risk”.

1.6.5 Education and training of auditors and instructors

In Austria, road safety auditors and inspectors undergo a joint five-day course organised by the Austrian Research Association for Roads (FSV). The course features a comprehensive set of issues including:

- Road planning and maintenance;
- Facilities and measures for pedestrians, cyclists, and powered 2-wheelers;
- Planning of urban roads and intersections;
- Road furniture and optical guidance;
- Lighting technology;
- Traffic control and traffic lights;
- Aspects of large vehicles;
- Accident analysis and treatment of high-risk sites;
- Psychological aspects;
- Human perception.

Road Safety Audit and Road Safety Inspection contracts are only being granted by The Austrian motorway agency ASFINAG to certified auditors and inspectors. The certification, issued by the Austrian Ministry of Transport, Innovation and Technology, requires completion of the above course. In order to be trained and certified as RSA, a university degree in a relevant field (or adequate alternative education) and several years of work experience in road design and in the transport safety field are prerequisites.
1.6.6 Delft University Road Safety course

The Delft Road Safety Course (DRSC) results from cooperation between the Delft University of Technology, the SWOV Institute for Road Safety Research, the Delft Post Graduate Education and the Road Safety for All institution. Since 2015 the Road Safety Course in Delft is organised in association with the FIA Foundation Road Safety Leadership Initiative.

The Delft Road Safety Course is a postgraduate course aiming at capacity building for road safety professionals in Low- and Middle-Income Countries (LMIC). The annual course is one of the core activities, besides organising local courses abroad and supporting training and research programs in LMICs.

The DRSC course is “evidence based and data driven” and takes its conceptual framework from the Safe System Approach. The philosophy behind the course is to support the development of road safety strategies and academic educational programs in the LMIC, i.e. both at universities and for policymakers. The program is focused on how to conduct a road safety analysis as well as selecting efficient and effective interventions using scientific evidence. At the end of the course, participants are expected to be able to make a road safety plan and to support the development of road safety programs in the areas of education, enforcement and engineering. The train-the-trainers approach also supports participants to develop curricula at their homeland universities.

Participants may have a background in engineering, behavioural sciences, public health, law enforcement, transportation and land use planning, statistics, economics, public policy etc. Potential participants may, for instance, aim to play a role as lecturer or trainer, or be affiliated to road safety policy and research. They may work for central or regional public authorities, for international organisations, in the private sector, as consultants, at universities, research institutes, police or NGOs, etc.

The course takes a period of two weeks, although it continues afterwards by means of a dedicated alumni network. This alumni network provides relevant information on new developments in the field of road safety and facilitates discussions between all those involved in the course (fellow participants, course leader, lecturers and external partners).

The course is structured in different modules covering the following topics:

- Awareness and Public Support;
- Hot topics: vehicles, speed, seat belts, two wheelers and alcohol;
- Safe System Approach and Road Safety Data;
- Smart Cities and Enforcement;
- Science & Policy;
- Engineering and effects of measures;
- Education;
- Designing a Road Safety Strategy.
1.6.7 Road Safety Master Courses for engineering and economics faculties: EU TEMPUS project Be-Safe

The main objective of Be-Safe project was to develop and test two first level University Masters courses in Road Safety in Belarus. This would take place according to the Bologna Process standards (60 ECTS\(^2\)), one for Engineering faculties and one for Economics faculties in four Belarusian universities: the Belarusian National Technical University, the Brest State Technical University, the Belarusian State University of Transport and the Belarusian State University of Economics.

An analysis carried out in cooperation with Belarusian Universities and stakeholders highlighted that there was a need to strengthen the role of research to start managing road safety policy based on an evidence-based approach in Belarus. For this reason, the development of master courses was focussed on transferring to Belarus the most recent knowledge and good practices developed in the European Union in the field of road safety with the help of EU Universities.

With reference to the definition of effective and useful Master curricula on road safety, a user needs analysis was carried out to clearly understand local conditions and needs, both in terms of research and teaching on road safety. The analysis highlighted that the local university system guaranteed an adequate level for designing and managing data collection and analysing road safety data. However, there was a huge gap: the isolation from the international research world that led to a need to update content and methods of courses for students, to update research topics in the field of road safety, and to update technical equipment in the current laboratories, topics deemed useful for the aims of a road safety Master.

In order to improve the employment opportunities at local level of the Masters’ graduates, the academics from local technical universities suggested focusing first of all on technical and practical skills, on the use of innovative software programmes and on the international overview of the courses.

A last aspect underlined by the user needs analysis was the importance of taking into account current approaches to road infrastructure safety management. The Directive 2008/96/EC constituted an essential tool in evaluating the influence of certain criteria at initial planning, detecting road safety issues, prioritising the potential technical-social-economic impacts, analysing scenarios, proposing interventions and finally controlling their implementation and effectiveness. For this reason, the methodologies defined in Directive 2008/96/EC were included within the Masters curricula, considering the difference between the technical and the economical universities.

According to those results, the new Masters programmes were defined accordingly as a 1 year, 60 credit Masters with transparent quality assured content in accordance with the Bologna Process that allowed the course to be recognised within the Lisbon Convention and on par with the European Area of Higher Education.

A set of “core competencies” for technical road safety professionals as well as economic ones were identified. These competencies were intended to provide a broad framework for educating new

\(^2\) ECTS – European Credit Transfer and Accumulation System; they represent the workload and defined learning outcomes of a higher degree course or programme. 60 ECTS are the equivalent of a full year of study or work.
safety professionals. They represent a fundamental set of knowledge, skills, and abilities needed to effectively function as a professional in road safety.

EU Partners supported the Belarusian academics in the definition of master curricula, in the preparation, as well as in delivering the lessons with a “Train the Trainer” method. In addition, each local university has been equipped with a laboratory dedicated to road safety.

1.7 Pillar 3: Safer Vehicles

1.7.1 EuroNCAP star rating

The European New Car Assessment Programme (Euro NCAP) was developed with the aim of bringing comprehensive consumer information on the crash performance of cars sold in the European Union, and the protection they provide to crashed vehicle occupants as well as pedestrians and cyclists hit by cars. It was implemented in 1997.

The assessment protocol involves measuring occupant trajectory and vehicle deformation, as well as analysing dummy instrumentation data. All cars are tested with safety equipment fitted as standard throughout all member states of the European Union, and the results are conveyed through a qualitative one to five stars system.

The basis of the Euro NCAP star rating system rests on a set of standardized safety tests and checks carried out on randomly selected vehicles from a given model, as provided at the factory door. In its current version and planned developments, Euro NCAP is complex, as it includes both passive (occupant and vulnerable road user protection) and active (crash avoidance) safety technologies. Adult and child protection tests include the well-known 64 km/h frontal 40% offset barrier test, the 50 km/h side impact and the side impact pole test; vulnerable user protection is assessed by specific tests, such as the pedestrian impact test (including eighteen component checks).

Results from the performed tests and checks are technically relevant for manufacturers and useful for the general public, since they are conveyed in a synthetic manner that is easily understood by the layman. Several types of organisations are interested in Euro NCAP information, besides car manufacturers and drivers’ clubs: public administration, insurance companies, enforcement agencies (Police, judicial system and legal institutions), research institutions and taxi owners associations.

Overall, the Euro NCAP procedure is internationally accepted by the general public, car users and other stakeholders in most developed countries. However, developing countries have not adopted these procedures and therefore manufacturers are not obliged to provide the same high safety standard build quality of products. Euro NCAP addresses only passenger car safety, and does not include tests for buses, trucks, motorcycles and trucks.

A general reduction in the risk of severe or fatal injuries is expected for each star improvement in Euro NCAP car rating. Euro NCAP was credited with 11% less car occupant fatalities in the UK, between 1997 and 2000. The application of NCAP in Malaysia was projected to result in 8% fewer car fatalities between 2014 and 2030. Implementation of Latin NCAP in Argentina, Brazil, Chile and Mexico, would correspond to sizable reductions in car occupant fatalities between 2015 and 2030: 2.4% to 7.4%, in a normal timescale implementation; and 4.8% to 12.4% in a quick implementation.
There are yet no estimations of the effects of enlarging the scope of GlobalNCAP to African countries.

The main reasons for the success of this intervention are considered to be:

1. Existence of testing centres, with proper equipment and skilled professionals.
2. Commitment of national public institutions for vehicle standardisation and homologation to cooperate at a regional level.
3. Governmental support to implement the testing procedures on newly fabricated models, and to control car sale advertising.
4. Use of traffic control checkpoints to monitor compliance once the law was introduced.

Given the extended life cycle of motorised vehicles, once incorporated in vehicles, the effects of evolving new vehicle specifications are long lasting.

This is an intervention best suited for supra-national level (e.g. ECOWAS or SADC in Africa), to capitalise on international trade and uneven geographical distribution of car manufacturing.

1.7.2 Implementation of motor vehicle safety regulations as developed by the United Nation's World Forum for the Harmonisation of Vehicle Regulations

Six motor vehicle safety regulations developed by the UN's World Forum for the Harmonization of Vehicle Regulations are defined as a minimum for today's world car markets:

- Seat belts and anchorages for all seating positions (UN regulations UNR14 and UNR16);
- Occupant protection in frontal collision (UNR94);
- Occupant protection in side or lateral collision (UNR95);
- Pedestrian protection (Global Technical Regulation GTR9);
- Electronic Stability Control & ABS (ESC) (GTR8).

The first four regulations (UNR14, UNR16, UNR94 and UNR 95) address issues related to vehicle crashworthiness and survivability of vehicle occupants in case of a crash; the fifth (GTR9) refers to improving the survivability of pedestrians hit by vehicles; the last regulation (GTR8) is concerned with crash avoidance, preventing an accident from happening.

A long-term stepwise procedure for implementation of these regulations could include: a first phase requiring new government cars (either first or second hand) to comply with these regulations; a second phase, extending the requirement to all new private company cars; and a third phase in which retrofitting of all cars from private companies and government would be required.

Given the extended life cycle of motorised vehicles, car fleet renewal is a lengthy process, taking 20 years or more to fully obtain a car fleet complying with newly approved standards; conversely, once incorporated in vehicles, the effects of evolving new vehicle specifications are long lasting, even though maintenance and monitoring are essential.

Implementation of UN's primary vehicle safety standards depends on:

- legislation,
- the authorities' commitment and skills,
- the active role of a national public institution for vehicle standardisation and homologation.
This intervention may be integrated with comprehensive policies aiming at the improvement of national vehicle fleets and at the progress of mechanical workshops’ quality.

The sustainability of the effects of the law on seatbelt use is considered to be high as the intervention is continuous so that seatbelts are also mandatory in the back seats in urban areas and more road users are involved and reinforce the campaign’s actions. Also, the government has become more responsive to the campaign’s messages and requests to carry on reinforcing the campaign.

1.7.3 Periodic vehicle inspection improvement

Periodic Technical Inspection (PTI) of motorized vehicles consists of the regular inspection of vehicles, carried out by specialized mechanical technicians in approved inspection garage sites specially built for these activities. The frequency of PTI depends mainly on the vehicle category, type of operation (private or commercial) and age.

The main driver of this intervention is the circumstance that vehicles deteriorate with normal ageing and operation, they may develop serious technical defects, and that the majority of vehicle owners and drivers are only able to detect very serious deficiencies, usually when there are already grave reductions in the vehicle performance. Modern vehicles are too complex for most owners to inspect and repair by themselves.

This intervention aimed at the improvement of the system of mandatory periodical inspection of vehicles in Turkey, in order to put it on par with similar current EU systems. Previously, a system of simple technical check-ups and document verifications was in place. In 2004, the Turkish government decided to apply EU’s Directive 96/96/EC (later on the current version of the EU Directive 2014/45/EU), which defines the minimum requirements to put in place by Member States regarding the periodical inspection of vehicles, and defining the category of vehicles to inspect, the frequency and the minimum content of the inspections.

Currently, 204 fixed, 5 motorcycle, 76 mobile and 13 mobile tractor stations are operating in two regions (covering 87% of the country).

The comprehensive nature of the vehicle requirements put on test in the inspections ensures that all types of accident are influenced and that both pre-crash and crash phases are considered, as active and passive safety devices are tested. For buses, post-crash effects are also foreseen, as inspections are also made to the performance of their emergency exits systems. All road users are beneficiaries of this intervention, even though pedestrians and cyclists only indirectly. The conformity of tested vehicle systems verified during the inspections ensures that vehicles have reduced risk of accidents and severity. Effects are expected on both injury and property damage only accidents.

Using 2007 as the basis year, it is estimated that the intervention will affect directly 12% of the total number of accidents (102,000 out of 825,600, yearly occurrences) and 9% of the total number of fatalities (450 out of 5,000, yearly occurrences).

The main reasons for the success of this intervention were the following:

1. Government support to implement and enforce the law;
2. Availability of resources and partnerships, for building technical capacity;
3. Availability of investment resources for installation of a country wide network of inspection garage sites, able to perform the required technical activities;
4. Good private and public partnership for implementing the PTI administrative and data management systems;
5. Use of traffic police to check the status of vehicle licencing and inspection within their normal enforcement activities, and of vehicle authorities to follow-up on detected violations.

The effects of this intervention are expected to be long lasting, as long as activities of main responsible parties – mainly traffic and vehicles authorities, police forces and inspection centres – are kept at reasonable levels of performance.

1.7.4  ABS and helmets in two-wheeled vehicles in the EU

Two-wheeled vehicle riders are particularly vulnerable to crashes, not only in collisions with other vehicles, but also in single vehicle accidents – even when not involving a collision with a dangerous obstacle.

ABS is very effective in preventing falls in emergency braking, ensuring high front brake effectiveness under strong load transfer while allowing for keeping the vehicle stability. Upright crashes with braking and sliding fatal crashes are significantly decreased by ABS.

Helmets are very effective in preventing serious head injuries, on motorcyclists, moped riders and cyclists. In the EU, helmets are compulsory for motorised two wheelers in all Member States; they have to comply with ECE regulation 22.05. Overall, bicycle helmets (EN 1078) are not compulsory for cyclists. In some Member States (e.g. Netherlands), helmets are not obligatory for light mopeds (less than 25 cc, or with speed limited to 25 km/h), but in several Member States there is mandatory use of helmets complying with ECE regulation 22.05.

The advantages of mandatory use of helmets by motorcyclists and moped riders are generally recognised and accepted. For cyclists, the benefits of helmets are disputed and potential reduction in bicycle use is a frequently mentioned disadvantage of mandatory cyclist helmet. However, bicycle helmets contain a thick layer of polystyrene which absorbs the force of an impact and can reduce the consequences of a crash, being particularly effective in case of head injury crashes.

In Germany, it was calculated that the number of fatal or seriously injured cyclists would decline by 20 % if all cyclists wore helmets, and slight injuries would slightly increase (by around 1 %), as some of the serious injuries would turn into slight injuries due to the helmet. In Holland, where there is widespread availability of dedicated cycling infrastructure, the effect is reported to be much smaller (about 2% if just young and elderly wore helmets). From a safe system perspective, the combination of no cycling infrastructure and no helmet on roads with speed limits higher than 30 km/h is not desirable and potentially very serious. One should also consider that wearing helmets on bicycles riding on roads with vehicle speeds of 80 km/h is not very effective in reducing injury severity in case of a collision, because at that speed the chance of being killed as vulnerable road user is almost 100%.

In the ROSEBUD project a benefit-cost ratio of 2.3 or 1.1 was calculated, when looking at all road crashes, and ratios of 4.1 or 2.1 when looking at bicycle crashes only, depending on the cost of bicycle helmet (20.00€, or 40.00€). In New Zealand, it was shown that mandatory bicycle helmets would be cost-effective for children, but not for adults.
There is considerable debate on the overall effectiveness of laws stating the mandatory use of helmets by bicyclists, due to possible reductions in willingness to use this transport mode. According to Elvik (2013), bicycle helmets clearly reduce the risk of injury to the head; concerning facial injury, the evidence suggests that the protective effect is smaller, but on balance there does seem to be a slight protective effect; the risk of neck injury does not seem to be reduced by bicycle helmets. When the risk of injury to head, face or neck is viewed as a whole, bicycle helmets do provide a protective effect. This effect is statistically significant in older studies; new studies indicate only a statistically non-significant protective effect.

Data on most unprotected road users (pedestrians, cyclists and powered two-wheelers) single crashes are not yet detected in the standard police reported accident statistics, which means that existing studies on this subject fail to fully address the phenomenon.

1.7.5 Heavy vehicle overweight control in the Douala-N’Djamena corridor

Overloading heavy goods vehicles has a negative impact in infrastructure lifetime and the environment, damages vehicle performance and traffic operation, and overall degrades the economy, namely by unfair competition with road transport operators complying with the established regulations.

Overloaded vehicles reduce the life of roads and structures, by premature deterioration of roadways and accelerated degradation of bridges and viaducts. Widespread truck overloading is also a serious safety problem, due to violation of road design assumptions and leading to wrong assessments of needed length for passing and crawling lanes; and inadequate design of emergency escape ramps and arrester beds on steep and long downhill ramps.

This intervention involves:

- the approval of legislation on road maintenance and protection;
- the close monitoring of overloading practices and vigorous enforcement of axle load and gross weight regulations, by means of the installation of weighting stations at strategic sections in a corridor;
- training drivers, freight operators, shippers and logistics operators, on the procedures for checking vehicle loading and on how to properly carry out cargo stowage;
- active involvement of government institutions, road administration agencies and enforcement agencies with stakeholders, to achieve progressive generalisation of compliance with the rules and facilitating fleet renewal;
- reaching international agreements on cross border goods transport regulations (in international corridors).

Results from a cost-benefit analysis of the intervention show that every euro (1 €) invested (between 2000 and 2015) by authorities in the overload controlling system generated a reduction of €19.4 in operating costs (for transport operators) and a decrease of €4.6 in road maintenance and rehabilitation costs (for the public administration).

The main reasons for the success of this campaign were considered to be:

- government will to tackle the overloading problem;
• active involvement with stakeholders, namely drivers, freight industry, and logistic operators;
• improvement in the organisation and management of transport freight operators;
• investment in technical equipment and installations;
• effective enforcement procedures.

The sustainability of the effects of overweight control also depends on area wide approaches, since tight control in a corridor may generate traffic diversions to alternate routes, generating unforeseen road safety problems and market competition distortions. Coordination with other transport policies is advisable, such as transport liberalization and port operation reforms.

1.8 Pillar 4: Safer Road Users

1.8.1 Introducing a law on mandatory helmet use

In 2009, 27 million vehicles were registered in Vietnam, of which 95% were powered two-wheelers. In 2008, there were 11243 reported deaths and 7771 serious injuries on the roads, 60% of the fatalities were motorcycle riders and passengers.

In 2007, Vietnam introduced its first comprehensive mandatory helmet law, which included stricter patrolling and penalties. The new helmet law required all riders and passengers to wear helmets on all roads without exceptions, as opposed to earlier laws. The mandatory helmet law was introduced by the National Traffic Safety Committee on behalf of the Vietnamese Government. What also strengthened this new law was that the NTSC established partnerships with NGOs, private companies and other agencies to help achieve national road safety objectives and it also had support from the country’s prime minister, who issued the legislation.

Penalties for non-use or misuse of helmets (e.g. not fastened) were significantly increased and the police were given further powers to enforce the law and issue the penalties. The government also used the civil service as role models, requiring that all government employees (over 4 million) wear helmets before the law came into effect, and over 50000 helmets were distributed to low income families nationwide. All of this was undertaken alongside intensive public education of the new law and penalties and social marketing to ensure all were aware prior to implementation.

An observation study was undertaken to evaluate the new law. In the 6 months after the law was introduced, helmet wearing in the Da Nang region for riders increased from 27% (November 2007) to 99% (June 2008), while helmet wearing increased from 21% to 99% in passengers (P<0.001). Helmet wearing also increased in the two other regions (Yen Bai and Binh Duong), although the increases were slightly less but still significant (up to 89% - 95%). Over the remaining study periods up to 2011, these high wearing rates were generally maintained.

In addition to monitoring helmet wearing, data on all road traffic injury patients with head injuries admitted to 20 provincial and central hospitals (out of 100) 3 months before and after the new law came into effect on 15 December 2007 were collected and indicated that the risk of head injuries decreased by 16% and the risk of death by 18% (both statistically significant). And one year after the legislation took effect, national police data reported 1557 lives saved and 2495 serious injuries prevented compared to the same time in 2007.
In summary, the main factors contributing to the effectiveness of the helmet wearing law in Vietnam were as follows:

1. stricter penalties for non-use (fines 10 times greater than previous);
2. advanced public education and social marketing;
3. the government used the civil service as role models, requiring that all employees wear helmets three months before the law came into effect;
4. stringent enforcement from day one of the law being introduced;
5. all roads were included in the law reducing potential for confusion;
6. affordable, high-quality, climatically appropriate helmets were readily available to the population;
7. political support - the Prime Minister issued the legislation;
8. 50000 helmets were distributed to low income families prior to implementation.

1.8.2 Enforcement of mandatory seatbelt use within the front seats in urban areas

Tunisia is the country in North Africa most affected by road deaths after Libya, with 24.4 killed per 100,000 population. This equates to more than 1,000 deaths per year for a population of 11 million.

While there was a law in Tunisia since 1986 requiring the use of seatbelts for all vehicle occupants on highways and rural areas and another one from 2002 for seatbelt use in urban areas, it was never enforced systematically and with very low fines. Also, public opinion regarding seatbelt use was that they weren’t necessary as driving in urban areas was considered as low risk on low speed, congested roads.

The introduction of a new mandatory law was championed by an NGO in Tunisia. With the support of the Tunisian government, the new law began to be enforced in April 2017 for drivers and front seat passengers in the Tunis area, and along with publicity campaigns, traffic control checkpoints were set up to monitor compliance with the law. The effects of the law change were studied by using accident rates up to one year before and one year after the law was introduced (2016 - 2018).

Although increased seatbelt use does not reduce the actual number of accidents, it has an effect on the number of vehicle occupants being seriously injured or killed. A reduction of 8.8% in fatalities was found in the first year of the mandatory law introduction (2017-2018). When compared with 2016 figures, the reduction was 35%, and when compared to 2013, 44%. When considering serious injuries, a reduction of 9.5% was found in the first year.

In addition, when undertaking monitoring at traffic control checkpoints in urban areas, drivers and front seat passengers were using a seatbelt in 89% of cars.

The main reasons for the success of this campaign were considered to be:

1. Strong support from NGOs, plus support from private and public sector;
2. Governmental support to implement and enforce the law;
3. Increased enforcement of the law;
4. Use of publicity (e.g. social media, news media) to improve public awareness of seatbelt use in urban areas and the impending new law;
5. Use of traffic control checkpoints to monitor compliance once the law was introduced.
The sustainability of the effects of the law on seatbelt use is considered to be high as the intervention is continuous so that seatbelts are also mandatory in the back seats in urban areas and more road users are involved and reinforce the campaign’s actions. Also, the government has become more responsive to the campaign’s messages and requests to carry on reinforcing the campaign.

1.8.3 National Speed Awareness Course

In 2015, exceeding the speed limit was reported as a contributory factor in 4.9% (5,272) of reported injury accidents in the UK, and this number has remained stable since 2011. For fatal accidents alone, the rate was 15% in 2015, which was a 12.8% increase since 2011 so accidents involving speed remains a substantial problem in the UK.

The National Speed Awareness Course (NSAC) is a short (around four hours) retraining course offered by most police forces in England and Wales as an alternative to penalties for low-level speeding offences. It is designed to address all aspects of a driver’s perceptions and thoughts about their speeding behaviour, their motives, views on risk and the consequences of their speeding. The aim is to educate the participants about the risks of speeding and reduce re-offending. The NSAC aims to encourage compliance with speed limits and to maintain the public acceptance of the speed limit enforcement regime, including the use of speed cameras and increased levels of enforcement of the limits.

The majority of first-time speeding offenders will be offered a place on the course as an alternative to penalty points and/or fines, as long as their speed was no more than 10% plus 9 mph above the speed limit. The driver will have to pay for the course, which is approximately the same as a speeding fine (currently £100), but as the course is not a seen as a conviction, unlike a fine and penalty points, it will not be recorded as a conviction on the driver’s licence.

Participating in the NSPC course was more effective at reducing speed reoffending than a fine and penalty points. Overall, between 2012 and 2017, 13.4% of those who participated on the course were detected reoffending, compared with 15.5% of those who did not accept the course and accepted the fine and penalty points instead. When looking at the length of time after the initial course offer was made (i.e. 6 months, 12 months, 18 months...), reoffending rates were also found to generally be greater for those who didn’t accept the course (from 5% 6 months after to 21% 36 months after for those who accepted the course compared with 7% to 23% for those who did not).

In terms of cost savings associated with reduced collisions due to NSAC participation, these have been estimated at between £56.66 and £91.33 per participant between 3 and 10 years after attending the course, although the calculation of these numbers have been based on a number of assumptions of unreported injury and minor collisions.

In conclusion, the main factors contributing to the success of the UK’s NSAC are:

1. Strong support from national government to implement the course nation-wide across the majority of police forces in England and Wales;
2. Public awareness and acceptability of the course as an alternative to penalty points and fines, as penalty points in particular can affect insurance policies greater than going on a NASC and some drivers ability to drive for work;
3. The course content is not looked on as a punishment, but as a way to educate and inform the majority of drivers who have been caught speeding just above the limits to enable them to voluntarily change their driving habits by providing them with the awareness and understanding of the importance of adhering to speed limits.

1.8.4 Reducing BAC limits and increasing penalties for drink-driving

In Mexico in 2011, the mortality rate was 14 deaths per 100,000 inhabitants for road traffic accidents, which is thought to be an underestimation (up to 30%) due to underreporting. One of the many risk factors involved in these accidents is the consumption of alcohol. Between 1999 and 2011, approximately 10% of drivers responsible for crashes on urban and suburban roads were found to have consumed alcohol. Another study reported that 20% of drivers who underwent an alcohol test were found to be positive for alcohol, with 3% being above the allowed limits.

The State of Jalisco, Mexico, amended its drink driving legislation, in 2010, by lowering the BAC level from 0.15 g/dL to 0.05 g/dL, in line with international best practice, and also introduced tougher penalties for not abiding by the amended law (WHO, 2017b). It was known as the ‘Lifeguard Law’ (‘El Salvavidas’). Before the law was introduced, the penalty for being caught driving above the permitted BAC level was a fine of 30 days minimum wage (around $133) and after the amended law, the fine was increased to 150-200 days minimum wage (around $663-884) for BAC up to 0.08 and even stricter penalties beyond this level (i.e. removal of vehicle and then at the highest BAC levels, both the vehicle and driver ‘are placed at the disposal of the authorities’).

To evaluate the effect of the amended law, a number of data sources were used which contained information from databases about mortality, hospital discharges and traffic collisions for the period from 1999 to 2011. After the law was amended in 2010, a statistically significant reduction in the deaths associated with alcohol was found into 2011 (5.7%, p = 0.018). A significant reduction was also found in the monthly trend of collisions after the law was amended. However, up until December 2011, no changes in hospital mortality were found and discharge rates were also similar to those before the introduction of the amended law.

It was thought that lack of enforcement and limited publicity reduced the effectiveness of the laws so in 2013 additional measures were introduced such as, random alcohol checks, with a payment of a fine or ‘administrative immutable arrest’ from 12 to 36 hours, depending on the levels of alcohol involved. Reoffending within 2 years also lead to driving licence suspension. There was also a hard-hitting social marketing campaign which highlighted the new regulation and penalties, and also made clear the risks of drunk driving. Initial results have shown that the additions to the law in 2013, plus the random checks and publicity campaigns have led to significant changes in the rates of alcohol-related deaths and accident rates in this area of Mexico.

In summary, the initial success of this amended law can be a result of the following factors:

1. Introduction of amended law with lower drink-driving levels (in 2010);
2. Tougher penalties for drunk-driving (in 2010 and 2013);
3. Enforcement through random police checks (2013);
1.8.5 Graduated Driver Licensing for motorcycle riders

In New Zealand, a comprehensive Graduated Driver Licensing System (GDLS) was introduced in 1987 for all car drivers and motorcycle riders. GDLS is aimed at all new motorcycle riders, regardless of their age, unlike the car GDLS which is aimed at 15-24 year olds. At the time the GDLS was introduced in New Zealand, 20% of fatalities and 25% of hospital admissions were found to be motorcycle riders, although motorcycles only represented 5% of all licenced vehicles and 1.4% of total distances driven on New Zealand’s roads.

There are three main stages to New Zealand’s GDLS for motorcyclists. These are a (i) learner licence, (ii) restricted licence and (iii) full licence:

i. A learner licence will be issued to a rider when an eyesight test has been passed, a theory test taken, road code knowledge displayed and motorcycle handling skills in an off-road environment have been demonstrated. The licence restricts to an engine of no more than 250cc, speeds of up to 70 km/h. They cannot carry pillion passengers, must adhere to stricter drink driving maximum levels (30 mg rather than 80 mg/100 ml blood) and have a curfew imposed on them between 22:00 and 05:00 hrs. The learner licence normally has to be held for at least 6 months and after this time, a practical on-road test must be passed to obtain a restricted licence.

ii. A restricted licence is issued once the on-road test is passed and has similar restrictions to the learner licence, but speed limits are less restricted and passengers can be carried in a sidecar.

iii. After a minimum of 18 months, a full licence can be issued without the need for further testing. These minimum times can be reduced if the rider agrees to attend further training.

To evaluate the effect of introducing a GDLS on road safety, the number of motorcycle riders and pillion passengers injured in motorcycle crashes were sourced from data in the New Zealand Health Information Services (NZHIS) between 1978 and 1994. This study focussed on non-fatal data. The data was split between three ages groups of riders: (i) 15-19 years, (ii) 20-24 years and (iii) 25 years and older. When the GDLS was introduced in 1987, this coincided with a significant 22% reduction in the amount of motorcycle rider hospital admissions in the 15-19 age group. There were no significant results for the other two age group ranges, but there was a non-significant reduction from 1987 in the 20-24 age group. These were thought to be a result of the GDLS, particularly due to a reduction in exposure to high-risk situations, but also linked to a reduction in the falling number of motorcycle licence holders and motorcycle vehicle registrations, also over these years. However, this reduction may also be another effect of the introduction of the GDLS.

In summary, the success of the GDLS, including its contribution to reducing the number of injured motorcyclists being hospitalised, particularly in the 15-19-year age range, is likely to be a result of:

1. The introduction of the system being government-led and nation-wide, and being a legal requirement for all new motorcyclists (and drivers) to have to go through the GDLS process;
2. The least experienced riders not being exposed to high risk situations (and their passengers) until the riders have more riding experience and have proven their knowledge and awareness through theoretical and practical testing;
3. A reduced number of riders in the 15-19 age group being licenced.
1.8.6  Speak Out publicity campaign (age 16-19)

The ‘Speak Out’ campaign was a campaign in Norway which combined education alongside publicity and enforcement. This campaign was introduced by the Norwegian government Public Roads Administration (NPRA) in 1993 and encouraged young people who are passengers in cars to speak out if the driver is driving in an unsafe manner. Its combined education in schools with enforcement (i.e. roadside checks by police). 16-19-year olds make up approximately 21% of killed or seriously injured car passengers in Norway and 7% of all killed car drivers and passengers put together. Accidents at weekends were found more likely to be serious than during the week.

The campaign’s primary target group was young people between 16 and 19 years who were travelling as passengers in cars, especially on weekends and at night. The aim was to encourage these passengers to tell the driver of the car to drive more carefully and responsibly if they are not driving safely (speed, drink/drug driving). The information and campaign message were disseminated through school visits and information posts and through information films and merchandise such as t-shirts. Alongside this educational publicity campaign, enforcement of non-compliance of safe driving was also undertaken through controls at visible control posts by police officers in uniform.

Three years after the campaign was introduced in the region of Sogn og Fjordane, an overall reduction in injuries and fatalities of 12% in the 16-19-year age group was found. When looking at car passengers only, the reduction was 36% by the third year. A cost-benefit ratio for this campaign was calculated by Amundsen et al. (1999) and was found to range from 1.9 (including development costs and taking the lower limit of the confidence interval for the safety effect) to 16.8 (excluding the development costs and taking the best estimate of the effect). Between 1993 and 1998, it is thought the campaign prevented 30 fatalities or injuries in the 16-19 age range, which equates to approximately 33.6 million NOK (3.5 million euros), compared to the approximate cost of the campaign of 2 million NOK (€206 000). Similar versions of this campaign have been taken up by other countries in more recent years (e.g. UK and Australia), showing that the campaign’s effectiveness can reach far beyond its origins in Norway.

In summary, the effectiveness of the ‘Speak Out’ campaign can be attributed to the following:

1. Support from the government and the campaign being led by a government department;
2. Intensive publicity and education aimed at 16-19-year olds in locations such as schools, plus distribution of t-shirts and campaign video to reinforce message that it’s ok for passenger to Speak Out if they feel the driver’s driving is unsafe;
3. Targeting passengers in the 16-19-year age range, who will have most influence over the actions of drivers of a similar age, plus who will be most affected by unsafe driving in terms of injury severity;
4. Using enforcement concurrently with the campaign, in the form of police controls stopping those who are unlikely to be affected by the campaign and not heed their passengers’ advice.
1.9 Pillar 5: Post-Crash Response

1.9.1 First aid courses in driver education

The main objective of including first aid courses in driver education is to habilitate future drivers to provide immediate first aid action at an accident scene, in the first minutes after a crash occurred, to know what actions to avoid and prevent; as well as to provide basic psychological support for victims and other people involved. Most fatalities die in the first minutes after a crash, before the arrival of the emergency services, and improper first aid support may increase injury severity and increase the chances of permanent disabilities. This is especially important in rural areas, where drivers will be most likely the first attendants to a road crash scene and face the need to support victims while waiting for emergency services and authorities to arrive.

Ideally, these courses could be integrated in the first aid education system in a country, comprising:

- first aid education at schools, repeated regularly (e.g. once a year), to refresh knowledge and update and practices;
- mandatory (legal requirement) first aid education for drivers during licensing;
- re-certification of driver first aid, at regular intervals;
- optional: first aid campaigns to motivate non-driving adults, maybe with special focus on special.

First aid courses are usually prepared by health organisations such as the Red Cross. Participants are expected to master the knowledge, practical skills & understanding required to provide appropriate first aid in such topics as:

- Actions to assist in an accident;
- First aid to an unconscious casualty, basic resuscitation, disorder of circulation (shock), controlling bleeding, wounds, burns and scalds, and joint injuries and fractures;
- Control of bystanders.

Because opportunities for practicing first aid knowledge are rare and medical procedures evolve in time, it is recommended that initial training during driver instruction be followed by updated first aid training sessions at regular intervals. Additionally, communication campaigns may help remind drivers of their skills and enhance their willingness to perform early pro-active intervention at accident scenes, before authorities arrive.

The main factors for the success of this campaign include:

- Direct involvement of health professionals in laying out the syllabus and in actual training;
- Governmental supervision to ensure consistent course contents;
- Regular training update, at least for special driver categories, such as truck, bus and taxi drivers;
- Regular communication campaigns to empower drivers to pro-active proper intervention at an accident scene.

This type of course is taught in several European countries, such as Austria, Bosnia and Herzegovina, Estonia, Germany, Hungary, Latvia, Lithuania, Slovakia, and Switzerland. The sustainability of the
effects of first aid courses is high as the intervention is continuous, each new licensed driver contributing to the system.

1.9.2 Emergency First Aid Responder System (EFAR) by lay-persons

This intervention consisted in the implementation of a community-based emergency first aid responder (EFAR) system in the community of Manenberg in the Cape Town area, in South Africa. The system was intended as a complement to the existing emergency medical service (EMS), and EFARs are supposed to provide immediate assistance, while waiting for the arrival of this EMS.

Emergency medical care comprises three steps: care in the community; care during transport; and care on arrival at the health facility. In urban areas where emergency medical systems are available EFARs help to stabilize the victims until the arrival of ambulances; in rural areas and in urban areas where EMS are not available EFARs help to prevent needless death and disability while ad hoc transport to hospital is being organized and to prepare minimum care during this transport.

This type of intervention consists in training lay-persons in basic emergency first aid skills, ensuring they are fit to manage emergency scenes and to provide basic support to accident victims, as well as victims of other violent events. Trainees may be volunteers from community members, from special interested road user groups or from especially relevant groups (e.g. drivers, taxi drivers, commercial drivers, community leaders). EFARs may volunteer to assist victims at the scene of an accident, may be called upon by bystanders during an emergency, or can be dispatched via SMS from an EFAR communications centre.

The EFAR system was initiated in 2011 and its implementation was cheap and easily done. Firstly, a preliminary assessment was made, of the most frequent categories of medical and traumatic emergencies in the community, and which were the most serious and fatal. Existing community-based services in Manenberg were involved in the process, such as the neighbourhood watch and those contributing to HIV/AIDS awareness campaigns. This allowed the assessment of how those community-based services are delivered, how effective they are, and how synergies with the envisioned EFAR could be efficiently reached might be. Following this preliminary analysis, the EFAR service was structured as a two tier service, comprising a baseline, basic foundation; and an advanced EFAR system, functioning as a community-based version of the city emergency medical service (METRO EMS) and ambulances, comprising specialized and specially equipped personnel. This advanced system was more sparsely distributed.

Basic EFAR training curriculum addresses the four major categories of need identified, and was developed to provide practical capabilities enabling trainees to manage emergency scenes, to deal with unconscious patients and to assist violent injury victims. All these issues are lectured in separate modules: emergency scene management; unconscious patients; violent injuries; and medical emergencies. The basic course lasted for one day and comprised both theoretical, PowerPoint based, and practical sections. Trainees are voluntary and most are already involved in community-based services, bus/taxi drivers, police officers or community leaders.

The course was successful in transmitting to the new EFARs both practical knowledge and confidence in its application. Before training, EFARs averaged 28% in competency; immediately after training they tested positively in 78% of the cases; and four months after training they still averaged 73%. After training, EFAR applicants were more confident in volunteering for helping accident victims and in providing first-aid, prior to arrival of formal prehospital care or transport to hospital. EFARs reported using virtually every skill taught them in the course, and further review
showed that they had done so adequately. EFAR training can provide stress relief to the communities, increase the likeliness that community members will cooperate in an emergency, and increase their confidence while helping.

To be most effective, the EFAR curriculum should be tailored to local community’s expressed needs.

- In urbanized areas, access to ambulances which are already en route but may be delayed by traffic congestion or access difficulties may be a major problem. Even in those cases, highly intense training may be inefficient, due to redundancy with the already existing ambulances and EMS centres.
- In rural areas, where ambulances are less available and emergency incidents are less frequent, higher level (advanced) training of each individual EFAR may be more important than having a big total number of EFARs.

The main reasons for the success of this intervention were the following:

1. Intense partnership between medical institutions, police, NGOs and community members and leaders;
2. EFAR curriculum tailored to local community’s expressed needs, and following the NGO and government care delivery models already well established in the area;
3. Integration of the EFAR system in existing EMS services.

The main requirements for EFAR systems sustainability are a stable population from which to recruit community instructors and trainees, a local community organisation to perform day-to-day administration, and an academic or official body to provide accreditation to the training.

### 1.9.3 Establishment of appropriate road user insurance schemes to finance rehabilitation services for crash victims

The Kenya National Hospital Insurance Fund (NHIF) is a government insurance scheme established in 1966 as a department under the Ministry of Health. In 1998 NHIF was transformed to a state corporation, aiming at improved effectiveness and efficiency. NHIF’s mission is to provide accessible, affordable, sustainable, equitable and quality social health insurance through optimal utilisation of resources; i.e. provide medical insurance cover to all its members and their declared dependants (spouse and children). NHIF membership is open to all Kenyans who have attained the age of 18 years and have a monthly income of more than Ksh 1000 (€8.50); registration is compulsory to those who are in the formal sector (registered workers of registered companies). Approximately 11% of the population in Kenya contributes to the Fund (NHIF, 2018).

NHIF is organised in autonomous branches across the country, each providing NHIF services including payment of benefits to hospitals or members or employers. Since June 2017, NHIF members are able to access emergency ambulance services following a partnership between the insurer and the Kenya Red Cross Society.
Transferability Audit in selected Countries

The TA has been undertaken in 5 Countries identified for special consideration in the Safer Africa Project, in particular WP3 and WP5, for which in-depth analysis of the ARSAP mid-term recommendations and capacity reviews have been produced. These Countries are:

- Burkina Faso
- Cameroon
- Kenya
- South-Africa
- Tunisia.

The following paragraph summarizes the results of the Capacity Reviews.

1.10 Main results of Capacity Reviews from WP5

Capacity reviews were undertaken within WP5 of the SaferAfrica project for Tunisia, Cameroon, Kenya, Burkina Faso and South Africa. These reports give an evaluation of existing structures and the state of road safety in these countries. Full reports were available for all countries except South Africa. For South Africa limited information is available, gained from a draft report. The four full reports are structured in a similar way but are not uniform. Within the capacity reviews for Tunisia, Cameroon and Kenya, recommendations are provided for Road Safety Management, Interventions (which covers vehicles, roads, mobility, road user and post impact care) and the collection of road safety data. For Burkina Faso, a detailed analysis of the situation in all these areas is included but recommendations are only provided for some areas – mainly in the ‘Interventions’ section. The finalised Capacity review was not available at the time of writing; however a comprehensive draft report was available. Specific recommendations were not included in this report, but it was possible to extract text that indicated possible improvements for South Africa. The main recommendations for improvements of the capacity reviews are summarised below under the topics that have been the focus of WP7: Road Safety Management, Safer roads and mobility, Safer vehicles, Safer road users and Post-crash care.

1.10.1 Tunisia


Road Safety Management

- There is a need for an inter-ministerial body created under the authority of the Prime Minister to be responsible for road safety. This body would be represented in the government by a Road Safety Deputy or Delegate.
- An active road safety “centre” should be created and be responsible for data analysis (regional and national), local actions and feedback. Local authorities should have the autonomy to create, manage and analyse common and homogeneous (across country) accident file with police and other data and use this to set priorities.
- There is a need for a customised “accidentology” training program for the police to enable them to identify how accidents occurred and what contributed to them.
There is a need for high-level technicians in the area of road safety audits and design and also integrating the knowledge from the application of human and social sciences in accident analyses. New areas of accidentology and road safety also needs to be developed in order provide Tunisia with experts in road safety (cross-disciplinary). Such training should be developed at Engineering Schools and Universities.

Data (from the observatory, insurance companies and hospitals) should be open and made available to students, teachers and researchers.

Institutional communication should be developed through road safety awareness advertising.

**Safer roads and mobility**

- The economic situation in the country has resulted in people moving to large urban areas which effects the mobility of freight and people and in turn road safety.
- Infrastructure design needs to take into account the climate of Tunisia as this can make infrastructure more fragile and increase the risk of accidents.
- Road infrastructure is underdeveloped and obsolete - the road network and urban roads have to be developed and maintained to meet the country needs for mobility and safety

**Safer vehicles**

- An organisation needs to be created, to facilitate the tracking of the motorcycles manufacture origins and their ownership, in order to have better registration and insurance rates for those vehicles.

**Safer road users**

- There is a need for road risk awareness training for young people by including road safety training within the middle/high school curriculum.
- Enforcement of road rules and laws needs to be introduced and corruption addressed.
- A communication campaign about the objective of the law enforcement policy is also required.
- Develop automatic speed detection radars with automated speed control/fines.

**Post-crash response**

- There is a need to implement procedures that define everyone’s role and procedures when a multi-victim accident (>8 casualties) occurs (status sheets, transfers, coordination, dispatching by hospitals, organization between regional general hospitals and emergency services, local hospitals and ambulances on call 24/7).
- Emergency care and services has to be expanded to cover the whole country, especially rural areas.
1.10.2 Cameroon


Road Safety Management

- Review and strengthen lead agency functions, structures and processes; strengthen parliamentary engagement and create cross agency and department coordination.
- Define institutional roles, responsibility and accountability for the national goal.
- Define provision for road safety within the major cities’ budget then extend to other local governments.
- Establish a resourced road safety strategy unit.
- Set interim targets in addition to national targets and evaluate progress made against them.
- Key elements of the Safe System model should be adopted and promoted by all stakeholders.
- Manage, monitor and evaluate road safety results in the two major cities and selected inter-urban corridor then extend to whole country.
- The newly created accident database should be made operational.
- There should be systematic collection and recording of fatalities and serious injury data by gendarmes, police and health facilities.

Safer roads and mobility

- Establish road infrastructure safety management procedures on the two major cities and a high-risk corridor then extend to other high-risk corridors.
- Adapt new safety standards for roads matching road design and layout to appropriate speed limits.
- New road projects should have a mandatory road safety audit and safety impacts on the surrounding area should be assessed.
- Improve signing of the road network.

Safer vehicles

- Compliance with existing vehicle safety standards should be systematically monitored through annual inspection procedures
- Capacity building for human resources to effectively manage vehicle safety on the road network is required.

Safer road users

- Awareness about road safety issues, particularly speed management should be raised through the media.
- Increase speed camera coverage.
- Increase front and rear seatbelt wearing rate through increased enforcement and campaigns.
- Road safety education and driver rehabilitation courses should be promoted.
- Control of the number of hours of driving for professional drivers should be emphasized.

**Post-crash response**
- A review of the entire system of post-crash care should be conducted.
- A single number to contact emergency services should be introduced.

1.10.3 Kenya

**Road Safety Management**
- Establish a lead agency role with respect to the coordination, research and development; monitoring and evaluation; funding and resource allocation functions.
- Define roles and responsibilities of stakeholders and develop performance-based contracts with road safety partners.
- Develop monitoring and evaluation program for road safety action plans and interventions.
- Develop a critical offence/safety performance indicator program defining targets and means of monitoring/evaluation.
- Review and consolidate the legislative framework, in particular for Vehicles, Drivers, Roads, Traffic management.
- Expand, monitor and evaluation driver and vehicle registration systems and review potential to integrate with enforcement.
- Develop a programme to determine the cost of road safety in Kenya.
- Review road safety information capability with focus on establishing a road crash data reporting and recording system.
- Review crash data recording and registration system, evaluate whether this meets stakeholder needs and develop specification for a new system.
- Set final and intermediate outcome targets.

**Safer roads and mobility**
- Evaluate the 20 highest crash locations, develop improvement plans and conduct cost benefit analyses.
- Revise road design standards and incorporate safe system design principles.
- Develop road categorisation plans based on safe system principles.
- Review transportation of hazardous materials and develop a routing and incident management policy and protocol.
• Develop and establish a national traffic counting programme.

**Safer vehicles**
• Conduct a full review of vehicle licensing, registration and testing systems, benchmark against international and African best practice and revise accordingly.

**Safer road users**
• Conduct a full review of driver training, testing and licensing, benchmark against international and African best practice and revise accordingly.
• Identify most critical offences, set targets and develop monitoring and evaluation.

**Post-crash response**
• Review post-crash and trauma care management and develop improvement projects.

### 1.10.4 Burkina Faso

**Road Safety Management**
• There is a need for a road safety fund managed at the level of the Prime Minister – this could be ‘financed’ by insurances, tickets, traffic taxes, carriers etc.
• The collection and processing of accident data needs improving to allow the identification of locations where interventions would be helpful e.g. when national roads travel through villages.

**Safer roads and mobility**
• Speed limits exist for certain types of roads, but these do not account for local conditions e.g. intersections, crossing areas of small villages etc.

**Safer vehicles**
• The vehicle fleet in Burkina Faso is generally old – 80% are second hand imports (from Europe). There has been a large rise in imported PTWs from countries such as China, however these do not meet all safety standards.
• Ensure that all vehicles annually pass the technical control – via better collaboration with the police, better training of the police/gendarmes, and increasing awareness of drivers

**Safer road users**
• There is a need to increase compliancy with existing laws e.g. developing a criminal policy specific to Burkina Faso, reinforce the link between campaign/awareness and police control,
improve coordination of law enforcement and additional training for police and
gendarmerie officers who deal with road safety.

- Educational tools need adapting to the context of Burkino Faso and there is a need for
  better control of driving schools and to avoid fake permits.
- Road safety education in primary and secondary schools should be strengthened.
- Evaluate the results of campaigns and local actions.
- Learn from other campaigns aimed at behavioural change (e.g. HIV prevention) to develop
campaigns to increase helmet use.

**Post-crash response**

- Strengthen the skills and equipment of paramedics.
- Develop coordination between hospitals in each health region.
- Develop a mutual insurance system accessible to all, in order to avoid non-treatment due to
  patients' financial problems.

1.10.5 South Africa

The origin of the following text is the DRAFT Capacity Review for South Africa: Small, M., van
Niekerk, E. (In Press) Road Safety Management in South Africa, A study for the National Road
Safety Steering Committee of South Africa, on behalf of the SaferAfrica project. Once approved
and revised, the final report will be available as D5.10 of the SaferAfrica project. It should be noted
that road safety policy and procedures are relatively well advanced in South Africa, especially when
compared with other African countries. The following are extracts of areas that would benefit from
improvement.

**Road Safety Management**

- Establish an inter-ministerial oversight council (as planned) that would include the
  Presidency would provide great impetus to the country's road safety efforts.
- Consideration should be given to how the UN Voluntary Safety Performance Targets could
  be adopted or adapted for South Africa.
- Some consideration could be given to identifying the critical road safety investment needs
  for South Africa, and the options for funding this investment.
- There is an extensive body of road traffic law in South Africa which needs constant
  attention and maintenance in its own right. It is also important that there is a safety
  focused analysis of the major legislative change that is needed to drive sustained
  reductions in fatalities and serious injuries.
- A road safety promotional plan could be developed in collaboration with a wide
  range of government and non-government stakeholders, led by the lead agency.
- There is an urgent need to develop a road safety results framework in South Africa
  which can drive improvement through national and provincial agencies.
There is an urgent need to bring senior officials with responsibility for road safety, and road safety professionals up to speed on modern road safety analyses, techniques and practices. A full willingness to pay survey could be undertaken to more fully explore the economic burden of road crashes on South Africa.

**Safer roads and mobility**
- It is advisable for South Africa to develop targets for the safety of the infrastructure, and an infrastructure safety program to achieve those targets.

**Safer vehicles**
- A major safety opportunity lies in increasing the quality of the vehicle safety technology as it enters the fleet (rather than just the current focus of maintaining old technology).
- South Africa has applied many UN vehicle safety regulations. A timetable could be set to apply the other key regulations (seatbelt, child restraints, front and side impact).

**Safer road users**
- Currently, established programs are in place to support maintenance of provincial roads, and public transport, and an additional program could be put in place dedicated to the safety of road users.
- It is important that the behaviour of the “visible” agencies in road safety, such as the police, emergency services, agency and department officials reflect the behaviour these departments want from the public.
- A comprehensive assessment of the driver licensing system appears warranted in South Africa to strengthen safety standards and compliance regarding who may be licensed to operate a motor vehicle and how.
- Road safety promotion (through mass media) does not seem to receive much attention and has been identified as a weakness – a coordinated approach is needed based on research of target groups, specific approaches and progressive messaging.
- Primary and pre-primary education programs should be including work on the safety of the trip to and from school for children, focusing on child pedestrian safety, including lower speed limits and supporting infrastructure.
- Enforcement needs to be strengthened and made more uniform – inefficiency of the justice system and corruption are a problem and smaller/poorer province do not have the equipment to adequately enforce.
- A full national revision of South Africa’s drink driving laws and enforcement processes would be highly beneficial, alongside a sustained new investment in general deterrent-based drink driving enforcement strategies.
- The use of average speed camera systems should be introduced/expanded and complemented by the use of mobile speed cameras.

**Post-crash response**
• The effectiveness and management of calls to the central road crash reporting number and provincial emergency numbers requires improvement.
• Access to pre-hospital care and overloading of tertiary facilities needs to be addressed.

1.11 Practical realization of Transferability Audit

The TA was targeted to the SaferAfrica stakeholders from the five Capacity Review Countries (Burkina Faso, Cameroon, Kenya, South Africa, and Tunisia).

In order to ease the process and make it simpler, the TA has been launched through an on line survey on the African Road Safety Observatory (African RSO - http://www.africanroadssafetyobservatory.org/) available both in English and French.

After filling the first page with personal data and indicating the Country of origin, respondents are asked to read a brief description of the transferability methodology using the Road Safety Space concept (Figure 0-1).

![Figure 0-1: First page of TA survey on the African RSO](image)

Then, respondents are asked to select a Road Safety Pillar according to their expertise (Figure 0-2. As reported in Chapter 0, practices are divided according the Pillars of the ARSAP. However, in this survey the Pillar 2 of the ARSAP has been split into different pillars: one related specifically to Safe roads and mobility and another one related to Capacity Building, so that each pillar contains maximum 6 practices to assess. Guidelines on how to fill the survey are available on line in PDF format.
After the Pillar selection, the respondent starts filling the survey. For each practice a short description is provided. For additional information a full practice’s description is available.
Questions related to each factor are reported in a table in order to guide respondents on how to answer the questions.

Then, respondents are asked to assign scores and weights.

In order to make the survey easier as possible, the PPM has been split into two separate questions: one related to scores and another one to weights; in such a way, the stakeholders are not asked to fill the matrix table (Figure 0-4).

After assign scores weights, respondents can continue with the second practice until the end of the session. Justifications for the assigned values and final comments can be also added.

1.12 Results

A total of 14 responses were obtained from the 5 countries for all the pillars. The largest participation was from Cameroon with a total of 8 responses, from Burkina Faso and Tunisia 2 responses were received for each and for Kenya and South Africa only one response (Figure 0-5).
The Safer Road Users pillar with a total of 5 responses was the one with the highest participation. Then Safer Roads with 4 responses, Road Safety Management and Data Collection with 2 responses and with only one response Capacity Building, Post-crash Response and Safer Vehicles (Figure 0-6).

The following paragraphs report the TA results in five selected Countries and an analysis of results for pillars across Countries.
1.12.1 TA results in Burkina Faso

In Burkina Faso 2 responses were received, both for Safer Road Users. This pillar includes 6 different road safety interventions, for this case the average between the two responses received was carried out (Table 0-1).

Table 0-1 TA results on Safer Road Users in Burkina Faso

<table>
<thead>
<tr>
<th>Interventions</th>
<th>People</th>
<th>Environment</th>
<th>Regulation</th>
<th>Political commitment</th>
<th>Cost affordability</th>
<th>Technical skill availability</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A The effect of introducing Vietnam’s first mandatory law on helmet use and head injury and fatality rates</td>
<td>3.5</td>
<td>35%</td>
<td>3</td>
<td>15%</td>
<td>1</td>
<td>5%</td>
<td>4 13%</td>
</tr>
<tr>
<td>B Tunisia: enforcement of the law related to mandatory seatbelt use within the front seats in urban areas</td>
<td>2.5</td>
<td>30%</td>
<td>2</td>
<td>10%</td>
<td>1</td>
<td>5%</td>
<td>2.5 20%</td>
</tr>
<tr>
<td>C Impact Evaluation of the National Speed Awareness Course – UK</td>
<td>2.5</td>
<td>35%</td>
<td>2</td>
<td>8%</td>
<td>1</td>
<td>5%</td>
<td>2 13%</td>
</tr>
<tr>
<td>D Effects of reducing BAC limits and increasing penalties on drink-driving - Short-term impact of changes in drinking-and-driving legislation in Mexico</td>
<td>5</td>
<td>43%</td>
<td>3.5</td>
<td>15%</td>
<td>1</td>
<td>5%</td>
<td>3.5 15%</td>
</tr>
<tr>
<td>E Driver/rider licencing: The effect of the New Zealand graduated driver licensing system on motorcycle traffic crash hospitalisations</td>
<td>4</td>
<td>33%</td>
<td>2.5</td>
<td>10%</td>
<td>1.5</td>
<td>8%</td>
<td>2.5 20%</td>
</tr>
<tr>
<td>F The ‘Speak Out’ Publicity Campaign (Norway)</td>
<td>2</td>
<td>28%</td>
<td>1.5</td>
<td>10%</td>
<td>1.5</td>
<td>8%</td>
<td>2 15%</td>
</tr>
</tbody>
</table>

Average: 3.3 34% 2.4 113% 1.2 6% 2.8 16% 3.1 23% 1.9 10%

With a final score of 3.9, "effects of reducing BAC limits and increasing penalties on drink-driving - Short-term impact of changes in drinking-and-driving legislation in Mexico" was the road safety intervention with the highest score and, thus, the more challenging.

"Tunisia: enforcement of the law related to mandatory seatbelt use within the front seats in urban areas" and "The ‘Speak Out’ Publicity Campaign (Norway)" with 2.2, followed by "Impact Evaluation of the National Speed Awareness Course – UK with 2.5, were the interventions with the lowest score (Table 0-1 & Figure 0-7), thus the less challenging.

Regarding the factors, for the pillar "Safer Road Users" in Burkina Faso, with a score of 3.3 the factor "People" and with a score of 3.1 the factor "Design, implementation and maintenance costs affordability" are the biggest challenge for transferability. The factor "Regulation" is the least challenging with a score of 1.2 (Figure 0-8).
For the pillar "Safer Road Users" in Burkina Faso, the weight of the factors depends 57% on "People" and "Design, implementation and maintenance costs affordability" with 34% and 23% respectively (Figure 0-9).
In Cameroon 8 responses were received: 2 for "Road Safety Management and Data Collection", "Safer Roads", and "Safer Road Users"; and 1 for "Capacity Building", and "Post-crash Response". The pillar “Road Safety Management and Data Collection” includes 4 different road safety interventions, for this case the average between the two responses received was carried out (Table 0-2).

Table 0-2 TA results on Road Safety Management and Data Collection in Cameroon

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Institution</th>
<th>Economy</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>People</td>
<td>Environment</td>
<td>Regulation</td>
<td>Political commitment</td>
</tr>
<tr>
<td>A Department for Transport - Great Britain [Transport Ministry as lead department]</td>
<td>2.5</td>
<td>23%</td>
<td>1.5</td>
<td>15%</td>
</tr>
<tr>
<td>B The Federal Road Safety Corps, in Nigeria [Stand-alone lead agency in Head of State’s Department]</td>
<td>2.5</td>
<td>23%</td>
<td>1</td>
<td>8%</td>
</tr>
<tr>
<td>C Traffic accident databases and Information Systems on road safety - Cameroon</td>
<td>1</td>
<td>8%</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>D The US Insurance Institute for Highway Safety</td>
<td>3</td>
<td>23%</td>
<td>2</td>
<td>15%</td>
</tr>
</tbody>
</table>

All the interventions show low scores, and, thus, and a potential for implementation. With a final score of 2.5, "The US Insurance Institute for Highway Safety" was the Road Safety Management and Data Collection intervention with the highest score, while "Department for Transport - Great Britain
(Transport Ministry as lead department)" and "Traffic accident databases and Information Systems on road safety – Cameroon" with 2.2 were the interventions with the lowest score (Figure 0-10).

![Final Score](chart)

*Figure 0-10 Final score of Road Safety Management and Data Collection interventions in Cameroon*

Regarding the factors, for the pillar "Road Safety Management and Data Collection" in Cameroon, with a score of 2.8 the factors “Design, implementation and maintenance costs affordability” and "Technical skill availability" are the biggest challenge for transferability, whilst the factors "Regulation" and "Environment" are the least challenging with a score of 1.6 (Figure 0-11).

![Average Score](chart)

*Figure 0-11 Average score of factors on Road Safety Management and Data Collection interventions in Cameroon*

For the pillar "Road Safety Management and Data Collection" in Cameroon, the weight of the factors depends 41% on "Technical skill availability" and "Design, implementation and maintenance costs affordability" with 21% and 20% respectively (Figure 0-12).
The pillar “Safer Roads” includes 4 different road safety interventions, for this case the average between the two responses received was carried out (Table 0-3).

**Table 0-3 TA results on Safer Roads in Cameroon**

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Institution</th>
<th>Economy</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>People</td>
<td>Environment</td>
<td>Regulation</td>
<td>Political commitment</td>
</tr>
<tr>
<td>A The hierarchical mono-functional road network – The Netherlands</td>
<td>3.5 23%</td>
<td>2.5 15%</td>
<td>2 20%</td>
<td>2.5 13%</td>
</tr>
<tr>
<td>B Infrastructure Safety Management on Austrian Motorways</td>
<td>3.5 20%</td>
<td>2.5 18%</td>
<td>3 20%</td>
<td>3.5 13%</td>
</tr>
<tr>
<td>C UK Road Safety Audits guidelines</td>
<td>3.5 18%</td>
<td>2.5 15%</td>
<td>3.5 20%</td>
<td>3 13%</td>
</tr>
<tr>
<td>D KiwiRAP – Road Assessment Program in New Zealand</td>
<td>3.5 18%</td>
<td>2.5 15%</td>
<td>2.5 20%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Average</td>
<td>3.5 19%</td>
<td>2.5 16%</td>
<td>2.8 20%</td>
<td>3.0 13%</td>
</tr>
</tbody>
</table>

Also in this case scores among interventions are similar and show to be potentially implemented. With a final score of 3.2, "UK Road Safety Audits guidelines" was the Safer Roads intervention with the highest score, while “The hierarchical mono-functional road network – The Netherlands” with 2.9 was the intervention with the lowest score (Figure 0-13).
Regarding the factors, for the pillar "Safer Roads" in Cameroon, with a score of 3.5, the factors "People" and "Technical skill availability" are the biggest challenge for transferability. While the factor "Environment" is the least challenging with a score of 2.5 (Figure 0-14).

For the pillar "Safer Roads" in Cameroon, the weight of the factors depends 39% on "Regulation" and "People" with 20% and 19% respectively (Figure 0-15).
Figure 0-15 Factor's weight of Safer Roads interventions in Cameroon

The pillar "Safer Road Users" includes 6 different road safety interventions, for this case the average between the two responses received was carried out (Table 0-4).

Table 0-4 TA results on Safer Road Users in Cameroon

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Institution</th>
<th>Economy</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Weight</td>
<td>Score</td>
<td>Weight</td>
</tr>
<tr>
<td>A The effect of introducing Vietnam's first mandatory law on helmet use and</td>
<td>4</td>
<td>38%</td>
<td>3.5</td>
<td>8%</td>
</tr>
<tr>
<td>head injury and fatality rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Tunisia: enforcement of the law related to mandatory seatbelt use within</td>
<td>4.5</td>
<td>35%</td>
<td>2.5</td>
<td>5%</td>
</tr>
<tr>
<td>the front seats in urban areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Impact Evaluation of the National Speed Awareness Course - UK</td>
<td>4</td>
<td>25%</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>D Effects of reducing BAC limits and increasing penalties on drink-driving -</td>
<td>3</td>
<td>25%</td>
<td>2.5</td>
<td>8%</td>
</tr>
<tr>
<td>Short-term impact of changes in drinking-and-driving legislation in Mexico</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Driver/rider licensing: The effect of the New Zealand graduated driver</td>
<td>4.5</td>
<td>40%</td>
<td>3.5</td>
<td>8%</td>
</tr>
<tr>
<td>licensing system on motorcycle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>traffic crash hospitalisations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F The 'Speak Out' Publicity Campaign [Norway]</td>
<td>4.5</td>
<td>30%</td>
<td>3</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>4.1</td>
<td>32%</td>
<td>3.2</td>
<td>7%</td>
</tr>
</tbody>
</table>

In this case scores among interventions are relatively high and, thus, showing a low potential of implementation. With a final score of 4.2, "Impact Evaluation of the National Speed Awareness Course - UK" was the Safer Road Users intervention with the highest score. While "Effects of reducing BAC limits and increasing penalties on drink-driving - Short-term impact of changes in drinking-and-driving legislation in Mexico" with 3.4, was the intervention with the lowest score (Figure 0-16).
Regarding the factors, for the pillar "Safer Road Users" in Cameroon, with a score of 4.1 the factor "People" and with a score of 3.9 the factor "Design, implementation and maintenance costs affordability" are the biggest challenge for transferability, while the factor "Regulation" is the least challenging with a score of 2.0 (Figure 0-17).

For the pillar "Safer Road Users" in Cameroon, the weight of the factors depends 57% on "People" and "Political commitment" with 32% and 25% respectively (Figure 0-18).
For Cameroon 1 response was received for the pillar “Capacity Building”, this pillar includes 3 different road safety interventions (Table 0-5).

**Table 0-5: TA results on Capacity Building in Cameroon**

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Institution</th>
<th>Economy</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>People</td>
<td>Environment</td>
<td>Regulation</td>
<td>Political commitment</td>
</tr>
<tr>
<td></td>
<td>Score</td>
<td>Weight</td>
<td>Score</td>
<td>Weight</td>
</tr>
<tr>
<td>A Education and training of auditors and instructors in Austria</td>
<td>2</td>
<td>22%</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>B Delft Road Safety Course - Delft University (The Netherlands)</td>
<td>2</td>
<td>22%</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>C Road Safety Master Courses for engineering and economics faculties:</td>
<td>2</td>
<td>25%</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>EU TEMPUS project Be-Safe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>2</td>
<td>23%</td>
<td>2.0</td>
<td>8%</td>
</tr>
</tbody>
</table>

In this case scores among interventions are relatively low and, thus, showing a higher potential of implementation. With a final score of 2.8, "Education and training of auditors and instructors in Austria" was the Capacity Building intervention with the highest score. While "Delft Road Safety Course - Delft University (The Netherlands)" with 2.4 was the intervention with the lowest score (Figure 0-19).

Regarding the factors, for the pillar "Capacity Building" in Cameroon, with a score of 3.3 the factors “Technical skill availability” and “Design, implementation and maintenance costs affordability” are the biggest challenge for transferability. The factors “Regulation”, “Environment”, and “Political commitment” are the least challenging with a score of 2.0 (Figure 0-20).
For the pillar "Capacity Building" in Cameroon, the weight of the factors depends 45% on "People" and "Technical skill availability" with 23% and 22% respectively (Figure 0-21).
Figure 0-21 Factor's weight of Capacity Building interventions in Cameroon

For Cameroon 1 response was received for the pillar "Post-crash Response", this pillar includes 3 different road safety interventions (Table 0-6).

Table 0-6 TA results on Post-crash Response in Cameroon

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Institution</th>
<th>Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>People Score</td>
<td>Environment Score</td>
<td>Regulation Score</td>
</tr>
<tr>
<td>A First Aid courses in driver education</td>
<td>2</td>
<td>3 15%</td>
<td>3 15%</td>
</tr>
<tr>
<td>B Emergency First Aid Responder System (EFAR) by lay-persons</td>
<td>2</td>
<td>3 15%</td>
<td>3 15%</td>
</tr>
<tr>
<td>C Establishment of an appropriate road user insurance scheme to finance rehabilitation services for crash victim</td>
<td>2</td>
<td>3 15%</td>
<td>3 15%</td>
</tr>
<tr>
<td>Average</td>
<td>2</td>
<td>3.0 15%</td>
<td>3 15%</td>
</tr>
</tbody>
</table>

In this pillar, the final score was very similar and relatively low for the three interventions, showing a higher potential of implementation. With a final score of 2.9, "First Aid courses in driver education" was the Post-crash Response intervention with the highest score. While "Emergency First Aid Responder System (EFAR) by lay-persons" and "Establishment of an appropriate road user insurance scheme to finance rehabilitation services for crash victim" with 2.8 were the interventions with the lowest score (Figure 0-22).

Regarding the factors, for the pillar "Post-crash Response" in Cameroon, with a score of 4.0 the factor "Technical skill availability" is the biggest challenge for transferability, while the factor "People" is the least challenging with a score of 2.0 (Figure 0-23).
For the pillar "Post-crash Response" in Cameroon, the weight of the factors depends 30% on "People" and 45% on "Environment", "Regulation", and "Political commitment" (Figure 0-24).
1.12.3 TA results in Kenya

In Kenya 1 response was received for Safer Roads. This pillar includes 4 different road safety interventions (Table 0-7).

Table 0-7 TA results on Safer Roads in Kenya

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Economy</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>People</td>
<td>Environment</td>
<td>Regulation</td>
</tr>
<tr>
<td>A The hierarchical mono-functional road network – The Netherlands</td>
<td>1.8</td>
<td>10%</td>
<td>1.8</td>
</tr>
<tr>
<td>B Infrastructure Safety Management on Austrian Motorways</td>
<td>1.8</td>
<td>10%</td>
<td>1.8</td>
</tr>
<tr>
<td>C UK Road Safety Audits guidelines</td>
<td>1.8</td>
<td>10%</td>
<td>1.8</td>
</tr>
<tr>
<td>D KiwiRAP – Road Assessment Program in New Zealand</td>
<td>1.8</td>
<td>10%</td>
<td>1.8</td>
</tr>
</tbody>
</table>

With a final score of 3.8, "Infrastructure Safety Management on Austrian Motorways" and "KiwiRAP – Road Assessment Program in New Zealand" were the Safer Roads intervention with the highest score and, thus, more challenging. While "The hierarchical mono-functional road network – The Netherlands" with 3.0 was the intervention with the lowest score (Figure 0-25) and, thus, less challenging.
Regarding the factors, for the pillar "Safer Roads" in Kenya, with a score of 4.3 the factor "Political commitment" is the biggest challenge for transferability, while the factors "People" and "Environment" are the least challenging with a score of 1.8 (Figure 0-26).

For the pillar "Safer Roads" in Kenya, the weight of the factors depends 51% on "Technical skill availability" and "Design, implementation and maintenance costs affordability" with 28% and 23% respectively (Figure 0-27).
1.12.4 TA results in South-Africa

In South Africa 1 response was received for Safer Road Users. This pillar includes 6 different road safety interventions (Table o-8).

Table o-8 TA results on Safer Road Users in South Africa

<table>
<thead>
<tr>
<th>Interventions</th>
<th>People</th>
<th>Environment</th>
<th>Regulation</th>
<th>Political commitment</th>
<th>Cost affordability</th>
<th>Technical skill availability</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A The effect of introducing Vietnam’s first mandatory law on helmet use and</td>
<td>1 50%</td>
<td>1 5%</td>
<td>3 5%</td>
<td>1 10%</td>
<td>1 20%</td>
<td>3 10%</td>
<td>1.3</td>
</tr>
<tr>
<td>head injury and fatality rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Tunisia: enforcement of the law</td>
<td>3 30%</td>
<td>3 10%</td>
<td>1 5%</td>
<td>4 20%</td>
<td>4 30%</td>
<td>4 5%</td>
<td>3.5</td>
</tr>
<tr>
<td>related to mandatory seatbelt use within the front seats in urban areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Impact Evaluation of the National Speed Awareness Course - UK</td>
<td>4 20%</td>
<td>4 10%</td>
<td>4 5%</td>
<td>4 5%</td>
<td>5 30%</td>
<td>5 30%</td>
<td>4.6</td>
</tr>
<tr>
<td>D Effects of reducing BAC limits and increasing penalties on drink-driving</td>
<td>1 20%</td>
<td>1 20%</td>
<td>1 0%</td>
<td>4 20%</td>
<td>4 20%</td>
<td>4 20%</td>
<td>2.8</td>
</tr>
<tr>
<td>Short-term impact of changes in drinking-and-driving legislation in Mexico</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Driver/rider licencing: The effect of the New Zealand graduated driver</td>
<td>5 20%</td>
<td>5 0%</td>
<td>5 20%</td>
<td>5 20%</td>
<td>5 20%</td>
<td>5 20%</td>
<td>5.0</td>
</tr>
<tr>
<td>licensing system on motorcycle traffic crash hospitalisations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F The ‘Speak Out’ Publicity Campaign [Norway]</td>
<td>5 30%</td>
<td>5 5%</td>
<td>2 5%</td>
<td>3 20%</td>
<td>3 30%</td>
<td>3 10%</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Average 3.2 28% 3.2 8% 2.7 7% 3.5 16% 3.7 25% 4.0 16%

Figure o-27 Factor’s weight of Safer Roads interventions in Kenya
With a final score of 5, "Driver/rider licensing: The effect of the New Zealand graduated driver licensing system on motorcycle traffic crash hospitalisations" was the Safer Road Users intervention with the highest score and, thus, more challenging. While "The effect of introducing Vietnam’s first mandatory law on helmet use and head injury and fatality rates" with 1.3 was the intervention with the lowest score (Figure 0-28) and, thus, less challenging.

![Figure 0-28 Final score of Safer Road Users interventions in South Africa](image)

Regarding the factors, for the pillar "Safer Road Users" in South Africa, with a score of 4.0 the factor "Technical skill availability" and with a score of 3.7 the factor "Design, implementation and maintenance costs affordability" are the biggest challenge for transferability. The factor "Regulation" is the least challenging with a score of 2.7 (Figure 0-29).

![Figure 0-29 Average score of factors on Safer Road Users interventions in South Africa](image)

For the pillar "Safer Road Users" in South Africa, the weight of the factors depends 53% on "People" and "Design, implementation and maintenance costs affordability" with 28% and 25% respectively (Figure 0-30).
1.12.5 TA results in Tunisia

In Tunisia 2 responses were received, 1 for Safer Roads and 1 for Safer Road Users. The pillar “Safer Roads” includes 4 different road safety interventions (Table 0-9).

**Table 0-9 TA results on Safer Roads in Tunisia**

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Society/Culture</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Institution</td>
<td>Score</td>
</tr>
<tr>
<td>A</td>
<td>The hierarchical mono-functional road network – The Netherlands</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Infrastructure Safety Management on Austrian Motorways</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>UK Road Safety Audits guidelines</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>KiwiRAP – Road Assessment Program in New Zealand</td>
<td>2</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td>2.0</td>
</tr>
</tbody>
</table>

In this pillar, the final score was very similar and relatively high for the four interventions, showing a lower potential of implementation. With a final score of 4.2, “KiwiRAP – Road Assessment Program in New Zealand” was the Safer Roads intervention with the highest score. While “The hierarchical mono-functional road network – The Netherlands” with 3.2 was the intervention with the lowest score (Figure 0-32).
Figure 0-31 Final score of Safer Roads interventions in Tunisia

Regarding the factors, for the pillar "Safer Roads" in Tunisia, with a score of 3.8 the factors "Technical skill availability" and "Design, implementation and maintenance costs affordability" are the biggest challenge for transferability. The factors "People" and "Environment" are the least challenging with a score of 2.0.

Figure 0-32).
For the pillar "Safer Roads" in Tunisia, the weight of the factors depends 50% on "Technical skill availability" and "Design, implementation and maintenance costs affordability" with 25% and 25% respectively (Figure 0-33).

The pillar “Safer vehicles” includes 4 different road safety interventions (Table 0-10).

Table 0-10 TA results on Safer Vehicles in Tunisia
With a final score of 3.6, "ABS and helmets in two-wheeled vehicles in the EU" score and "Heavy vehicle overweight control in the Douala-N'Djamena corridor, in Cameroun" with 3.5 were the Safer vehicles intervention with the highest score and, thus, more challenging. "Implementation of motor vehicle safety regulations as developed by the United Nation's World Forum for the Harmonization of Vehicle Regulation" and "Periodic vehicle inspection Turkey" with 1.3 were the interventions with the lowest score (Figure 0-34) and, thus, less challenging.

![Figure 0-34 Final score of Safer Vehicles interventions in Tunisia](image)

Regarding the factors, for the pillar "Safer Vehicles" in Tunisia, with a score of 3.0 the factor "Political commitment" and with a score of 2.6 the factor "Design, implementation and maintenance costs affordability" are the biggest challenge for transferability. The factor "Technical skill availability" is the least challenging with a score of 1.2 (Figure 0-35).
For the pillar "Safer Vehicles" in Tunisia, the weight of the factors depends 44% on "People" and "Political commitment" with 23% and 21% respectively (Figure 0-36).

After the analysis by countries and taking into account the responses received per pillar, a comparison between countries was carried out for the pillars "Safer Road Users" and "Safer Roads".
For the pillar "Safer Road Users" the comparison was made between Burkina Faso, Cameroon and South Africa. As shown in the

The intervention (A) “The effect of introducing Vietnam’s first mandatory law on helmet use and head injury and fatality rates” faces a greater challenge for Cameroon with a final score of 3.9 and a lower challenge for South Africa with 1.3. The intervention (B) “Tunisia: enforcement of the law related to mandatory seatbelt use within the front seats in urban areas” faces a greater challenge for Cameroon with a final score of 4.0 and a lower challenge for Burkina Faso with 2.2. The intervention (C) “Impact Evaluation of the National Speed Awareness Course – UK” faces a greater challenge for South Africa with a final score of 4.6 and a lower challenge for Burkina Faso with 2.5. The intervention (D) “Effects of reducing BAC limits and increasing penalties on drink-driving - Short-term impact of changes in drinking-and-driving legislation in Mexico” faces a greater challenge for Burkina Faso with a final score of 3.9 and a lower challenge for South Africa with 2.8. The intervention (E) “Driver/rider licencing: The effect of the New Zealand graduated driver licensing system on motorcycle traffic crash hospitalisations” faces a greater challenge for South Africa with a final score of 4.0 and a lower challenge for Burkina Faso with 2.2. The intervention (F) “The ‘Speak Out’ Publicity Campaign (Norway)” faces a greater challenge for South Africa and Cameroon with a final score of 3.7 and a lower challenge for Burkina Faso with 2.2 (Figure 0-37).

Table 0-11 and Figure 0-37 each intervention varies its final score depending on the country.

The intervention (A) “The effect of introducing Vietnam’s first mandatory law on helmet use and head injury and fatality rates” faces a greater challenge for Cameroon with a final score of 3.9 and a lower challenge for South Africa with 1.3. The intervention (B) “Tunisia: enforcement of the law related to mandatory seatbelt use within the front seats in urban areas” faces a greater challenge for Cameroon with a final score of 4.0 and a lower challenge for Burkina Faso with 2.2. The intervention (C) “Impact Evaluation of the National Speed Awareness Course – UK” faces a greater challenge for South Africa with a final score of 4.6 and a lower challenge for Burkina Faso with 2.5. The intervention (D) “Effects of reducing BAC limits and increasing penalties on drink-driving - Short-term impact of changes in drinking-and-driving legislation in Mexico” faces a greater challenge for Burkina Faso with a final score of 3.9 and a lower challenge for South Africa with 2.8. The intervention (E) “Driver/rider licencing: The effect of the New Zealand graduated driver licensing system on motorcycle traffic crash hospitalisations” faces a greater challenge for South Africa with a final score of 5.0 and a lower challenge for Burkina Faso with 3.0. The intervention (F) “The ‘Speak Out’ Publicity Campaign (Norway)” faces a greater challenge for South Africa and Cameroon with a final score of 3.7 and a lower challenge for Burkina Faso with 2.2 (Figure 0-37).

Table 0-11 Comparison of final score between countries on Safer Road Users interventions
<table>
<thead>
<tr>
<th>Interventions</th>
<th>Final Score</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>A The effect of introducing Vietnam’s first mandatory law on helmet use and head injury and fatality rates</td>
<td>3.2 3.9 1.3</td>
<td>2.8</td>
</tr>
<tr>
<td>B Tunisia: enforcement of the law related to mandatory seatbelt use within the front seats in urban areas</td>
<td>2.2 4.0 3.5</td>
<td>3.2</td>
</tr>
<tr>
<td>C Impact Evaluation of the National Speed Awareness Course - UK</td>
<td>2.5 4.2 4.6</td>
<td>3.8</td>
</tr>
<tr>
<td>D Effects of reducing BAC limits and increasing penalties on drink-driving - Short-term impact of changes in drinking-and-driving legislation in Mexico</td>
<td>3.9 3.4 2.8</td>
<td>3.4</td>
</tr>
<tr>
<td>E Driver/rider licencing: The effect of the New Zealand graduated driver licensing system on motorcycle traffic crash hospitalisations</td>
<td>3.0 3.8 5.0</td>
<td>3.9</td>
</tr>
<tr>
<td>F The ‘Speak Out’ Publicity Campaign (Norway)</td>
<td>2.2 3.7 3.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Average</td>
<td>2.8 3.8 3.5</td>
<td></td>
</tr>
</tbody>
</table>
Likewise, a comparison was made between the final score and the weights for the different factors: People; Environment; Regulation; Political commitment; Cost affordability; and Technical skill availability between Burkina Faso, Cameroon and South Africa for the pillar Safer Road Users (Table 0-12).

Figure 0-37 Comparison of final score between countries on Safer Road Users interventions
Table 0-12 Comparison of factors between countries on Safer Road Users interventions

<table>
<thead>
<tr>
<th>Factor</th>
<th>Burkina Faso</th>
<th>Cameroon</th>
<th>South Africa</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Weight</td>
<td>Score</td>
<td>Weight</td>
</tr>
<tr>
<td>People</td>
<td>3.3</td>
<td>34%</td>
<td>4.1</td>
<td>32%</td>
</tr>
<tr>
<td>Environment</td>
<td>2.4</td>
<td>11%</td>
<td>3.2</td>
<td>7%</td>
</tr>
<tr>
<td>Regulation</td>
<td>1.2</td>
<td>6%</td>
<td>2.0</td>
<td>7%</td>
</tr>
<tr>
<td>Political commitment</td>
<td>2.8</td>
<td>16%</td>
<td>3.8</td>
<td>25%</td>
</tr>
<tr>
<td>Cost affordability</td>
<td>3.1</td>
<td>23%</td>
<td>3.9</td>
<td>15%</td>
</tr>
<tr>
<td>Technical skill availability</td>
<td>1.9</td>
<td>10%</td>
<td>3.8</td>
<td>14%</td>
</tr>
</tbody>
</table>

The factors that have the highest score for the three countries are "People" and "Cost affordability" with 3.6 and 3.5 respectively; while the factor with the lowest score is "regulation" with 1.9. Burkina Faso has a lower value on all factors compared to Cameroon and South Africa (Figure 0-38).

Figure 0-38 Score comparison by country on Safer Road Users interventions

Regarding how the weights influence in the 3 countries, "People" and "Cost affordability" represent 52% with 31% and 21% respectively. The factor with the lowest weight is "regulation" with 6%. In the same way, although the factor "Cost affordability" has a greater impact in Burkina Faso and South Africa, in Cameroon the “Political Commitment” factor has a greater impact (Figure 0-39).
Figure 0-39 Weight comparison by country on Safer Road Users interventions

For the pillar “Safer Roads” the comparison was made between Cameroon, Kenya, and Tunisia. As shown in the Table 0-13 and Figure 0-40 each intervention varies its final score depending on the country.

Table 0-13 Comparison of final score between countries on Safer Roads interventions

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Final Score</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cameroon</td>
<td>Kenya</td>
</tr>
<tr>
<td>A The hierarchical mono-functional road network –</td>
<td>2.9</td>
<td>3.0</td>
</tr>
<tr>
<td>The Netherlands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Infrastructure Safety Management on Austrian</td>
<td>3.1</td>
<td>3.8</td>
</tr>
<tr>
<td>Motorways</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C UK Road Safety Audits guidelines</td>
<td>3.2</td>
<td>3.5</td>
</tr>
<tr>
<td>D KiwiRAP – Road Assessment Program in New Zealand</td>
<td>3.0</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

The intervention (A) “The hierarchical mono-functional road network – The Netherlands” faces a greater challenge for Tunisia with a final score of 3.2 and a lower challenge for Cameroon with 2.9. The intervention (B) “Infrastructure Safety Management on Austrian Motorways” faces a greater challenge for Kenya with a final score of 3.8 and a lower challenge for Cameroon with 3.1. The intervention (C) “UK Road Safety Audits guidelines” faces a greater challenge for Tunisia with a final score of 4.0 and a lower challenge for Cameroon with 3.2. The intervention (D) “KiwiRAP – Road Assessment Program in New Zealand” faces a greater challenge for Tunisia with a final score of 4.2 and a lower challenge for Cameroon with 3.0 (Figure 0-40).
Figure 0-40 Comparison of final score between countries on Safer Roads interventions

Likewise, a comparison was made between the final score and the weights for the different factors: People; Environment; Regulation; Political commitment; Cost affordability; and Technical skill availability between Cameroon, Kenya, and Tunisia for the pillar Safer Roads (Table 0-14).

Table 0-14 Comparison of factors between countries on Safer Roads interventions

<table>
<thead>
<tr>
<th>Factor</th>
<th>Cameroon</th>
<th>Kenya</th>
<th>Tunisia</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Weight</td>
<td>Score</td>
<td>Weight</td>
</tr>
<tr>
<td>People</td>
<td>3.5</td>
<td>19%</td>
<td>1.8</td>
<td>10%</td>
</tr>
<tr>
<td>Environment</td>
<td>2.5</td>
<td>16%</td>
<td>1.8</td>
<td>8%</td>
</tr>
<tr>
<td>Regulation</td>
<td>2.8</td>
<td>20%</td>
<td>3.8</td>
<td>20%</td>
</tr>
<tr>
<td>Political commitment</td>
<td>3.0</td>
<td>13%</td>
<td>4.3</td>
<td>13%</td>
</tr>
<tr>
<td>Cost affordability</td>
<td>3.0</td>
<td>16%</td>
<td>3.8</td>
<td>23%</td>
</tr>
<tr>
<td>Technical skill availability</td>
<td>3.5</td>
<td>16%</td>
<td>3.8</td>
<td>28%</td>
</tr>
</tbody>
</table>

The factors that have the highest score for the three countries are “Technical skill availability” and “Political commitment” with 3.7 and 3.6 respectively. The factor with the lowest score is “Environment” with 2.1 (Figure 0-41).
Regarding how the weights influence in the 3 countries, "Technical skill availability" and "Cost affordability" represent 44% with 23% and 21% respectively; while the factor with the lowest weight is "Environment" with 10%. In the same way, the factor "Technical skill availability" has a greater impact in Kenya and Tunisia, while in Cameroon "People" and "Environment" factors have a greater impact (Figure 0-42).
1.12.7 Transferability Ranking

Table 0-15 reports the scores assigned to each intervention in the five Countries. Transferability of interventions has been assessed according to the following ranking:

- Green scores (from 1 to 2.5): low challenging interventions
- Yellow scores (from 2.6 to 3.8) medium challenging interventions
- Red scores (from 3.9 to 5): high challenging interventions.

**Table 0-15 Final Scores for interventions**

<table>
<thead>
<tr>
<th>Road safety interventions</th>
<th>Scores</th>
<th>Burkina Faso</th>
<th>Cameroon</th>
<th>Kenya</th>
<th>South Africa</th>
<th>Tunisia</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road safety management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department for Transport as Great Britain’s Lead Agency</td>
<td></td>
<td>--</td>
<td>1,6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,6</td>
</tr>
<tr>
<td>Federal Road Safety Corps</td>
<td></td>
<td>--</td>
<td>1,5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,5</td>
</tr>
<tr>
<td>Traffic accident databases and information system on road safety</td>
<td></td>
<td>--</td>
<td>1,3</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,3</td>
</tr>
<tr>
<td>Insurance Institute for Highway Safety</td>
<td></td>
<td>--</td>
<td>1,6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,6</td>
</tr>
<tr>
<td>Safer roads and mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hierarchical monofunctional road network</td>
<td></td>
<td>--</td>
<td>2,9</td>
<td>3,0</td>
<td>--</td>
<td>3,2</td>
<td>3,0</td>
</tr>
<tr>
<td>Infrastructure safety management on Motorways</td>
<td></td>
<td>--</td>
<td>3,1</td>
<td>3,8</td>
<td>--</td>
<td>3,5</td>
<td>3,5</td>
</tr>
<tr>
<td>Road Safety Audits guidelines</td>
<td></td>
<td>--</td>
<td>3,2</td>
<td>3,5</td>
<td>--</td>
<td>4,0</td>
<td>3,6</td>
</tr>
<tr>
<td>kiwiRAP</td>
<td></td>
<td>--</td>
<td>3,0</td>
<td>3,8</td>
<td>--</td>
<td>4,2</td>
<td>3,6</td>
</tr>
<tr>
<td>Safer vehicles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction of EuroNCAP star rating in 1997</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
<td>--</td>
<td>2,9</td>
<td>2,9</td>
</tr>
<tr>
<td>Implementation of motor vehicle safety regulations as developed by the United Nation’s World Forum for the Harmonisation of Vehicle Regulations</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
<td>--</td>
<td>1,3</td>
<td>1,3</td>
</tr>
<tr>
<td>Periodic vehicle inspection</td>
<td></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,3</td>
<td>1,3</td>
</tr>
<tr>
<td>ABS and helmets in two-wheeled vehicles</td>
<td></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3,6</td>
<td>3,6</td>
</tr>
<tr>
<td>Road safety interventions</td>
<td>Scores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>Cameroon</td>
<td>Kenya</td>
<td>South Africa</td>
<td>Tunisia</td>
<td>Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy vehicle overweight control in the Douala-N’Djamena corridor</td>
<td>--</td>
<td>2,9</td>
<td>3,0</td>
<td>--</td>
<td>3,5</td>
<td>3,5</td>
<td></td>
</tr>
<tr>
<td>Introduction of mandatory helmet use and law enforcement</td>
<td>--</td>
<td>3,1</td>
<td>3,8</td>
<td>--</td>
<td>3,5</td>
<td>3,2</td>
<td></td>
</tr>
<tr>
<td>Enforcement of the law related to mandatory seatbelt use within the front seats in urban areas</td>
<td>--</td>
<td>3,2</td>
<td>3,5</td>
<td>--</td>
<td>4,0</td>
<td>3,8</td>
<td></td>
</tr>
<tr>
<td>Reducing BAC limits and increasing penalties on drinking</td>
<td>--</td>
<td>3,0</td>
<td>3,8</td>
<td>--</td>
<td>4,2</td>
<td>3,4</td>
<td></td>
</tr>
<tr>
<td>The ‘Speak Out’ Publicity Campaign</td>
<td>--</td>
<td>2,9</td>
<td>3,0</td>
<td>--</td>
<td>3,2</td>
<td>3,9</td>
<td></td>
</tr>
<tr>
<td>National speed awareness course for offenders</td>
<td>--</td>
<td>3,1</td>
<td>3,8</td>
<td>--</td>
<td>3,5</td>
<td>3,2</td>
<td></td>
</tr>
<tr>
<td>Graduated driver licensing system: the effect on motorcycle traffic crash hospitalisations</td>
<td>--</td>
<td>2,8</td>
<td>3,0</td>
<td>--</td>
<td>2,8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Aid courses in driver education</td>
<td>--</td>
<td>2,9</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2,9</td>
<td></td>
</tr>
<tr>
<td>Emergency First Aid Responder System (EFAR)</td>
<td>--</td>
<td>2,8</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2,8</td>
<td></td>
</tr>
<tr>
<td>Establishment of appropriate road user insurance schemes to finance rehabilitation services for crash victims</td>
<td>--</td>
<td>2,8</td>
<td>--</td>
<td>--</td>
<td>2,8</td>
<td>2,8</td>
<td></td>
</tr>
<tr>
<td>Education and training of auditors and instructors</td>
<td>--</td>
<td>2,8</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2,8</td>
<td></td>
</tr>
<tr>
<td>Delft Road Safety Course</td>
<td>--</td>
<td>2,4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2,4</td>
<td></td>
</tr>
</tbody>
</table>
### 1.12.8 Comparison of Road Safety Space domains

Figures 4-44 – 4-48 illustrate the total problem scoring of the 3 Road Safety Space domains for each Country taking into account all the interventions assessed.

Burkina Faso shows a problem score with “Society/Culture” while the “Institution” problem score is low. Cameroon shows a well-balanced problem scores with the 3 domains. In Kenya, “Economy” represents the 50% of the total problem scoring, whilst Society/Culture is low.

#### Road safety interventions

<table>
<thead>
<tr>
<th>Road Safety Master Courses for engineering and economics faculties</th>
<th>Burkin Faso</th>
<th>Cameroon</th>
<th>Kenya</th>
<th>South Africa</th>
<th>Tunisia</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>--</td>
<td>2.6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2.6</td>
</tr>
</tbody>
</table>

*Figure 0-43 Road Safety Space in Burkina Faso*
Also South Africa shows a high problem score with "Economy" and a low problem score with "Institution" as well as Tunisia.
Figure 0-46 Road Safety Space in South Africa

Figure 0-47 Road Safety Space in Tunisia
Conclusions

A total of 14 responses were obtained from the 5 Countries for all the pillars, showing that there isn't a full coverage of pillars for each Country surveyed. The Safer Road Users pillar with a total of 5 responses was the one with the highest participation.

In Burkina Faso only, the Safer Road Users pillar has been assessed. The less challenging interventions are "enforcement of the law related to mandatory seatbelt use within the front seats in urban areas", "The 'Speak Out' Publicity Campaign (Norway)" and "Impact Evaluation of the National Speed Awareness Course. Regarding the factors, "People" and "Design, implementation and maintenance costs affordability" are the biggest challenge for transferability. These results are confirmed by the Road Safety Space problem scores.

Cameroon has reported the majority of answers. All the pillars have been assessed except for "Safer Vehicles". Regarding "Road Safety Management and Data Collection", all the interventions show low scores, and, thus are less challenging. Concerning the factors, "Design, implementation and maintenance costs affordability" and "Technical skill availability" are the biggest challenge for transferability. For the "Safer Roads" pillar, also in this case scores among interventions are similar and show to be potentially implemented. The factors "People" and "Technical skill availability" are the biggest challenges for transferability. In "Safer Road Users" scores among interventions are relatively high and, thus, showing a lower potential of implementation. Regarding the factors, "People" and "Design, implementation and maintenance costs affordability" are the biggest challenges for transferability. In Capacity Building, scores among interventions are relatively low and, thus, show a higher potential for implementation. "Technical skill availability" and "Design, implementation and maintenance costs affordability" are the biggest challenges for transferability. In the Post-crash Response pillar, the final scores were very similar and relatively low for the three interventions, showing a high potential of implementation, while "Technical skill availability" is the biggest challenge for transferability. Finally, the overall problem scores of the Road Safety Space components are well balanced.

In Kenya only, the Safer Roads pillar has been assessed. "The hierarchical mono-functional road network – The Netherlands" is the intervention with the lowest score and, thus, less challenging. Regarding the factors, "Political commitment" is the biggest challenge for transferability, followed by "Cost Affordability" and "Technical skills availability"; this result is confirmed by the problem score of the Economy domain that represents the 50% of the overall problem scoring.

In South Africa only, the Safer Roads Users pillar has been assessed. "The effect of introducing Vietnam's first mandatory law on helmet use and head injury and fatality rates" was the intervention with the lowest score and, thus, less challenging. Regarding the factors, "Technical skill availability" "Design, implementation and maintenance costs affordability" are the biggest challenges for transferability as also showed in the Road Safety Space scores.

In Tunisia the pillars "Safer Roads" and "Post-crash response" have been assessed.

In "Safer Roads" the final scores were very similar and relatively high for the four interventions, showing a lower potential for implementation. Regarding the factors, "Technical skill availability" and "Design, implementation and maintenance costs affordability" are the biggest challenges for transferability. Regarding "Post-crash response", "Implementation of motor vehicle safety regulations as developed by the United Nation's World Forum for the Harmonization of Vehicle Regulation" and "Periodic vehicle inspection Turkey" were the interventions with the lowest scores.
and, thus, less challenging. Regarding the factors, “Political commitment” and “Design, implementation and maintenance costs affordability” are the biggest challenge for transferability. Finally, the Country shows a higher problem score with "Economy".

The transferability ranking has showed that the majority of interventions are medium challenging. Pillars in which a comparison between Countries has been made (Safer Roads and Safer Road Users) show similar ranking of interventions.

Finally, analysing the problem scores across the Countries, the domain "Economy" has the highest scores, proving to be the most important barrier for transferability. Conversely, "Institution" is not perceived as a barrier.
References


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