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Developing the African Road Safety Observatory

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Abstract

The paper presents the development of the web portal "African Road Safety Observatory (ARSO)" within the research project "SaferAfrica - Innovating dialogue and problems appraisal for a safer Africa" aiming to support policy makers and stakeholders with evidence on critical risk factors, related actions and good practices drawn from high quality data and knowledge. The project is funded by the European Union's Horizon 2020 research and innovation programme. The African Road Safety Observatory is structured using the relevant European Road Safety Observatory as reference, and adjusting it to the specific needs of African stakeholders, the particularities of road safety problems and the availability and quality of data in African countries. Moreover, additional crowdsourcing functions are foreseen in order to deliver a "participative" environment between experts and end users. ARSO is designed based on the certain core sections, namely; Statistics, Road Safety Management, Good Practices, Capacity Building and Dialogue Platform. A brief description of each section is provided and the required inputs and outputs are outlined and discussed.

Keywords: road safety observatory; road safety; SaferAfrica; crowdsourcing functions

1. Introduction

Africa is the worst performing continent in road safety. As shown in Figure 1, the mortality rate in Africa (26.6 fatalities/10^5 population) is almost three times that of Europe's, where the number of road fatalities represents 31% of the relevant global figure. However, the most disturbing concern is the fact that the disparity in road safety results seems to be increasing. More specifically, according to the World Health Organisation (WHO, 2015), in Europe fatality rates improved from 10.3 per 100,000 population in 2010 to 9.3 per 100,000 population in 2013. Over the same period, road fatality rates in Africa, increased from 24.1 per 100,000 population to 26.6 per 100,000 population (Figure 1.1b). As far as Africa is concerned, road trauma is expected to worsen further, with fatalities per capita projected to double from 2015 to 2030 (WHO, 2015).

Fig 1 Mortality rate (fatalities/100,000 population) per region, WHO 2015.

Despite these pressuring and unfavourable potentials, several actions are already ongoing and important documents are already in place, paving the way for road safety improvements. Such an example is the African Road Safety Action Plan 2011-2020 developed by the common effort of the African Union (AU) and the United Nations Economic Commission for Africa (UNECA, 2010).

In order to improve road safety performance in African countries, many barriers need to be overcome. Among them stands the substantial lack of detailed knowledge on road casualties in terms of their number as well as associated factors leading to road accidents or affecting their consequences. There is a serious lack of road safety data in African countries, and even when data are available [e.g. through the reports of WHO (2015), International Road Federation – IRF (2016), etc.], little is known about data collection systems, data definitions, etc. Moreover, in order to be usable and insightful, existing national data should be gathered, assessed and processed to improve quality. Safety data should be enhanced through additional data and indicators, which may be available at the individual country level but are not currently published (e.g. due to exposure data, road safety performance indicators, road safety management, etc.). Finally, data should be analysed to provide a factual appraisal of road safety levels in Africa, to reveal critical issues and to indicate priority areas with high potentials for road safety improvement.

Within this ambitious challenge, Europe could play an important role in supporting African countries to improve their road safety and traffic management performance.

Such considerations are addressed through the SaferAfrica project, an Horizons 2020 Coordination and Concerted Action; a joint effort between 17 partners from both continents, aiming to create favorable conditions and opportunities for the effective implementation of road safety and traffic management actions in the African countries, by setting up a Dialogue Platform between Africa and Europe. Moreover, besides African governmental organizations, research institutions and NGOs, the involvement of a large number of African actors represented by prominent institutions operating in Africa ensures a mostly extensive coverage of the African continent. The project started in October 2016 and will be completed in September 2019.

Among the key objectives of the SaferAfrica project is the support of policy makers and stakeholders with evidence on critical risk factors, related actions and good practices drawn from high quality data and knowledge. For such an elemental provision the development of an African Road Safety Observatory (ARSO) is essential. The African Road Safety Observatory is structured using the relevant European Road Safety Observatory as reference, where

certain adjustments are foreseen in order to serve the specific needs of African stakeholders and the particularities of road safety problems in African countries. Moreover, ARSO is integrated with crowdsourcing functions (i.e. functions/tools allowing the contribution of stakeholders to the development of the background), thus, delivering a "participative" environment between experts as well as end users.

However, structuring the ARSO is not an easy task having in mind the substantial lack of detailed knowledge on the number of road casualties occurring in Africa, as well as the factors leading to road accidents or affecting their consequences. Such considerations are addressed in more detail later on.

The present paper describes the collection and analysis process of the required road safety data and knowledge in African countries in order to setup such a valuable tool able to analyze and facilitate the dissemination of road safety data (including safety performance indicators), identify risk factors, support the definition of effective and efficient policies – measures, provide specialized information - opinions on specific issues for users and mostly introduce good practices.

2. Existing Road Safety Observatories at Regional Level

Worldwide, a number of organizations, national and/or international agencies activated in promoting road safety have joined their efforts in establishing Regional Road Safety Observatories. Such observatories serve as knowledge platforms where best practices and expertise are being shared among stakeholders and road safety policy planners.

However, the reliability of such observatories largely depends on the data and indicators accuracy and availability. Therefore, the improvement of such information in terms of quality and uniformed collection procedures is a first step in this initiative.

The main objective of such Observatories is to facilitate better coordination between neighbor governments through the establishment of a noble emulation framework and support countries of the same region to realise the necessity for common evidence based actions in developing, promoting and supporting effective road safety policies.

A brief description of such platforms are presented in the following paragraphs.

2.1. Ibero-American Road Safety Observatory

The Ibero-American Road Safety Observatory (OISEVI, www.oisevi.org) is an international cooperation instrument bringing together the highest road safety authorities of Ibero-American member countries. OISEVI's main objective is to

- coordinate road safety strategies and initiatives at the regional level, based on the generation of timely, objective and reliable information

- effectively contribute to reducing accident rates in Ibero-America, within the framework of the United Nations Decade of Action for Road Safety 2011-2020

The purpose of these strategies is to bring relevance to road safety by strengthening the technical skills of national authorities, road safety experts and members of non-governmental organizations. Furthermore, these initiatives aim at addressing effective road safety policies, standardised data collection and processing, intervention options, and in general assisting to obtain resources for funding the necessary activities.

The Ibero-American Road Safety Observatory was established as a body during the 20th Meeting of the United Nations Road Safety Collaboration (UNRSC), held in the city of Geneva, Switzerland (2014).

2.2. European Road Safety Observatory

A key element in EU's 2003 Road Safety Action Programme concerned the development of a new European Road Safety Observatory (ERSO) to gather data and knowledge in order to inform future safety policies. The

development of the Observatory was undertaken by the Sixth Framework funded project SafetyNet (2004), an integrated project funded by DG-TREN of the European Commission.

The objective of the Observatory was to support all aspects of road and vehicle safety policy development at European and national levels. Through the SafetyNet project, where 22 institutes from 17 countries cooperated, new proposals for common European approaches in several areas including exposure data and SPIs were delivered. Moreover, the CARE database was extended to incorporate the new EU Member States and new fatal and in-depth accident causation databases were developed as well as new statistical methods that can be used to analyse combined macroscopic and other data.

The SafetyNet project was completed in 2008 and the ERSO website contents were later updated and expanded by the DACOTA (2008) project. Since then, the results of the EU funding research projects on road safety are available to the public, the ERSO toolbox has been redesigned in order to communicate such initiatives.

Currently, the ERSO website has been transferred to the Road Safety section on the website of the European Commission, Directorate - General for Mobility & Transport (https://ec.europa.eu/transport/road_safety/specialist/erso_en). This reformed profile of ERSO (Figure 2) holds published reports, manuals and best practice guides by these projects which could be useful for road safety specialists. They cover a large range of road safety knowledge; from accidentology and infrastructure to policy assessments. All documents are easily accessible and can be downloaded free of charge.

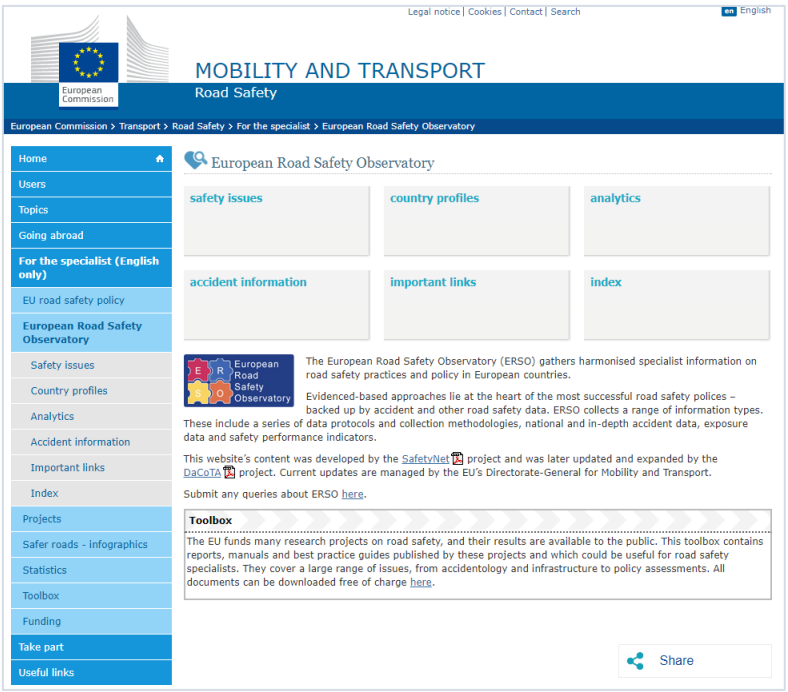

Fig 2 Current interface of ERSO

The ERSO contains a wealth of information, knowledge and data. However, this wealth is not conveyed to the end user in a straightforward manner, mainly because the structure of the website which is not very clear. This is the result of several structural updates in order to cover the needs arising in different time intervals.

3. Developing the African Road Safety Observatory

Within the SaferAfrica project, a pan-African road safety data and knowledge centre is developed in order to support policy makers and stakeholders with evidence on critical risk factors, related actions and good practices drawn from high quality data and knowledge. In this framework, road safety data and safety performance indicators of African countries are collected and analysed. Comparisons with the respective European data are also made. Main risk factors are identified. This work served as the basis for the development of the African Road Safety Observatory (ARSO, www.africanroadsafetyobservatory.org).

The project activities are oriented to the "Safe System" approach and grouped in four pillars namely road safety knowledge and data; road safety and traffic management capacity review; capacity building and training; sharing of good practices. In order to develop an ergonomic, user-friendly and efficiently designed web portal, feedback in terms of information, data and findings from project tasks on these pillars are provided as well.

More specifically, on the basis of the results of the analyses within the SaferAfrica project, a set of high quality data, knowledge and management tools are being developed to support and increase the awareness of stakeholders, policy makers and other users in obtaining evidence-based views of road safety problems and challenges, as well as insights for potential actions and priorities. The African Road Safety Observatory, for which, as already stated, the reference tool is the European Road Safety Observatory, is further integrated with crowdsourcing functions; thus, serving as a networking platform through which end users could contact experts and other stakeholders, submit questions or data and exchange knowledge and experiences. As seen in Figure 3, ARSO is structured based on the following core sections:

- About ARSO
- Statistics
- Road Safety Management
- Good Practices
- Capacity Building
- Dialogue Platform

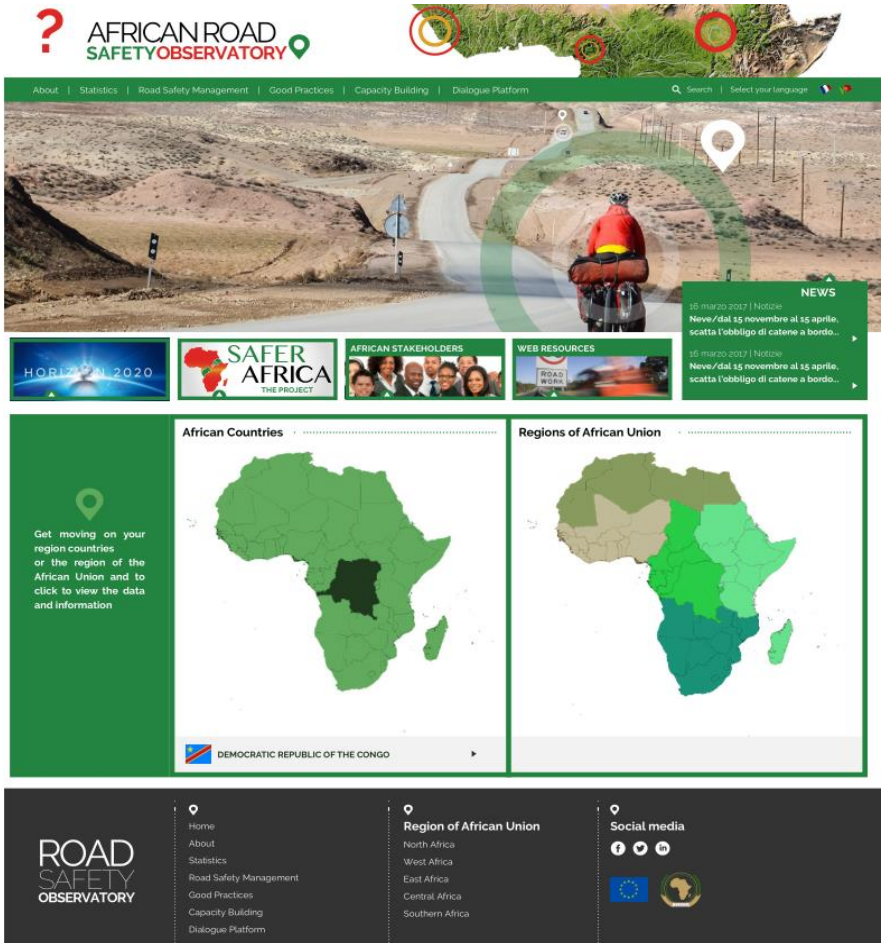

Fig 3 Profile of African Road Safety Observatory

Moreover, aiming to support various road safety activities in the African continent, a separate section addresses African, European, and international

- links to policy organisations, research institutes, stakeholders groups, road user associations and other groups of interest
- web-resources (campaigns, etc.)
- conferences - events

Every core section holds key resources in order to support the respective thematic field and bring together key publications and manuals that may be used by policy makers and stakeholders in Africa (e.g. ERSO resources and recommendations, WHO road safety manuals, OECD/ITF reports, African road safety publications, etc.).

A brief description of the core sections is provided in the following paragraphs. It should be noted that between these main sections there is a strong interconnection both in terms of the work carried out and the findings reached, although every core section belongs to a different work package of the SaferAfrica project.

Initially a general description of ARSO's objective in the context of SaferAfrica project is provided ("About ARSO" section) followed by an introduction of the project management structure in terms of the African countries and African stakeholders involved.

Among the most important contents of ARSO is the "Statistics" section where a variety of information related to road safety is provided; namely, road accident, fatalities and injuries data (comprehensive database), survey collected data, statistics tables and statistics resources. Reliable and accurate data are a fundamental prerequisite to understand the magnitude of road safety problems in Africa and convince stakeholders to take certain actions. Reliable and accurate data are also needed to identify problems, risk factors and priority areas in order to formulate strategies, set targets and monitor performance.

In terms of existing road safety databases, two analysis documents were exploited; namely the Global Status Report on Road Safety (WHO, 2015) and the IRF World Road Statistics 2016 (IRF, 2016) reports. It is widely known that in African countries there is a serious lack of road safety data availability. Regarding fatality data, only few countries dispose suitable time series which are limited for the latest available decade 2005-2014 and less than half African countries have available data for more than 5 years (WHO, 2015). However, the greatest lack in data concerns risk exposure and safety performance indicators, for which very limited countries have collected such information. Even when data are available, for example through international databases, little is known about data collection systems, data definitions, etc.

Unfortunately the varying quality of data collection process among the African countries is not the only barrier that makes impossible a direct data comparison. Another issue of concern is the comparability of data and the potential of using different databases in a complementary way. For example, concerning the fatality data, the review revealed that different definitions are used among the countries. On the other hand, the comparison between WHO and IRF databases revealed that while the IRF uses the 30-days definition for fatalities in road accidents, the published data are the one reported by the national sources, which have different definitions. Thus, the data cannot be comparable among the countries, without being processed before, while attention is needed when combining the two databases. In order to take into account under-reporting issues and achieve comparability, statistical models have been developed to estimate the number of fatalities (WHO).

As an initial approach, existing national data was gathered, assessed and processed to improve their quality. However, safety data should be enhanced through additional data and indicators, which may be available at the individual country level but are not currently published (e.g. exposure data, road safety performance indicators, road safety management, etc.). Moreover, it was essential to convey a clear view of current road safety practices followed in Africa by assessing the needs of road safety stakeholders in African countries in terms of knowledge, data and information tools, and deliver concrete data and information to be accessible by all stakeholders involved in road safety.

Towards this direction, within the SaferAfrica project two relevant surveys were undertaken (a short questionnaire, followed by an extensive survey where stakeholders from 20 and 21 countries respectively delivered feedback) in order to assess the current situation of Africa in terms of road safety data collection systems and definitions. It should be noted that the road safety issues raised in both surveys and mostly the contents of the extensive one were not confined to the data assessment approach, since more road safety fields, such as management practices, were tackled as well and the respective findings were addressed accordingly.

Through these surveys, a number of the questioned issues for many African countries were collected for the first time which can be very useful to road safety decision-makers for future actions. Based on the stakeholders' responses, the results revealed that there is a significant demand for data and knowledge in order to be used for road safety-related decision making.

As a final step, data were analysed to provide a factual appraisal of road safety level in Africa, reveal critical issues and indicate priority areas with high potentials for road safety improvement. Such analyses include a variety of statistical reports and fact sheets and are presented through tables, graphs, or combined infographics (Figure 4), which the user may view interactively, in terms of navigation per country, region, or the entire African continent.

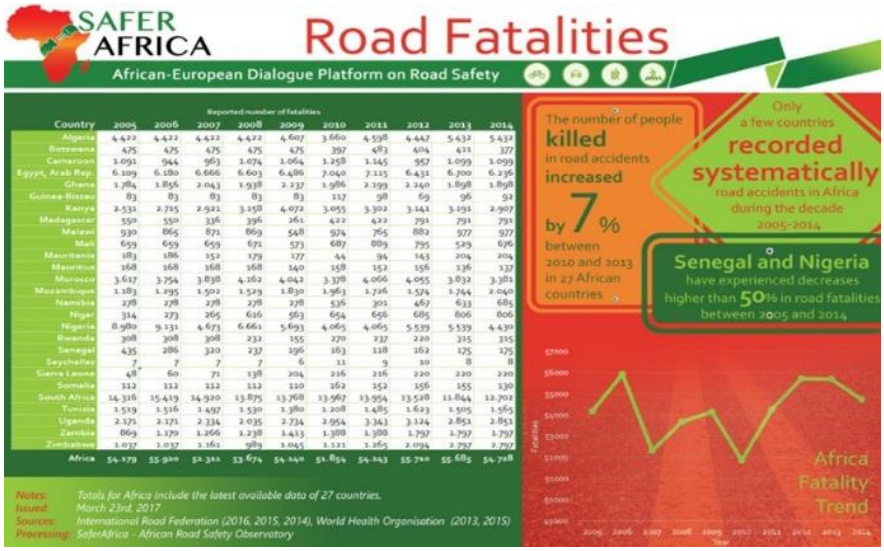

Fig 4 Example of interactive infographic window in ARSO

The "Road Safety Management" section is aimed at assessing the status of traffic and road safety management, with a view towards developing remedial and sustainable programs and actions to fundamentally improve traffic and road safety management.

Relevant documentation concerning road safety management is provided. More specifically policy documents, legislation, strategies, guidelines and standards, annual reports, programmes, enforcement initiatives, management plans, development plans and any other relevant information facilitating the development of an initial benchmark.

However, the most important entity in this section, which is based on the outcomes of certain tasks carried out within the SaferAfrica project, is the development of African guidelines – recommendations for establishing and/or improving national road safety agencies. The guidelines draw a direct link between the primary road safety management guidance prepared by the World Bank and the experience of African road safety agencies, and are intended to be used as the basis for developing concrete, country-specific recommendations for the strengthening or creation of national agencies responsible for road safety and traffic management.

In the "Good Practices" section a collection of effective road safety measures and policies from African and global experiences are presented related to infrastructure, behaviour, vehicle and management points of view. A systematic analysis of African good practice measures is carried out and both successful and non-successful solutions are outlined interactively at both measure grouping (infrastructure, behaviour, vehicle, management) as well as geographical level (country, region and continent).

It is well known that the basic principles of accident prevention (risk reduction and exposure management) remain the same regardless of country. However, implementation modalities may vary considerably, and a road safety measure that is effective in one country is not necessarily similarly effective elsewhere. Thus, a key factor during such an evaluation process is the transferability. Therefore, the most interesting parts of a transferability audit, where different African stakeholders and experts provide opinions about the adaptation of road safety measures in different contexts, according to factors as society/culture, institutions and economy, are presented as well.

Special emphasis is given to identify and highlight road safety measures and policies which have shown high potential for casualty reductions in African countries, as reported through various documents (e.g. mid-term review of the African Action Plan), in order to be further supported and potentially implemented in other countries as well.

Another interesting section is the "Capacity Building" area which aims at identifying training, research and innovation needs of staff involved in road safety related activities and develop capacity building programs focused on road safety in African countries. African stakeholders must become owners of the problems and be responsible for developing and implementing the appropriate solutions with appropriate technical assistance, as necessary.

The overall objective of the "Capacity Building" section is to highlight and assess the needs for training and education on road safety and specify the content of the training activities by providing modules and tools for efficient training (e.g. train-the-trainers approach). The curricula collection of relevant European training courses (e.g. Delft Road Safety Courses, CEMAC road safety week, master's degree on road safety created for Belarusian Universities, SITRASS summer school) are examples of actions performed under this section.

In the "Dialogue Platform" (DP) section is dedicated to the high-level body that will be established within the SaferAfrica project with the 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 DP consists of two different levels; the Technical level and the Institutional level.

The Technical level comprises of both African and European government and research institutions, international institutions and organisations for citizen representation (e.g. NGOs) and acts as an advisory board to the Institutional level by providing guidance and recommendations on strategic and investment priorities. Among these bodies, subjects not involved as project partners are part of the Stakeholders Group. At this level, various Working Groups are in charge of specific road safety and traffic management topics and suggest activities to the Institutional level.

The Institutional level, ran by a Management Board, comprises representatives of existing institutions and competent authorities at the country and continent levels tackling regulatory, financing and planning issues in the different fields involved in road safety. The actors belonging to this level include: the African Union, economic and financial institutions (e.g. African Regional Economic Communities), multilateral development banks and other relevant international organisations working in the African continent. At this level, the evidence stemming from the work done on the Technical level is discussed and decisions are made on the basis of value-for-money assessments. The initiatives include projects or partnerships (e.g. twinning programs) between African and EU partners on particular issues related to the afore-mentioned sections. Furthermore, policy recommendations to ensure the achievement of the Action Plan objectives are formulated. The implementation of these initiatives is entrusted to the Technical level of the Platform.

Each member of the Dialogue Platform has unique access to the reserved area of the ARSO. According to the different roles in the Dialogue Platform, the contents and the tools available in the reserved area are distinguished according to three user groups:

- Working Groups Member (mainly project partners);
- Stakeholders Group Member;
- Management Board Member.

Both ARSO as well as the DP are anticipated to act as an individual and stable bodies, capable of operating beyond the end of the SaferAfrica project.

Apart from the six core sections, described above, the ARSO includes links to the European Union's Horizon 2020 research and innovation programme (http://ec.europa.eu/programmes/horizon2020/en/area/transport), the SaferAfrica project website (http://www.saferafrica.eu/), to a list of key African road safety stakeholders and key road safety web-resources. Finally, the latest news are published in a dedicated area of the portal.

4. Discussion

Road safety in Africa is poor and is expected to worsen further. The paper presents the web portal developed in the context of the SaferAfrica project in order to support policy makers and stakeholders with evidence on critical risk factors, related actions and good practices drawn from high quality data and knowledge. The *African Road Safety Observatory* (ARSO), for which the relevant European Road Safety Observatory stands as a reference, is further integrated with crowdsourcing functions; thus, serving as a networking platform through which end users could contact experts and other stakeholders, submit questions or data and exchange knowledge and experiences.

ARSO is structured based on the certain core sections, namely; About ARSO, Statistics, Road Safety Management, Good Practices, Capacity Building and Dialogue Platform.

Moreover, aiming to support various road safety activities in the African continent, a separate section addresses African, European, and international

- links to policy organisations, research institutes, stakeholders groups, road user associations and other groups of interest
- web-resources (campaigns, etc.)
- conferences - events

A brief description of each core section is provided and the required inputs as well as outputs are discussed and outlined. Among the most important section stands the Dialogue Platform which consists the key tool for continuously updating the African Road Safety Action Plan and the African Road Safety Charter.

The main objectives through launching the African Road Safety Observatory can be summarised as follows:

- Assess the implementation of the African Action Plan
- Identify problems, risk factors and priority areas for formulating strategies and further actions
- Motivate active partnership between Africa and Europe (twinning programmes)
- Conduct capacity reviews
- Enable sharing of good practices
- Support capacity-building activities

Finally, a further challenge for the future is to maintain the operation of both ARSO as well as the Dialogue Platform and further enhance their significant contribution in improving road safety performance in Africa.

At present a pilot version of ARSO has been launched. The full operation of the African Road Safety Observatory is expected approximately in mid-2018.

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