SSATP Africa Transport Policy Program

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Africa Status Report on Road Safety

2025

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Foreword

Road traffic crashes and injuries are a significant cause of death and disability worldwide, and Africa bears an increasingly heavy burden from crashes and disproportionately high costs for essential mobility. The continent accounts for 24 percent of global road fatalities despite hosting less than 4 percent of the world's vehicles. This alarming situation demands an urgent and comprehensive response. The *Africa Status Report on Road Safety 2025* is essential to inform that response. It provides an overall picture of the current state of road safety in Africa, progress made in addressing road safety challenges, and promising initiatives being carried out across the continent to inspire and motivate key stakeholders to collaborate in continued efforts to implement the United Nations (UN) Decade of Action for Road Safety 2021–2030 at the country level and scale up interventions to ensure safe mobility.

Road safety is the core of UN Sustainable Developmental Goal targets 3.6 and 11.2 and Goals and Priority Areas of the African Union's Agenda 2063. In 2020, the Decade of Action for Road Safety and the African Road Safety Action Plan 2021–2030 called for reducing road traffic deaths and injuries by 50 percent. But we are far off target. The current report marks a milestone in our collective efforts to address the road safety crisis while underscoring the importance of a coordinated, multisectoral, and comprehensive approach using data-driven decisions to improve road safety across the continent.

Since the release of the *Africa Status Report on Road Safety 2020*, significant progress has been made on many fronts to improve road safety on the continent, including signature and ratification of the *African Road Safety Charter* by 13 countries. The charter serves as a policy framework for road safety improvement in Africa and as an advocacy tool for road safety improvement with the goal of facilitating the creation of an enabling environment to drastically reduce road traffic crashes.

This 2025 edition of the Africa Status Report on Road Safety highlights some examples of key initiatives in Africa's journey toward improved road safety through case studies, national and regional milestones, and success stories. These include the establishment and operationalization of the African Road Safety Observatory (ARSO), which serves as a regional forum enabling African countries to generate robust road safety data and analysis to positively impact policies and actions for road safety in the region.

While ARSO has shortcomings, it is one of the major achievements of the African road safety agenda during the decade 2011–2020, providing a platform for managers of road safety and road safety national data coordinators to regularly exchange data and information, particularly best practices in policy formulation, planning, road safety strategies, and data management.

But much more needs to be done to reach the ambitious goal of the Decade of Action for Road Safety, and thus one of the key objectives of this report is to provide the continent with a comprehensive picture of the current situation and to monitor road safety progress made in the first five years of the Decade of Action.

The report demonstrates the importance of establishing and strengthening road safety lead agencies, implementing key policy and investment decisions, and enhancing data management systems. It also emphasizes the need for a balanced approach that includes data-driven strategies, engineering, and enforcement to effectively reduce road traffic injuries and fatalities.

Now, past the halfway point to the 2030 deadline, the government of Morocco, in partnership with the World Health Organization, will host the first Ministerial Conference on Road Safety on African soil (Marrakech, February 2025). This historic event will bring together key stakeholders across the world, including government officials, industry leaders, and international organizations, to discuss and generate support for the new vision of safe and sustainable mobility. The conference provides an international high-level platform for sharing knowledge and best practices and fostering collaboration to tackle the formidable road safety challenges still facing countries. It should also help the continent secure a step-change in support for proven prevention solutions and reset collective ambitions to realize the 2030 Agenda for Sustainable Development target of halving the number of deaths and injuries from road traffic crashes globally.

The core solutions to address road safety at the continental level fall under the Safe System approach, which includes improved management, safer roads, vehicles, and road users, as well as better postcrash response, and involves applying the UN road safety conventions and domesticating the African Road Safety Charter. As we move forward, it is imperative to maintain political commitment and allocate adequate funding to road safety initiatives and identified solutions. By doing so, we can create safer roads, save lives, and contribute to the overall development and prosperity of the African continent.

We hope this report will serve as a catalyst for action for rest of the decade and inspire all stakeholders to work together to improve road safety across Africa.

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The report was developed under the overall guidance of Mustapha Benmaamar (SSATP Program Manager), Jean-Francois Marteau (Transport Practice Manager, World Bank), and Eric Ntagengerwa (Head of Transport and Mobility Division, African Union Commission). The task team leader of this assignment was Marisela Ponce de Leon Valdes (SSATP Road Safety Pillar Lead).

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Acronyms

AfDB	African Development Bank
AFRO	WHO Regional Office for Africa
ARSO	African Road Safety Observatory
ASE	Automated Speed Enforcement
AU	African Union
AUC	African Union Commission
BAC	blood alcohol concentration
BrAC	breath alcohol concentration
CRVS	civil registration and vital statistics
EMRO	WHO Regional Office for the Eastern Mediterranean
GSRF	World Bank Global Road Safety Facility
GSRRS	Global Status Report on Road Safety
iRAP	International Road Assessment Programme
NARSA	National Road Safety Agency (Morocco)
NRSAP	National Road Safety Action Plan 2024–2028 (Kenya)
NTSA	National Transport and Safety Authority (Kenya)
PAAPAM	Pan African Action Plan for Active Mobility
RSLA	road safety lead agency
RSM	road safety management
SDG	Sustainable Development Goal
SSATP	Africa Transport Policy Program
UN	United Nations
UNECA	United Nations Economic Commission for Africa
WHO	World Health Organization

Executive Summary

Road traffic crashes and injuries in Africa pose a significant public health and developmental challenge. According to the most recent World Health Organization (WHO) estimates, 259,601 fatalities occurred in Africa in 2021, accounting for 24 percent of global road traffic deaths. Since 2000, fatalities have generally risen, although there was a slight decrease during the COVID-19 pandemic. Since 2010, there has been a gradual decline in number of fatalities in 22 countries. Despite these improvements, the African continent still has the highest road traffic fatality rate, 19.6 per 100,000 population, with wide variations among countries.

The burden disproportionately affects males, individuals ages 18 to 59 years, and vulnerable road users, with pedestrians accounting for 31 percent of all deaths, motorized two- and three-wheelers 17.5 percent, and cyclists 4.4 percent—together accounting for more than half of the continent's fatalities.

Reporting on road traffic fatalities remains a challenge in Africa, with significant discrepancies between the country reported and WHO estimated figures. In 2021, estimated fatalities were three times higher than reported fatalities. Gaps in data systems, including single-source data reliance, and incomplete reporting on the distribution of road traffic fatalities among the different population groups, serious injuries, and road safety key performance indicators continue to undermine efforts to monitor road safety effectively and implement evidence-based interventions. It is encouraging to note that, despite these gaps, the discrepancy between reported and estimated fatalities has decreased since the previous Global Status Report on Road Safety (2018), demonstrating that data collection systems can improve when countries take measures to strengthen them.

Over the past decade, the African Union Commission (AUC) has demonstrated a strong commitment to improving road safety across the continent, aligning its efforts with global and regional road safety goals. Through key initiatives such as the Intergovernmental Agreement on Trans-African Highways, and the African Road Safety Charter, the AUC has actively worked to enhance road safety management, policies, and infrastructure. The establishment of the African Road Safety Observatory (ARSO), with the vision to create a data-driven approach to road safety and contribute to Africa's broader development goals under AU Agenda 2063, supports the AUC's efforts.

In line with the Sustainable Development Goals (SDG 3.6 and 11.2) and the UN Decade of Action for Road Safety 2021–2030, the AUC has led the development of the African Road Safety Action Plan 2021–2030, a framework guiding regional and national interventions.

To realize this vision for road safety in Africa, countries must address the multiple factors contributing to the continent's significant road traffic burden, guided by the Safe System approach and the five key pillars of road safety: road safety management, safer roads and mobility, vehicle safety, safe road user behavior, and postcrash response.

Effective road safety management, anchored by the establishment of road safety lead agencies (RSLAs), is essential for integrating institutional management functions, scaling up targeted interventions, and achieving measurable outcomes. Forty-nine countries have reported having national road safety lead agencies, with only 29 of them receiving allocated budget support. Good progress has been made through the creation of

RSLAs and the development of national strategies. Further enhancements in institutional management are essential to expand these functions and boost their effectiveness. Further analysis of the management capacity of RSLAs is needed to assess key factors such as institutional ownership, financial and human resources, as well as core institutional functions. The SSATP study on RSLAs in Africa provides valuable insights, and available tools such as the road safety management capacity reviews from the Global Road Safety Facility (GRSF) are useful for this in-depth evaluation.

Global and regional support for African countries must now be focused on assisting executive leaders and specialists to address the practical realities and priorities of country strategy delivery and the strengthening of country management processes necessary to mobilize scaled-up road safety financing. Limited and inconsistent funding, inadequate budgetary allocations, and weak data systems hinder the ability of RSLAs to perform their roles effectively. Strengthening road safety management in Africa requires sustained investment, robust data systems, and alignment with international frameworks to ensure comprehensive and impactful interventions.

Africa's road and transport infrastructure is designed and built with insufficient consideration of motorized two- and three-wheelers, cyclists, and pedestrians, who account for most fatalities. Only nine countries mandate formal road safety assessments, using methodologies like iRAP star rating. Further, only a few countries promote the use of safer, alternative modes of transport. Therefore, designing and maintaining road infrastructure to meet the safety and accessibility needs of vulnerable road users while supporting other more sustainable modes of transport should be a key focus area in Africa.

Vehicle regulation faces challenges because of weak registration systems and inadequate safety legislation. Less than a third of the countries have laws that include safety features for four-wheeled vehicles and none of the laws include safety features for motorized two- and three-wheelers. Strengthening vehicle safety laws, aligning them with United Nations road safety conventions, rigorously enforcing laws, and restricting the import and export of unsafe used vehicles are critical steps toward improving road safety across the continent.

Ensuring the safety of all road users requires addressing behavioral risk factors (speeding, driving under the influence of alcohol or drugs, distracted driving, and nonuse of helmets, seat belts, and child restraints) that significantly contribute to road traffic injuries and fatalities. While many African countries have laws addressing these risk factors, none fully meet WHO-recommended best practices, in that they include the recommended requirements to ensure the safety of road users. To improve safety, countries should refine their laws to align with international standards, strengthen enforcement mechanisms, and establish reliable data collection systems to monitor compliance and evaluate the impact of interventions.

Postcrash response and care remains a crucial yet underdeveloped area in Africa's road safety landscape. Systems for emergency prehospital care, such as emergency care numbers and coordinating agencies, are available in most countries. Countries have also taken steps to ensure the availability of emergency care specialists, with training programs for trauma surgeons, emergency care physicians, and trauma nurses. Half of the countries have trauma registries, but less a third have national level data. Efforts to improve postcrash response and care should prioritize expanding access to prehospital and emergency care, ensuring quality of emergency care systems, and strengthening data collection systems for effective monitoring and planning. Additionally, strengthening postcrash legislation and implementing financial protection mechanisms will provide the necessary guarantees of access to quality care and support for victims and their families.

Addressing Africa's road safety challenges calls for a comprehensive strengthening of institutional management frameworks, to ensure the sustainable funding of effective and efficient interventions, guided by enhanced data collection systems that accurately assess and monitor the burden of road traffic injuries. Meeting these needs will require considerably higher levels of road safety financing than currently evident. To address these challenges comprehensively, concerted efforts are needed to strengthen national road safety strategies embedded in regional transportation policies. This entails enhancing coordination mechanisms, allocating adequate resources, and improving data collection systems.

This report is intended for policy makers, government agencies, development agencies, regional and international organizations, road safety practitioners, law enforcement authorities, researchers, private sector stakeholders, and civil society groups involved in road safety governance and policy implementation in Africa. It aims to provide decision-makers with a snapshot of the status of road safety in the African continent as well as the governance structures, regulations, standards, legislation, and the systems in place to improve road safety outcomes.

Introduction

The Decade of Action for Road Safety 2011–2020 marked significant efforts globally and has given new impetus to Africa's initiatives to address road safety challenges. Following a review of the decade of action, the United Nations (UN) General Assembly proclaimed a second decade of action in 2020, aiming to halve road traffic deaths by 2030 (UN 2020). Building on these efforts, the World Health Organization (WHO) plays a central role in global road safety, coordinating with UN regional commissions to develop the Global Action Plans for Road Safety, publish Global Status Reports on Road Safety, and provide technical guidance. The WHO collaborates with UN agencies and other development entities to implement road safety initiatives. It is also responsible for supporting the 2030 Agenda road safety targets and monitoring progress through harmonized data collection, ensuring a coherent, system-wide approach to reducing road traffic injuries worldwide. The Global Plan for the Decade of Action for Road Safety 2021–2030 aligns with the UN Sustainable Development Goals (SDG targets 3.6 and 11.2) and the 12 UN voluntary global road safety performance targets (UN 2015; WHO 2018, 2021). Based on the Safe System approach, the global plan focuses on five strategic areas contributing to road safety: multimodal transport and land-use planning, safe road infrastructure, vehicle safety, safe road users, and postcrash response.

The burden of road traffic crashes in Africa remains critical in the context of rapid urbanization and motorization coupled with exponential growth of two-wheeler use, inadequate funding for road engineering safety measures, and lack of compliance to safety standards and monitoring of road user behavior. Responding to this challenge requires a harmonized and collective effort that fosters shared expertise and resources, using advanced technologies to create safer road environments and reduce fatalities. Simultaneously, it calls for developing a modern infrastructure network to realize Africa's full economic potential and physical integration. The African Union Commission (AUC), through its mandate to enhance sustainable transportation and road safety, leads these efforts in collaboration with continental and regional bodies such as the United Nations Economic Commission for Africa (UNECA), the African Development Bank (AfDB), regional economic communities, the WHO, and the Africa Transport Policy Program (SSATP). Together, these assist the AUC to harmonize road transport policies, improve road infrastructure, and promote regional cooperation to implement proven solutions in the efforts to address road safety. The adoption of the Intergovernmental Agreement on Trans-African Highways (TAH) in 2014 and the African Road Safety Charter in 2016, the establishment of the African Road Safety Observatory (ARSO) in 2018, and the development of the African Road Safety Action Plan for the Decade 2021–2030 are significant initiatives of the AUC, born out of these collaborative efforts. Ultimately, the goal of these efforts is to strengthen road safety management in Africa under the strategic framework of the SDG-AU Agenda 2063 (AU 2016; SSATP 2021; UNECA and AUC 2020).

The African Union (AU) developed the African Road Safety Action Plan 2021–2030 to guide continental road safety initiatives (AU 2021). The plan aligns with and focuses on the five pillars of the UN Decade of Action for Road Safety—road safety management, safe road infrastructure, vehicle safety, safe road users, and postcrash response—and aims to address road safety challenges through coordinated efforts. The African action plan has an additional pillar on cross-cutting issues that addresses rural road safety.

Multilateral development banks play a crucial role in enhancing road safety in Africa through their investments and support for country-level implementation. These banks, through their Road Safety Working Group, established in 2009, have committed to a comprehensive approach that includes strengthening road safety management capacity, integrating safety measures in road infrastructure projects, improving safety performance metrics, and mobilizing resources for road safety initiatives and standalone investments. The World Bank, through its funding platform the Global Road Safety Facility (GRSF) and its donors, has been instrumental in promoting harmonized road safety practices to support these efforts while also developing tools like the Road Safety Screening and Appraisal Tool (RSSAT) to ensure road investments consider safety from early stages. The World Bank's portfolio includes various projects aimed at reducing road fatalities and injuries, with an estimated road safety financing under World Bank projects in continental Africa between fiscal year 2021 and the present of US$797 million. Through these collaborative efforts, multilateral development banks and other relevant organizations, such as FIA Foundation and Bloomberg Philanthropies, are making significant strides in improving road safety and saving lives across Africa.

Africa has demonstrated strong commitments to improving road safety outcomes; however, effective monitoring of the African Road Safety Action Plan requires systematic reporting and high-quality data to facilitate cross-country comparisons, knowledge sharing, and evidence-based decision-making. While WHO Global Status Reports on Road Safety, along with regional reports for Africa and the Eastern Mediterranean (WHO AFRO 2024; WHO EMRO 2024a), have tracked progress over the years, a comprehensive understanding of the burden of road traffic crashes and road safety performance in Africa remains essential for developing a unified, continent-specific approach. The *Africa Status Report on Road Safety 2020* (SSATP 2021) marked an important step by establishing a baseline for measuring future progress; however, the limited participation of countries in the report prevented a fully comprehensive review of the situation in the continent.

Objectives of the Report

The *Africa Status Report on Road Safety 2025* represents a significant milestone in establishing a harmonized monitoring mechanism for Africa, building on prior efforts by the SSATP, AU, WHO, and other partners. It aims to facilitate informed decision-making and to enhance systematic reporting across the continent. Specifically, this report

- Describes the burden of road traffic crashes on injuries and deaths in Africa;
- Provides an overview of the status of institutional road safety management practices and legislation on risk factors, road infrastructure, vehicle standards, and postcrash response systems in Africa; and
- Identifies key gaps and provides proposed actions to enhance road safety data and implementation strategies across Africa.

This report builds on the *Africa Status Report on Road Safety 2020*, offering a comprehensive analysis of road safety trends and management of road safety across the continent. It further explores additional areas of relevance to Africa using data from the WHO *Global Status Report on Road Safety 2023 (GSRRS 2023)* and country-specific case studies. It highlights persistent gaps within each of the five pillars, delivering proposed actions to address them.

Methodology

This report was developed using data generated for the *GSRRS 2023*,[1] incorporating, among others, data from 51 countries that participated in the *GRSSR 2023* survey, representing 97 percent of the population of the African continent. Data for the *GSRRS 2023* was collected in each country, under the supervision of a designated coordinator who assembled multisectoral teams of up to 10 contributors from relevant fields, including an in-country representative of ARSO, to ensure comprehensive and representative data collection. A rigorous multitier validation process ensured accuracy, consistency, and completeness of the data. At the national level, the data were validated and endorsed through a stakeholders' consensus meeting, while at the global level, the data underwent further verification and quality checks to ensure uniformity and reliability before analysis, enhancing the credibility and standardization of the data set.

Variables for analysis were selected from the *GSRRS 2023* database, guided by the *Africa Status Report on Road Safety 2020*, and key frameworks, including the African Road Safety Action Plan 2021–2030, ARSO minimum road safety indicators (miniARSO), the 12 UN voluntary targets, and the Road Safety Performance Monitoring Framework (RSPMF) for African Countries (UNECA and AUC 2020; Segui-Gomez et al. 2021; WHO 2018; SSATP 2025). An indicator matrix was developed to link variables in the GSRRS 2023 data to the frameworks and the *Africa Status Report on Road Safety 2020* (see appendix A).

1. WHO publishes the Global Status Report on Road Safety every two to three years. The *GSRRS 2023* contains data spanning the period between the fourth status report in 2018 and the fifth one in 2021, although most countries reported on 2021 data and 2022 legislation status. Because of delays caused by COVID-19, the fifth status report was published in 2023 instead of 2021.

The *GSRRS 2023* data collection was guided by the Global Action Plan for Road Safety, UN voluntary global road safety performance targets, and previous Global Status Reports on Road Safety. While the African Road Safety Action Plan 2021–2030 aligns with the global frameworks, it includes specific indicators tailored to the African context. Consequently, some indicators in the African action plan were not included in the analysis for this report as they were not included in the *GSRRS 2023* data collection effort.

Topics for the case studies were derived from the indicators not covered in the *GSRRS 2023* data, and information on these topics was solicited from countries that have implemented relevant interventions. Each country completed a standardized case study template, which was subsequently used to develop the case studies. The information for each case study was provided by national governments and/or implementing agencies.

Besides the *GSRRS 2023* specific survey, data for this report include WHO-derived mortality estimates, data on country populations (UN population division), country income level (World Bank), data on UN road safety conventions (UNECE, UN Treaty Collection), and data on road safety core ratings (iRAP).[2]

Key Considerations for Interpreting the Findings

This report presents a descriptive analysis of road safety governance, legal frameworks, enforcement mechanisms, safety regulations, and data collection systems based on data captured in the *GSRRS 2023*. While this report provides an overview of their existence and comprehensiveness, it does not assess their operational effectiveness, implementation consistency, or real-world impact. As such, the findings should be interpreted as a status report rather than a performance evaluation, and any conclusions regarding road safety outcomes should be made with caution.

Additionally, this report provides a summary of findings from across the continent. For certain elements, such as estimated deaths and fatality rates, data are available for 54 countries. For other elements, the analysis relies on country-reported data and thus the total number of data points varies; for example, reported deaths are available for only 51 countries. Unless noted, the data presented refer to these 51 countries. Appendix B lists the participating countries and provides link to their respective country profile.

Data for this report are available on the WHO Road Safety Data mobile app; on the country profiles, which can be downloaded from *https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/global-status-report-on-road-safety-2023*; and from the country and territory profiles document available at *https://www.who.int/publications/i/item/9789240087712*.

2. The data used on road safety core ratings are those from the iRAP Safety Insights Explorer (*https://irap.org/safety-insights-explorer*).

SECTION 1.

Burden of Road Traffic Injuries in Africa

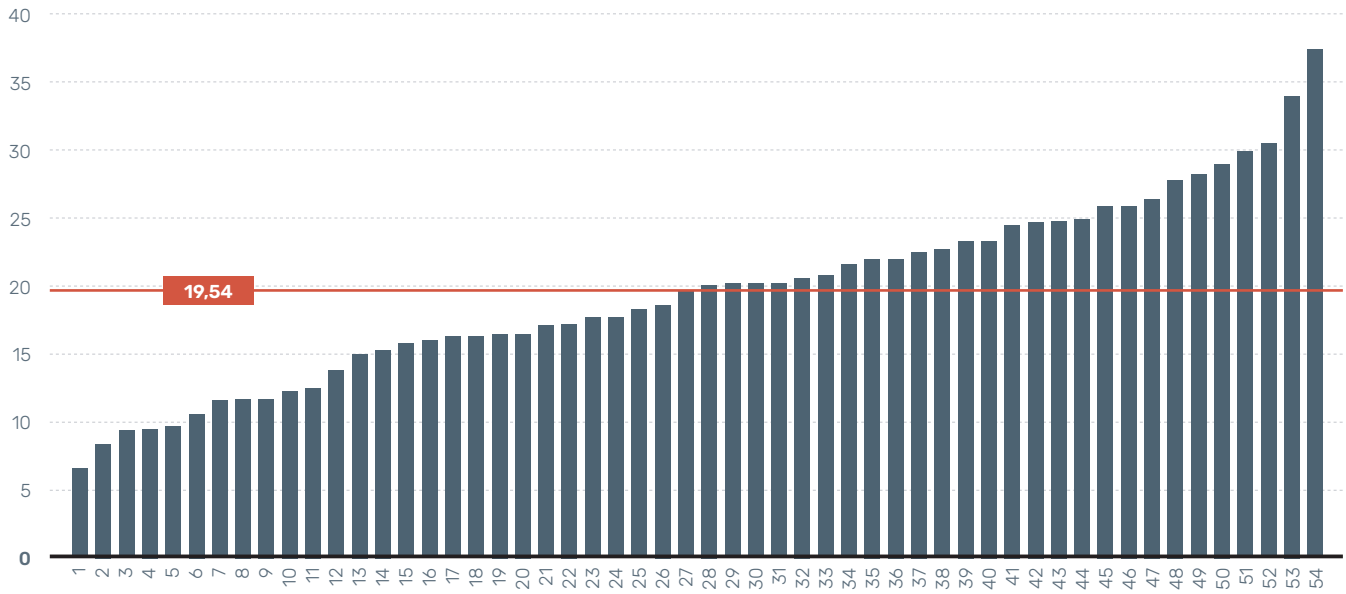
In 2021, an estimated

259,601 road traffic deaths occurred across 54 countries of the African continent, accounting for 24 percent of the global burden of deaths resulting from road traffic injuries.

In 2021, an estimated 259,601 road traffic deaths occurred across 54 countries of the African continent,[3] accounting for 24 percent of the global burden of deaths resulting from road traffic injuries. The average estimated road traffic fatality rate for Africa is 19.6 per 100,000 population, with significant variation ranging from 6.6 per 100,000 to 37.4 per 100,000, and 26 countries exceeding the continental average (figure 1).

The distribution of deaths across the continent is not consistently correlated with the subregional share of the vehicle fleet. Western Africa and eastern Africa bear 64 percent of the continent's deaths but account for only a third of the vehicle fleet, while northern Africa and southern Africa bear less than a third of the deaths despite having two-thirds of the vehicle fleet (figure 2).

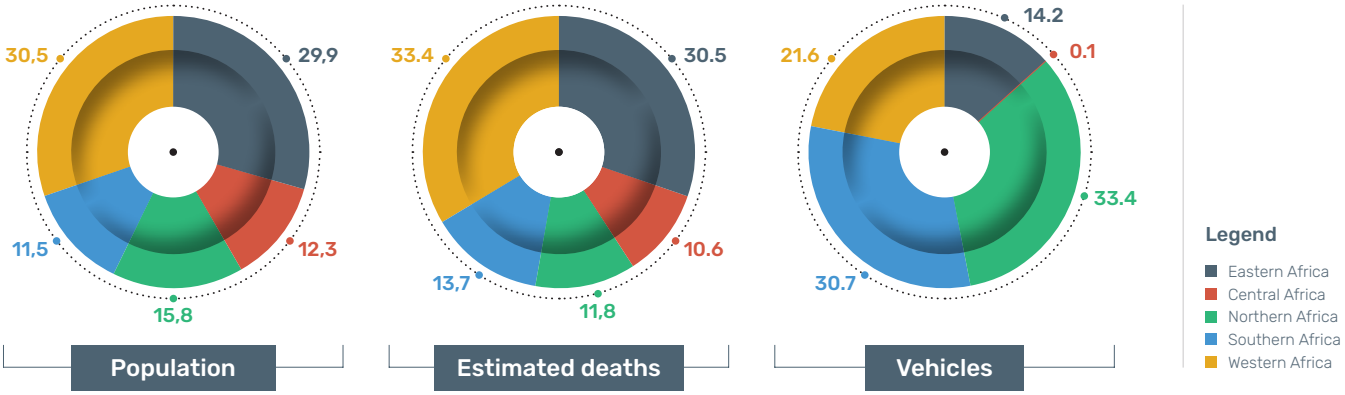
Figure 1: Estimated Road Traffic Fatality Rates per 100,000 Population, 2021



Source: WHO 2023.
Note: N=54.

3. Estimates of road traffic fatalities for all member states are periodically produced by the World Health Organization (WHO). Methods used to derive the estimates can be found in annex 1 of the *GSRRS 2023*.

Figure 2: Proportion of Population, Estimated Deaths, and Registered Vehicles, 2021

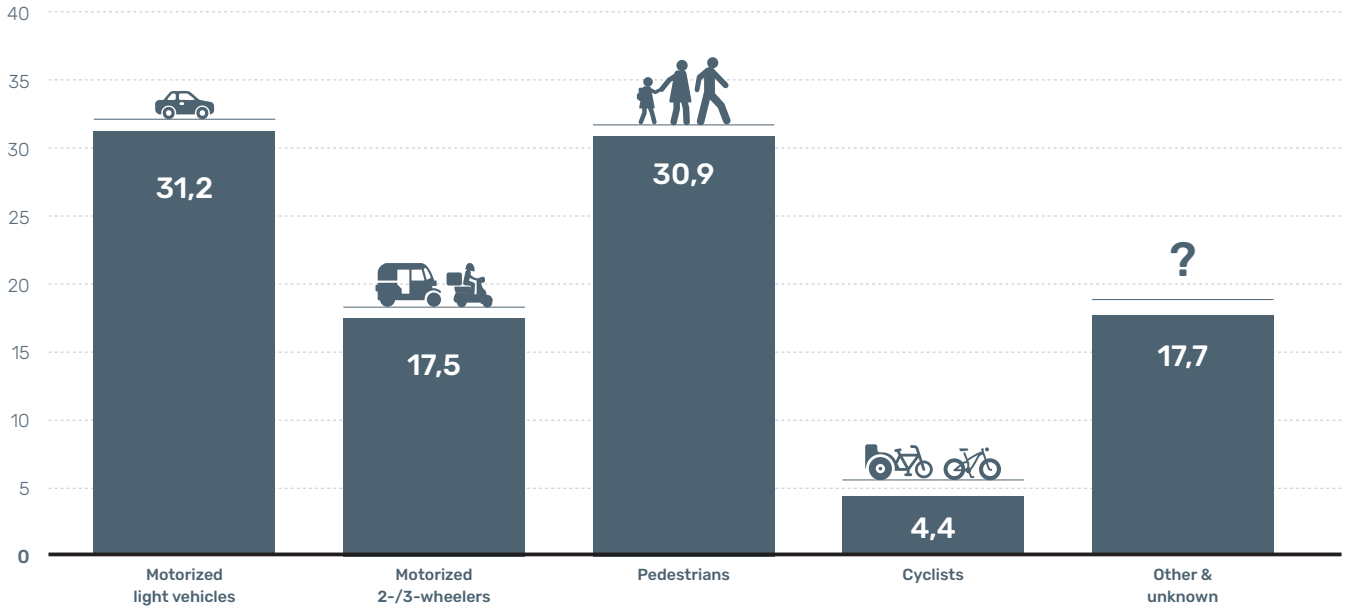


Source: WHO 2023.
Note: N=54.

The highest proportion of road traffic fatalities occur among males (75 percent), individuals ages 18 to 59 years (66 percent), and vulnerable road users (53 percent), with pedestrians accounting for 31 percent of all deaths (figure 3).

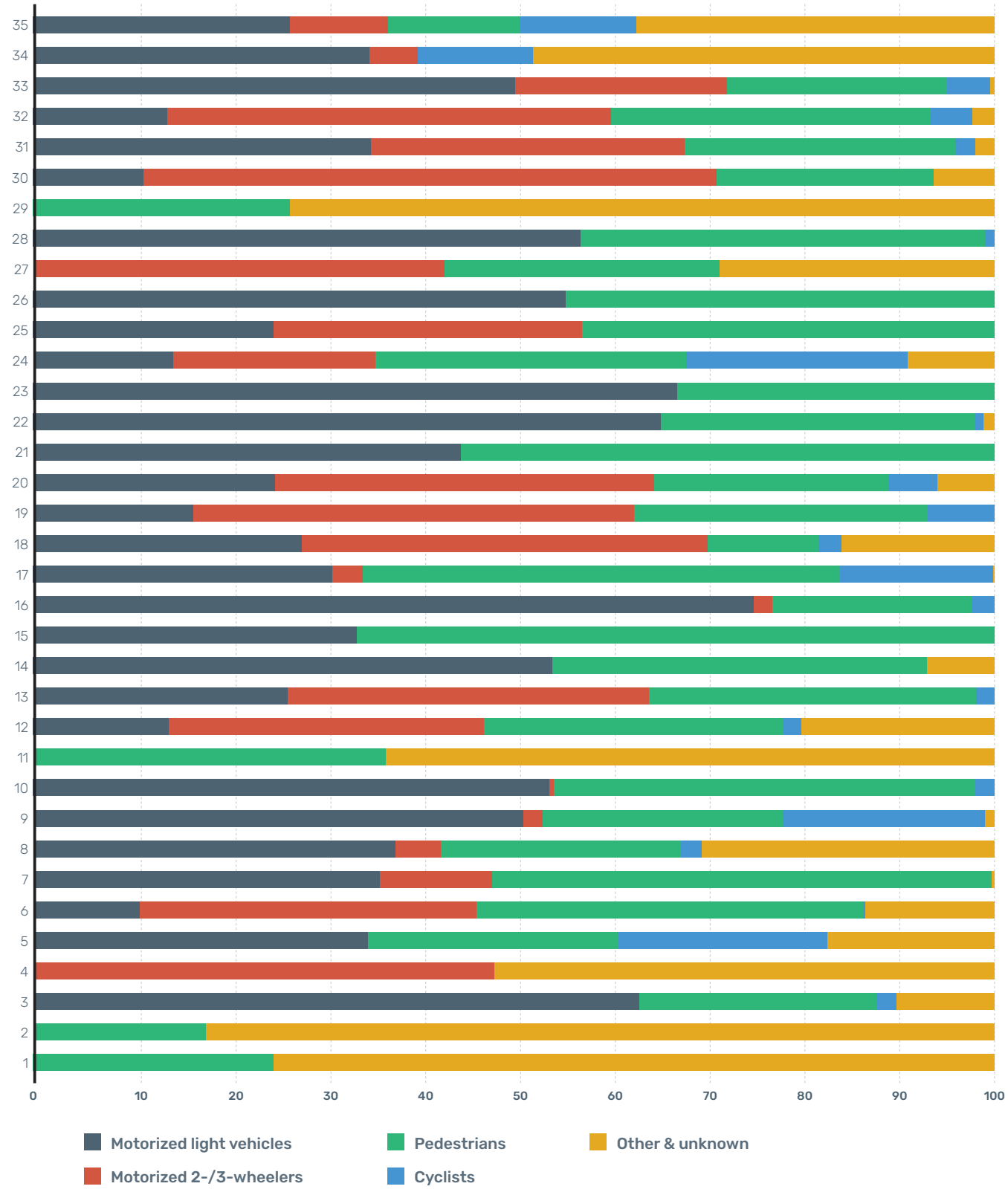
The distribution of road user fatalities varies across countries, with eight countries having distributions that differ from the continental trend. In four of these countries, car occupants account for over 60 percent of all deaths, while in the other four, unspecified or other road users account for more than 60 percent of all deaths (figure 4).

Figure 3: Road Traffic Fatalities by Road User Type, 2021



Source: WHO 2023.
Note: N=35.

Figure 4: Distribution of Road Traffic Fatalities by Road User Type, 2021

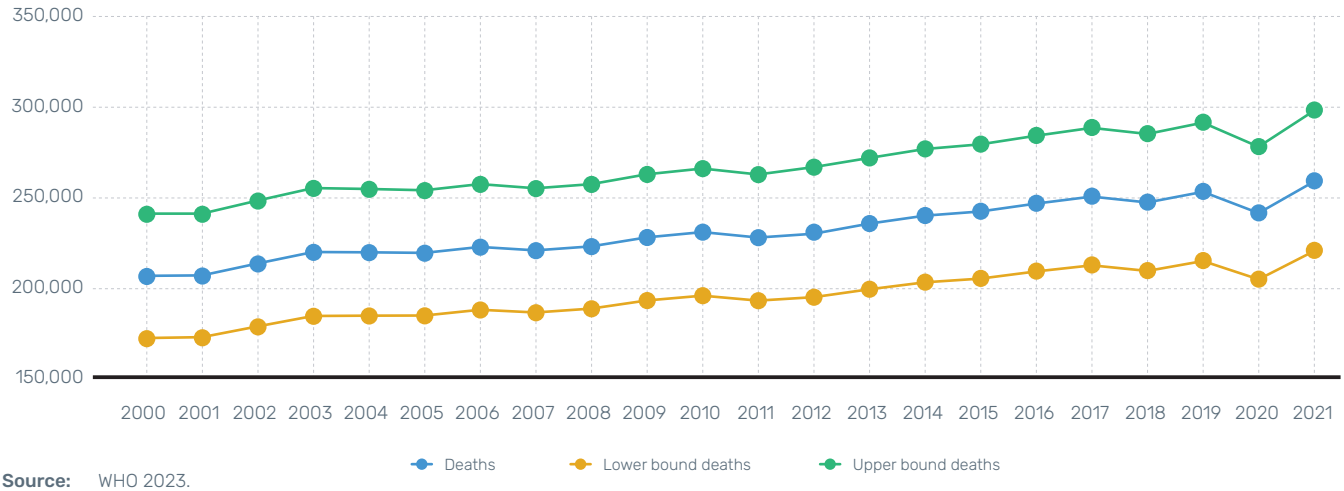


Source: WHO 2023.
Note: N=35.

Trends in Estimated Road Traffic Fatalities between 2000 and 2021

Since 2000, there has been an overall increase in the estimated road traffic fatalities in Africa. The number of road traffic fatalities has been increasing gradually, with a slight decrease in 2020, which can be explained by the reduced mobility during the COVID-19 pandemic (figure 5). It is worth noting that, despite the overall increase, since 2010 there has been a reduction in the estimated road traffic fatalities in 22 countries—specifically, six countries each in central and eastern Africa, four in northern Africa, and three countries each in southern and western Africa. Of these, three countries have reduced fatalities by 40–49 percent, two countries by 30–39 percent, five countries by 20–29 percent, 10 countries by 10–19 percent, and two countries by less than 10 percent.

Figure 5: Estimated Road Traffic Fatalities, 2000–2021



Source: WHO 2023.
Note: N=54.

Reporting on Road Traffic Injuries and Fatalities

Twenty-six countries report on the number of serious injuries and only four countries have data on the estimated proportion of people with road traffic injuries who incur a long-term impairment because of a crash. Fifty-one countries reported a total of 82,865 road traffic fatalities in 2021. The reported fatality numbers are obtained from country data collection systems that mostly rely on a single source and do not capture all deaths that occur because of road traffic crashes. The World Health Organization (WHO) uses mathematical models to estimate road traffic fatalities to overcome existing challenges in the data collection systems to ensure the numbers more accurately present the burden of road traffic fatalities (Mitra and Bhalla 2023; Martensen et al. 2021; Papadimitriou, Iaych, and Adamantiadis 2019).[4]

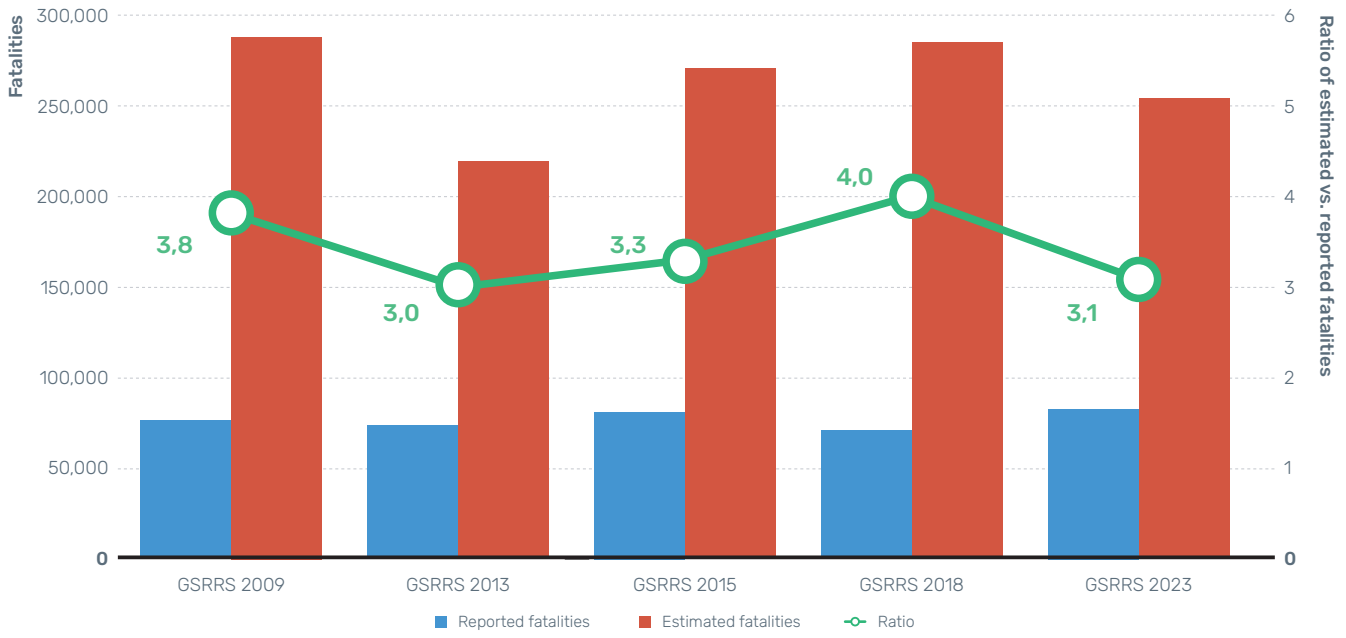
4. See the GSRRS 2023 for details on estimation methodology.

The WHO estimates the road traffic fatalities for 2021 among 54 countries in Africa at 259,601, which is three times higher than that reported by countries.[5] When estimated and reported figures are compared for the 51 countries that have reported death data, the reported fatalities match or almost match the WHO estimations for only six countries. For the other countries, the ratio of estimated versus reported fatalities ranges from 0.1 to 49.1, indicating significant underreporting in some countries. Figure 6 shows estimated and reported fatalities since the GSRRS 2009, highlighting persistent but fluctuating discrepancies. The highest discrepancy was observed in the GSRRS 2018, where estimated road fatalities were four times higher than reported fatalities.

Thirty-nine countries report having taken action to address the discrepancies between estimated and reported data. These efforts include collaboration among data custodians (for example, police, hospitals, forensics) to integrate data sources and capacity-building initiatives. However, discrepancies between reported and estimated deaths have been identified since the first Global Status Report on Road Safety (2009) and continue to increase in some countries. In this regard, the Marrakech Declaration at the 1st African Road Safety Forum (2018) urged countries to prioritize the development of their civil registration and vital statistics (CRVS) systems to improve the accuracy of road traffic fatality data. Individual country assessments, including those conducted in Ethiopia and Tanzania, have demonstrated significant discrepancies between official statistics and global estimates (Martensen et al. 2021; Segui-Gomez et al. 2021; WHO 2010).

Several countries (Côte d'Ivoire, Morocco, Senegal, Tanzania, and Zambia) have made progress in improving their road safety data collection systems through various country or regional initiatives, collaborations, and capacity-building efforts. While initiatives have focused on integrating data from police, hospitals, and mortality records, gaps in coordination and system interoperability persist (Mitra and Bhalla 2023).

Figure 6: Estimated versus Reported Road Traffic Fatalities, 2009–2021



Source: WHO 2023.

5. Discrepancies between reported and estimated deaths have been identified since the first Global Status Report on Road Safety (2009). For updates on the estimated deaths, the WHO produces revisions of the General Health Estimates, which are available at https://www.who.int/data/global-health-estimates.

While countries report the total number of road traffic fatalities, the reporting on fatalities by different population groups is incomplete. The distribution of road traffic fatalities by age, gender, and road user type is not uniformly reported across the continent. Gender distribution is reported by 23 countries, while 16 countries report on age distribution, with data gaps in some of the age groups. Thirty-five countries report on road user type distribution. Notably, in 10 countries road traffic fatalities are distributed among only two road user types, with four countries recording a considerable number of fatalities among the unknown/other road user types.

Other population groups are age and user type (11 countries), deaths in crashes related to work, including deaths among drivers traveling to and from work, while traveling for work (for example, delivery drivers), and among professional vehicle drivers (for example, bus drivers, truck drivers), all of which are reported by less than 10 countries.

Ensuring driver safety is essential for reducing work-related road traffic deaths, and it entails a combined effort from employers, governments, and corporations. Employers can implement driver safety programs, provide well-maintained vehicles with modern safety features, enforce rest periods to prevent fatigue, and utilize technologies like telematics and tachographs to monitor driving behavior. Corporations can establish fleet safety protocols, including speed management, driving hour limits, and safety monitoring devices. Governments complement these efforts by enforcing workplace safety regulations, improving road infrastructure, and incentivizing best practices (ERSO 2015; WHO 2021).

CASE STUDY 1

The African Road Safety Observatory: Toward a Pan-African Road Safety Knowledge Forum and Data Center

Africa is the region with the highest road traffic fatality rates globally. Each year, road crashes claim tens of thousands of lives, leaving millions injured and imposing significant economic and social burdens on countries across the continent. In response to this challenge, the African Road Safety Observatory (ARSO) was launched in 2018 as a regional knowledge platform and data repository to guide evidence-based road safety interventions. With its mission to empower African countries through robust data systems and policy support, ARSO plays a pivotal role in fostering safer roads and sustainable mobility across the continent.

Addressing Data and Capacity Challenges

The lack of reliable road safety data has long hindered African nations' ability to implement targeted and effective safety interventions. Challenges such as inconsistent data collection methods, limited capacity for analysis, and insufficient cross-border collaboration have perpetuated high fatality and injury rates. Recognizing these issues, African ministers of transport initiated the Lomé Declaration in 2017, calling on the African Union Commission (AUC), the World Bank, the Africa Transport Policy Program (SSATP), the United Nations Economic Commission for Africa (UNECA), and the African Development Bank (AfDB) for the establishment of a regional observatory to harmonize and strengthen road safety data systems.

ARSO was subsequently established under the auspices of the AUC and aligned with the African Road Safety Charter. The observatory provides a centralized platform for member states to collect, analyze, and share road safety data, enabling policy makers to monitor trends, identify high-risk areas, and design evidence-based interventions.

Core Components and Governance

ARSO's activities have so far been structured around several core components:

1

Data repository and analytics: ARSO serves as a centralized repository for crash and road safety data, supporting trend analysis, monitoring, and decision-making. Deliverables like the Africa Status Report on Road Safety establish baselines and track progress toward the UN Decade of Action for Road Safety goals.

2

Harmonized indicators and "miniARSO": A major milestone was the agreement among member countries on minimum harmonized indicators for collection of crash data. Known as "miniARSO," this framework will ensure consistency and comparability across nations, enabling more accurate cross-country analyses.

3

Knowledge sharing and capacity building: ARSO facilitates collaboration among member states through high-impact webinars, training programs, and technical workshops. These initiatives strengthen national data management systems, including safety performance indicators (SPIs) and civil registration and vital statistics (CRVS).

Governance and Sponsoring

ARSO's activities are guided by a Transitional Steering Committee, currently composed of representatives from Benin, Cameroon, Kenya, Morocco, Nigeria, Uganda, and South Africa. The committee provides strategic oversight and ensures alignment with ARSO's mission and goals. ARSO's work has so far been supported by a diverse range of funding partners, including the European Union (EU), the World Bank, SSATP, the Global Road Safety Facility, AfDB, UK Aid, and Agence Française de Développement (AFD). Technical support from organizations like the World Health Organization (WHO), UNECA, Fédération Internationale de l'Automobile (FIA), and International Transport Forum (ITF) has been instrumental in advancing ARSO's objectives. From 2025 onward, the EU will be the main sponsor.

Impact and Lessons Learned

ARSO's efforts have already had a transformative impact on road safety data management across the continent. By providing a centralized data repository, ARSO can empower countries to analyze crash data more effectively and implement targeted interventions.

One of ARSO's greatest strengths lies in its collaborative approach. Partnerships with national governments, regional economic communities, and international organizations have been vital to its success. However, challenges such as uneven technical capacity among member states and data quality issues highlight the need for continued support and investment.

Key Achievements

Since its inception, ARSO has made significant progress in strengthening road safety across Africa:

Engagement through General Assemblies and meetings:
ARSO has facilitated numerous gatherings, including the 1st African Road Safety Forum in Marrakech (2018), General Assemblies in South Africa (2019) and virtually (2022), and the Continental Road Safety Meeting in Morocco (2024). These events have fostered collaboration and advanced ARSO's agenda.

Publications:
The Africa Status Report on Road Safety 2020 marked an important step by establishing the first continent-wide baseline report. This report provided critical insights into road safety challenges and opportunities. The current report is another important milestone toward establishing a harmonized monitoring mechanism for Africa.

Harmonized indicators:
Through agreements like the Dakar Communiqué, Abuja Communiqué, and Marrakesh Declaration, member states committed to using harmonized indicators to monitor road safety data systematically.

Capacity building through webinars:
A series of webinars have equipped lead agencies with the skills needed to enhance their data systems, manage crash data, and implement safety performance indicators.

In 2020, ARSO and the Asia-Pacific Road Safety Observatory received the Prince Michael International Road Safety Award, recognizing their innovative contributions to global road safety.

Conclusion

The African Road Safety Observatory represents a groundbreaking approach to addressing Africa's road safety crisis. By harmonizing data collection, fostering knowledge sharing, and building capacity, ARSO can provide member states with the tools needed to implement evidence-based policies and programs. Its achievements to date underscore the importance of collaboration and innovation in saving lives and creating safer roads.

Effective partnerships and intensive cooperation between national authorities, international organizations, and key experts are crucial at every stage of ARSO's development, operation, and enhancement. As ARSO continues to evolve, it holds immense potential to serve as a model for regional road safety observatories worldwide, contributing to sustainable transportation and improved public health across Africa.

CASE STUDY 2

Data-Driven Road Safety Policies: Morocco's Collision Matrix Underpins and Facilitates Road Safety Policy Measures and Interventions

In Morocco, a novel initiative is reshaping how road safety can be understood and addressed. The Collision Matrix, developed by the National Road Safety Agency (NARSA), leverages data to uncover the dynamics of crashes and identify high-risk interactions among road users. This innovative diagnostic tool equips decision-makers with actionable insights, paving the way for targeted interventions to save lives.

Context and Challenges

Road traffic crashes in Morocco, as in many other countries, disproportionately affect road users such as pedestrians, cyclists, and motorcyclists. Effective safety planning has been hampered by limited understanding of the specific factors contributing to these crashes. To address this, NARSA embarked on the Collision Matrix project to provide a granular understanding of road crash dynamics.

The Collision Matrix is designed to diagnose crash patterns by analyzing interactions among road users. It highlights high-risk scenarios, such as collisions involving motorcyclists and trucks or cars and pedestrians, offering a foundation for prioritizing safety measures. NARSA considers that reliable data are the cornerstone of effective road safety planning, emphasizing the matrix's potential in addressing Morocco's road safety crisis.

Project Design and Implementation

The Collision Matrix project followed a structured, multiphase approach:

(1) Data collection: Crash data were collected from police reports, encompassing over 120,000 crashes. Each case was categorized to capture details such as road type, time of day, and the road user types involved.

(2) Matrix development: Using the collected data, NARSA developed a detailed Collision Matrix to visualize interactions between road users. Crashes were categorized into single-vehicle incidents, multi-vehicle collisions involving pedestrians, and other configurations. This categorization highlighted the primary contributors to fatalities and injuries.

(3) Stakeholder engagement: Findings were shared with stakeholders, including local authorities and ministerial departments, to facilitate informed decision-making. By providing both national and localized insights, the matrix empowered policy makers to design tailored interventions.

(4) Targeted interventions: Based on the insights, targeted action plans were implemented. For instance, the project prioritized motorcyclists, who are particularly vulnerable. Interventions included distributing safety helmets, enforcing helmet use laws, and restricting engine modifications on motorcycles. Dedicated bike lanes and cycling paths were also established in urban areas to improve safety for nonmotorized road users.

Lessons Learned

The Collision Matrix[a] underscores the importance of reliable data in road safety planning. Accurate crash data not only inform interventions but also enable ongoing evaluation of their effectiveness. Collaboration among stakeholders proved equally critical. By engaging local authorities, policy makers, and enforcement agencies, the project ensured that solutions were both inclusive and practical.

The initiative also highlighted the need for continuous innovation. Future efforts should prioritize adopting advanced technologies, such as real-time traffic monitoring, to provide more accurate and timely insights.

Results and Impact

The Collision Matrix has already had a considerable impact on road safety interventions in Morocco. By offering a comprehensive view of crash dynamics, it has enabled decision-makers to focus resources on the most critical issues. Key achievements include the following:

Enhanced insights:
The matrix provided a detailed breakdown of road traffic crashes, identifying that single-vehicle incidents and collisions involving motorcyclists and heavy vehicles were major contributors to fatalities.

Targeted actions:
Interventions based on the matrix have led to noticeable improvements. Helmet distribution campaigns, coupled with stricter enforcement, have significantly increased helmet usage among motorcyclists. These measures, along with enhanced road infrastructure, have reduced the severity of injuries.

Informed decision-making:
Local authorities have adopted the matrix to tailor safety measures to specific regional challenges, such as urban congestion or rural road conditions.

While the project's early successes are evident, challenges remain. Ensuring the sustainability of interventions and expanding the matrix's scope to include automated traffic monitoring systems are among the next steps identified by NARSA.

Conclusion

Morocco's Collision Matrix exemplifies how data-driven approaches can transform road safety strategies. By focusing on high-risk interactions and empowering stakeholders with actionable insights, the initiative has laid a solid foundation for measures and interventions that can reduce road traffic fatalities and injuries.

As Morocco continues to refine and expand the Collision Matrix, its impact is expected to grow, offering a model adoptable by other nations seeking to address road safety challenges through evidence-based planning. The project demonstrates that with the right tools and collaborations, it is possible to create safer roads and save lives.

a. For an example of a Collision Matrix, please visit *collision_matrix_2024_update.png (3780×2126)*.

SECTION 2.

Road Safety Pillars

The African Road Safety Action Plan 2021–2030 aligns with and focuses on five pillars of road safety: road safety management, safer roads and mobility, vehicle safety, safe road users, and postcrash response. The following sections present an overview of the status of implementation of the interventions in each pillar.

Road Safety Management

Road safety management is a systematic approach to reducing the burden and severity of road traffic injuries and fatalities. An effective road safety management system integrates institutional management functions, interventions, and outcomes to address road safety comprehensively, emphasizing collaboration, accountability, and evidence-based strategies. The key road safety management functions are coordination, legislation, funding and resource mobilization, promotion, monitoring and evaluation, research, development, and knowledge transfer (Bliss and Breen 2009), and a key institution should be appointed for carrying out these functions (that is, road safety lead agencies).

The African Road Safety Action Plan 2021–2030 outlines six expected accomplishments for road safety management, each accompanied by actions or recommendations to improve road safety (refer to appendix A for details). The following sections provide an overview of the implementation status of these recommendations.

Road Safety Lead Agencies

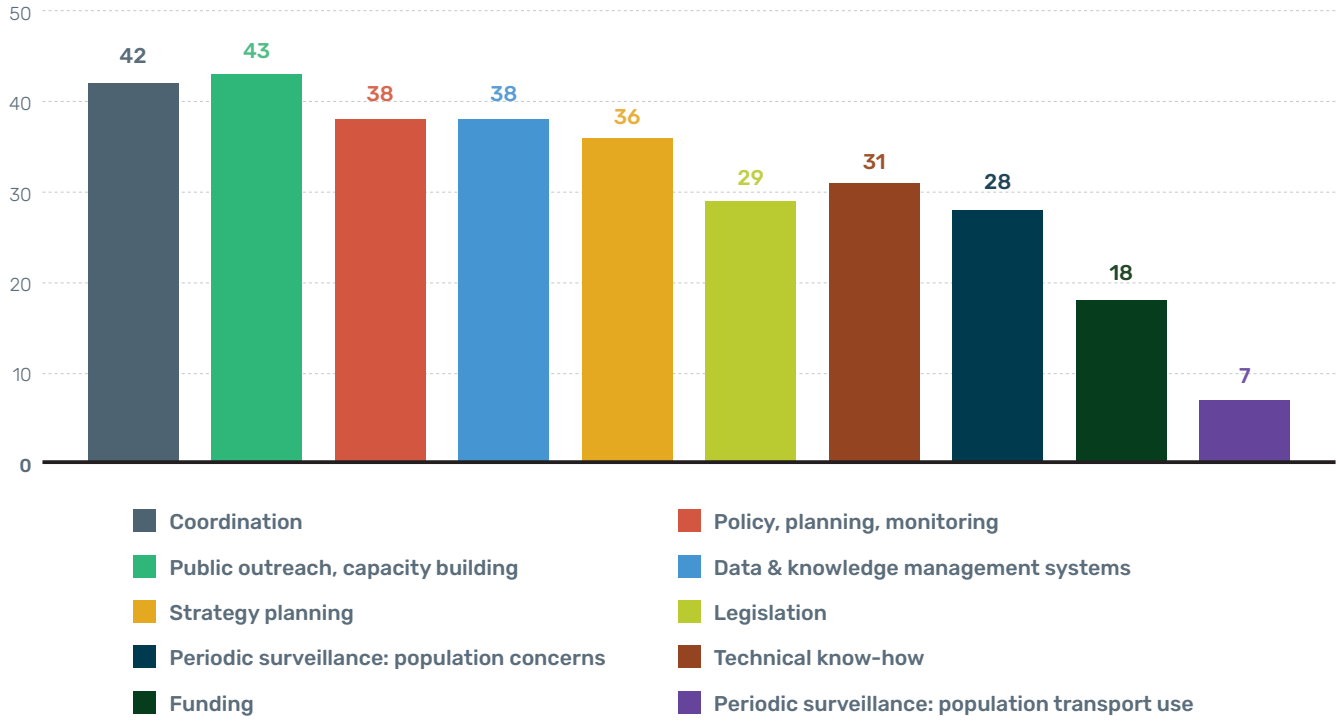
Road safety lead agencies (RSLAs) play a pivotal role in strengthening road safety management by driving strategic funding, setting well-defined targets, and ensuring effective data management aligned with global frameworks. These agencies are central to a holistic approach that integrates sustainable funding mechanisms, robust strategy development, internationally aligned targets, and advanced data systems. According to the SSATP working paper on RSLAs in Africa, these agencies coordinate the involvement of government, civil society, and other stakeholders to improve safety outcomes (Mitullah, Small, and Azzouzi 2022).

Forty-nine countries report having a national RSLA to lead and coordinate road safety activities. The main functions of the RSLAs, reported by 43 countries, include coordination; public outreach and capacity building; policy, planning, and monitoring; and data and knowledge management systems (figure 7). However, conducting periodic surveillance of population transport use (that is, monitoring the extent to which the population uses different modes of transport) is a less prioritized function, as it is assigned to RSLAs in only seven countries.

Funding for RSLAs

Adequate funding is essential for RSLAs to perform effectively their functions to achieve national road safety goals. Government budget allocations for RSLAs are reported in 29 countries, with 20 countries providing details on the amount of funding. These budget allocations primarily focus on crash and injury prevention, capacity building, injury care and treatment, as well as surveillance, monitoring, and evaluation, with about two-thirds of the countries receiving allocations for these

Figure 7: Countries Reporting Road Safety Lead Agency Functions, 2021



Source: WHO 2023.
Note: N=43.

activities. In contrast, only about a third of countries report budget allocations for survivor rehabilitation and palliative care, and research.

Funding for road safety activities, reported by 18 countries, is mainly sourced from general government revenues. Twelve countries attribute 50 percent or more of their total funding to this source, and six attribute less than 50 percent. Additional sources of funds include motor vehicle insurance (16 countries), international donors (15 countries), earmarked taxes (14 countries), national donors (13 countries), and general insurance (11 countries). Contributions from these sources range from 2 percent to 25 percent, except for that from national donors, which in one country contribute up to 60 percent.

Fiscal interventions such as taxation on fuel, road use (for example, tolls), and vehicle purchase, economic sanctions for infractions, and vehicle insurance provide additional funding opportunities. Among these, the most widely adopted measures are taxes on vehicle insurance (implemented in 37 countries), fuel (34 countries), road tolls (32 countries), alcoholic beverages (31 countries), and vehicle purchase (30 countries). However, only 19 countries earmark funds raised through fiscal measures specifically for road safety.

Lessons drawn from the *SSATP study of RSLAs in Africa* (Mitullah, Small, and Azzouzi 2022) highlight the importance of a comprehensive understanding of their management capacity and performance in implementing road safety interventions. Further analysis, using such tools as the road safety management capacity reviews from the Global Road Safety Facility (GRSF) (Bliss and Breen 2013), is recommended to assess in detail the institutional ownership, financial and human resources, and core functions of RSLAs. This comprehensive evaluation would help identify gaps and opportunities for strengthening the institutional effectiveness of RSLAs, ensuring they are well equipped to implement the African Road Safety Action Plan 2021–2030 and contribute to broader regional road safety objectives.

CASE STUDY 3

Transforming Road Safety in Kenya: National Road Safety Action Plan 2024–2028

Kenya, a country that relies heavily on road transport for its economic and social vitality, faces a grave challenge in road safety. With over 90 percent of goods and services transported via road networks, crashes have become a significant threat to lives and livelihoods. Recognizing this urgency, the Kenyan government launched the National Road Safety Action Plan (NRSAP) 2024–2028, an ambitious and multifaceted strategy aimed at reducing road traffic fatalities by 50 percent by 2030. This initiative reflects a bold commitment to creating safer roads through multisectoral collaboration and sustainable interventions.

A Strategic Framework for Road Safety

The NRSAP draws its foundation from global frameworks, such as the UN Decade of Action for Road Safety, while integrating local priorities. Anchored on the Safe System approach, it recognizes the interdependence of road design, vehicle standards, user behavior, and postcrash services. The strategy is structured around eight key priorities:

(1) **Strengthening partnerships:**
Enhancing coordination among government agencies, private sectors, and civil society

(2) **Sustainable financing:**
Establishing dedicated funding mechanisms, including the National Road Transport and Safety Fund

(3) **Risk targeting:**
Identifying high-risk areas and deploying targeted interventions

(4) **Infrastructure safety:**
Upgrading road designs to meet safety standards

(5) **Vehicle standards:**
Enforcing compliance with safety regulations

(6) **Behavioral change:**
Targeting unsafe road behaviors through enforcement and education

(7) **Postcrash services:**
Improving emergency response and trauma care

(8) **Data and monitoring:**
Building robust systems for road safety data collection and evaluation

President William Ruto, speaking at the plan's launch, emphasized the significance of road safety, highlighting the collaboration required across all sectors to transform roads into safe corridors of productivity and opportunity.

Collaborative Implementation for Impact

The NRSAP's implementation is managed through a robust governance structure that includes the following: the Cabinet Committee on Health and Social Protection, which provides high-level oversight; the Multi-Agency Steering Committee (MASC), which ensures inter-agency coordination; and technical working groups, which execute technical and operational aspects.

Stakeholders such as the National Transport and Safety Authority (NTSA), the Kenya National Police Service, and private transport operators play pivotal roles in driving the agenda. Notably, the NTSA is tasked with overseeing the strategy, leveraging its mandate established under the NTSA Act of 2012 to ensure road safety compliance.

One key innovation under the NRSAP is the allocation of 10 percent of road infrastructure budgets to safety measures, such as pedestrian crossings, lighting, and barriers. Additionally, a portion of the fuel levy will be dedicated to safety programs, ensuring consistent funding.

Addressing Road User Behavior

Speeding, drink driving, using mobile devices while driving, not using seat belts, and reckless driving are major contributors to road traffic fatalities in Kenya. The NRSAP prioritizes education and enforcement to combat these road user behaviors. Public awareness campaigns are planned to promote responsible road use, complemented by stricter penalties for traffic violations.

The Kenya National Police Service is undergoing capacity building to enhance its enforcement capabilities. Automated systems, including speed cameras and mobile Breathalyzers, are being deployed to reduce human error and corruption during enforcement.

Advancing Vehicle Safety Standards

Kenya's strategy also addresses vehicle safety by enforcing compliance with standards such as regular inspections and crashworthiness requirements. Collaborations with manufacturers aim to improve vehicle quality, while stringent penalties for noncompliance are expected to deter substandard practices. These efforts align with the NRSAP's goal of ensuring that vehicles on Kenyan roads meet international safety benchmarks.

Improving Postcrash Services

A critical component of the NRSAP is improving postcrash services to save lives and reduce the severity of injuries. Ambulance services are being expanded, and emergency response times are being shortened through centralized coordination. Hospitals are receiving enhanced training and equipment to handle trauma cases effectively. A national trauma registry will track injury data, enabling targeted interventions and resource allocation.

Early Results and Public Perception

Since its launch, the NRSAP has shown promise. Initial evaluations indicate a reduction in speeding violations and improved adherence to traffic rules in targeted areas. Public support for the plan is growing, particularly among transport operators and civil society organizations. However, challenges such as inadequate infrastructure in rural areas and resistance to behavioral change remain.

Lessons Learned and Path Forward

The NRSAP demonstrates that multisectoral collaboration and sustainable funding are crucial for road safety interventions. The Kenyan government has successfully mobilized resources and partnerships, including support from development partners such as the World Bank and the European Union. President Ruto's leadership has been instrumental in rallying diverse stakeholders, ensuring alignment with national priorities.

Looking forward, Kenya aims to expand its safety measures to underserved regions, strengthen enforcement mechanisms, and scale up data-driven interventions. The government's commitment to automating traffic management and integrating digital solutions will further enhance efficiency and transparency.

Conclusion

The National Road Safety Action Plan 2024–2028 reflects Kenya's determination to address its road safety challenges comprehensively. By fostering partnerships, prioritizing evidence-based interventions, and committing resources, the government is laying the foundation for safer roads. While the journey is far from complete, the NRSAP serves as a model for other nations seeking to reduce road traffic fatalities and build safer, more sustainable transport systems.

President Ruto aptly reiterated the need for a zero-tolerance approach to negligence on the roads, aiming to ensure every Kenyan can travel safely and reach their destination.

National Road Strategy and Targets

RSLAs play a critical role in developing ambitious yet actionable strategies and targets that align with global and regional frameworks. However, these efforts must be supported by adequate and sustained funding to close the gap between planning and implementation (Mitullah, Small, and Azzouzi 2022). Thirty-eight countries have national road safety strategies, of which 32 are developed, implemented, and evaluated in collaboration with stakeholders, including academia, civil society organizations, the private sector, and youth groups. Funding for strategy implementation is reported in 33 countries.

While 24 countries include fatality reduction targets in their strategies, only 17 report having nonfatality reduction targets. Additionally, only 19 of the fatality reduction targets and 14 of the nonfatality reduction targets align with Sustainable Development Goal (SDG) target 3.6, to halve road traffic deaths and injuries by 2030. While some national road safety strategies address alternative forms of transport, safe road user behavior, and adherence to vehicle and road safety standards, only a few have set targets with clear time frames for achievement (table 1).

Table 1: Road Safety Targets Included in Road Safety Strategies, 2021

	Addressed in strategy	Strategy sets targets
Alternative modes of transport		
Promotion of walking as an alternative to car travel	14	4
Promotion of bicycling as an alternative to car travel	13	3
Promotion of convenient access to public transport	25	8
Safe road user behavior		
Promotion of the use of seat belt use	35	17
Promotion of the use of child restraints	23	10
Promotion of the use of helmets	38	15
Limiting vehicle speed	37	13
Preventing alcohol-impaired driving	29	11
Preventing drug-impaired driving	26	5
Decreasing distracted driving	30	10
Ensuring rest periods for professional drivers	22	14
Vehicle and road safety standards		
Ensuring roads traveled meet technical safety standards for all users	27	12
Ensuring new vehicles meet United Nations technical safety regulations or equivalent	23	5
Improved times between crash and access to professional emergency health care	28	12

Source: WHO 2023.

Ratification of International and Regional Legal Road Safety Instruments

The United Nations (UN) road safety conventions serve as a foundation on which states can build national legal frameworks governing road safety interventions. To apply these conventions, countries must accede to and integrate them into national legislation with clear enforcement measures (UNECE 2020). Seven road safety conventions are considered priorities for accession (box 1). African countries could adapt these standards to their local context when updating or improving their national legislation and policies to ensure relevance and effectiveness. In this respect, the African Road Safety Charter further provides a structured framework for improving road safety across the continent and serves as an advocacy tool for creating an enabling environment to reduce road traffic crashes (AU 2016).

BOX 1: United Nations Road Safety Conventions

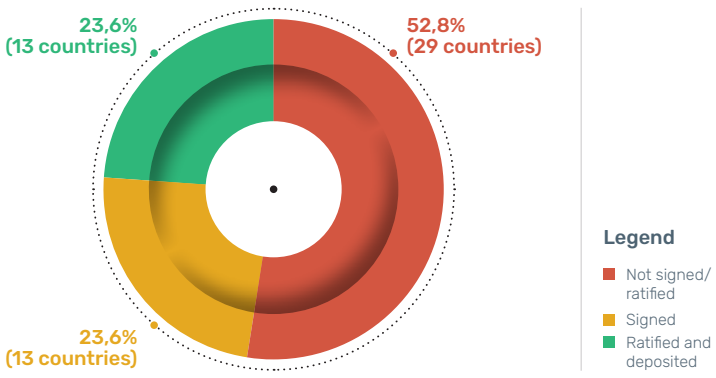
- Conventions on Road Traffic (1949 and 1968)
- Convention on Road Signs and Signals (1968)
- "Vehicle Regulations" Agreements (1958, 1997, 1998)
- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (1957)
- European Agreement concerning the Work of Crews of Vehicles Engaging in International Road Transport (AETR) (1970).

Source: UNECE 2020.

Other international convention and regulations include the 1950 Traffic Arteries Convention, the 1975 AGR Convention, and the 2003 International Asian Highway Network.

To date, 31 African countries adhere to at least one UN convention; only three adhere to all seven. In the same vein, 13 countries have signed, ratified, and deposited their instruments of ratification of the African Road Safety Charter to the AU Chairperson Legal Office (figure 8).

Figure 8: Ratification of the African Road Safety Charter, 2021



Source: AU 2025.
Note: N=55.

Data Management

Effective road safety management requires robust data systems to define road safety problems, identify risk factors, set priorities, and monitor progress (WHO 2010). Comprehensive road safety data management systems comprise the mechanisms and arrangements for data collection and analysis that cover all road safety interventions, including process indicators (for example, legislation), performance indicators (for example, helmet use), exposure measures (for example, vehicle fleet), outcome indicators (injuries and fatalities), and the social costs of road traffic crashes.

Outcome Indicators

Most countries (47) collect data on road traffic crashes and injuries.[6] Thirty-four countries also have a system to document serious injuries. Road traffic fatalities are recorded through the civil registration and vital statistics (CRVS) system in 21 countries, yet this system is the source of road traffic fatality data in only three countries. Most countries (28) rely on police records as their only source of road traffic fatality data, and one country did not report on the source of data used (table 2). Reliance on a single source of data likely leads to underreporting.

Definitions of serious injuries and fatalities vary widely, with countries using more than one definition. Thirty countries use the definition "died within 30 days of crash" for fatalities, while only three countries use standard criteria (MAIS, RTS, or MGAP)[7] for injury severity. Inconsistent definitions compromise data quality, limiting the ability to manage road safety effectively.

Over the past decade, reviews to address the challenges in road safety data systems have consistently highlighted issues such as underreporting of road traffic injuries and fatalities, fragmented data collection processes, and the absence of standardized methodologies (Martensen et al. 2021; Mitra and Bhalla 2023). Efforts to harmonize road safety data, such as the establishment of the African Road Safety Observatory (ARSO), have provided a platform for regional collaboration to regularly exchange data on road safety issues and share information on safety performance indicators. Despite the abundance of diagnostic studies, limited technical and financial resources remain a major barrier to achieving robust and reliable data systems. As emphasized in the Marrakech Declaration of the 1st African Road Safety Forum (2018), there is a need for sustained investment and capacity building tailored to the African context (Segui-Gomez et al. 2021; WHO 2010).

Table 2: Sources of Road Traffic Fatality Data, 2021

Single source		Two sources		Three sources		Four or more sources
Other/health facility records	Police	Police, health facility records	Police, other	Police, health facility records, other	Police, health facility records, CRVS	Police, CRVS, health facility records, insurance, other
5	28	5	7	2	1	2

Source: WHO 2023.
Note: CRVS = civil registration and vital statistics.

6. This survey did not assess whether countries collected data on the social costs of road traffic crashes.
7. MAIS = Maximum Abbreviated Injury Severity; RTS = Revised Trauma Score; MGAP = Mechanism, Glasgow Coma Scale, Age, Arterial Pressure.

Performance Indicators

More countries have systems to monitor road user behavior compared to transport modality use. Among road-use behaviors, seat belt use (25 countries) and speeding violations (24 countries) are the most monitored, while the use of child restraint systems is monitored in only eight countries. Data are obtained mainly from issuance of tickets for violation or police crash reports.

Only 10 countries report on the use of public transport, and no country reports on the use of motorized two- and three-wheelers. This lack of performance indicator data undermines efforts to identify risk factors, monitor trends, and evaluate the effectiveness of road safety interventions.

Reporting on process indicators is described in other sections of this report.

Strengthening road safety data systems requires standardized definitions, diversified data sources, sustained investment, capacity building, effective monitoring, and regional collaboration to enable evidence-based policy making and impactful interventions (Mitullah, Small, and Azzouzi 2022). Numerous country data reviews conducted across Africa in recent years have provided a clear understanding of road safety challenges; the focus must now shift from diagnosing the problems to implementing effective solutions.

CASE STUDY 4

Intelligent Transport Management: Improving the Safety of Interurban Transport in Cameroon with Ym@ne Driver

Road safety has long been a pressing issue in Cameroon, where traffic accidents claim an average of 1,200 lives annually and leave thousands more injured. The economic cost of these incidents is staggering, estimated at 1 percent of the national GDP, or roughly US$1.3 billion. Recognizing the need for transformative action, the Ministry of Transport, in collaboration with public and private partners, introduced the Ym@ne Driver system, a centralized, intelligent platform designed to address key risk factors in interurban transport. This initiative represents a milestone in the country's efforts to modernize transport safety and reduce traffic-related fatalities and injuries.

Addressing the Road Safety Crisis

The development of Ym@ne Driver stems from three primary concerns: human error, vehicle defects, and poor road conditions. Studies attribute up to 70 percent of crashes to risky driver behavior, including speeding, fatigue, and distraction. Previous government interventions, from regulatory reforms to infrastructure upgrades, achieved limited success in tackling these multifaceted challenges.

In response, the Ym@ne Driver system was conceptualized to leverage advanced technology in monitoring, managing, and improving interurban transport safety. The platform, launched as a public-private partnership with CAMTRACK-MTN, represents an investment of approximately US$20 million. It combines real-time data collection, driver behavior analysis, and fleet management to address these systemic issues proactively.

Key Features of Ym@ne Driver

The Ym@ne Driver system comprises several interconnected components:

(1) **Establishment of a centralized traffic control center:**
Located at the Ministry of Transport, this state-of-the-art facility collects, processes, and stores data on interurban transport operations. High-resolution monitors display vehicle locations, traffic patterns, and potential hazards in real time.

(2) **Continuous in-vehicle surveillance:**
Participating vehicles are equipped with GPS trackers, multiple cameras, and behavior-monitoring sensors. These devices capture critical data such as driver actions (for example, speeding, fatigue, phone use), passenger interactions and seat belt use, and external road conditions, including obstacles and congestion.

(3) **Real-time alerts and reporting:**
The system immediately notifies drivers, transport companies, and police enforcement teams of risky behaviors or violations, enabling prompt corrective actions.

(4) **Provision of fleet management tools:**
Transport operators benefit from features that track vehicle maintenance schedules, monitor compliance with administrative requirements, and generate automated reports on fleet performance.

(5) **Behavioral scoring and accountability:**
Transport companies are ranked based on their adherence to safety standards, fostering accountability and encouraging industry-wide improvements.

Implementation and Achievements

The implementation of Ym@ne Driver has been phased, beginning with high-risk sectors such as hazardous goods transport and interurban passenger services. Over five years, 764 goods transport vehicles and 934 passenger transport vehicles have been equipped with the system. Key achievements include the following:

- **Zero fatalities in hazardous goods transport:**
  Since the system's deployment in this sector, no fatal accidents have been recorded, demonstrating its effectiveness in mitigating risks.
- **Reduction in risky behaviors:**
  Instances of speeding, phone use, and seat belt noncompliance have significantly decreased among drivers monitored by Ym@ne Driver.
- **Strong decrease in crash numbers:**
  Transport companies that previously recorded an average of three crashes every 10 days have reported a near-total elimination of incidents post-implementation.

Challenges and Lessons Learned

While Ym@ne Driver has achieved notable success, its implementation has not been without challenges. Some transport operators initially resisted adopting the system because of the costs involved and concerns over privacy. Public awareness campaigns, coupled with financial incentives such as insurance discounts for compliant vehicles, have helped address these issues.

Lessons learned from the project highlight the importance of collaboration. The partnership between the Ministry of Transport, private sector entities like CAMTRACK-MTN, and transport operators has ensured the system's sustainability. Additionally, the use of real-time alerts and feedback has proven crucial in improving driver behavior and preventing accidents.

Recommendations for the Future

To build on the success of Ym@ne Driver, the following steps are recommended:

(1) **Expand coverage:**
Mandatory installation of the system in all interurban transport vehicles should be enforced, with phased implementation for smaller operators.

(2) **Enhance training:**
Continuous education programs for drivers and transport operators are needed to maximize the system's impact.

(3) **Integrate advanced analytics:**
Incorporate artificial intelligence to predict high-risk scenarios based on historical data, further improving preventive measures.

(4) **Strengthen incentives:**
Broaden financial benefits, such as reduced leasing costs or tax breaks, to encourage adoption among hesitant operators.

(5) **Improve emergency response:**
Use data from Ym@ne Driver to enhance coordination among emergency services, reducing response times to accidents.

Conclusion

Ym@ne Driver is a groundbreaking approach for improving the safety of interurban transport in Cameroon. By combining cutting-edge technology with robust governance, the system addresses key risk factors and sets a new standard for traffic management in the region. With its demonstrated success in reducing crashes and fatalities, Ym@ne Driver can serve as a model for other countries grappling with similar challenges.

As Cameroon continues to refine and expand this initiative, its commitment to innovation and collaboration offers hope for safer roads and a more efficient transport network. The project underscores the potential of technology-driven solutions to transform road safety, saving lives and fostering economic growth.

Safer Roads and Mobility

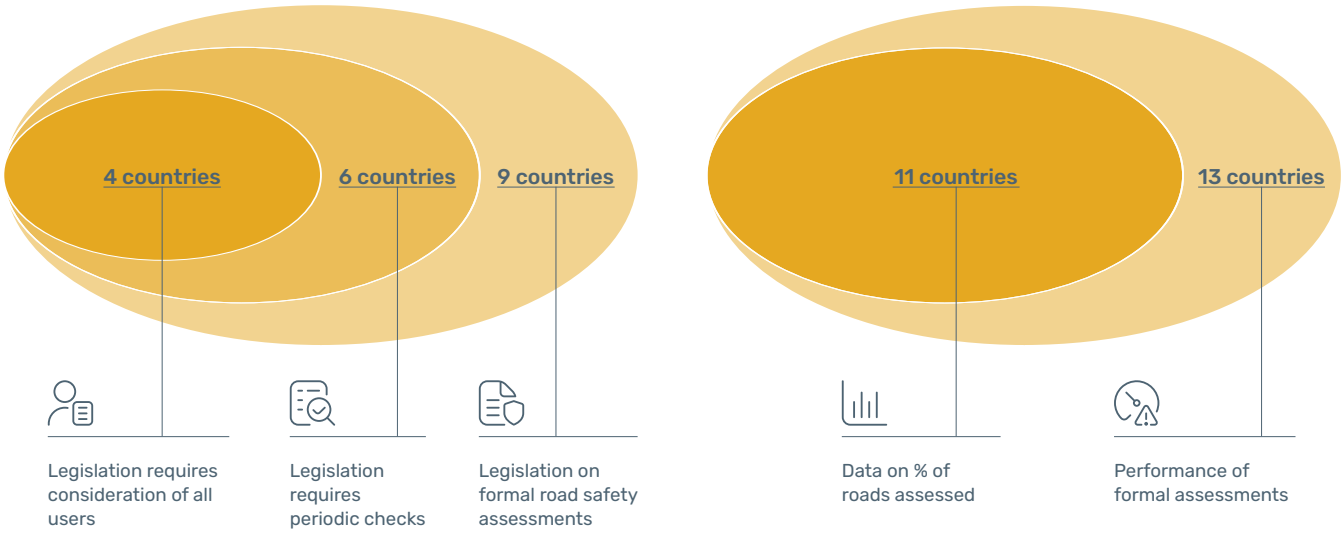
Safe road infrastructure is essential for reducing road traffic crashes and injuries. It serves as a preventive measure by minimizing risks, promoting safe road user behavior, and ensuring safety for all road users, particularly pedestrians, cyclists, and motorcyclists. Effective road infrastructure supports multimodal mobility—including public transport, walking, and cycling—through careful design, construction, and maintenance (Mitra et al. 2022; AU 2021; WHO 2021).

Establishing mechanisms that prioritize safety in the design and maintenance of new and existing roads is crucial for achieving safer mobility. The African Road Safety Action Plan 2021–2030 recommends adopting technical design standards that consider the safety of all users, supported by formal road safety audits. The star rating system developed by the International Road Assessment Programme (iRAP) is an objective measure of the level of safety, with three stars the minimum acceptable rating for both new and existing roads (iRAP 2018).

Technical design standards for new roads are present in 38 countries but are aligned with relevant international conventions in 35 countries. Safety features for pedestrians and cyclists (such as managing speed, global street design guidelines, safe crossings, and separation from vehicular traffic) are included in the standards of 36 countries; in 29 countries, the standards recognize the importance of land use and how land-use considerations influence the expected mix of different road users within the transport system.

Only nine countries have laws mandating formal road safety assessments. Six countries legally require periodic maintenance checks, while only four countries mandate consideration for all road users. Formal road assessments are performed in 13 countries, of which 11 report the proportion of the road network undergoing safety rating assessment. Additionally, only 11 countries report on the use of specific guidelines for auditing, including safety/star ratings and global street design standards (figure 9).

Figure 9: Road Safety Assessment: Legislation, Performance, and Data Availability, 2021



Source: WHO 2023.
Note: N=49.

Based on available data from 37 countries, there are 1,188,734 kilometers of paved roads. Only six countries report having dedicated cyclist lanes, with a combined total length of 1,233.4 kilometers, 94 percent of which is in one country.

According to assessments performed using the iRAP star rating methodology on 50,166 kilometres of roads across 13 countries, only 17 percent meets a three-star or higher safety rating for pedestrians, 29 percent for motorized two- and three-wheelers, 15 percent for cyclists, and 38 percent for passenger vehicles.[8] These findings suggest that few roads in Africa achieve a three-star or higher rating, though it is important to note that these assessments were not necessarily based on a representative sample of all roads within the continent.

The design, construction, and maintenance of road and transport systems in Africa reflect prioritization of motorized vehicles over vulnerable road users. Given that over 70 percent of road users in Africa are pedestrians (UNEP and UN-Habitat 2022), and that vulnerable road users account for the highest proportion of fatalities, prioritizing their safety and accessibility is essential. This is especially important considering the rapid urbanization of African cities, where equitable transport systems are urgently needed.

8. Safety rating data are from iRAP Safety Insights Explorer, iRAP, London (n.d.), https://irap.org/safety-insights-explorer/.

CASE STUDY 5

Reimagining Mobility: Regional Collaboration, Kenya, and the Pan African Action Plan for Active Mobility

In the heart of Africa's dynamic urban landscapes, where walking and cycling remain dominant yet perilous modes of transport, a transformative initiative is taking shape. Kenya, alongside several other African nations, is pioneering efforts under the Pan African Action Plan for Active Mobility (PAAPAM) to revolutionize mobility and prioritize safety and inclusivity for nonmotorized transport users.

A Systematic Neglect

Active mobility—walking and cycling—is the lifeblood of African cities and rural areas, where millions depend on these modes daily, yet infrastructure planning has historically catered to private vehicles, leaving pedestrians and cyclists neglected. In many cities, this oversight manifests in poorly designed and disconnected walkways, nonexistent cycling lanes, and alarming road fatality rates disproportionately affecting vulnerable groups like women, children, and persons with disabilities.

The 2022 Africa Regional Forum for Action in Kigali illuminated this widespread challenge. Stakeholders from across the continent recognized a shared crisis: walking and cycling, while crucial to economic and social mobility as well as local transport pollution reduction targets, were consistently sidelined in policy and investment frameworks. This gathering catalyzed the creation of PAAPAM, a blueprint for reversing decades of neglect and reshaping African mobility systems.

A Unified Vision for Active Mobility

PAAPAM, launched in 2024 at the World Urban Forum in Cairo, represents a bold vision. Anchored in three strategic pillars—safety, advocacy, and integration into policy—the plan sets ambitious goals to eliminate road fatalities for pedestrians and cyclists, enhance accessibility, reduce pollution, and create infrastructure that fosters comfort and health.

In Kenya, the plan is not just an abstract document; it is a road map for action. With support from international organizations like the United Nations Environment Programme (UNEP), United Nations Human Settlements Programme (UN-Habitat), and the World Health Organization (WHO), Kenya is one of five pilot countries implementing the plan. Local governments are conducting baseline analyses, revisiting outdated urban policies, and committing to building infrastructure that reflects PAAPAM's safety, climate, and inclusivity goals.

Collaborative Action Across Sectors

The success of PAAPAM hinges on a multisectoral approach. In Kenya, national ministries, local authorities, civil society organizations, and international development partners work hand in hand across sectors. At the international level, UNEP leads policy development and capacity-building initiatives, while UN-Habitat integrates urban planning expertise. The WHO emphasizes health and safety components, ensuring that the plan is as much about well-being as it is about mobility.

Workshops and training sessions have equipped Kenyan officials with the tools to draft both national and local-level active mobility policies and strategies. Stakeholders, including local nongovernmental organizations and research institutions, are rallying communities to embrace the vision. From Nairobi to smaller cities, the message is clear: active mobility is no longer an afterthought but a critical component of sustainable development.

Progress and Challenges

Since its launch, PAAPAM has galvanized action across Africa, with dedicated consultations and collaboration from north to south, east to west. Over 1,400 stakeholders across sectors have been directly engaged in consultations, fostering a sense of ownership and commitment. These dialogues have not only highlighted diverse perspectives but also ensured that solutions are tailored to Africa's unique urban and rural dynamics.

The plan's most tangible achievement is the prioritization of nonmotorized transport in urban policy discussions. For the first time, a regionally specific framework exists to guide investment in walking and cycling infrastructure. However, challenges remain. Shifting cultural perceptions about walking and cycling, ensuring sustained financial commitment, and addressing enforcement gaps require unwavering effort.

Looking Ahead

PAAPAM is more than a plan; it is a movement toward a safer, more equitable future. By embedding walking and cycling prioritized in the urban and rural fabric, the initiative promises reduced greenhouse gas emissions, healthier lifestyles, and safer streets. The ripple effects extend beyond mobility, fostering social cohesion and bridging economic divides.

For Kenya, the path forward lies in sustained advocacy, robust stakeholder engagement, and scaling successful pilot projects to the national level as well as exploring opportunities for a national commitment for walking and cycling. The lessons learned will not only shape the country's transport future but also serve as a beacon for other African nations striving to reimagine mobility in an inclusive, sustainable manner.

Vehicle Safety

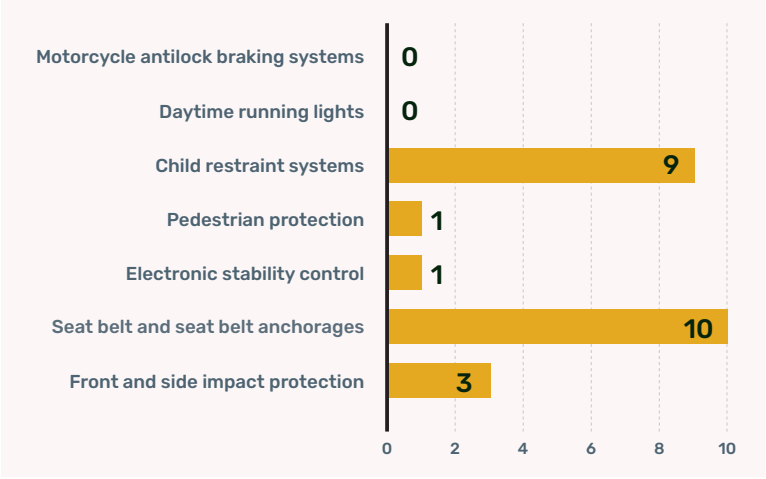
The design of vehicles plays a significant role in determining the likelihood of crashes and the risk and severity of injuries for both vehicle occupants and other road users. Adherence to the UN legislative standards for vehicle design and technology ensures a uniform and acceptable level of safety for motorized vehicles (WHO 2017).

Table 3: Registered Vehicles in Africa, 2021

Registered vehicles	Number	n/51
Total registered vehicles	87,724,608	37
Cars and wheeled light vehicles	20,122,458	21
Motorized two- and three-wheelers	7,810,822	21
Heavy trucks	2,785,166	23
Buses	853,711	21
Other	2,125,209	12

Source: WHO 2023.
Note: N=37.

Figure 10: Vehicle Safety Legislation, 2021



Source: WHO 2023.
Note: N=33.

Laws on the registration of motorized vehicles are present in 49 countries, but these laws apply to both private and professional vehicles in only four countries. Despite the presence of vehicle registration systems in 44 countries, data on the number of registered vehicles are available in only 37 countries, with even fewer countries reporting on the breakdown of vehicles by type. This highlights significant weaknesses in vehicle registration systems, which fail to adequately capture the number and types of vehicles in circulation.

Based on available data, there were 87,724,608 registered vehicles in Africa in 2021. Cars and wheeled light vehicles form the bulk of all registered vehicles, accounting for 23 percent, followed by motorized two- and three-wheelers (9 percent), heavy trucks (3 percent), other vehicles (2 percent), and buses (1 percent) (table 3).[9]

Periodic vehicle inspections are required by law in 42 countries. While 33 countries have national laws addressing vehicle safety for four-wheeled motorized vehicles, only one country has similar laws for motorized two- and three-wheeled vehicles. The safety features most included in these laws are seat belts, seat belt anchorages, and child restraints, while pedestrian protection and electronic control stability are the least included features (figure 10).

Restrictions on the import and export of used vehicles are reported in 36 countries, of which 31 use vehicle safety criteria (none of the countries specified the vehicle safety criteria used) with or without age limits. Additionally, government vehicle procurement practices include safety prerequisites in 30 countries. As Africa remains the largest global market for used vehicles (UNEP 2021), restricting the import and export of unsafe vehicles is critical for protecting all road users and preserving the environment.

9. Reporting on the number of registered vehicles was incomplete, with some countries not reporting the registration of some types of vehicles. Totals of the types of vehicles do not add up to the total number of registered vehicles.

CASE STUDY 6

Tunisia's National Road Safety Strategy: A Framework for Safer Roads (2023–2034)

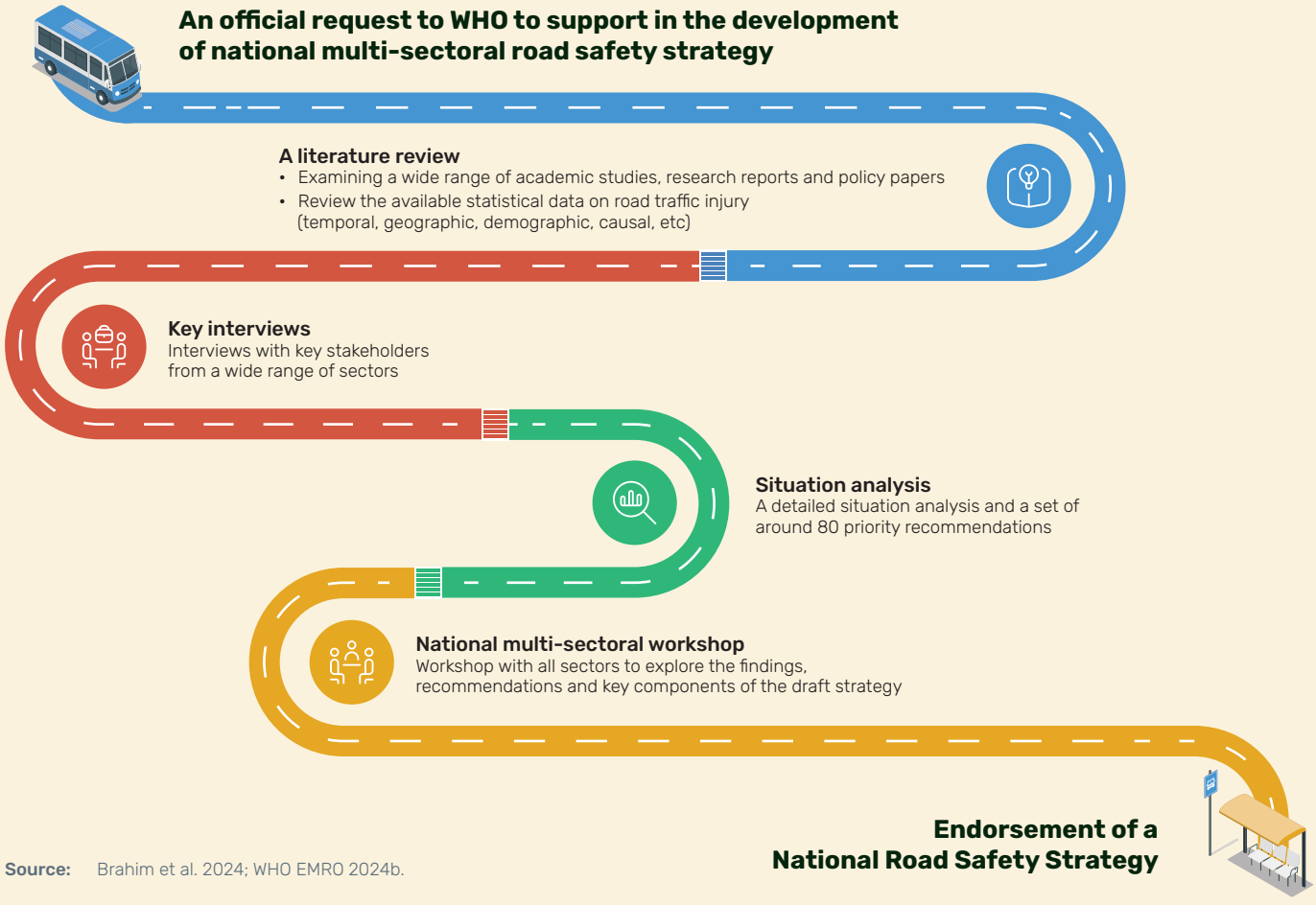
Tunisia's National Road Safety Strategy (2023–2034) is the latest effort in addressing the country's persistent road safety challenges. While progress has been made—reducing road traffic fatalities from 24 per 100,000 in 2016 to 16 per 100,000 in 2021—Tunisia still faces over 2,000 road fatalities annually, alongside economic and social repercussions. The new strategy, developed with support from the World Health Organization (WHO), takes a structured approach to reduce these numbers through evidence-based interventions and multisectoral collaboration.

Supported by WHO Normative Guidance

The National Road Safety Strategy has been informed by global best practices and guidance from the WHO's Global Plan for the Decade of Action for Road Safety 2021–2030 as well as findings of the *Global Status Report for Road Safety 2023*, the Strategic Action Framework to Strengthen Road Safety Systems in the Eastern Mediterranean Region, and *Documenting Road Safety, a Guide for Governments and Lead Agencies*.

These frameworks emphasize a "safe system" approach, which recognizes that human errors are inevitable and aims to mitigate their consequences through safer infrastructure, vehicles, and behaviors. This approach also aligns with Sustainable Development Goal 3.6, which targets a 50 percent reduction in road traffic deaths and injuries by 2030.

WHO provided technical expertise throughout the strategy's development, ensuring it was both evidence based and aligned with international standards. This included workshops to assess Tunisia's existing road safety policies and to identify priority areas for intervention, as well as capacity-building activities to enhance the knowledge of national stakeholders.



Source: Brahim et al. 2024; WHO EMRO 2024b.

Strategic Themes and Objectives

Tunisia's strategy is organized around three key themes:

(1) **Inclusive mobility:**
This requires safe and accessible transport for all users, with a focus on vulnerable road users such as pedestrians and cyclists.

(2) **Forgiving roads:**
This requires improving road design and management to reduce the severity of crashes and protect users from fatal outcomes.

(3) **A secure future:**
Utilizing technological advancements and fostering a culture of accountability should sustain long-term road safety improvements.

These themes are underpinned by detailed action plans aimed at reducing road traffic fatalities and serious injuries by 50 percent by 2030. Additionally, the strategy guided enabling actions including governance, performance management, capacity building, and resource mobilization.

Key Priority Areas for Action

The strategy outlines priority actions under five broad categories:

(1) **Safe infrastructure and speeds:**
Immediate measures include deploying automated speed controls, establishing safer school zones, and conducting safety assessments of high-risk roads using tools such as the International Road Assessment Programme (iRAP). Over the medium term, national speed limits will be reviewed to reflect road safety principles.

(2) **Promoting multimodal transport:**
Measures to encourage sustainable mobility include restricting vehicle use in dense urban areas, improving public transport systems, and implementing user-friendly ticketing platforms.

(3) **Safer road users:**
Initiatives in this area focus on driver education and enforcement, including stricter helmet requirements, public awareness campaigns, and technology-based monitoring of seat belt and mobile phone use.

(4) **Safer vehicles:**
Tunisia plans to harmonize its vehicle safety regulations with international standards, ensuring compliance with features such as electronic stability control (ESC) and antilock braking systems (ABS).

(5) **Postcrash response:**
Enhancing emergency medical services is a key focus, with the aim of halving average emergency response times and expanding access to trauma care and rehabilitation services.

Actions under each theme have been prioritized into groups to be completed over different time periods. For the short term, these actions are expected to be complete in less than two years, medium term actions should be complete in three to five years' time, while longer term actions will take more than five years to be fully implemented.

Governance and Implementation Requirements

The strategy emphasizes the importance of robust governance structures and clear implementation pathways. Oversight is provided by the National Road Safety Council, which coordinates activities among government agencies, local authorities, and private stakeholders. Regional committees and the National Road Safety Observatory (ONSR) monitor progress and adapt interventions to local contexts.

The successful implementation of the strategy will rely on several prerequisites:

- Translation of all priority actions into specific, well-defined tasks
- Attribution of responsible agencies to all tasks
- Definition of timescales and measurable performance indicators for all tasks
- Provision of specific resource inputs and seeking additional funding to support the implementation plan
- Organization of monitoring, communication, and evaluation components

Source: Brahim et al. 2024; WHO EMRO 2024b.

Challenges and Regional Implications

Although the strategy represents a significant step forward, its success will depend on overcoming several challenges. These include addressing gaps in technical capacity, managing resistance to behavioral changes, and securing consistent funding for interventions. Furthermore, expanding public awareness and fostering a culture of accountability among road users will be critical for achieving lasting results.

On a broader level, Tunisia's strategy may serve as a potential model for other nations in the region. By aligning its actions with WHO's global framework and prioritizing data-driven interventions, Tunisia demonstrates the feasibility of structured road safety planning in resource-limited settings.

Conclusion

Tunisia's National Road Safety Strategy for 2023–2034 provides a structured framework for addressing the country's road safety challenges. The strategy lays the groundwork for reducing road fatalities and injuries in a sustainable manner. Effective partnerships and intensive cooperation between national authorities, international organizations, and key experts will remain essential at every stage of the strategy's further development, implementation, and ongoing refinement. While significant challenges remain, the strategy reflects a pragmatic approach to improving road safety, with the potential to save thousands of lives and serve as a regional benchmark for similar initiatives.

Safe Road Users

Speeding, driving under the influence of alcohol or drugs, distracted driving, and the nonuse of seat belts, child restraints, and motorcycle helmets significantly increase the risk of crashes and the vulnerability of people to serious injuries and death. Addressing these behavioral risk factors requires an integrated strategy that combines legislation, enforcement, and education. The WHO recommends a minimum set of best-practice criteria for laws and regulations that are based on scientific evidence to prevent and mitigate the impact of crashes (box 2).[10]

BOX 2: WHO Best-Practice Criteria

RISK FACTOR	WHO BEST-PRACTICE CRITERIA
Speed	National speed law in place Speed limits on urban roads ≤50 km/h Local authorities have the power to modify national speed limits
Drink driving	National drink-driving law in place Drink-driving law is based on BAC or equivalent BrAC BAC limit for general population ≤0.05 g/dl BAC limit for novice population ≤0.02 g/dl
Motorcycle helmets	National motorcycle helmet law in place Law applies to all riders Law applies to all road types Law applies to all engine types Law requires helmet to be properly fastened Law requires helmet to meet a national or international standard
Seat belts	National seat belt law in place Law applies to driver and front seat passengers Law applies to rear seat passengers
Child restraints	National child restraint law in place Law requires that children up to 10 years and 135 cm in height must use a child restraint Law restricts children under a certain age from sitting in front seat Law requires that child restraint meet a national or international standard

Source: WHO 2023.
Note: BAC = blood alcohol concentration; BrAC = breath alcohol concentration; WHO = World Health Organization.

10. WHO best-practice criteria do not exist for laws on drug driving, distracted driving, and professional driver time limits.

The comprehensiveness of laws on behavioral risk factors was assessed based on their alignment with the WHO recommended minimum set of best-practice criteria. For each risk factor, countries are categorized as: have laws that meet best practices, include only some of the criteria, or lack the criteria entirely. Most countries have comprehensive laws for only one risk factor, and no country has comprehensive laws for all five risk factors (figure 11).

The most common behavioral risk factor addressed by comprehensive laws is the use of seat belts (21 countries), and the least common is the use of child restraints (1 country) (table 4).

Speeding

Speed is a widely recognized factor influencing the risk of road traffic crashes, injury severity, and death. A 1 percent increase in mean speed correlates with a 3 percent increase in the risk of serious injuries and a 4 percent increase in the risk of death. Reducing speed by 5 percent can reduce fatalities by 20 percent. More recent evidence suggests that a change in speed has a greater impact on injury severity and fatal crash outcomes (GRSP and IFRC 2023). Setting and enforcing national speed limits is therefore essential to minimize fatalities.

Figure 11: Countries Meeting One or More of the Five Risk Factor Best Practices, 2021

18 countries
National law does not meet best practice for any risk factor

20 countries
National law meets best practice for 1 risk factor

8 countries
National law meets best practice for 2 risk factors

4 countries
National law meets best practice for 3 risk factors

1 country
National law meets best practice for 4 risk factors

NO country
National law meets best practice for all risk factors

Source: WHO 2023.

Table 4: Countries with Comprehensive Laws on Behavior Risk Factors, 2021

Risk factor	Countries with comprehensive laws
Speed	15
Drink driving	7
Seat belts	21
Helmets	8
Child restraints	1

Source: WHO 2023.

National laws setting upper speed limits for private passenger cars and motorcycles exist in 48 countries, covering urban roads in all 48 countries, rural roads in 44 countries, and motorways in 34 countries. Local authorities are legally permitted to reduce national speed limits, based on local road situations, in 24 countries.

To be effective, laws setting speed limits must be rigorously enforced. While the laws prescribe penalties for violation in 45 countries (figure 12), enforcement is reported in 41 countries. Manual enforcement is the most common measure used (31 countries), followed by use of speed limiters (8 countries) and automated enforcement (2 countries).

Monitoring systems for speeding while driving are present in 44 countries, but data on vehicles exceeding speed limits is available in only eight countries, and information on road traffic deaths attributable to speeding is reported in only 13 countries (figure 12).

Progress made in speed laws since the *GSRRS 2018* includes two additional countries enacting speed laws and two countries strengthening their laws to meet best practice. Additionally, three countries modified their existing speed laws to include penalties for violations of speed limits.

Driving under the Influence of Alcohol

Driving under the influence of alcohol significantly increases the risk and severity of a crash, with studies attributing 33–69 percent of road traffic fatalities and 8–29 percent of injuries among drivers with alcohol impairment. The WHO recommends that drink-driving laws are based on blood alcohol concentration (BAC) or breath alcohol concentration (BrAC), with specific limits for the general population, novice drivers, and commercial drivers (WHO 2014). The level of alcohol in the body can be measured as BAC by testing a sample of urine or blood, or as BrAC, which is tested using a Breathalyzer (GRSP and IFRC 2022).

While 48 countries have laws restricting alcohol-impaired driving, 41 countries base their laws on BAC/BrAC limits. Of these, only 15 countries set the BAC limit at ≤0.05 g/dl for the general population, seven countries have a BAC limit of ≤0.02 g/dl for novice drivers, and only three countries have a BAC limit of ≤0.02 g/dl for commercial drivers. This leaves drivers, especially young ones, at risk of being involved in alcohol-related road traffic crashes.

Testing for BAC/BrAC is limited, with seven countries allowing random testing, 11 countries testing drivers suspected of traffic offenses, and six countries requiring testing of drivers involved in fatal crashes. Penalties for violations are specified in the laws of 48 countries. Monitoring systems are present in 24 countries, but only 12 countries have data on the deaths attributable to drink driving (figure 13).

Since the *GSRRS 2018*, three more countries have enacted drink-driving laws, five countries have included BAC/BrAC limits in their existing laws, and one country has included all criteria in its law to meet best practice.

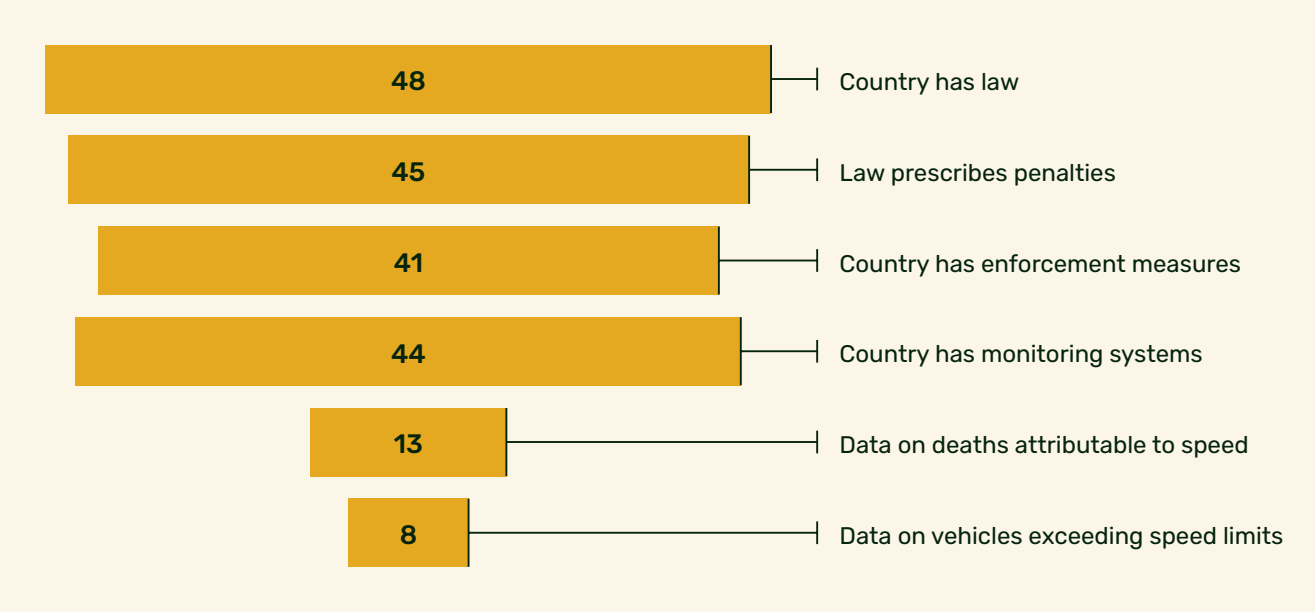
Driving under the Influence of Drugs

Drug-impaired driving is associated with an increased risk of road traffic crashes, with the severity depending on the type of drug consumed (WHO 2016a). Laws prohibiting drug-impaired driving exist in 41 countries, but only five countries specifically reference cannabis, cocaine, amphetamines, methamphetamines, and opiates.

Random testing for drugs is mandated in only three countries and in cases of suspected offenses in 11 countries. Testing of drivers involved in fatal crashes is prescribed in the laws of only five countries. Despite this, the laws require penalties for violation in 35 countries.

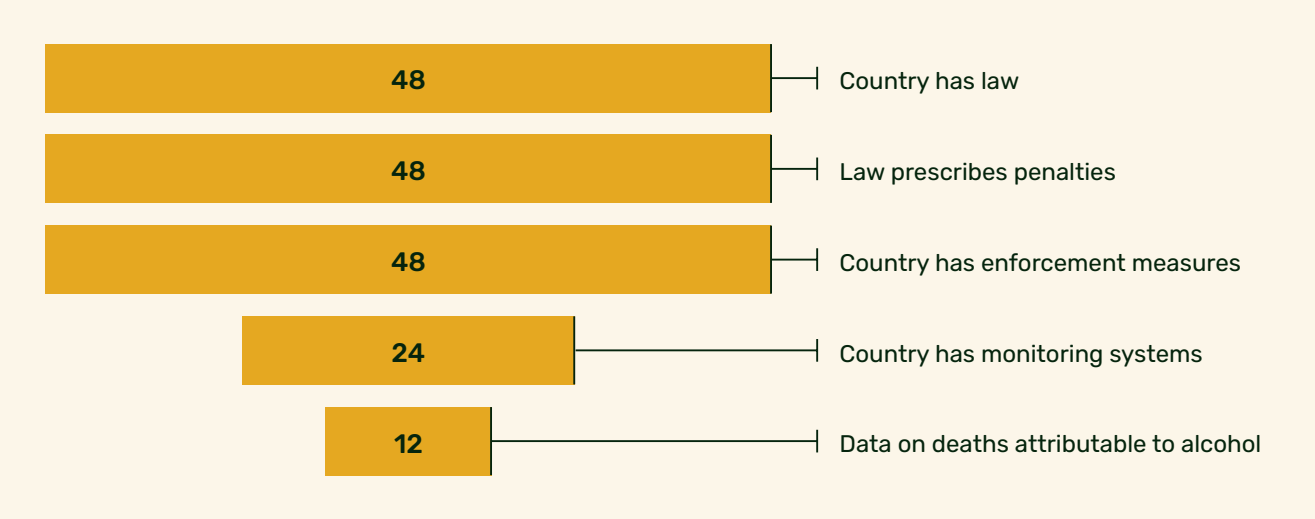
The status of drug-driving laws represents an increase of six countries since the previous status report in 2018.

Figure 12: Speed Laws, Enforcement Measures, Monitoring Systems, and Data Availability, 2021



Source: WHO 2023.

Figure 13: Drink-Driving Laws, Enforcement Measures, Monitoring Systems, and Data Availability, 2021



Source: WHO 2023.

CASE STUDY 7

Rwanda: Innovating in Road Safety

Rwanda, often heralded as a pioneer in digital transformation across Africa, has embraced technology to tackle one of its most pressing challenges: road safety. With traffic-related fatalities and injuries rising across the continent, Rwanda has positioned itself at the forefront of innovation, employing advanced solutions to safeguard its citizens. Two landmark initiatives, the deployment of drones for traffic monitoring and the implementation of a nationwide Automated Speed Enforcement system, underscore the country's commitment to making its roads safer while serving as a model for other nations.

Revolutionizing Traffic Management with Drones

In 2023, the Rwanda National Police launched an ambitious program to deploy drones for monitoring road traffic. This initiative builds on Rwanda's previous success in using drones for various public service applications, from health care delivery to environmental monitoring. The aim is simple yet transformative: reduce road traffic violations, enhance enforcement efficiency, and ensure safer mobility for all road users.

Addressing Traditional Limitations

Rwanda, like many African countries, faces challenges in managing traffic violations because of resource constraints and geographic complexities. Traditional enforcement methods, relying heavily on manual observation, struggle to cover sprawling urban areas and remote rural regions. Drones, equipped with high-resolution cameras, offer a solution by providing aerial views of roads and capturing real-time data on traffic flow and driver behavior.

The drone initiative stems from pilot projects that demonstrated their potential for public safety applications. For instance, drones were used to monitor illegal mining activities and large gatherings, proving their utility in complex enforcement scenarios. Their success prompted the Rwanda National Police to expand their use to road safety, starting with high-risk areas prone to traffic violations.

Implementation and Early Impact

The drones operate under strict protocols, capturing violations such as speeding, dangerous overtaking, and illegal parking. The data are transmitted to centralized traffic control centers, where law enforcement officers can respond promptly. In addition to issuing penalties, the drones provide valuable insights into traffic patterns, helping policy makers identify hot spots for intervention.

Initial results are promising. Traffic violations have visibly decreased in drone-monitored areas, reflecting a shift in driver attitudes and behavior. Moreover, the use of drones has significantly reduced response times for accidents and other emergencies, potentially saving lives.

Overcoming Challenges

Despite its success, the initiative has faced some hurdles. Not surprisingly, privacy concerns emerged as a key issue, with citizens questioning how drone footage would be used. To address this, the Rwanda National Police launched public awareness campaigns, emphasizing that the data are strictly regulated and used solely for enforcement purposes. Another challenge has been the high cost of drone technology, which has necessitated partnerships with private sector actors and international donors to ensure scalability.

The drones not only symbolize Rwanda's commitment to innovation but also highlight the importance of leveraging technology to address systemic challenges in road safety.

Automated Speed Enforcement: A Game Changer

Building on its digital transformation agenda, Rwanda also became the first low-income African country to implement a nationwide Automated Speed Enforcement (ASE) system. Launched in 2017 and scaled up by 2023, the ASE initiative aims to curb speeding—a major contributor to road traffic fatalities—and foster a culture of accountability among drivers.

A Pioneering Approach to Speed Management

Speeding remains one of the most critical risk factors for road safety in Rwanda, contributing significantly to crash severity and fatalities. Previously, manual enforcement methods were labor-intensive and limited in scope, often leaving high-risk areas unmonitored. The ASE program introduced fixed, mobile, and covert cameras, which are now strategically deployed across the country's highways and urban areas.

These cameras automatically detect vehicles exceeding speed limits and record violations, linking them to vehicle registration databases. Drivers receive notifications via mobile phone, detailing the infraction and associated penalties. This streamlined process not only enhances enforcement efficiency but also minimizes opportunities for corruption.

Impact on Road Safety

The introduction of the ASE system has led to a marked reduction in speeding violations and crash severity. Between 2019 and 2022, serious injury crashes declined by 87 percent in areas covered by the system. The considerable reduction in serious injuries and fatalities underscores the program's success. Minor crashes appear to have increased, but this most likely is due to improved reporting mechanisms.

Furthermore, the data generated by ASE cameras have become a valuable resource for traffic management. Authorities now have a clearer understanding of speeding hot spots, enabling targeted infrastructure improvements and better allocation of enforcement resources.

Community Engagement and Public Perception

The ASE initiative has been widely accepted by the public, thanks in part to sustained awareness campaigns. Surveys indicate that most Rwandans view the system as a fair and effective means of ensuring compliance with traffic laws. However, the program has not been without criticism. Some drivers expressed concerns about excessive penalties, particularly for minor infractions. To address this, the government introduced a tiered penalty system, distinguishing between minor and severe violations.

Transparency has also been a cornerstone of the initiative. The Rwanda National Police regularly publishes reports on ASE performance, reinforcing public trust in the system.

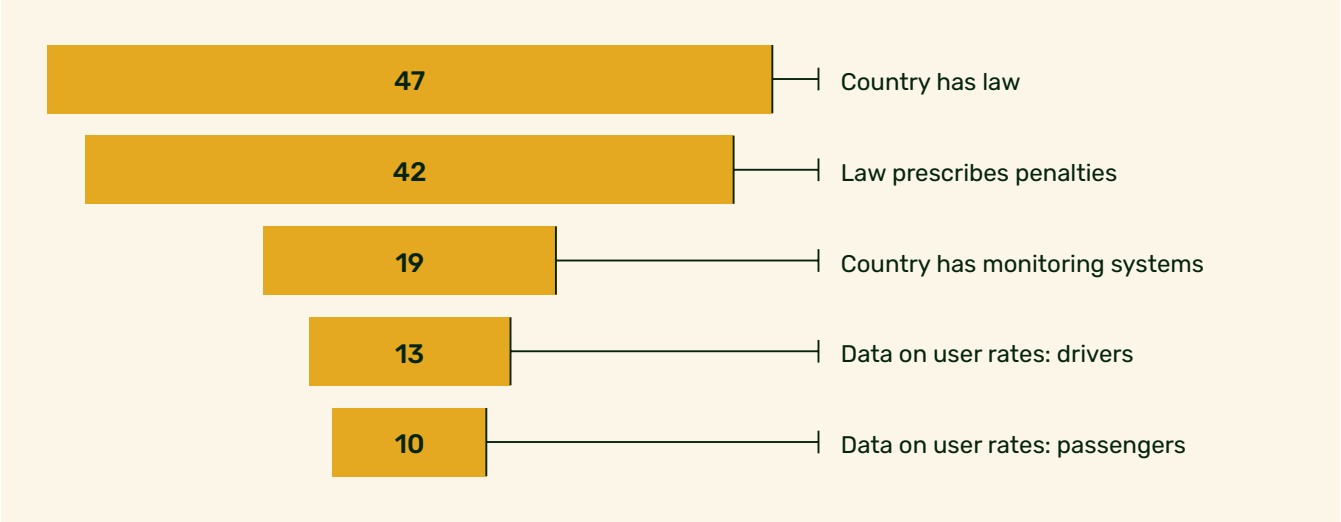
Overcoming Data and Capacity Challenges

While the ASE program has demonstrated considerable success, challenges persist. For instance, the absence of baseline speed data and inconsistencies in crash reporting have made it difficult to assess the full impact of the system. To address this, the government has partnered with international organizations to enhance data collection and analysis capabilities.

Rwanda's dual initiatives—the deployment of drones and the nationwide ASE system—represent a bold vision for road safety. Both programs showcase the country's ability to integrate advanced technology into public safety strategies, setting an example for other nations grappling with similar challenges. By reducing traffic violations and enhancing enforcement efficiency, these innovations are saving lives and fostering safer mobility. However, the journey is far from complete. Rwanda must continue to address challenges such as data gaps, public awareness, and financial sustainability to ensure the long-term success of these programs. Additionally, the lessons learned from these initiatives can serve as a blueprint for scaling similar efforts across Africa.

In a region where road traffic injuries remain a leading cause of death, Rwanda's commitment to innovation offers hope. By leveraging technology and fostering collaboration, the country is charting a path toward safer, more equitable roads—proving that with vision and determination, transformative change is possible.

Figure 14: Helmet Laws, Monitoring Systems, and Data on Helmet Use, 2021



Source: WHO 2023.

Distracted Driving

Distracted driving diverts attention away from safe driving toward activities such as the use of a handheld or hands-free mobile phone or other distractions (cognitive, visual, or auditory). With rapidly increasing ownership and use of mobile phones, distracted driving is becoming a growing concern (WHO 2011, 2016a).

Laws restricting distracted driving exist in 46 countries, with a ban on the use of handheld mobile phones reported in 41 countries and a ban on the use hands-free devices reported in 16 countries. Penalties for violations are prescribed in 41 countries.

Some progress has been made in restricting the use of mobile phones while driving, with three more countries enacting laws and four more countries banning the use of hands-free devices. Additionally, the number of countries with penalties for violations has increased by four.

Helmet Laws

The use of motorcycle helmets can reduce the risk of death by 42 percent and severe head injuries by 70 percent if the appropriate standard is used and when the helmets are properly fastened (WHO 2014). With the increasing demand for and ownership of motorcycles in Africa, establishing and enforcing laws and standards on helmet use are critical to reduce road traffic fatalities involving motorcycles.

Laws mandating helmet use are in place in 47 countries, but only 20 countries reference specific helmet standards, and 10 countries require proper fastening. Penalties for violation are prescribed in 42 countries.

Helmet use rates are reported in 23 countries, of which 13 provide data on driver helmet use; the use rates range from 9 percent to 100 percent, with nine countries reporting rates above 50 percent. Passenger helmet use rates, reported by 10 countries, range from 2 percent to 100 percent, with four countries having rates above 50 percent (figure 14).

Progress made in helmet laws since the *GSRRS 2018* includes an increase in the number of countries with a law by five, and strengthening of existing laws to meet best practice (1 country) and to prescribe penalties for violation (three countries).

Seat Belt Use

Seat belt use reduces the number of fatalities and severity of injuries. When properly restrained with seat belts, the risk of death is reduced by 40–50 percent among front seat passengers (WHO 2014).

National laws mandating the use of seat belts are reported in 45 countries, but only 22 countries require all car occupants to use seat belts, while 23 countries limit the requirement to only drivers. Penalties for noncompliance exist in 40 countries (figure 15).

Seat belt use among drivers was provided by 13 countries (with usage ranging from 30 percent to 100 percent), use among front seat passengers by 10 countries (with usage ranging 18–100 percent), and use among rear seat passengers by 5 countries (with usage ranging 1–10 percent).

Since the *GSSRS 2018*, the number of countries with seat belt laws has increased by five. Additionally, countries have strengthened laws by including criteria to meet best practice (three countries), requiring all care occupants to wear a seat belt (four countries), and prescribing penalties for violation (two countries).

Child Restraint Laws

Studies show that road traffic fatalities and injuries are significantly reduced when children are properly restrained in vehicles. The effectiveness of child restraint systems is maximized when technical requirements for their use, based on the child's seating position, age, height, and weight, are specified in the laws and enforced (WHO 2014).

Laws mandating the use of child restraints exist in 14 countries, with requirements for appropriate age, height, and reference to specific standard included in the laws of 11 countries. Penalties for violations are prescribed in only eight of the countries.

Since the previous status report (*GSRRS 2018*), the number of countries with a child restraint law has increased by five, but no additional countries have amended their existing laws to meet best practice or include penalties for violations.

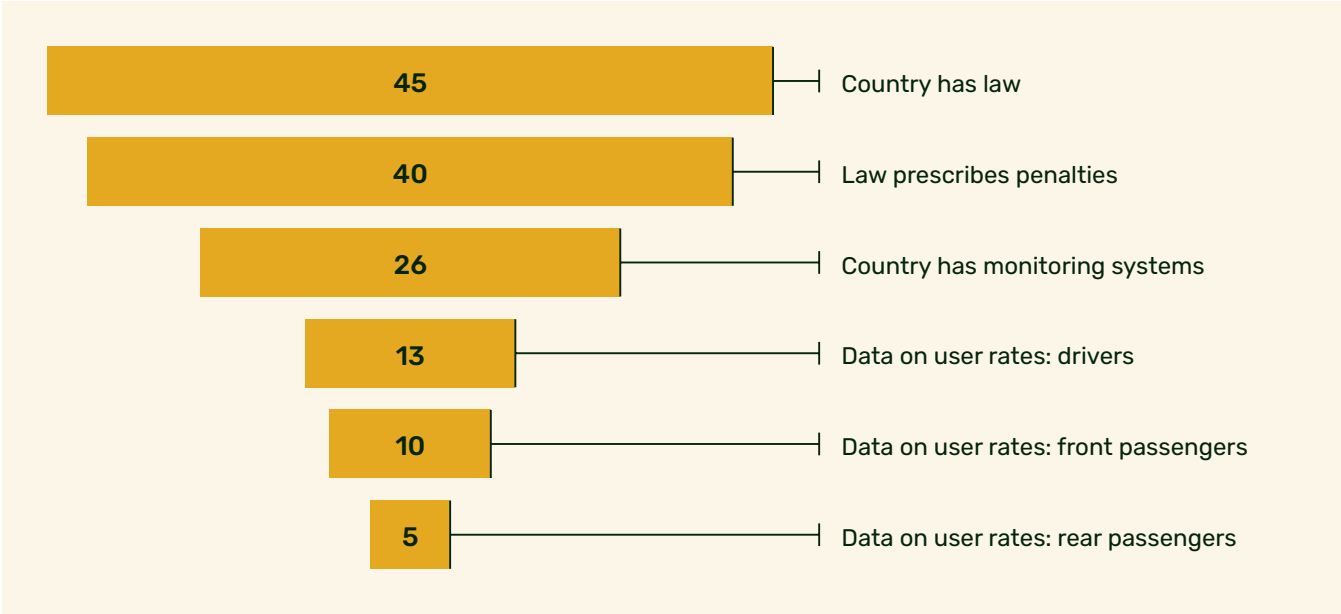
Driver Licensing

Driver licensing requirements and enforcements ensure that drivers have the requisite knowledge, skills, and experience to safely use motorized vehicles. Institutional and legislative mechanisms that regulate the entry of drivers into the road system form crucial elements of the Safe System approach to road safety (WHO 2021).

Formal licensing systems exist in 49 countries, but only two countries include additional licensing requirements for professional drivers, and none of the countries specify minimum requirements for obtaining a full licence or require holding a learner's permit prior to obtaining a full licence. Penalties or demerit systems for violations for repeated driving offences are specified in the laws of only two countries and include license suspension and revocation.

Mandatory driving time and rest periods for professional drivers exist in 16 countries, of which five specify maximum driving hours and minimum rest periods.

Figure 15: Seat Belt Laws, Monitoring Systems, and Data on Seat Belt Use, 2021



Source: WHO 2023.

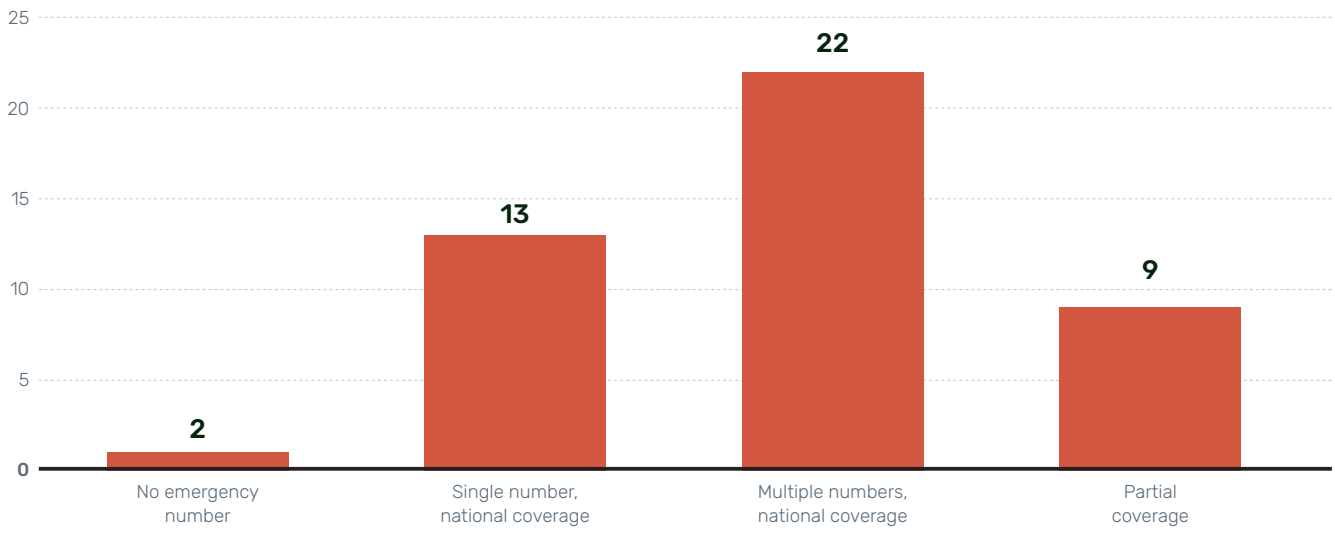
Postcrash Response

The first few minutes following a road traffic crash are critical for survival, as studies indicate that 50 percent of all deaths occur either at the scene or during transport to the hospital. Timely and effective emergency care can save lives and reduce disability. This requires time-sensitive actions at the scene of the crash, rapid transport to an appropriate facility for emergency care, and access to rehabilitation services to mitigate the long-term effects of road traffic crashes for victims and their families (WHO 2016b).

Key components of a postcrash response include the following:

- A system to activate postcrash response, such as emergency service numbers
- Bystanders and lay responders (nonmedical professionals) with the capacity to provide basic lifesaving interventions
- Professional medical care, supported by trauma registries and integrated prehospital, hospital, and rehabilitation services that are accessible 24 hours, regardless of ability to pay
- Multidisciplinary, postcrash investigation; financing mechanisms, such as mandatory third-party liability motor vehicle insurance; and appropriate social, judicial, and financial support to bereaved families and survivors

Figure 16: Status of Emergency Care Numbers, 2021



Source: WHO 2023.
Note: N=48.

Prehospital Care

Emergency care service numbers are available in 35 countries with national coverage using either a single number (13 countries) or multiple numbers (22 countries). Partial coverage exists in nine countries, while two countries lack emergency care service numbers entirely (figure 16). While 28 countries have included a target to improve times between occurrence of a crash and access to professional emergency health care, only 12 have set target times, nine of which aim to ensure that professional care is provided within one hour of a crash.

Forty countries have agencies that coordinate prehospital and emergency medical services; five countries have national laws requiring training, licensing, or other certification processes for first health responders.

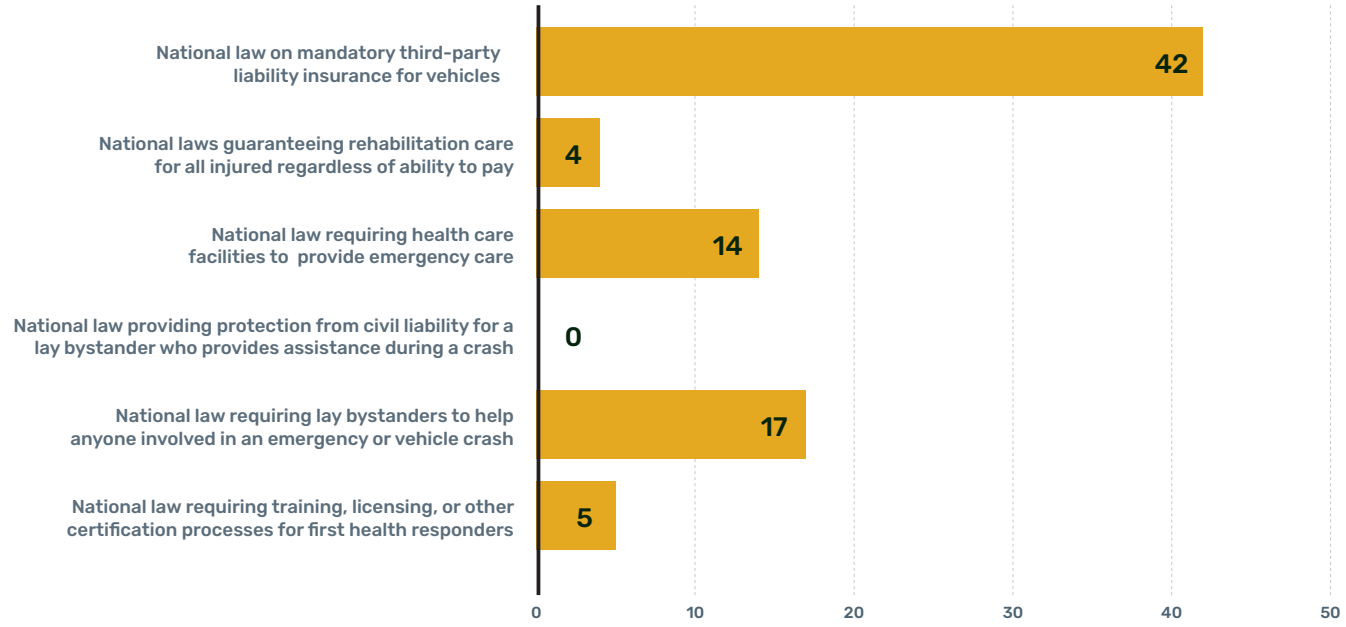
Seventeen countries have laws that require individuals to provide assistance at crash sites. Notably, no country has laws that provide protection from civil liability for a lay bystander assisting crash victims (Good Samaritan laws) (figure 17).

Professional Hospital Care

In terms of ensuring the quality of emergency care provided at health facilities, certified specialist or subspecialist training programs are reported in 26 countries for emergency medicine physicians, in 30 countries for trauma surgeons, and in 18 countries for nurses in emergency care or trauma care. Additionally, standardized assessments of the prehospital and facility-based emergency care systems are performed in only 10 countries. Trauma registries are present in 24 countries, of which 13 aggregate facility data at the national level and 11 in selected facilities.

National laws requiring health care facilities to provide emergency care are reported in 14 countries, while national laws guaranteeing rehabilitation care for all injured regardless of ability to pay are present in only four countries. Forty-two countries have mandatory third-party liability motor insurance, but the laws apply to all vehicles in only four countries, and no country has a national law that sets up a fund to cover victims of uninsured or unidentified (unregistered) vehicles. Furthermore, only two countries have a law regulating insurance premiums (figure 17).

Figure 17: Postcrash Response and Care Legislation, 2021



Source: WHO 2023.
Note: N=51.

CASE STUDY 8

Transforming Trauma Care in Madagascar: CAREnet-MG

Madagascar, an island nation in the Indian Ocean, faces significant challenges in health care delivery, particularly trauma care. With one of the highest road traffic fatality rates in the world (23 per 100,000 people) and an underdeveloped emergency response system, the country collaborates with partners to provide timely and quality care to its population. Among the initiatives, the CAREnet-MG project, launched in 2024 and funded by the Else Kröner-Fresenius Stiftung, is transforming trauma care in Madagascar by establishing a hospital network, implementing a trauma registry, and providing advanced training for health care providers. This ambitious initiative showcases the potential for innovation and collaboration in tackling systemic health care challenges.

Building a Trauma Care Network

Central to the CAREnet-MG project is the creation of a structured hospital network that links five university hospitals and two regional referral hospitals. These hospitals, located in the northwest, central highlands, eastern, and southern regions, form the backbone of the country's trauma care system. For example, CHU JRA, Madagascar's largest hospital, serves as a critical hub in the central highlands, treating up to 32,000 emergency cases annually. Similarly, CHU PZaGa in Mahajanga handles over 8,400 admissions yearly, providing specialized care across 23 disciplines.

By connecting these facilities, the network aims to address long-standing gaps in coordination and referral pathways. Patients requiring specialized treatment are now referred more efficiently, with regional hospitals like CHRR Maevatanana and CHRR Ambatondrazaka providing initial care before transferring critical cases to university hospitals. This system minimizes delays in treatment, which is critical in trauma care where timely interventions can save lives.

The steering committee established under CAREnet-MG ensures strategic oversight of the network. Comprising representatives from the Ministry of Health, participating hospitals, and international partners, the committee develops clinical guidelines, monitors project progress, and facilitates communication among stakeholders.

Leveraging Data for Better Outcomes: WHO Trauma Registry

One of the project's most innovative components is the implementation of the WHO Trauma Registry. This data collection system enables hospitals to capture detailed information about trauma cases, including demographics, injury mechanisms, and treatment outcomes. For a country like Madagascar, where data on trauma care performance has been sparse and sometimes inconsistent, the registry represents a game-changing development.

The registry's pilot phase began in CHU PZaGa, where early adoption has already yielded valuable insights. For example, data analysis revealed a high prevalence of head injuries resulting from motorcycle crashes, prompting targeted interventions such as helmet advocacy campaigns. The registry also supports continuous monitoring, allowing hospitals to identify trends and allocate resources more effectively.

During a workshop in Antananarivo in November 2024, Malagasy health care professionals received training on using the registry, with technical guidance provided by the World Health Organization (WHO), Charité–Universitätsmedizin-Berlin, and BG Unfallklinik Frankfurt am Main. The workshop highlighted the system's adaptability to local contexts, ensuring its successful integration into Madagascar's health care framework.

Despite these successes, challenges remain. Data privacy and reliability are key concerns, requiring strict protocols to safeguard patient information. Additionally, expanding the registry to rural hospitals will require significant investments in infrastructure and training.

Training the Frontline Workforce

Improving trauma care requires not just infrastructure and data but also skilled health care providers. To this end, CAREnet-MG has planned a series of training programs tailored to Madagascar's unique needs. These include the Advanced Trauma Life Support (Demo-ATLS) course for physicians, the Advanced Trauma Care for Nurses (Demo-ATCN), and the Basic Critical Care (BCC) course for multidisciplinary teams.

The ATLS and ATCN courses focus on the critical "golden hour" following trauma, equipping participants with skills to assess, resuscitate, and stabilize patients. For example, physicians learn to perform lifesaving procedures such as chest tube placement and intubation, while nurses gain expertise in assisting with airway management and hemorrhage control. These courses emphasize the ABCDE (Airway, Breathing, Circulation, Disability, Exposure) algorithm, a globally recognized approach validated by the American College of Surgeons.

The BCC course complements these programs by teaching health care providers to identify and manage critical illnesses in resource-limited settings. Participants develop skills in teamwork, effective communication, and ongoing patient monitoring, ensuring comprehensive care for trauma patients.

By the end of the program's first year, 64 health care professionals will have completed these courses, with plans to expand the training to additional staff through a "train-the-trainer" model. This approach not only enhances capacity but also ensures the sustainability of the program by embedding knowledge within the local workforce.

Strengthening Emergency Coordination

Another critical element of CAREnet-MG is the joint development of a working structure within the emergency coordination center in Antananarivo. Once fully operational, this center will act as a central hub for dispatching emergency medical services and coordinating hospital responses. Personnel training will begin this year, focusing on efficient communication, rapid decision-making, and integration with the trauma registry.

The center addresses a major gap in Madagascar's prehospital care system, where the lack of centralized coordination often leads to delays in emergency response. By streamlining communication between ambulances and hospitals, the center will reduce response times and improve patient outcomes.

Early Results and Future Direction

Though still in its early stages, the CAREnet-MG project has already made significant strides. The establishment of the hospital network and the trauma registry has laid a strong foundation for improving trauma care, while training programs will enhance the skills of frontline health care workers, with the expectation of better coordination in patient referrals and improved outcomes for trauma patients in participating hospitals.

However, challenges persist. Expanding the project to rural areas, where health care access is limited, remains a priority. Plans include integrating telemedicine to support remote hospitals and scaling the trauma registry nationwide. Securing long-term funding and political commitment will be critical to sustain these efforts.

Conclusion

The CAREnet-MG initiative exemplifies how innovation, collaboration, and data-driven approaches can address systemic health care challenges. By building a robust hospital network, leveraging advanced data systems, and investing in workforce training, Madagascar is transforming its trauma care landscape. While the journey is far from over, the progress made thus far offers a blueprint for other resource-limited countries striving to improve health care outcomes.

In a nation where every second counts in saving lives, CAREnet-MG is not just a project. It's a lifeline, paving the way for a safer, healthier Madagascar.

Conclusion and Proposed Actions

The burden of road traffic injuries and deaths in Africa remains alarmingly high, disproportionately impacting the most economically productive age group (18–59 years). This crisis poses a severe public health and development challenge, with significant economic and social implications, including diminished workforce productivity, escalating health care costs, and long-term setbacks to sustainable development and poverty reduction across the continent. Pedestrians, cyclists, and users of two- and three-wheelers, who account for 53 percent of fatalities and represent the largest transport modality, are particularly affected, further intensifying the impact. Addressing this challenge requires urgent, collective action and increased political will to implement robust policies, prioritize investments in safer infrastructure, and ensure effective design and delivery of road safety measures to protect lives and secure Africa's development future.

Most countries report having road safety lead agencies tasked with performing key institutional functions and have national road safety strategies. These encouraging developments signal the need for a decisive shift in related global and regional support, from an emphasis on advocacy and good practice guidelines to addressing the practical realities and priorities of country delivery. Attention must now be focused on supporting executive management leaders and senior specialists responsible for country road safety performance, to ensure the necessary strengthening of the country management processes required for the mobilization of scaled-up road safety financing and the effectiveness of their action plans' implementation.

The lack of sustainable and adequate funding for strengthening institutional management functions and related interventions remains a significant obstacle to the effective operation of many lead agencies. In particular, data limitations, including the lack of data on underlying factors that influence road traffic crashes and other safety indicators, hinder the design of targeted interventions and the evaluation of progress toward road safety goals. Countries should be supported in developing data collection systems that align with the recommendations of the African Road Safety Action Plan 2021–2030, African Road Safety

Observatory minimum road safety indicators, and the Road Safety Performance Monitoring Framework. Strengthening data systems is essential to enable countries to collect and manage road safety data effectively.

In Africa, road infrastructure is often designed and built with insufficient consideration of vulnerable road users, exposing them to increased risks of road traffic injuries and fatalities. This approach also fails to promote alternative, safer modes of transport. More efforts are required to enact and enforce laws, regulations, and standards that ensure road design, construction, and maintenance address the safety and accessibility needs of all users. As urbanization accelerates across the continent, transport systems should be planned and designed with consideration of an appropriate land-use mix to provide safe, affordable, and sustainable modes of transport while preserving the environment. Strengthening data collection systems on transport modality use will play a critical role in improving transport system and land-use planning.

The regulation of vehicles in Africa is characterized by weak vehicle registration systems and weak legislation on vehicle safety standards, which lack measures to protect the most vulnerable road users, including young children. Countries should ensure adherence to United Nations road safety conventions by integrating safety requirements into vehicle safety laws and regulations. This should be accompanied by rigorous enforcement measures, including restrictions on the import and export of used vehicles to ensure all vehicles in circulation are roadworthy and properly registered.

Ensuring safe road user behaviors requires comprehensive laws that are rigorously enforced to promote the safe use of roads and transport systems. While most countries in Africa have laws addressing the key behavioral risk factors, few meet the World Health Organization criteria for best practice, with seat belt laws being the notable exception. This highlights gaps in addressing all elements of these risk factors that influence the likelihood and severity of road traffic crashes. Countries should amend their laws to meet best-practice standards, specify enforcement measures, and implement strong monitoring systems. This effort must be complemented by the implementation of enforcement measures and strengthening of data collection systems to monitor road-use behavior and assess the burden of road traffic crashes attributable to noncompliance with laws and regulations.

Postcrash response systems are deficient, with insufficient access to emergency care facilities. Legislative gaps further hinder progress; only a few countries have the necessary laws to facilitate access to prehospital emergency and rehabilitative services. Financial protection for crash victims is inadequate, with insufficient motor vehicle insurance regulations and no funds for victims of uninsured or unidentified vehicles. To address these challenges, countries must invest in expanding access to emergency care, strengthen prehospital systems, strengthen comprehensive legislation for care and rehabilitation and bolster financial protection. These actions will enhance postcrash response systems, reduce fatalities, and alleviate the socioeconomic burden of road traffic injuries.

In essence, effective road safety management is paramount to achieving the goal of the African Road Safety Action Plan 2021–2030. This involves a holistic approach encompassing strengthening country management processes and related executive leadership and specialist knowledge and skills robust institutional frameworks, to enable sustainable funding, robust data systems, and enforcement of laws and standards. By prioritizing the safety of all road users through thoughtful infrastructure design, rigorous vehicle regulation standards, and promotion of responsible road behaviors, countries can significantly reduce road traffic injuries and fatalities. Strengthened postcrash care systems and equitable access to emergency services will further ensure that progress toward these goals is inclusive and sustainable. The collective effort to enhance road safety management will not only save lives in the African continent but contribute to the broader objectives of sustainable development and improved quality of life for all.

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Appendices

APPENDIX A.
Indicator Matrix

Pillar 1: ROAD SAFETY MANAGEMENT

African Road Safety Action Plan 2011–2021 & 2021–2030	Africa Status Report on Road Safety 2020	GSRRS 2023	n/51	UN voluntary targets & indicators	RSPMF
Sustainable funding					
Allocate 10% of road infrastructure funding to road safety	N/A	N/A		N/A	Percentage of financed annual RSLA budget
Set specific budget for road safety	N/A	Dedicated funding allocated in the government budget for prevention of crashes	48	N/A	
	N/A	Dedicated funding allocated in the government budget for prevention of injuries	46	N/A	
	N/A	Dedicated funding allocated in the government budget for health care and treatment of injuries sustained as the result of a crash	46	N/A	
	N/A	Dedicated funding allocated in the government budget for rehabilitation for survivors of crashes	47	N/A	
	N/A	Dedicated funding allocated in the government budget for palliative care for survivors of crashes	46	N/A	
	N/A	Dedicated funding allocated in the government budget for surveillance monitoring and evaluation of road safety strategies	46	N/A	
	N/A	Dedicated funding allocated in the government budget for capacity building for road safety	46	N/A	
	N/A	Dedicated funding allocated in the government budget for research relevant to road safety	46	N/A	
	N/A	Funding for lead agency to carry out core functions	47	N/A	
	N/A	Funding for strategy	42	N/A	
Create a fund for road safety	N/A	N/A		N/A	
Provide a clear framework for public-private partnerships	N/A	N/A		N/A	
Facilitate financing of road safety by technical and financial partners	N/A	N/A		N/A	

Allocate sufficient financial/ human resources to road safety	N/A	Dedicated funding allocated in the government budget for capacity building for road safety	48	N/A	
Allocate 5% of road maintenance resources to road safety	N/A	N/A		N/A	
Fully empowered lead road safety agencies (strong collaboration among national actors)					
Establish or strengthen national lead road safety agencies	Existence of national lead road safety agency	Existence of national lead road safety agency	51	Number of countries that have a national lead agency to coordinate, monitor, evaluate and implement the multisectoral national road safety action plan	
National road safety strategy developed					
Develop national road safety strategies	Existence of national road safety strategy	Existence of national road safety strategy	51	Number of countries with published national action plan with regularly updated time-bound targets for reductions in fatalities and injuries	National road safety action plan with time-bound targets published
Set road safety targets and key performance indicators	N/A	National/subnational strategies set measurable targets to reduce the number of people who are killed and/or seriously injured in a road traffic crash	51		
		Ensuring roads traveled meet technical safety standards for all users	47		
		Ensuring new vehicles meet UN technical safety regulations or equivalent	46		
		Limiting vehicle speed	47		
		Preventing alcohol-impaired driving	46		
		Preventing drug-impaired driving	47		
		Decreasing distracted driving	47		
		Ensuring rest periods for professional drivers	45		
		Improved times between crash and access to professional emergency health care	46		
		Nonfatality reduction target	17		
		Fatality reduction target	24		
		National target for time between serious crash and initial provision of professional emergency care	46		
		Promotion of walking as an alternative to car travel	46		

		Promotion of bicycling as an alternative to car travel	45		
		Promotion of convenient access to public transport	45		
		Promoting seat belt use	46		
		Promoting child restraint use	47		
		Promoting motorcycle helmet use	46		
Business and enterprises to provide annual public sustainability reports including road safety disclosures	N/A	N/A			
Governments and private sectors should prioritize road safety following the Safe System approach in procurement of fleet vehicles and transport services, road safety investments, and operation of public transit and commercial vehicles	N/A	N/A			
Effective data management					
Adopt minimum reporting requirement	N/A	N/A			
Adopt and implement a common strategy to establish centralized databases on road safety	N/A	N/A			Centralized database on road safety established and operationalized
Encourage the transmission of data by forces of public order (police), hospitals and other sources to lead road safety agencies	N/A	N/A			
Build national capacity to manage road safety data	N/A	N/A			
Take advantage of regional good practices in the development and use of databases	N/A	N/A			
Join IRTAD	N/A	N/A			
Use of state-of-the-art data management tools and techniques	N/A	N/A			
Create knowledge management portals on road safety	N/A	N/A			
Enforce mandatory reporting, use of standardized data, sustainable funding	N/A	N/A			
Undertake road safety research/ studies	N/A	N/A			
Establish/strengthen/harmonize injury data system for health facilities	N/A	Existence of a system to document individuals who are “seriously injured” due to a crash	51		
Establish baseline data on road safety	N/A	N/A			
Harmonize data format, international standards in reporting	N/A	N/A			
Creation of African Road Safety Observatory	N/A	N/A			

Ratification and implementation of legal instruments					
Ratification and implementation of the African Road Safety Charter	N/A	N/A			
Ratification of the Intergovernmental Agreement on Norms and Standards of the Trans-African Highways (TAH), with emphasis on the annex on road safety	N/A	N/A			
Ratification and implementation of UN conventions on road safety	N/A	Country adheres to corresponding UN or equivalent international safety regulation	51	Number of countries that have ratified or acceded to one or more of the core road safety–related UN legal instruments	
	N/A	Technical design standards for roads align with relevant international conventions	40		
Multimodal transport and land-use planning					
Implement policies that promote compact urban design	N/A	N/A			
Implement policies that lower speeds, and prioritize the needs of pedestrians, cyclists, and public transport users	N/A	N/A			
Promote transit-oriented development to concentrate urban and commercial developments around mass transit nodes	N/A	N/A			
Strategically locate—where feasible—public, subsidized, and workforce housing to provide convenient access to high-capacity transit services	N/A	N/A			
Discourage the use of private vehicles in high-density urban areas by putting restrictions on motor vehicle users, vehicles, and road infrastructure, and provide alternatives that are accessible, safe, and easy to use, such as walking, cycling, buses and trams	N/A	N/A			
Provide intermodal connectivity between transit and bike share schemes at major transit stops and create transport connections for bicycle and pedestrian travel that reduce total travel time	N/A	N/A			
Construct (or reconstruct existing) transport networks to ensure that nonmotorized modes of travel are as safe as motorized ones, and most importantly serve the travel needs of all ages and abilities	N/A	N/A			

Note: GSRSS 2023 = *Global Status Report on Road Safety 2023*; N/A = variables not included; RSPMF = Road Safety Performance Monitoring Framework.

PILLAR 2: SAFE ROADS AND MOBILITY

African Road Safety Action Plan 2011–2021 & 2021–2030	Africa Status Report on Road Safety 2020	GSRRS 2023	n/51	UN voluntary targets	RSPMF
Mandatory risk assessment of road infrastructure (safety ratings)					
Develop road safety audit and inspection guidelines	N/A	Guidelines were used for the auditing (star rating/ safety rating assessments considering all road users, Global Street Design guidelines, other)	15	Number of countries using systematic approaches to assess/audit new roads	
	Formal inspections on existing networks	Presence of systematic approaches to assess/audit new roads	47	Number of countries using systematic approaches to assess/audit existing roads	
Safety rating on new and rehabilitated roads	Safety rating systems for conducting formal inspections on existing roads, % road network evaluated	Length or roads with 3-star or higher rating for road users	12		Percentage of trunk (national/ primary) road length (km) with 3-star or better rating for road users (vehicle occupants, motorcyclists, cyclists, pedestrians)
					Percentage of other (secondary and tertiary) road length (km) with 3-star or better rating for road users (vehicle occupants, motorcyclists, cyclists, pedestrians)
Building capacity for use of infrastructure road safety assessment tools and techniques at the local level	N/A	N/A			

Shift travel toward cleaner, safer, and affordable modes	N/A	N/A			
Eliminate risks along routes frequently traveled by children to school and for other purposes	N/A	Technical design standards on roads where pedestrians and cyclists are present provide for: Managing speed to Safe System outcomes (e.g., 20 mph or 30 km/h), Global Street Design guidelines, safe crossings for pedestrians and cyclists, separation of pedestrians and cyclists from vehicular traffic	45		
Allocate sufficient resources to upgrade existing road infrastructure to incorporate Safe System principles as soon as feasible	N/A	N/A			
Develop functional classifications and desired safety performance standards for each road user group at the geographic land-use and road-corridor levels	N/A	Presence of technical design and operational standards that recognize the importance of land use and how land-use considerations influence the expected mix of different road users within the transport system	48		
Review and update legislation and local design standards that consider road function and the needs of all road users, and for specific zones	N/A	Legislation for the existing road network to undergo formal road safety inspections/assessments considering all road users on a periodic basis	49		
		Legislation for the existing road network to undergo maintenance safety inspections on a periodic basis	50		
Specify a technical standard and star rating target for all designs linked to each road user, and the desired safety performance standard at that location	N/A	Presence of technical design standards that are required to be met in the development of new roads that account for the safety of all road users	49	Number of countries that have implemented technical standards for new roads that consider the safety of all road users, or that are aligned with the relevant UN conventions and regulate compliance to those standards Number of countries that have implemented technical standards for existing roads that consider the safety of all road users, or that are aligned with the relevant UN conventions and regulate compliance to those standards	

Implement infrastructure treatments that ensure logical and intuitive compliance with the desired speed environment (e.g., 30 km/h urban centers; ≤ 80 km/h undivided rural roads; 100 km/h expressways)	N/A	N/A			
Undertake road safety audits on all sections of new roads (prefeasibility through to detailed design) and complete assessments using independent and accredited experts to ensure a minimum standard of three stars or better for all road users	All designs for new infrastructure require a formal road safety audit prior to construction	Design (plans) for new road infrastructure projects mandate a formal road safety audit and/or star/safety rating assessment prior that considers the safety of all road users	50	Number of countries that have implemented technical standards for new roads that consider the safety of all road users, or that are aligned with the relevant UN conventions and regulate compliance to those standards	
Undertake crash-risk mapping (where crash data are reliable) and proactive safety assessments and inspections on the target network with a focus on relevant road user needs as appropriate	N/A	N/A			
Set a performance target for each road user based on the inspection results with clear measurable metrics at the road-attribute level (e.g., sidewalk provision)	N/A	Ensuring roads travelled meet technical safety standards for all users	39		

Note: GSRSS 2023 = *Global Status Report on Road Safety 2023*; N/A = variables not included; RSPMF = Road Safety Performance Monitoring Framework.

PILLAR 3: VEHICLE SAFETY

African Road Safety Action Plan 2011–2021 & 2021–2030	Africa Status Report on Road Safety 2020	GSRRS 2023	n/51	UN voluntary targets	RSPMF
Mandatory technical control of vehicles (vehicle inspections)					
Introduce incentives for importation of safer vehicles	N/A	N/A			
Vehicle standards and safety ratings for new and used vehicles	N/A	Presence of high-quality safety standards for used vehicle imports/exports	47	Number of countries implementing high-quality safety standards for new vehicles	Percentage of vehicles that pass first registration inspection
	N/A				Percentage of registered motor vehicle fleets that pass periodic roadworthiness inspection (RWI)
Establish a reliable system for regular technical controls and inspections	N/A	Legislation on periodic vehicle technical inspection	47	Number of countries using systematic approaches for vehicle assessments	
Vehicles produced for every market should be equipped with recommended levels of safety performance, and incentives should be provided for use of vehicles with enhanced safety	N/A	N/A			
Require high-quality harmonized safety standards for new and used motor vehicles, safety belts, child restraint systems, and motorcycle helmets					
Standards on front and side impact to ensure that occupants are protected in a front and side-impact crash	N/A	Legislation on standard front and side impact protection to ensure occupants are protected in a front and side-impact crash	36		
Safety belts and safety belt anchorage for all seats to ensure that safety belts are fitted in vehicles when they are manufactured and assembled	N/A	National law on vehicle safety includes safety regulations on safety belt anchorage	50		
ISOFIX child restraint anchor points to secure the child restraint systems attached directly to the frame of the vehicle to prevent misuse	N/A	National law addressing vehicle safety for new 4-wheeled motorized vehicles: child restraint systems	50		

Electronic stability control to prevent skidding and loss of control in cases of oversteering or understeering	N/A	Legislation on electronic stability control to prevent skidding and loss of controls in cases of over- or understeering	37		
Advanced emergency braking to reduce collisions	N/A	Legislation on advanced emergency braking to reduce collisions	16		
Pedestrian protection standards to reduce the severity of impact with a motor vehicle	N/A	Legislation on pedestrian protection standards to reduce the severity of impact with a motor vehicle	38		
Motorcycle helmets certified according to international harmonized standards	N/A	Legislation (relating to motorized two-wheelers) make specific reference to a helmet standard (national or international), or refer to a body responsible for setting such a standard	50		
Antilock braking system and daytime running lights for motorcycles	N/A	Legislation on daytime running lights & antilock braking systems for 2-/3-wheelers	38		
Intelligent speed assistance systems to help drivers keep to speed limits	N/A	N/A			
eCall or Accident Emergency Call System (AECS) to trigger an emergency response by an in-vehicle sensor	N/A	Legislation mandating the availability of eCall or AECS to trigger an emergency response by a vehicle sensor in all new vehicles	48		
Mandatory certification and registration systems for new and used vehicles based on established safety requirements and combined with routine inspections	N/A	National legislation mandating periodic inspection of motorized vehicles	47		Percentage of registered motor vehicle fleets that meet UN vehicle safety standards
Regulations for the export and import of used vehicles that are accompanied by inspections at entry and exit points, and mandatory periodic technical inspection of vehicles	N/A	Country imposes any restrictions on the export or import of used vehicles	47		
Building demand for safer vehicles by encouraging independent new car assessment programs	N/A	N/A			
Ensure that high-quality, harmonized safety standards are kept throughout the full life cycle of the vehicle	N/A	N/A			Percentage of registered motor vehicle fleets that meet UN vehicle safety standards
	Vehicle registration	Vehicle registration	37		
	Age of vehicle fleet				Mean age of registered motor vehicle fleet in years

Note: GSRSS 2023 = *Global Status Report on Road Safety 2023*; N/A = variables not included; RSPMF = Road Safety Performance Monitoring Framework.

PILLAR 4: SAFE ROAD USERS

African Road Safety Action Plan 2011–2021 & 2021–2030	Africa Status Report on Road Safety 2020	GSRRS 2023	n/51	UN voluntary targets	RSPMF
Effective road safety regulatory environment					
Comprehensiveness of legislation on risk factors and enforcement of existing laws	N/A	Legislation on risk factors that meet best-practice criteria	23-50		
Driver training and driving licences, special focus on professional drivers	N/A	Formal driving licensing process for motorized vehicles, additional licensing requirements for professional drivers	50		
Stronger and more consistent enforcement by traffic police	N/A	N/A			
Promote the use of child restraints	N/A	Promoting child restraint use	47	Number of countries in which the proportion of all child motor vehicle occupants using standard child restraints systems is close to 100%	
Vehicles produced for every market should be equipped with recommended levels of safety performance, and incentives should be provided for use of vehicles with enhanced safety	N/A	N/A			
Empowered road users					
Establish or strengthen Road Safety Clubs in schools	N/A	N/A			
Empower road users, establish road safety as a right, including for vulnerable road	N/A	N/A			
Enact and enforce road safety legislation					
Set maximum speed limits considering the type and function of roads	N/A	National speed limits on urban roads (maximum default limit) km/h	45	Number of countries having legislation setting appropriate speed limits and effective enforcement	

		National speed limits on rural main roads (maximum default limit) km/h	41	Number of countries that have reduced by half the proportion of vehicles traveling over the posted speed limit	Percentage of drivers exceeding speed limits
		National speed limits on motorways (maximum default limit) km/h	30	Number of countries that have national and, where applicable, subnational data systems on speeding violations and speeding-related injuries and fatalities	
				Number of countries that achieved reductions in speeding-related injuries and fatalities	
Establish blood alcohol concentration (BAC) limits to prevent impaired driving (drink and drug driving) with specific provisions for novice and professional drivers	N/A	Maximum legal BAC/ BrAC for vehicle drivers in the general population	40	Number of countries having appropriate legislation and effective enforcement on driving under the influence of alcohol and/or other psychoactive substances	
		Maximum legal BAC/ BrAC for young-novice drivers	40	Number of countries that have national and, where applicable, subnational data on driving under the influence of alcohol and/or psychoactive substances and related road traffic-related fatalities and injuries	
		Maximum legal BAC/ BrAC for commercial drivers	49	Number of countries that have reduced by half the number of road traffic injuries and fatalities related to driving under the influence of alcohol and/or other psychoactive substances	Percentage of drivers under the influence of alcohol
Mandate the use of protective equipment (safety belts, child restraints, and helmets)	N/A	National laws or regulations requiring helmet use among users of motorized 2-wheelers	50	Number of countries having legislation requiring motorcycle riders to wear a helmet properly fastened and meeting appropriate standards for protection	
				Number of countries that effectively enforce legislation on helmet use	
				Number of countries implementing regulations on safety for child and adult helmets sold	
				Number of countries that have national and, where applicable, subnational data systems on helmet use	
				Number of countries in which the proportion of motorcycle riders correctly using helmets is close to 100%	Daytime helmet wearing rates by cyclists, moped riders, and motorcyclists

		National legislation (i.e., law, statue, regulation, etc.) regarding seat belt use	49	Number of countries having and effectively enforcing legislation requiring the use of safety belts for all motor vehicle occupants	
				Number of countries having and effectively enforcing legislation requiring the use of child restraint systems meeting appropriate standards	
				Number of countries in which the proportion of all motor vehicle occupants using safety belts is close to 100%	Daytime seat belt–wearing rate of all occupants
				Number of countries in which the proportion of all child motor vehicle occupants using standard child restraints systems is close to 100%	
				Number of countries having and effectively enforcing regulations on safety for child restraints systems sold	
				Number of countries that have national and, where applicable, subnational data on use of safety belts, as well as the appropriate use of child restraint systems	
				Number of countries having and effectively enforcing legislation on restricting or prohibiting the use of mobile phones while driving	
Restrict the use of handheld electronic devices while driving.				Number of countries that have national and, where applicable, subnational data systems on the use of mobile phones while driving	Percentage of drivers using a mobile phone while driving
Establish a dedicated enforcement agency, provide training, and ensure adequate equipment for enforcement activities	N/A	N/A			
Establish traffic rules and licensing requirements					
Set out and regularly update traffic rules and codes of conduct for road users	N/A	N/A			
Provide information and education on traffic rules	N/A	N/A			
Set minimum age and vision requirements for drivers	N/A	Minimum requirements to obtaining a full license, earliest age a person is legally allowed to drive a motorized vehicle	50		

Implement competency-based testing for driver licensing and adoption of graduated driver licensing for novice drivers	N/A	New drivers required to hold a learner's permit prior to obtaining a full license	50		
Set limits for maximum driving time and minimum rest periods for professional drivers	N/A	Government-issued rules for mandatory driving time and rest periods for professional drivers	50	Number of countries having acceded to international/ regional regulation on driving time and rest periods for professional drivers	
				Number of countries with regulation, effective enforcement, and audit of driving time and rest periods for professional drivers	
Make liability insurance mandatory for operators of motorized vehicles	N/A	Coverage of the mandatory motor insurance	50		
Ensure road infrastructure takes account of the needs of all road users and is designed to facilitate safe behaviors	N/A	N/A			
Clear road signage and road markings that are intuitive	N/A	N/A			
Use of roundabouts and traffic calming designs such as speed humps	N/A	N/A			
Physical separation of road users including use of protected bicycle lanes and pedestrian only zones	N/A	Technical design standards on roads where pedestrians and cyclists are present for: managing speed to safe system outcomes (e.g., 20 mph or 30 km/h), Global Street Design guidelines, safe crossings for pedestrians and cyclists, separation of pedestrians and cyclists from vehicular traffic)	45		
Make use of vehicle safety features and technologies to support safe behaviors					
Automatic safety belts and seat belt alerts	N/A	N/A			
Intelligent speed assistance	N/A	N/A			
Technologies to disable texting and or other forms of distraction while driving	N/A	N/A			
		National (or subnational if applicable) information system to monitor alcohol-impaired driving	44		Percentage of drivers under influence of alcohol

		National (or subnational if applicable) information system to monitor mobile phone use while driving	41	Number of countries having and effectively enforcing legislation on restricting or prohibiting the use of mobile phones while driving	Percentage of drivers using a mobile phone while driving
		National (or subnational if applicable) information system to monitor speeding while driving	45	Number of countries that have reduced by half the proportion of vehicles traveling over the posted speed limit	Percentage of drivers exceeding speed limits
		Data routinely collected in your country on motorcycle helmet use	42	Number of countries that have national and, where applicable, subnational data systems on helmet use	Daytime helmet–wearing rates by cyclists and motorcyclists
		Data routinely collected in your country on seat belt use in car occupants	40	Number of countries in which the proportion of all child motor vehicle occupants using standard child restraints systems is close to 100%	Daytime seat belt–wearing rates of all occupants
		Data routinely collected in your country on child restraint use	40		N/A

Note: BrAC = breath alcohol concentration; GSRSS 2023 = *Global Status Report on Road Safety 2023*; N/A = variables not included; RSPMF = Road Safety Performance Monitoring Framework.

PILLAR 5: POSTCRASH RESPONSE

African Road Safety Action Plan 2011–2021 & 2021–2030	Africa Status Report on Road Safety 2020	GSRRS 2023	n/51	UN voluntary targets & indicators	RSPMF
Improved postcrash care					
Introduce emergency medical services coordinating centers at strategic locations	N/A	N/A			
Provide fully equipped ambulances with medical supplies, and crash extraction and rescue equipment	N/A	N/A			
Develop capacity for long-term hospital trauma care and rehabilitation	N/A	N/A			
Introduce health facilities along main highways	N/A	N/A			
Postcrash care, WHO protocol and training for professionals	N/A	Standardized assessment of the prehospital and facility-based emergency care systems conducted at the national level in your country			
Provide a system to activate postcrash response	N/A	N/A			
Unique emergency telephone number with national coverage	N/A	Coverage of the national emergency access telephone number	44		
Coordination mechanism for dispatching response (fire brigade, police, ambulance)	N/A	Presence of agencies that coordinate prehospital and emergency medical services	45	Number of countries that have appointed agencies for effective coordination of the provisions of prehospital and facility-based emergency medical services	Fully operationalized designated EMS lead agency for coordination of prehospital and facility-based EMS
				Number of countries that have achieved the national targets of the time interval between a crash resulting in serious injury and the provision first professional emergency care	Average response time for EMS

Build response capacity among lay responders (nonmedical professionals)					
Provide basic (EMS) training for lay providers such as taxi and public transport providers, police, fire brigade, etc.	N/A	National law requiring training/licensing/ certification of first health responders	50		
Enact Good Samaritan laws to ensure protection for lay responders	N/A	National law that provides protection from civil liability for a lay bystander who provides assistance during a crash	50		
Strengthen professional medical care					
Establish trauma registries in health care facilities to gather information on the cause of injury and clinical interventions	N/A	Presence of trauma registry	33		
Build capacity of prehospital, hospital, and rehabilitation care/ services, and establish a basic package of emergency care services for each level of the health system	N/A	Existence of fully certified specialist or subspecialist programs that doctors can train for in-country, post-graduate specialization courses for nurses in emergency care or trauma care	47 (45 nurses)		
Ensure 24-hour access—regardless of ability to pay—to operative and critical care services that are staffed and equipped	N/A	National law that requires health care facilities (e.g., hospitals or clinics) to take care of anyone who arrives with a health emergency	50		
Provide recovery and rehabilitation services to prevent permanent disability	N/A	National law guaranteeing rehabilitation care for all injured regardless of ability to pay	50		
Establish requirements multidisciplinary, postcrash investigation					
Mandate investigations for crashes resulting in serious and fatal injuries to inform prevention strategies and apply an effective judicial response for victims and their families	N/A	N/A			
Establish coordination mechanisms for postcrash investigation and sharing of data by relevant sectors	N/A	N/A			
Establish appropriate financing mechanisms such as road-user insurance schemes (e.g., mandatory third-party liability)	N/A	Coverage of third-party liability in mandatory motor insurance	49		
Provide social, judicial, and, where appropriate, financial support to bereaved families and survivors	N/A	N/A			

Note: EMS = emergency medical services; GSRSS 2023 = *Global Status Report on Road Safety 2023*; N/A = variables not included; RSPMF = Road Safety Performance Monitoring Framework.

APPENDIX B.

Participating Countries and Links to the Respective Country Profiles

Click on a country to view profile.

- Algeria
- Benin
- Botswana
- Burkina Faso
- Burundi
- Cabo Verde
- Cameroon
- Central African Republic
- Chad
- Comoros
- Congo, Dem. Rep.
- Congo, Rep.
- Côte d'Ivoire
- Egypt, Arab Rep.
- Eritrea
- Eswatini
- Ethiopia
- Gabon
- Gambia, The
- Ghana
- Guinea
- Guinea-Bissau
- Kenya
- Lesotho
- Liberia
- Libya
- Madagascar
- Malawi
- Mali
- Mauritania
- Mauritius
- Morocco
- Mozambique
- Namibia
- Niger
- Nigeria
- Rwanda
- Sao Tome and Principe
- Senegal
- Seychelles
- Sierra Leone
- Somalia
- South Africa
- South Sudan
- Sudan
- Tanzania
- Togo
- Tunisia
- Uganda
- Zambia
- Zimbabwe

APPENDIX C.

MiniARSO Crash Indicators

Crash-related minimum data set and data sources

ARSO minimum indicators

1.	Crash identification number	**Definition:** The unique identifier (e.g., a 10-digit number) within a given year that identifies a particular crash. **Obligation:** Mandatory **Data type:** Numeric or character string **Comments:** The police usually assign this value, as they are responsible at the crash scene. Other systems may reference the incident using this number.
2.	Crash date	**Definition:** The date (day, month, and year) on which the crash occurred. **Obligation:** Mandatory **Data type:** Numeric (DDMMYYYY) **Comments:** If a part of the crash date is unknown, the respective places are filled in with 99 (for day and month). Absence of year should result in an edit check. Important for seasonal comparisons, time series analyses, management/administration, evaluation, and linkage.
3.	Crash time	**Definition:** The time at which the crash occurred, using the 24-hour clock format (00.0023:59). **Obligation:** Mandatory **Data type:** Numeric (HH:MM) **Comments:** Midnight is defined as 00:00 and represents the beginning of a new day. Variable allows for analyses of different time periods.
4.	Crash location	**Definition:** The exact location at which the crash occurred. Optimum definition is route name and GPS/GIS coordinates if there is a linear referencing system (LRS), or other mechanism that can relate geographic coordinates to specific locations in road inventory and other files. The minimum requirement for documentation of crash location is the street name, the reference point, and distance from reference point and direction from reference point. **Obligation:** Mandatory **Data type:** Character string, to support latitude/longitude coordinates, linear referencing method, or link node system. **Comments:** Critical for problem identification, prevention programs, engineering evaluations, and mapping and linkage purposes.

5.	Crash type	**Definition:** The crash type is characterized by the first injury or damage-producing event of the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Crash with pedestrian – Crash between a vehicle and at least one pedestrian. 2. Crash with parked vehicle – Crash between a moving vehicle and a parked vehicle. A vehicle with a driver that is just stopped is not considered as parked. 3. Crash with fixed obstacle – Crash with a stationary object (for example, a tree, post, barrier, fence, and so on). 4. Non-fixed obstacle – Crash with a non-fixed object or lost load. 5. Animal – Crash between a moving vehicle and an animal. 6. Single vehicle crash/non-collision – Crash in which only one vehicle is involved and no object was hit. Includes vehicle leaving the road, vehicle rollover, and cyclists falling. 7. Crash with two or more vehicles – Crashes where two or more moving vehicles are involved. 8. Other crashes – Other crash types not described above. **Comments:** If the road crash includes more than one event, the first should be recorded, through this variable. If more than one value is applicable, select only the one that corresponds best to the first event. Important for understanding crash causation, identifying crash avoidance countermeasures.
6.	Impact type	**Definition:** Indicates the manner in which the road motor vehicles involved initially collided with each other. The variable refers to the first impact of the crash, if that impact was between two road motor vehicles. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. No impact between motor vehicles – There was no impact between road motor vehicles. Refers to single vehicle crashes, collisions with pedestrians, animals, or objects. 2. Rear-end impact – The front side of the first vehicle collided with the rear side of the second vehicle. 3. Head-on impact – The front sides of both vehicles collided with each other. 4. Angle impact, same direction – Angle impact where the front of the first vehicle collides with the side of the second vehicle. 5. Angle impact, opposite direction – Angle impact where the front of the first vehicle collides with the side of the second vehicle. 6. Angle impact, right angle – Angle impact where the front of the first vehicle collides with the side of the second vehicle. 7. Angle impact, direction not specified – Angle impact where the front of the first vehicle collides with the side of the second vehicle. 8. Side-by-side impact, same direction – The vehicles collided side by side while travelling in the same direction. 9. Side-by-side impact, opposite direction –The vehicles collided side by side while travelling in opposite directions. 10. Rear to side impact – The rear end of the first vehicle collided with the side of the second vehicle. 11. Rear to rear impact – The rear ends of both vehicles collided with each other. **Comments:** Useful for identifying structural defects in vehicles.

7.	Weather conditions	**Definition:** Prevailing atmospheric conditions at the crash location, at the time of the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Clear – No hindrance from weather, neither condensation nor intense movement of air. Clear and cloudy sky included. 2. Rain – Heavy or light. 3. Snow. 4. Fog, mist or smoke. 5. Sleet, hail. 6. Severe winds – Presence of winds deemed to have an adverse effect on driving conditions. 8. Other weather condition. 9. Unknown weather condition. **Comments:** Allows for the identification of the impact of weather conditions on road safety. Important for engineering evaluations and prevention programs.
8.	Light conditions	**Definition:** The level of natural and artificial light at the crash location, at the time of the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Daylight – Natural lighting during daytime. 2. Twilight – Natural lighting during dusk or dawn. Residual category covering cases where daylight conditions were very poor. 3. Darkness – No natural lighting, no artificial lighting. 4. Dark with streetlights unlit – Streetlights exist at the crash location but are unlit. 5. Dark with streetlights lit – Streetlights exist at the crash location and are lit. 9. Unknown – Light conditions at time of crash unknown. **Comments:** Information about the presence of lighting is an important element in analysis of spot location or in network analysis. Additionally, important for determining the effects of road illumination on night-time crashes to guide relevant future measures.
9.	Crash severity	**Definition:** Describes the severity of the road crash, based on the most severe injury of any person involved. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Fatal – At least one person was killed immediately or died within 30 days because of the road crash. 2. Serious/severe injury – At least one person was hospitalized for at least 24 hours because of injuries sustained in the crash, while nobody was killed. 3. Slight/minor injury – At least one of the participants of the crash was hospitalized less than 24 hours or not hospitalized, while no participant was seriously injured or killed. **Comments:** Provides a quick reference to the crash severity, summarizing the data given by the individual personal injury records of the crash. Facilitates analysis by crash severity level. Several crash-related variables can be derived from collected data, including number of vehicles involved (total), number of motorized vehicles involved, number of nonmotorized vehicles involved, number of fatalities, number of non-fatal injuries, day of week, and more. These variables provide counts or other information, without the user having to go back to individual records. Depending on the type of reports generated, deriving these data elements can save time and effort.

Road-related indicators

10.	Type of roadway	**Definition:** Describes the type of road, whether the road has two directions of travel, and whether the carriageway is physically divided. For crashes occurring at junctions, where the crash cannot be clearly allocated in one road, the road where the vehicle with priority was moving is indicated. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Motorway/freeway – Road with separate carriageways for traffic in two directions, physically separated by a dividing strip not intended for traffic. Road has no crossings at the same level with any other road, railway or tramway track, or footpath. Specially sign-posted as a motorway and reserved for specified categories of motor vehicles. 2. Express road – Road with traffic in two directions, carriageways not normally separated. Accessible only from interchanges or controlled junctions. Specially sign-posted as an express road and reserved for specified categories of motor vehicles. Stopping and parking on the running carriageway are prohibited. 3. Urban road, two-way – Road within the boundaries of a built-up area (an area with signposted entries and exits). Single, undivided street with traffic in two directions, relatively lower speeds (often up to 50 km/h), and unrestricted traffic, with one or more lanes, which may or may not be marked. 4. Urban road, one-way – Road within the boundaries of a built-up area, with entries and exits sign-posted as such. A single, undivided street with traffic in one direction, relatively lower speeds (often up to 50 km/h). 5. Road outside a built-up area – Road outside the boundaries of a built-up area (an area with sign-posted entries and exits). 6. Restricted road – A roadway with restricted access to public traffic. Includes cul-de-sacs, driveways, lanes, private roads. 8. Other – Roadway of a type other than those listed above. 9. Unknown – Not known where the incident occurred. **Comments:** Important for comparing crash rates of roads with similar design characteristics, and for conducting comparative analyses between motorway and non-motorway roads.
11.	Road functional class	**Definition:** Describes the character of service or function of the road where the first harmful event took place. For crashes occurring at junctions, where the crash cannot be clearly allocated to one road, the road where the vehicle with priority was moving is indicated. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Principal arterial – Roads serving long distance and mainly interurban movements. Includes motorways (urban or rural) and express roads. Principal arterials may cross through urban areas, serving suburban movements. The traffic is characterized by high speeds and full or partial access control (interchanges or junctions controlled by traffic lights). Other roads leading to a principal arterial are connected to it through side collector roads. 2. Secondary arterial – Arterial roads connected to principal arterials through interchanges or traffic light-controlled junctions, supporting and completing the urban arterial network. Serving middle distance movements but not crossing through neighborhoods. Full or partial access control is not mandatory. 3. Collector – Unlike arterials, collectors cross-urban areas (neighborhoods) and collect or distribute the traffic to/from local roads. Collectors also distribute traffic leading to secondary or principal arterials. 4. Local – Roads used for direct access to the various land uses (private property, commercial areas, and so on). Low service speeds not designed to serve interstate or suburban movements.

12.	Road surface conditions	**Definition:** The condition of the road surface at the time and place of the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Dry – Dry and clean road surface. 2. Snow, frost, ice – Snow, frost, or ice on the road. 3. Slippery – Slippery road surface due to existence of sand, gravel, mud, leaves, oil on the road. Does not include snow, frost, ice, or wet road surface. 4. Wet, damp – Wet road surface. Does not include flooding. 5. Flood – Still or moving water on the road. 6. Other – Other road surface conditions not mentioned above. 9. Unknown – The road surface conditions were unknown. **Comments:** Important for identification of high wet-surface crash locations, for engineering evaluation and prevention measures.
13.	Speed limit	**Definition:** The legal speed limit at the location of the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** nnn – The legal speed limit as provided by road signs or by the country's traffic laws for each road category, in kilometers per hour (km/h). 999 unknown – The speed limit at the crash location is unknown. **Comments:** For crashes occurring at junctions, where the crash cannot be clearly allocated to one road, the speed limit for the road where the vehicle with priority was moving is indicated.
14.	Road obstacles	**Definition:** The presence of any person or object that obstructed the movement of the vehicles on the road. Includes any animal standing or moving (either hit or not), and any object not meant to be on the road. Does not include vehicles (parked or moving vehicles, pedestrians) or obstacles on the side of the carriageway (for example, poles, trees). **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Yes – Road obstacle(s) present at the crash site. 2. No – No road obstacle(s) present at the crash site. 9. Unknown – Unknown presence of any road obstacle(s) at the crash site. **Comments:** Countries where a large proportion of the road network is unpaved may wish to include the variable 'road surface type' to allow for analysis of crash rates by road surface type.
15.	Junction	**Definition:** Indicates whether the crash occurred at a junction (two or more roads intersecting) and defines the type of junction. In at-grade junctions, all roads intersect at the same level. In not-at-grade junctions, roads do not intersect at the same level. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. At-grade, crossroad – Road intersection with four arms. 2. At-grade, roundabout – Circular road. 3. At-grade, T, or staggered junction – Road intersection with three arms. Includes T-intersections and intersections with an acute angle. 4. At-grade, multiple junction – A junction with more than four arms (excluding roundabouts). 5. At-grade, other – Other at-grade junction type not described above. 6. Not at grade – The junction includes roads that do not intersect at the same level. 7. Not at junction – The crash has occurred at a distance greater than 20 meters from a junction. 9. Unknown – The crash location relative to a junction is unknown. **Comments:** Crashes occurring within 20 meters of a junction are considered as crashes at a junction. Important for site-specific studies and identification of appropriate engineering countermeasures.

16.	Traffic control at junction	**Definition:** Type of traffic control at the junction where crash occurred. Applies only to crashes that occur at a junction. **Obligation:** Mandatory if crash occurred at a junction **Data type:** Numeric **Data values:** 1. Authorized person – Police officer or traffic warden at intersection controls the traffic. Applicable even if traffic signals or other junction control systems are present. 2. Stop sign – Priority is determined by stop sign(s). 3. Give-way sign or markings – Give-way sign or markings determine priority. 4. Other traffic signs – Priority is determined by traffic sign(s) other than 'stop', 'give way', or markings. 5. Automatic traffic signal (working) – Priority is determined by a traffic signal that was working at the time of the crash. 6. Automatic traffic signal (out of order) – A traffic signal is present but out of order at time of crash. 7. Uncontrolled – The junction is not controlled by an authorized person, traffic signs, markings, automatic traffic signals, or other means. 8. Other – The junction is controlled by means other than an authorized person, signs, markings, or automatic traffic signals. **Comments:** If more than one value is applicable (for example, traffic signs and automatic traffic signals), record all that apply.
17.	Road curve	**Definition:** Indicates whether the crash occurred inside a curve, and what type of curve. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Tight curve – The crash occurred inside a road curve that was tight (based on the judgment of the police officer). 2. Open curve – The crash occurred inside a road curve that was open (based on the judgment of the police officer). 3. No curve – The crash did not occur inside a road curve. 9. Unknown – It is not defined whether the crash occurred inside a road curve. **Comments:** Useful for identification and diagnosis of high-crash locations, and for guiding changes to road design, speed limits, and so on.
18.	Road segment grade	**Definition:** Indicates whether the crash occurred on a road segment with a steep gradient. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Yes – The crash occurred at a road segment with a high grade. 2. No – The crash did not occur at a road segment with a high grade. 9. Unknown – It is not defined whether the crash occurred at a road segment with a high grade. **Comments:** Useful for identification and diagnosis of high-crash locations, and for guiding changes to road design, speed limits, and so on.

Vehicle-related indicators

19.	Vehicle number	**Definition:** Unique number assigned to identify each vehicle involved in the crash. **Obligation:** Mandatory **Data type:** Numeric, sequential number **Comments:** Allows the vehicle record to be cross-referenced to the crash record and person records.
20.	Vehicle identification number (VIN, issued by manufacturer)	**Definition:** Unique vehicle number attached to the engine compartment of the vehicle by the manufacturer to identify each vehicle involved in the crash. **Obligation:** Mandatory **Data type:** Numeric, sequential number **Comments:** Allows the vehicle record to be cross-referenced with registration and person records.
21.	Vehicle registration number	**Definition:** Unique vehicle registration number appearing on the number plate and registration documents. **Obligation:** Mandatory **Data type:** Numeric, sequential number **Comments:** Allows cross-referencing with vehicle VIN number and identification.
22.	Country of vehicle registration	Whether the vehicle is registered in a country different than where it crashes.
23.	Vehicle type	**Definition:** The type of vehicle involved in the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Bicycle – Road vehicle with two or more wheels, generally propelled solely by the energy of the person on the vehicle, in particular by means of a pedal system, lever, or handle. 2. Other non-motor vehicle – Other vehicle without engine not included in the list above. 3. Two/three-wheel motor vehicle – Two or three-wheeled road motor vehicle (includes mopeds, motorcycles, tricycles, and all-terrain vehicles). 4. Passenger car – Road motor vehicle other than a two or three-wheeled vehicle, intended for the carriage of passengers and designed to seat no more than nine (driver included). 5. Bus/coach/trolley – Passenger-carrying vehicle, most commonly used for public transport, interurban movements, and tourist trips, seating more than nine persons. Includes vehicles connected to electric conductors and vehicles that are not rail-borne. 6. Light goods vehicle (<3.5 t) – Smaller (by weight) motor vehicle designed exclusively or primarily for the transport of goods. 7. Heavy goods vehicle (>3.5 t) – Larger (by weight) motor vehicle designed exclusively or primarily for the transport of goods. 8. Pedestrian. 9. Animal-propelled vehicles. 10. Other motor vehicle – Other vehicle not powered by an engine and not included in the lists of values. 11. Unknown – The type of vehicle is unknown, or it was not stated. **Comments:** Allows for analysis of crash risk by vehicle type and road user type. Important for evaluation of countermeasures designed for specific vehicles or to protect specific road users.

24.	Vehicle make	**Definition:** Indicate the make (distinctive name) assigned by motor vehicle manufacturer. **Obligation:** Mandatory if the vehicle is a motorized vehicle. Not applicable to bicycles, tricycles, rickshaws, and animal-powered vehicles. **Data type:** Character string. Alternatively, a list of motor vehicle makes can be composed, with a code corresponding to each. Such a list allows for more consistent and reliable recording, as well as for easier interpretation of the data. **Comments:** Allows for crash analyses related to the various motor vehicle makes.
25.	Vehicle model	**Definition:** The code assigned by the manufacturer to denote a family of motor vehicles (within a make) that have a degree of similarity in construction. **Obligation:** Mandatory if the vehicle is a motorized vehicle. Not applicable to bicycles, tricycles, rickshaws, and animal-powered vehicles. **Data type:** Character string. Alternatively, a list of motor vehicle models can be composed, with a code corresponding to each. Such a list allows for more consistent and reliable recording, as well as for easier interpretation of the data. **Comments:** Record the name of the model as referred to in the country in which the crash occurred. Allows for crash analyses related to the various motor vehicle models.
26.	Vehicle year of manufacture	**Definition:** The year assigned to a motor vehicle by the manufacturer. **Obligation:** Mandatory if the vehicle is a motorized vehicle. Not applicable to bicycles, tricycles, rickshaws, and animal-powered vehicles. **Data type:** Numeric (YYYY) **Comments:** Can be obtained from vehicle registration. Important for use in identifying motor vehicle model year for evaluation, research, and crash comparison purposes.
27.	Engine size	**Definition:** The size of the vehicle's engine is recorded in cubic centimeters. **Obligation:** Mandatory, if vehicle is motorized. Not applicable to bicycles, tricycles, rickshaws, and animal-powered vehicles. **Data type:** Numeric **Data values:** nnnn – Size of engine 9999 – Unknown engine size **Comments:** Important for identifying the impact of motor vehicle power on crash risk.
28.	Vehicle special function	**Definition:** The type of special function being served by this vehicle, regardless of whether the function is marked on the vehicle. **Obligation:** Mandatory if the vehicle is a motorized vehicle. Not applicable to bicycles, tricycles, rickshaws, and animal-powered vehicles. **Data type:** Numeric **Data values:** 1. No special function – No special function of the vehicle. 2. Taxi – Licensed passenger car for hire with driver, without predetermined routes. 3. Vehicle used as bus – Passenger road motor vehicle used for the transport of people. 4. Police/military – Motor vehicle used for police or military purposes. 5. Emergency vehicle – Motor vehicle used for emergency purposes (includes ambulances, fire service vehicles, and so on). 8. Other – Other special functions, not mentioned above. 9. Unknown – It was not possible to record a special function. **Comments:** Important to evaluate the crash involvement of vehicles with special uses.

29.	Vehicle maneuver (what the vehicle was doing at the time of the crash)	**Definition:** The controlled maneuver for this motor vehicle prior to the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Reversing – The vehicle was reversing. 2. Parked – Vehicle was parked and stationary. 3. Entering or leaving a parking position – The vehicle was entering or leaving a parking position. 4. Slowing or stopping – The vehicle was slowing or stopping. 5. Moving off – The vehicle was still and started moving. Does not include vehicle leaving or entering a parking position. 6. Waiting to turn – The vehicle was stationary, waiting to turn. 7. Turning – The vehicle was turning (includes U-turns). 10. Changing lane – The vehicle was changing lane. 11. Avoidance maneuver – The vehicle changed its course in order to avoid an object on the carriageway (including another vehicle or pedestrian). 12. Overtaking vehicle – The vehicle was overtaking another vehicle. 13. Straightforward/normal driving – The vehicle was moving ahead away from any bend. 8. Other. 9. Unknown.

Person-related indicators

30.	Person ID	**Definition:** Number assigned to uniquely identify each person involved in the crash. **Obligation:** Mandatory **Data type:** Numeric (two-digit number, nn) **Comments:** The persons related to the first (presumed liable) vehicle will be recorded first. Within a specific vehicle, the driver will be recorded first, followed by the passengers. Allows the person record to be cross-referenced to crash, road, and vehicle records, in order to establish a unique linkage with the crash ID and the vehicle number.
31.	Occupant's vehicle number	**Definition:** The unique number assigned for this crash to the motor vehicle in which the person was an occupant. **Obligation:** Mandatory **Data type:** Numeric (two-digit number, nn) **Comments:** Allows the person record to be cross-referenced to the vehicle records, linking the persons to the motor vehicle in which they were traveling.
32.	Pedestrian's linked vehicle number	**Definition:** The unique number assigned for this crash to the motor vehicle that collided with this person. The vehicle number assigned under to the motor vehicle that collided with this person. **Obligation:** Mandatory **Data type:** Numeric (two-digit number, nn, from V1) **Comments:** Allows the person record to be cross-referenced to the vehicle records, linking the person to the motor vehicle that struck them.
33.	Date of birth	**Definition:** Indicates the date of birth of the person involved in the crash. **Obligation:** Mandatory **Data type:** Numeric (date format – dd/mm/yyyy, or 99/99/9999 if birth date unknown) **Comments:** Allows calculation of person's age. Important for analysis of crash risk by age group, and for assessing effectiveness of occupant protection systems by age group. Key variable for linkage with records in other databases.

34. Sex	**Definition:** Indicates the sex of the person involved in the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Male – Based on identification documents/personal ID number or determined by the police. 2. Female – Based on identification documents /personal ID number or determined by the police. 9. Unknown – Sex could not be determined (police unable to trace person, not specified). **Comments:** Important for analysis of crash risk by sex. Important for evaluation of the effects of sex of the person involved on occupant protection systems and on motor vehicle design characteristics.
35. Type of road user	**Definition:** This variable indicates the role of each person at the time of the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Driver – Driver or operator of motorized or nonmotorized vehicle. Includes cyclists, persons pulling a rickshaw, or riding an animal. 2. Passenger – Person riding on or in a vehicle, who is not the driver. Includes person in the act of boarding, alighting from a vehicle, or sitting/standing. 3. Pedestrian – Person on foot, pushing, or holding a bicycle, pram, or a pushchair, leading or herding an animal, riding a toy cycle, on roller skates, skateboard or skis. Excludes persons in the act of boarding or alighting from a vehicle. 4. Cyclist – Person on bicycle. 8. Other – Person involved in the crash who is not of any type listed above. 9. Unknown – It is not known what role the person played in the crash. **Comments:** Allows for analysis of crash risk by road user type (in combination with Vehicle type, V2). Important for evaluation of countermeasures designed to protect specific road users.
36. Seating position	**Definition:** The location of the person in the vehicle at the time of the crash. **Obligation:** Mandatory for all vehicle occupants **Data type:** Numeric **Subfield: Row** **Data values:** 1. Front 2. Rear 3. Not applicable (for example, riding on motor vehicle exterior) 8. Other 9. Unknown **Subfield: Seat** **Data values:** 1. Left 2. Middle 3. Right 4. Not applicable (for example, riding on motor vehicle exterior) 8. Other 9. Unknown **Comments:** Important for full evaluation of occupant protection programs.

37.	Injury severity	**Definition:** The injury severity level for a person involved in the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Fatal injury – Person was killed immediately or died within 30 days, as a result of the crash. 2. Serious/severe injury – Person was hospitalized for at least 24 hours because of injuries sustained in the crash. 3. Slight/minor injury – Person was injured and hospitalized for less than 24 hours or not hospitalized. 4. No injury – Person was not injured. 9. Unknown – Injury severity was not recorded or is unknown. **Comments:** Important for injury outcome analysis, evaluation, and appropriate classification of crash severity (PD1). Important element for linkage with records in other databases.
38.	Safety equipment	**Definition:** Describes the use of occupant restraints, or helmet use by a motorcyclist or bicyclist. **Obligation:** Mandatory **Data type:** Numeric **Subfield: Occupant restraints** **Data values:** 1. Seat belt available, used. 2. Seat belt available, not used. 3. Seat belt not available. 4. Child restraint system available, used. 5. Child restraint system available, not used. 6. Child restraint system not available. 7. Not applicable – No occupant restraints could be used on the specific vehicle (for example, agricultural tractors). 8. Other restraints used. 9. Unknown – Not known if occupant restraints were in use at the time of the crash. 10. No restraints used. **Subfield: Helmet use** **Data values:** 1. Helmet worn 2. Helmet not worn 3. Not applicable (for example, person was pedestrian or car occupant) 9. Unknown **Comments:** Information on the availability and use of occupant restraint systems and helmets is important for evaluating the effect of such safety equipment on injury outcomes.

39.	Pedestrian maneuver	**Definition:** The action of the pedestrian immediately prior to the crash. **Obligation:** Mandatory **Data type:** Numeric **Data values:** 1. Crossing – The pedestrian was crossing the road. 2. Walking on the carriageway – The pedestrian was walking across the carriageway, facing or not facing traffic. 3. Standing on the carriageway – The pedestrian was on the carriageway and was stationary (standing, sitting, lying, and so on). 4. Not on the carriageway – The pedestrian was standing or moving on the sidewalk or any point beside the carriageway. 8. Other – The vehicle or the pedestrian was performing a maneuver not included in the list of the previous values. 9. Unknown – The maneuver performed by the vehicle or pedestrian was not recorded or it was unknown. **Comments:** Provides useful information for the development of effective road design and operation, education, and enforcement measures to accommodate pedestrians.
40.	Alcohol use suspected	**Definition:** Law enforcement officer suspects that person involved in the crash has used alcohol. **Obligation:** Mandatory for all drivers of motorized vehicles, recommended for all nonmotorists (pedestrians and cyclists). **Data type**: Numeric **Data values:** 1. No 2. Yes 3. Not applicable (for example, if person is not driver of motorized vehicle) 9. Unknown
41.	Alcohol test	**Definition:** Describes alcohol test status, type, and result. **Obligation:** Conditional (mandatory if alcohol use suspected) **Data type:** Numeric **Subfield: Test Status** **Data values:** 1. Test not given 2. Test refused 3. Test given 9. Unknown if tested **Subfield: Test type** **Data values:** 1. Blood 2. Breath 3. Urine 8. Other 9. Test type unknown **Subfield: Test result** **Data values:** 1. Pending 9. Result unknown **Comments:** Alcohol-related crashes are a major road safety problem. Information on alcohol involvement in crashes facilitates evaluation of programs to reduce drink driving.

42.	Drug use	**Definition:** Indication of suspicion or evidence that person involved in the crash has used illicit drugs. **Obligation:** Mandatory for all drivers of motorized vehicles, recommended for all nonmotorists (pedestrians and cyclists). **Data type:** Numeric **Data values:** 1. No suspicion or evidence of drug use 2. Suspicion of drug use 3. Evidence of drug use (further subfields can specify test type and values) 4. Not applicable (for example, if person is not driver of motorized vehicle) 9. Unknown
43.	Driving licence issue date	**Definition:** Indicates the date (month and year) of issue of the person's first driving license, provisional or full, pertaining to the vehicle they were driving. **Obligation:** Mandatory for all drivers of motorized vehicles **Data type:** Numeric (MMYYYY) **Data values:** Value (MMYYYY) 1. Never issued a driving license 9. Date of issue of first license unknown **Comments:** Allows calculation of number of years' driving experience at the time of crash.
44.	Driving licence type fitting vehicle	**Definition:** Whether the driving license allowed the driver to operate the vehicle s/he was operating. **Data type:** Yes or No
45.	Age	**Definition:** The age in years of the person involved in the crash. **Data type:** Numeric **Comments:** Derived from Date of birth and Crash date. Important for analysis of crash risk by age group, and for assessing effectiveness of countermeasures by age group.
46.	Driver nationality*	
47.	Hit and run	**Definition:** The behavior of a driver of a vehicle who is involved in a collision with another vehicle, property, or human being, who knowingly fails to stop to give his/her name, license number, and other information as required by statute to the injured party, a witness, or law enforcement officers. **Data type:** Yes or No **Comments:** Information captured when more than one vehicle involved in the crash but only one vehicle's data available.

Source: SSATP 2021
* Added after deliberations during second workshop toward establishment of ARSO.

APPENDIX D.

Proposed Actions

Pillar 1: : ROAD SAFETY MANAGEMENT	
Lack of Sustainable and Adequate Funding for RSLAs	
›•• Only 29 countries have allocated government budget funding for implementation of activities ›•• Only 19 countries earmark funds raised through fiscal measures specifically for road safety	›•• Establish dedicated funding mechanisms for RSLAs through fiscal interventions like taxes on fuel, road use tolls, and vehicle purchases ›•• Government to allocate specific budget for road safety ›•• Promote regional partnerships to leverage international funding and technical support for RSLAs ›•• Mobilize public-private sector collaboration to implement local demonstration projects ›•• Allocate 10% of road infrastructure funding to road safety ›•• Allocate 5% of road maintenance resources to road safety ›•• Provide a clear framework for public private partnerships (PPP)
National Road Safety Strategies	
›•• 38 countries have national road safety strategies, 24 have set fatality reduction targets, and just 19 align with SDG target 3.6 ›•• Limited targets for key performance indicators: nonmotorized transport, safe road user behavior, road & vehicle safety ›•• Insufficient funding for strategy implementation	›•• Develop and fund national road safety strategies with explicit, measurable, and time-bound targets aligned with international frameworks like the SDGs ›•• Set clear, measurable targets for key performance indicators: nonmotorized transport, safe road user behavior, road & vehicle safety ›•• Building capacity of government authorities to implement holistic, evidence-based approaches that improve road safety ›•• Business and enterprises to provide annual public sustainability reports including road safety disclosures ›•• Ratification and implementation of the African Road Safety Charter and the UN Conventions on Road Safety
Weak Data Systems	
›•• Significant discrepancies between estimated and reported road traffic fatalities, ranging from one to 22-fold differences ›•• Insufficient use of multiple data sources, with 28 countries relying on a single source, often police records ›•• Limited disaggregation of data by road user type, sex, age, and other vulnerable groups ›•• Inconsistent data formats and reporting	›•• Adopt minimum reporting requirement such as miniARSO ›•• Harmonize data format, international standards in reporting in line with AU ARSO and WHO ›•• Strengthen CRVS systems through collaboration across government sectors to improve mortality data registration and reporting ›•• Promote the use of multiple data sources, such as CRVS systems, health records, and police reports, to improve data accuracy ›•• Implement capacity-building programs to train stakeholders on international classification standards like International Classification of Diseases (ICD) and cause-of-death certification ›•• Address underreporting by establishing robust systems for timely and accurate data collection ›•• Enhance the capacity of RSLAs to manage data collection, ensure disaggregation, and enable evidence-based decision-making
Insufficient Monitoring	
›•• Insufficient monitoring of road Infrastructure and mobility patterns	›•• Strengthen data collection systems to gather accurate and comprehensive information on mobility patterns to inform development of Safe System policies ›•• Leverage data to inform transport and land-use planning, ensuring resources are allocated effectively to meet user needs

PILLAR 2: SAFE ROADS AND MOBILITY

Limited National Strategies for Nonmotorized Transport

››• Only 25 countries have strategies promoting public transport ››• Strategies for walking and cycling are even more limited (14 and 13 countries, respectively), and only a few include specific targets for increasing walking and cycling	››• Develop and implement comprehensive national strategies that prioritize walking and cycling alongside public transport ››• Set clear, measurable targets for increasing walking and cycling, aligning with sustainable mobility goals ››• Promote public awareness and education campaigns to encourage the adoption of nonmotorized transport modes ››• Integrate nonmotorized transport into national transport and urban planning strategies

Insufficient Focus on Vulnerable Road Users

››• Technical design standards: ≥ Include safety feature in 36 countries ≥ Include land-use consideration in 29 countries ››• Laws mandating formal road safety assessments requires consideration of all road users in only 4 countries ››• Cycling lanes present in only 6 countries	››• Improve legislation to require consideration of all road users ››• Prioritize infrastructure development for vulnerable road users, including protected bicycle lanes, pedestrian-only zones, and accessible walkways ››• Implement land-use planning policies that ensure a mix of motorized and nonmotorized transport to enhance safety and accessibility ››• Allocate funding for urban transport projects that address the needs of pedestrians and cyclists ››• Invest in infrastructure like protected bicycle lanes and pedestrian-only zones to ensure the safety of vulnerable road users

Weak Implementation of Road Safety Audits and Standards

››• Only 9 countries have legislation mandating formal road safety audits ››• Only 13 countries conduct formal road safety audits ››• Only 11 countries report the use of guidelines for auditing	››• Mandate road safety audits and assessments for all new roads and periodically evaluate existing roads ››• Strengthen legislation to ensure compliance with road safety standards, including periodic maintenance checks ››• Increase investment in upgrading existing infrastructure to meet at least a three-star safety rating, particularly for vulnerable road users ››• Promote the use of guidelines like the iRAP star rating system to evaluate road safety performance

PILLAR 3: VEHICLE SAFETY

Inconsistent Reporting	
›•• Inconsistent reporting on vehicle types and fleet size	›•• Strengthen vehicle registration systems and standardize reporting mechanisms across countries to ensure consistent and accurate data collection ›•• Enhance capacity-building initiatives to improve national reporting on vehicle types and fleet sizes ›•• Use regional platforms like the African Road Safety Observatory (ARSO) to facilitate data sharing and harmonization
Lack of Comprehensive Legislation on Vehicle Safety Standards	
›•• Legislation specifying requirements for core safety equipment recommended by the United Nations Economic Commission for Europe (UNECE) is missing in many countries ›•• None of the countries in the region mandates all eight core areas of vehicle safety equipment ›•• Only 1 country has legislation specifying requirements for core safety equipment for motorized 2- and 3-wheelers	›•• Develop and enforce comprehensive national legislation mandating core vehicle safety standards in line international standards for all motorized vehicles, including motorized 2- and 3-wheelers
Insufficient Regulation of Used Vehicle Imports	
›•• 36 countries have restrictions on used vehicle imports, and 31 require safety criteria with or without an additional age limit	›•• Strengthen regulation of used vehicle imports to ensure consistent application of safety criteria for combined with age limits ›•• Monitor compliance with import restrictions through regular inspections and enforcement mechanisms ›•• Foster regional agreements to harmonize import standards and reduce the entry of unsafe vehicles into the market ›•• Governments and private sectors should prioritise road safety following the Safe System approach in procurement of fleet vehicles and transport services, road safety investments, and operation of public transit and commercial vehicle

PILLAR 4: SAFE ROAD USERS

Low Adherence to Best Practices for Risk Factor Laws	
››• 35% of the countries do not adhere to best practices for any of the five behavioral risk factors ››• None of the countries meet best practices for all five risk factors ››• Child restraint system laws show the least improvement, with only 1 country meeting best practices	››• Amend national laws to align with WHO best practices for all five risk factors, with a focus on child restraint systems ››• Ensure laws address all road users, including drivers and passengers ››• Raise public awareness on the importance of compliance with these laws to reduce crashes and fatalities
Weak Enforcement of Risk Factor Laws	
››• Enforcement measures, such as penalties for violations, are inconsistently applied across countries ››• Random breath testing for drink driving is conducted in only 7 countries, and 6 countries routinely tests fatally injured drivers for alcohol ››• Limited use of speed cameras and reliance on penalties alone to enforce speed laws	››• Strengthen enforcement mechanisms by equipping authorities with the tools and training needed to monitor and penalize violations effectively ››• Scale up random breath testing for drink driving ››• Establish data collection systems to monitor compliance with laws and inform enforcement strategies ››• Increase the use of automated enforcement tools, such as speed cameras, to monitor compliance
Limited Scope of Drink-Driving Laws	
››• Only 7 countries meet best practice criteria for drink-driving laws, including BAC levels ≤0.02 g/dl for young and commercial drivers ››• Limited BAC/BrAC testing of drivers	››• Update drink-driving laws to meet best practices, including adhering to BAC limits for young and commercial drivers ››• Institutionalize random breath testing and mandatory testing of fatally injured drivers to improve deterrence and data accuracy ››• Launch education campaigns to increase public awareness about the dangers of drink driving
Insufficient Legislation on Distracted Driving	
››• Only 16 countries have laws prohibiting the use of hands-free mobile phones.	››• Expand legislation to address all forms of distracted driving, including hands-free device use
Inadequate Focus on Professional Driving Times	
››• Only 21 countries have laws on rest periods for professional drivers, with inconsistent enforcement of maximum driving hours and minimum rest periods	››• Standardize laws on professional driving times to align with international best practices ››• Implement monitoring systems, such as tachographs, to ensure compliance with rest period laws ››• Provide training for commercial drivers to emphasize the importance of rest in preventing fatigue-related crashes
Weak data systems for monitoring compliance	
››• Limited data collection on compliance with risk factor laws and enforcement effectiveness	››• Strengthen data collection systems to monitor compliance with road safety laws and enforcement measures ››• Regularly analyze and publish data to inform policy decisions and assess the impact of interventions ››• Promote regional collaboration to harmonize data collection methods and improve reporting consistency
Inadequate Licensing and Driver Regulation	
››• Licensing laws lack provisions for minimum age and learner permits ››• Penalty and demerit systems are implemented in only 2 countries	››• Revise licensing laws to include minimum age requirements and learner permits ››• Implement penalty and demerit systems to address repeated driving offenses and promote safer behavior ››• Enhance enforcement capacity to ensure adherence to licensing laws

PILLAR 5: POSTCRASH RESPONSE

Inadequate Postcrash Care Assessments	
›•• Only 10 countries conduct assessments of prehospital and facility-based emergency care, essential for designing responsive services	›•• Conduct regular assessments of prehospital and facility-based emergency care systems to identify needs and allocate resources effectively ›•• Strengthen national health planning to integrate postcrash care into broader health systems
Limited Training and Certification for First Responders	
›•• Only 5 countries have laws requiring training, licensing, or certification processes for first health responders ›•• There is insufficient access to certified specialization programs for emergency care professionals, such as trauma surgeons and emergency nurses	›•• Mandate training and certification for first responders through national legislation ›•• Expand access to specialist and subspecialist training programs for emergency and trauma care professionals ›•• Develop regional training hubs to build capacity and ensure a skilled emergency care workforce
Insufficient Trauma Registries and Data Systems	
›•• Trauma registries are reported in only 24 countries, with aggregated facility-based trauma data limited to 13 countries nationally and 11 in selected facilities	›•• Establish or restore trauma registries in all countries to enable effective monitoring and planning of postcrash care services ›•• Standardize data collection and aggregation systems to ensure comprehensive national trauma data
Lack of Comprehensive Emergency Care Legislation	
›•• Only 14 countries have laws requiring health care facilities to provide emergency care ›•• No country has laws protecting lay bystanders from civil liability when assisting crash victims ›•• Only 4 countries guarantee rehabilitation care regardless of ability to pay ›•• Only 5 countries require training, licensing, or other certification processes for first health responders	›•• Support countries to enact or strengthen national legislation and regulations to ensure equitable access to emergency and rehabilitation services ›•• Support countries to enact laws to protect lay responders and encourage bystander assistance
Weak Financial Protections for Crash Victims	
›•• The law mandating third-party liability motor insurance covers all vehicles in only 4 countries ›•• The law lacks provision for a fund to provide protections for victims of uninsured or unregistered vehicles ›•• Motor insurance premiums regulated in only 2 countries	›•• Expand third-party liability insurance laws to cover all vehicles, ensuring universal protection ›•• Establish national funds to cover victims of uninsured or unidentified vehicles, reducing the financial burden on vulnerable populations ›•• Regulate and monitor insurance premiums to ensure affordability for all income levels

Note: BAC = blood alcohol concentration; BrAC = breath alcohol concentration; CRVS = civil registration and vital statistics; iRAP = International Road Assessment Programme; RSLA = road safety lead agency; SDG = Sustainable Development Goal; WHO = World Health Organization.