GEORGIA ROAD CRASH DATA REVIEW AND REPORTING

STATUS AND RECOMMENDATIONS

MARCH 2025

CAREC
Central Asia Regional Economic Cooperation Program

GEORGIA
ROAD CRASH DATA REVIEW AND REPORTING
STATUS AND RECOMMENDATIONS

MARCH 2025

CAREC
Central Asia Regional Economic Cooperation Program

Cover photos (left to right): ADB is financing the shoreline rehabilitation works in Batumi in order to protect the Black Sea coast from erosion in the resort areas and conserve the existing urban space, the Road Corridor Investment Program constructs a 28-kilometer, two-lane bypass road skirting Kobuleti and widen the road between Kobuleti and Batumi.

Cover design by Josef Ilumin.

Contents

Tables, Figures, and Boxes

Tables

Figures

Boxes

Abbreviations

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ADB	Asian Development Bank
AIS	Abbreviated Injury Scale
APRSO	Asia Pacific Road Safety Observatory
BAAC	Bulletin d'Analyse des Accidents Corporels
CADaS	Common Crash Data Set
CARE	Community Database on Road Accidents
CAREC	Central Asia Regional Economic Cooperation
CDC	Centre for Disease Control and Prevention
COVID-19	coronavirus disease
ETSC	European Transport Safety Commission
FIA	Fédération Internationale de l'Automobile
GIS	geographic information system
GRSF	Global Road Safety Facility
iRAP	International Road Assessment Programme
ICD	International Classification of Diseases
ITF	International Transport Forum
MAIS	maximum abbreviated injury scale
MESCS	Ministry of Education, Science, Culture and Sport
MIA	Ministry of Internal Affairs
MOESD	Ministry of Economy and Sustainable Development
MOILHSA	Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health, and Social Affairs
MRDI	Ministry of Regional Development and Infrastructure
ONISR	Observatoire National Interministériel de la Sécurité Routière
SPI	safety performance indicator
STBA	Statistisches Bundesamt
UN	United Nations
WHO	World Health Organization

1 Introduction

This report presents an overview of the current road crash data management situation in Georgia, offering strategic recommendations for improvement based on the best globally recognized practices. The report is prepared as part of the consultancy "Enhancing Road Safety for Central Asia Regional Economic Cooperation Member Countries (Phase 2) - IC7 Road Crash Data Review and Reporting," funded by the Asian Development Bank (ADB).

The consultancy aims to assess road crash data management practices for 10 countries of the Central Asia Regional Economic Cooperation (CAREC)[1] and develop guidance and tools in an effort to improve road crash data management and move toward greater harmonization of crash data across the region.

The consultancy is part of the effort from ADB and other international stakeholders[2] to develop the **Asia Pacific Road Safety Observatory** (APRSO); i.e., the regional forum on road safety data, policies, and practices to ensure the protection of human life on the roads across Asia and the Pacific.

Reliable safety and traffic data are essential to assess the full nature of the road safety problem, measure the real economic costs associated with road crashes, and design the most cost-effective road safety interventions. As well, the establishment of road safety observatories (e.g., at national and/or regional level) helps to strategically deal with high quality road crash data.

A road safety observatory can be seen as a formal network of government representatives sharing and exchanging road safety data and experience to reduce traffic injuries across the country or within a region. Moreover, an observatory can provide reliable and comparable data on road crashes, in-depth analysis and information on road safety practices and policies. An observatory typically provides evidence base on road safety, composed, for instance, of statistical reports, country/region profiles, thematic analysis, and key performance indicators. In other terms an observatory can help to:

- measure progress toward reducing deaths and serious injuries on national roads,
- identify and quantify road safety problems,
- develop and evaluate the effectiveness of road safety measure, and
- facilitate the exchange of experience between regions or countries.

Since a road safety observatory is strongly dependent on safety and traffic data, a prerequisite is thus to design and implement of a reliable **road crash data management system**, which is the strategic objective of this consultancy.

[1] Afghanistan, Azerbaijan, the People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. https://www.carecprogram.org/. ADB placed its regular assistance to Afghanistan on hold effective 15 August 2021.

[2] World Bank Group, Fédération Internationale de l'Automobile , International Transport Forum, United Nations Economic and Social Commission for Asia and the Pacific, World Health Organization (WHO), Global Road Safety Facility.

To assess road crash data management practices, and to recommend improvements in view of **country-wide systems for road crash data management**, strategic guidelines issued by World Health Organization, by World Bank[3] and by European Commission, such as the Community Database on Road Accidents (CARE),[4] have been considered.

Accordingly, within this report, recommendations for the improvement of the current road crash data collection process are provided, and main data sources and collection procedures are assessed and considered to define a specific and tailored **road crash data management framework for Georgia.**

[3] Martensen H., G. Duchamp, V. Feypell, V. I. Raffo, F. A. Burlacu, B. Turner, and M. Paala. 2021. *Guidelines for Conducting Road Safety Data Reviews.* World Bank.

[4] CARE database.

2 Reference Standards

The importance of road safety data and information and of **data-driven approaches to road safety** improvement is widely recognized at international level.

According to the European Transport Safety Commission (ETSC, 2001), the main emphasis of a road safety information system has shifted from a single focus on road crash data recording to the collection of data and information required to support different levels of the road safety management system, as visualized in the pyramid in Figure 1.

Figure 1: Essential Elements of a Road Safety Information System

Source: Wegman. 2001.

According to World Bank Guidelines for Conducting Road Safety Data Reviews (footnote 3),

> *Road safety data are not just about crash data (or outcome data – the observed crashes and injuries), but also about the safety performance of the road traffic system, and about interventions to improve road safety. These data are best used when combined with other information, such as traffic volumes and distances travelled, or split between different transport modalities. For an evidence-based approach to the management of road safety, these data can be used by policy makers, traffic engineers, police, the health sector, the research community, insurance companies, prosecutors, vehicle manufacturers, and others.*

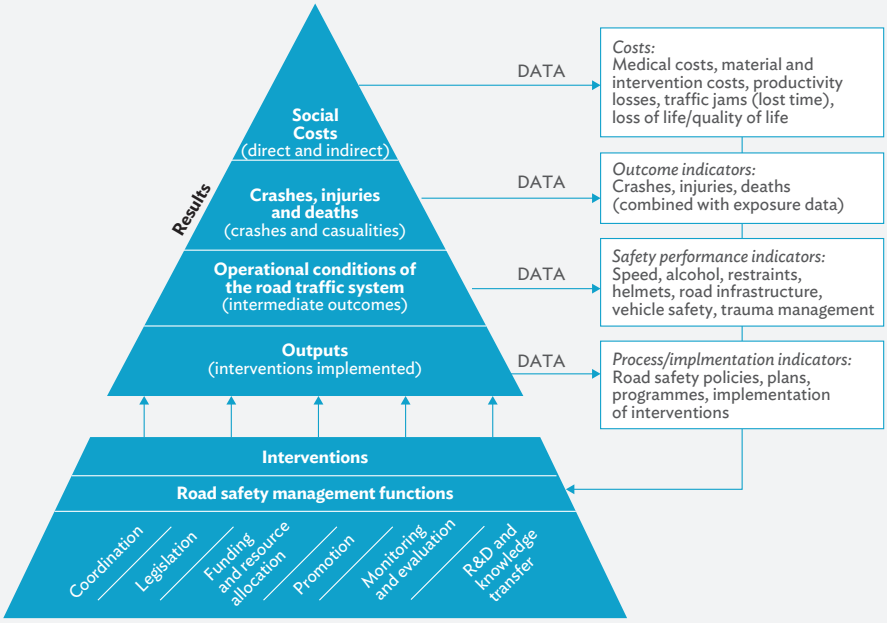
The rationale is that data at all levels of the pyramid is necessary to describe and understand the process leading to crashes. This knowledge then serves as the basis for evidence-based road safety management. The road safety information framework according to this philosophy is visualized in Figure 2.

The pyramid has four levels. At the bottom level, road safety interventions can be found (policy, programs, and initiatives). If implemented effectively, and at scale, improved government road safety policy delivery should result in certain changes in road traffic (the next level). For example: a lower percentage of drivers and passengers traveling without wearing a helmet or seatbelt, a higher proportion of vehicles obeying speed limits, a shorter time interval that medically qualified personnel need to reach a crash location, etc. These are known as **safety performance indicators (SPIs)**. These are parameters that have a causal relationship with crashes and casualties/victims. They are not used instead of crash and injury data, but in addition to them. The purpose is to be able to assess the effectiveness (and risk-reduction effectiveness) of specific programs and to understand better the impact of policy interventions.

The next level contains the features of crashes and victims; possibly related to exposure quantities to calculate road safety risks. These contain the (national) crash registration data, that, nearly everywhere in the world, is based on the police crash data. This data is then processed into national road crash statistics.

The top level of the pyramid contains data that express the social cost of crashes. This concerns the damage that society judges to be negative (hospitalization cost, loss of earnings etc.), and to be prevented.

Figure 2: Outcomes of Road Safety Management



Source: WHO. 2010.

When data at all four levels are available and actively used, the process leading to crashes can be described, analyzed, and understood. This knowledge can then serve as a basis for a rational road safety management system to lower the social costs.

A road crash data collection system is usually characterized by three main elements: (i) a data collection process (i.e., a set of operations or phases carried out for the purpose of data collection); (ii) the data collection techniques and tools; and (iii) the actors who carry out the operations foreseen within the process.

The ultimate purpose of road crash data should be to support the process of improving road safety. As such, a safety-oriented data collection system should:

- make the data accessible to road safety managers, in particular road management bodies and territorial administrative bodies;
- provide relevant information, in particular to:
  - locate road crashes on the road network,
  - understanding crash patterns and contributory factors,
  - understand the outcomes of crashes,
- provide complete and reliable information in a timely manner; and
- allow linkage between different data sources (e.g., police, health services, insurance, etc.).

A road crash data management framework should be organized according to some basic topics to which some standards are connected to ensure reliability and completeness of information:

- Road crash data collection.
- Storage, processing, and use of road crash data.
- Other road safety data.

Road crash data collection is the basic function to be ensured since it provides information about the final outcomes' indicators (crashes, injuries, deaths). The collection of crash data concerns mainly the police bodies attending the scenes of crashes with victims. However, other actors can provide important complementary data. Health services (mainly hospitals) can provide data used for statistics on road traffic casualties and victims follow up. Insurance companies can complement police data with information about history of vehicles and drivers, as well as road crashes without victims.

A reliable road crash data collection can be ensured when:

- A common nation-wide notification system is in place, ensuring that police bodies and emergency services are rapidly informed about the crash. The use of a central emergency number is usually a good practice.
- Police bodies and emergency services have sufficient resources to attend all scenes of road crash with victims.
- A unique and comprehensive road crash registration system is in place, allowing for collection of at least a minimum set of crash attributes and variables, preferably by using IT devices rather than paper-based forms.
- Procedures for almost immediately storing the road crash data into a jurisdiction-wide (e.g., provincial, national) database exist and allow for an easy retrieval of data. This feature should be made via a centralized information system (e.g., road crash data management system).
- The persons in charge of road crash data collection and storage are adequately trained about the importance of road crash data and about the practices to be followed.

All these aspects can greatly influence the amount and quality of data collected and can lead to important underreporting of data.

When it comes to the specific road crash attributes and variables to be collected, it is important to ensure that data are complete, of good quality, and collected uniformly throughout the country.

World Bank Guidelines for Conducting Road Safety Data Reviews (footnote 3) recommend to:

- Attend at least every crash scene resulting in serious or fatal injuries.
- When possible, record causation and aggravation factors such as speeding, driving under the influence, seatbelt use, and other violations.
- Report the severity of the victims' injuries since the initial data collection at the scene and update the initial assessment based on medical records.
- Ensure the road crash fatality count includes the victims who die in hospital.
- Record a minimum set of information on eventual road crashes not investigated by police (e.g., those without victims).

The **minimum set of crash attributes and variables** should include information about the location, the road infrastructure, road users, and vehicles involved as well as variables characterizing the maneuvers and the consequences of the crash. For instance, the World Bank Guidelines for Conducting Road Safety Data Reviews (footnote 3) refer to a set of 28 road crash attributes derived from the Common Accident Data Set (CADaS) of the European Commission (Table 1).

Table 1: Minimum Set of Crash Attributes

Crash	Traffic unit	Person
Crash ID		Person ID
Date	Traffic unit type (e.g., pedestrian, cyclist, passenger car)	Date of birth
Time	Special function vehicle	Gender
Weather conditions	Registration year	Road user type (pedestrian, driver, passenger)
Lighting conditions (daylight, dark, with/without lighting, dusk/dawn)	Country of registration (e.g., foreign, national)	Injury severity (slight, more than 24 hours in hospital, fatal)
Crash type (e.g., with pedestrian, single, two vehicles turning, two vehicles no turning)	Vehicle maneuver (e.g., turning, overtaking, etc.)	Alcohol test (not tested, not applicable, positive, negative, unknown)
Location: X coordinate (latitude) and Y coordinate (longitude)		Drug use
Road type (e.g., motorway, expressway, national road, local road)		Safety equipment
Section type (e.g., bridge, tunnel, bend, gradient, straight)		Nationality (national, foreigner – possibly by relevant country grouping)
Junction type (not at junction, crossroad, roundabout)		Injury severity assessed on the basis of the Maximum Abbreviated Injury Scale (MAIS)
Speed limit		
Surface conditions (dry, snow/ice, wet, slippery)		
Crash severity		

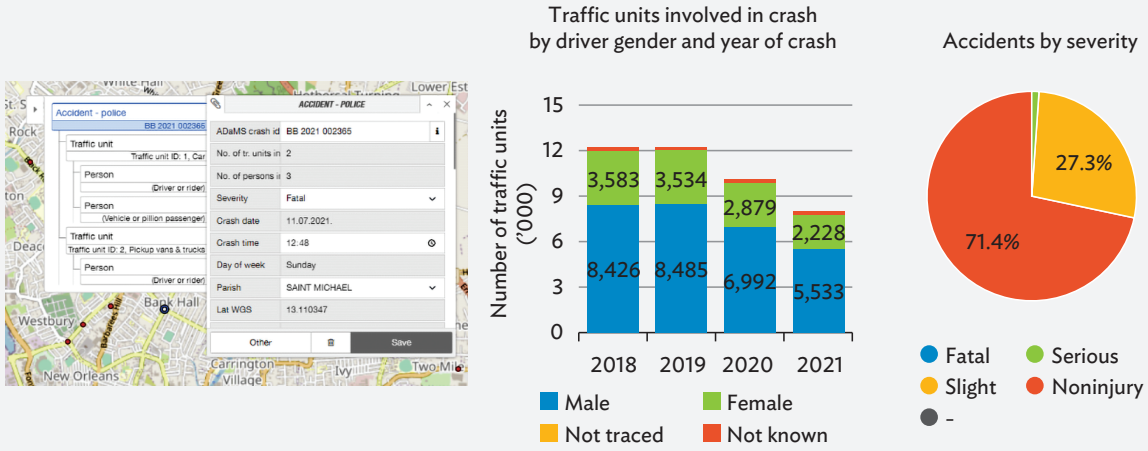
Source: World Bank Guidelines for conducting road safety data reviews.

The international standards give specific attention to the **crash location** due to its importance for identifying road safety interventions. Knowing the location of road crashes on geographic information system (GIS) allows for identification of high-risk sites and road sections and, consequently, for selection of road safety interventions.

Storage, processing, and use of road crash data into a national database is also important to ensure that a reliable process is established a national level, involving all the stakeholders having a role on road safety. The following aspects should be considered to ensure that data are properly stored and can be used for road safety analysis:

- The data should be recorded in a **common system** (directly from the crash scene or from office by transferring paper-based forms into the database).
- The data should be regularly transferred to a central data repository where all crash data are consolidated (**national road crash database**).
- The national database and the common system should be accessible both by actors charged of data collection (e.g., police, health services) and by actors charged of selecting road safety interventions or developing road safety policies. This is highly important for **data-driven decision-making**.
- The database should feed into **analysis tools.** The data per se are useless if they cannot be analyzed and used to inform decision-makers. A **road crash data management system** should be in place allowing for a number of analyses: querying of data (by combining different crash variables), mapping the data, assessing the single crash data, obtaining graphics and reports, etc. (Figure 3).

Figure 3: Screenshot of ADaMS - Accident Data Management System



Source: FRED Engineering.

Other road safety data should be included in the process and, when possible, embedded in a road crash data management system. Main additional data (possibly to be added into a road crash data management system) refer to:

- **Risk exposure data**, usually measured in terms of number of crashes or victims by population, number of vehicles, road length, distance traveled, etc. The specific measurements of risk exposure depend on the availability of specific mobility data in the country (for instance, data on traffic volumes may not

always be available). In some cases, using surrogate measures to compensate missing information is also possible.

- **Safety Performance Indicators** (SPIs) causally linked to road safety. SPIs can be linked to conditions of road infrastructure, vehicle used, road user behavior, post-crash care. The selection of SPIs to be considered (and when possible, added to a road crash data management system) depends on country road safety policies and on the main risks of crashes. Some examples are:
  - **Road infrastructure**. level of risk related to road attributes (e.g., iRAP star rating).[5]
  - **Road users**. percentage of vehicles' occupants wearing a seatbelt, percentage of motorcycles' riders wearing a helmet, percentage of drivers using mobile phone while driving, etc.
  - **Vehicles**. percentage of vehicles equipped with active safety features such as the Anti-Lock Braking System (ABS) or the Electronic Stability Control (ESC).

It is to note that other road safety data can be difficult to collect on a regular basis. When available in a country they can lack a full national coverage or in some cases are outdated. These data should thus be treated carefully and coherently with the road crash data available to avoid misleading interpretations of road crash contributory factors. That said, these data can be valuable for deeper road safety considerations, especially for planning purposes.

Table 2 synthesizes the reference standards described above, that will be considered when assessing the existing road crash data framework of Georgia.

Table 2: Synthesis of Reference Standards for a Road Crash Data Framework

Topic	#	Reference Standard
Road crash data collection	A.1	Common/unique crash notification system
	A.2	Road crash and injury definitions compliant with international standards.
	A.3	All road crash scenes with victims attended by police and emergency services
	A.4	Unique and comprehensive road crash registration system
	A.5	Collected road crash attributes and variables allows for data analysis
	A.6	System allowing for precise location of road crashes on map
Storage, processing and use of road crash data	B.1	Data registered by all actors in a common information system
	B.2	Data regularly transferred to a national road crash database
	B.3	Data accessible by all actors involved in data collection and analysis
	B.4	Road crash data management system available including analysis tools
Other road safety data	C.1	Risk exposure data included in data collection and storage (minimum data: population, traffic volumes)
	C.2	SPIs included in data collection and storage (minimum data: road risk assessment, use of mobile phone while driving, use of seatbelts, use of helmets, driving over speed limit)
Data analysis	D.1	Comprehensive analysis of road crash data and other road safety data oriented to planning and decision-making

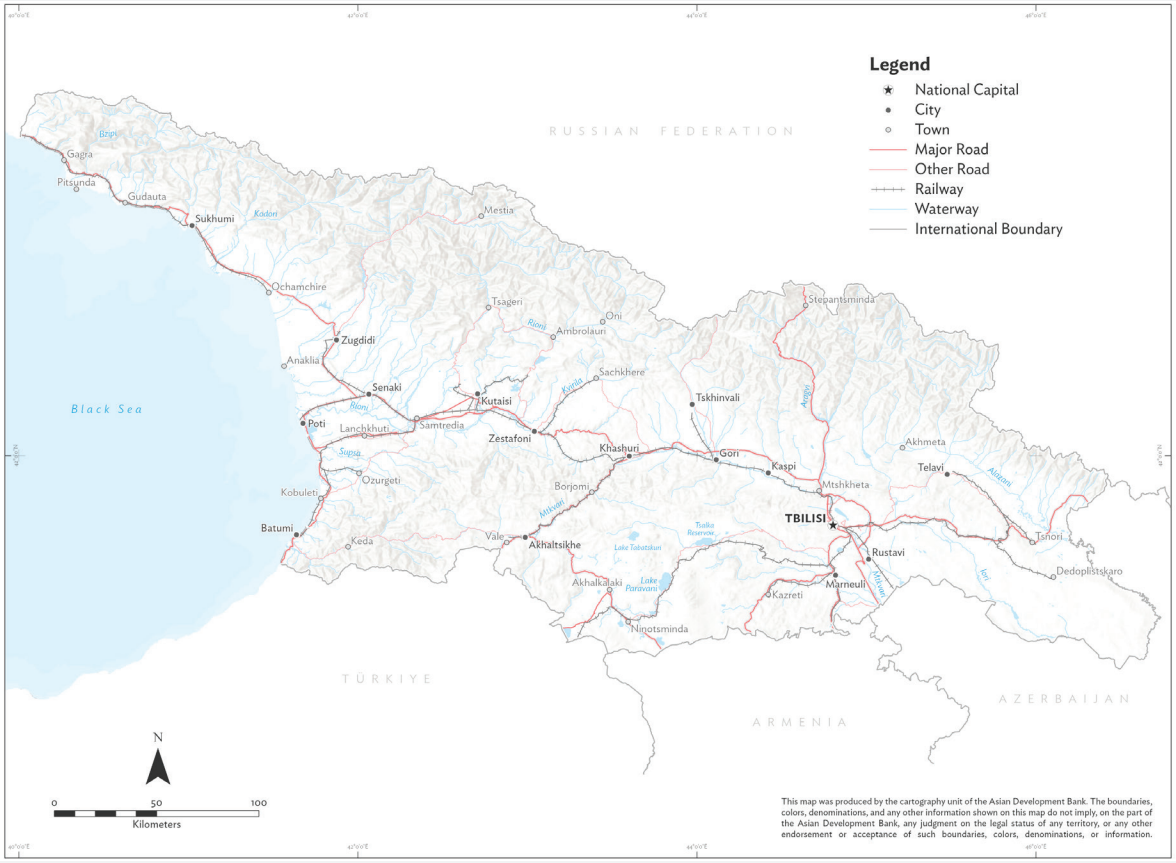
Source: FRED Engineering

[5] The International Road Assessment Programme (iRAP) is a registered charity dedicated to saving lives by eliminating high risk roads throughout the world. iRAP Star Ratings are used for road safety inspections and road safety impact assessments. They provide a measure of the risk to which vehicle occupants, motorcyclists, cyclists and pedestrians are exposed. Risk is rated on a scale of 1 to 5; 1-Star roads have the highest risk and 5-Star roads the lowest risk.

3 Background

Georgia is a South Caucasus state located on the Eastern Shore of the Black Sea (Figure 4). The country covers an area of 69,700 square kilometers (km^2). Georgia borders the Russian Federation, the Black Sea, Türkiye, Armenia, and Azerbaijan.

Figure 4: Map of Georgia



Source: Asian Development Bank.

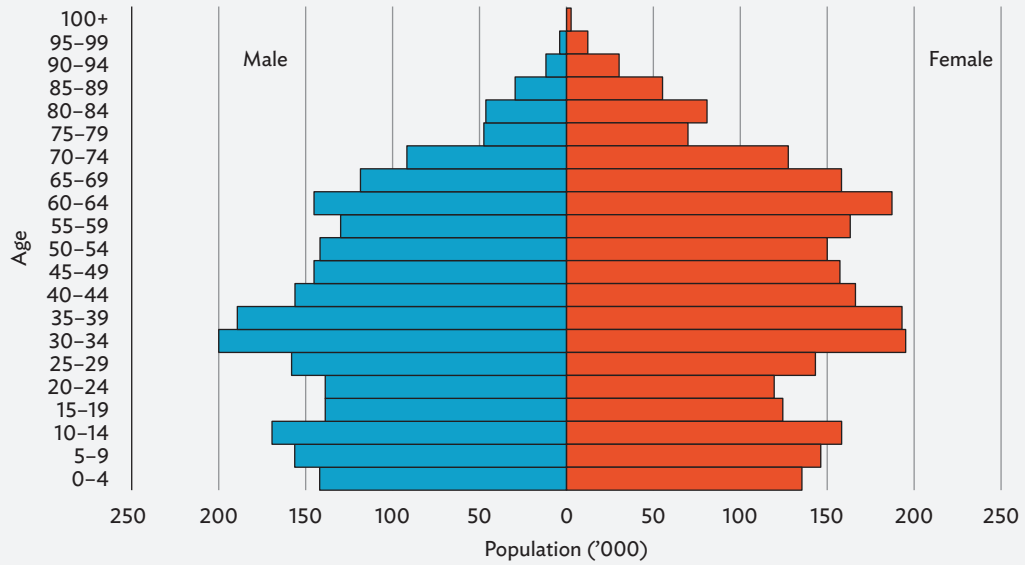
Georgia is divided into two autonomous republics, namely Abkhazia and Adjara, one autonomous city, corresponding to the capital, Tbilisi, and nine regions, were provisionally established between 1994 and 1996. The regions and autonomous republics are in turn divided into municipalities (or districts).

The country's most populous city is the capital, Tbilisi, which is the only one exceeding 1 million inhabitants. Other main cities, with significantly smaller populations (under 200,000 inhabitants) are Kutaisi, Batumi, and Rustavi. The remaining cities do not reach 100,000 inhabitants.

Population

At the beginning of 2022, Georgia had about 3,736,400 inhabitants. Georgia accounts for a significant youth component, since 18% of the population is under 14 years old and nearly 40% of the population is under 30 years old (Figure 5). The median age of the population is 38 years old, more specifically 35.6 for the male population and 40.4 for the female population. Almost 61% of the population lives in urban areas, while the remaining 39% lives in rural areas. The current population density in Georgia is 53.5 people per km^2.

Figure 5: Age and Gender Distribution in Georgia



Source: The World Factbook.

Roads

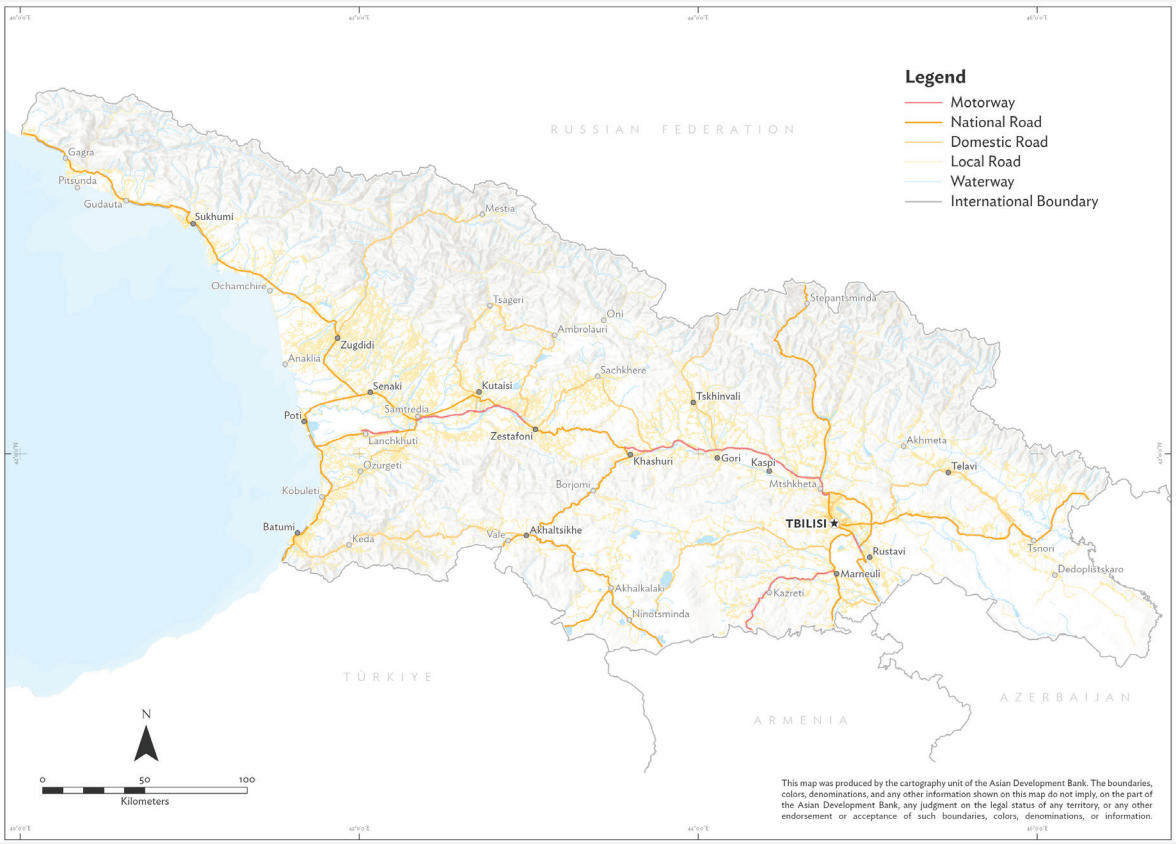
According to data provided by the National Statistics Office of Georgia,[6] the country's road network covers about 41,000 kilometers (Figure 6).

[6] National Statistics Office of Georgia.

The law on roads defines:

- **Roads of international importance.** roads connecting administrative, industrial, and cultural centres of Georgia with other countries.
- **Roads of national importance.** roads connecting the capital, Tbilisi, with cultural or economic centers, capitals of autonomous republics and administrative centers of regions, as well as roads connecting important centres of autonomous republics.
- **Roads of local importance.** roads connecting administrative centres of municipalities with their communities, roads connecting them with international and national roads, as well as roads connecting tourist, recreational, sports, historical, cultural, or scientific destinations with municipal centers.

Figure 6: Map of Whole Road Network of Georgia



Source: Asian Development Bank.

Table 3 shows the length of Georgia's road network by type of road.

Table 3: Road Network Length by Type in Georgia (2022)

Type of road	Length (kilometers)
International roads	1,593
National roads	5,460
Local roads	34,019
Total	41,072

Source: National Statistics Office of Georgia

Most of the international roads are in good or acceptable condition, with an asphalt or concrete surface. They are generally highways with two lanes per carriageway. Since 2006, some sections have been upgraded to 2- or 4-lane highways and expressways, and they are gradually increasing. These upgrades are mostly related to the E60/E70 East–West Highway Project, an internationally sponsored project to improve the transportation corridor (east–west) through Georgia, connecting Azerbaijan, Armenia, and Türkiye.

The condition of national roads varies from good to poor. Some key upgrading projects have been started since 2006, and, increasingly, since 2014. Overall, the quality of the road network is improving over the years.

Road Traffic Crashes

Figure 7 shows crash data from 2015 to 2021 in terms of:

- Number of road crashes.
- Number of road injuries.
- Number of road fatalities.

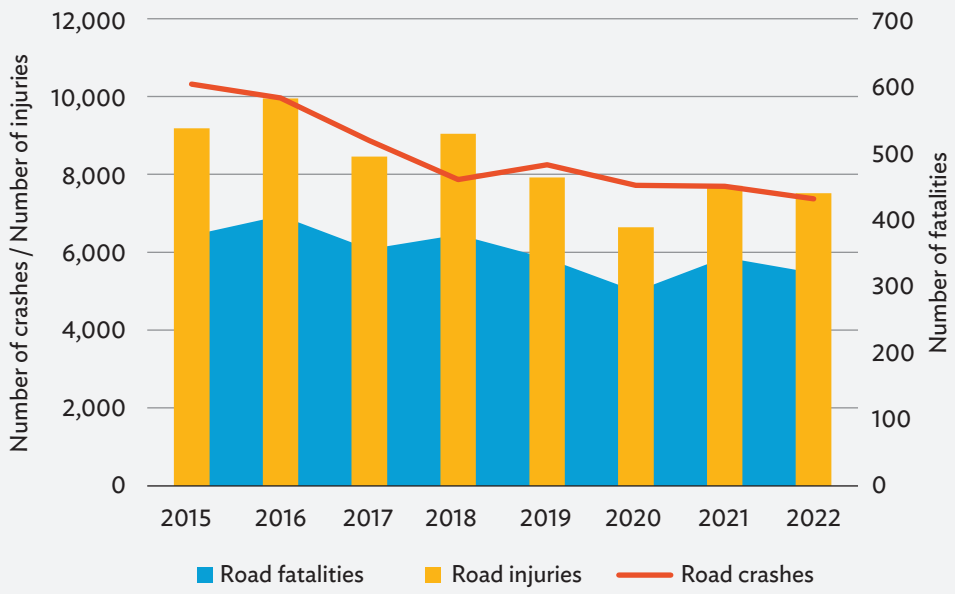
Between 2015 and 2022, almost 4,000 fatal crashes and more than 60,000 crashes with severe injuries occurred in Georgia.

The number of crashes maintained an uneven trend between 2015 and 2018; starting in 2018, figures decreased until they reached a minimum value in 2020, which is probably due to the significant reduction in vehicle traffic (and thus the exposure to crash risk) caused by the coronavirus disease (COVID-19) pandemic. Between 2021 and 2022, crashes began to increase again, except for the number of fatalities which, although slightly, decreased.

On average, 6,000 road crashes have been recorded each year from 2015 to 2022, causing on average about 8,300 injuries and 500 fatalities by year (Table 4).

The trend in the number of road crashes and victims shows a general improvement since 2015 (Table 5) Apart from some fluctuations, a significant decrease in the number of crashes, injuries, and fatalities has been recorded. The only outlier is represented by the year 2020 which, as mentioned previously, is biased by the impact of COVID-19 pandemic (which has likely lowered the number of vehicles on the road and consequently the exposure to risk).

Figure 7: Trend of Road Crashes, Injuries, and Fatalities (2015-2022)



Source: Ministry of Internal Affairs of Georgia.

Table 4: Number of Road Crashes, Injuries, and Fatalities (2015-2022)

Year	Road crashes	Road injuries	Road fatalities
2015	6,432	9,187	602
2016	6,939	9,951	581
2017	6,079	8,461	517
2018	6,452	9,047	459
2019	5,839	7,921	481
2020	4,999	6,640	450
2021	5,863	7,705	449
2022	5,469	7,517	430
Average	6,009	8,304	496
Total	48,072	66,429	3,969

Source: Ministry of Internal Affairs of Georgia.

Table 5: Trends in the Number of Road Crashes and Victims

From 2015 up to 2022
No. of crashes decreased by **15%**
No. of fatalities decreased by **18%**
No. of injuries decreased by **28%**

Source: Elaboration from the Ministry of Internal Affairs of Georgia.

Legislative Framework, State Policy, and National Strategies

The regulatory framework governing road safety and transport in Georgia is presented below.

- The law of Georgia "On administration and regulation in the field of transportation" governs, at the national level, the administration and regulation in the field of transport.
- The law of Georgia "On motor transport" regulates the legal, economic, and organizational bases for the activities of road transport."
- The Law on Georgia "On traffic" determines the legal basis for the organization of traffic and road safety, the main directions of state policy in the field of road safety, the rights and obligations of public authorities, the rules and conditions of the road, road signs and markings, the rights and obligations of road users, the rights of the road movement and the general requirements for the provision and registration of a vehicle.
- The technical regulations of the government of Georgia, which are developed in accordance with international agreements, regulates the Georgian transport sector.
- The association agreement between Georgia and the European Union includes requirements regarding the regulation of road sector.
- The national Road Safety Strategy of Georgia for 2016-2020, approved by the Government of Georgia in 2016, set out some actions plans to improve road safety in the country; the Ministry of Economy and Sustainable Development of Georgia has been appointed as the coordinating agency for the implementation of the measures envisaged by the strategy.
- The Georgian Governmental Program for 2021-2024 "Building a European State" elaborated a national strategy and action plan for road safety.
- The National Road Safety Strategy of Georgia for 2022-2025 and the Action Plan for 2022-2023 have been adopted by the Governmental Decree N°353 (04/07/2022), in accordance with the best international standards and recommendations for the United Nations (UN) and the World Health Organization (WHO); currently, they are fully operational.
- The Action Plan for 2024-2025 has been adopted by the Governmental Decree N°281 (26/08/2024).

4 Assessment of Existing Road Crash Data Management Framework

There are seven agencies in Georgia that are involved in road safety (including for some of them collection and management of data on road crashes).

Currently, there is an **Inter-Agency Commission** for Road Safety, chaired by the deputy minister for the Economy and Sustainable Development, which is responsible for the coordination and monitoring of the implementation of the Road Safety Strategy.

The members of the commission are the Ministry of Economy and Sustainable Development (MOESD), the Ministry of Internal Affairs (MIA), the Ministry of Regional Development and Infrastructure (MRDI), the Ministry of Education, Science, Culture and Sports (MESCS), the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health, and Social Affairs (MOILHSA) and the office of the Mayor of Tbilisi.

The commission has identified five sectoral priorities:

- Improving the efficiency of road safety management.
- Improving behavior of road users.
- Safe road infrastructure.
- Improving the quality of vehicle safety.
- Fast and effective post-crash response.

The agencies responsible are committed to implement the National Strategy and the Action Plan within the allocations provided by the state budget of Georgia and funds raised by international donor organizations. A midterm and a final evaluation of the Strategy and Action Plan implementation is foreseen under the coordination of the MOESD.

The main functions and roles of the various road safety agencies in Georgia are listed below.

1. Ministry of Economy and Sustainable Development

By the Governmental Decree N°33 (19/02/2024), the development and implementation of policies in the field of road safety have been assigned to the MOESD.

By the mentioned decree, a Road Safety Department has been created within the MOESD with the following functions:

- Coordination between different agencies for the planning and execution of road safety measures.
- Analysis of road safety regulatory legislation and preparation of relevant initiatives.
- Attraction of national and international resources.
- Planning of road safety awareness campaigns.
- Analytical activities regarding road safety data, crash statistics and performance indicators.
- Definition of road safety policies and recommendations on necessary interventions.
- Development of policy documents in the field of road safety.
- Monitoring the effectiveness of implemented road safety measures.
- Development of research activities and capacity-building initiatives.

2. Ministry of Internal Affairs

The main functions of the MIA are:

- Enforcement of road traffic regulations.
- Enforcement of penalties.
- Development of national crash reports and use of road crash databases.
- Issuance of drivers' licenses.
- Promotion of road safety campaigns together with the MOESD.

The MIA is the chief state agency responsible for road safety in the country. Road patrolling is implemented through the Patrol Police Department, which, although not covering the entire national territory, enforces legal measures to regulate traffic rules on all the international roads and most roads of national and local importance. Regional police departments exercise road traffic functions on roads and settlements outside the authority of the Patrol Police Department.

Through its International Relations Department, MIA works with international organizations and partner countries to organize road safety training courses for patrol police inspectors. These training sessions include (but are not limited to):

- Police preventive activities and road safety promotion.
- Road safety policies and legislation.
- Identification of high-risk road sections.
- Differentiation of sanctions related to various offenses.
- Importance of risk assessment for road safety.
- Registration of road crashes through a database.
- Safe system approaches to road policy.
- Traffic management and road policy.

MIA's Patrol Police Department is responsible for collecting data on road traffic rules violation and road crashes. Information is published on the official MIA website: https://police.ge/.

To strengthen road safety:

- A Road Traffic Safety Analysis Department has been established within the Analytical Department of MIA with the primary objective of conducting comprehensive road crash analysis and identifying high-risk locations within the country.
- Each territorial Police Department of the MIA has been assigned an analyst who attended specialized training on road safety.

3. Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health, and Social Affairs

The main functions of the MOILHSA are:

- Emergency medical assistance policy and operations.
- Trauma care and rehabilitation.
- Work-related road safety.
- Road injury prevention strategies.
- Road safety promotion campaigns.
- Road injury data and trauma registries in the health sector.

4. Ministry of Education, Science, Culture and Sport

The main functions of the MESCS are:

- Road safety education in schools.
- School bus safety.
- Safe school management systems.
- Road safety promotion and community involvement.

5. Ministry of Regional Development and Infrastructure

The main functions of the MRDI are:

- Road infrastructure project management.
- Policies related to road safety engineering.
- Implementation of standards and instructions, as well as road safety audits, assessments, and inspections.
- Aspects of land-use planning.
- Data systems supporting road safety planning and engineering.

6. Tbilisi City Hall

The main functions of the Tbilisi City Hall are:

- Land-use planning/transportation.
- Public transportation licensing.
- Road traffic management and road safety engineering.
- Emergency assistance.
- Road safety promotion campaigns.

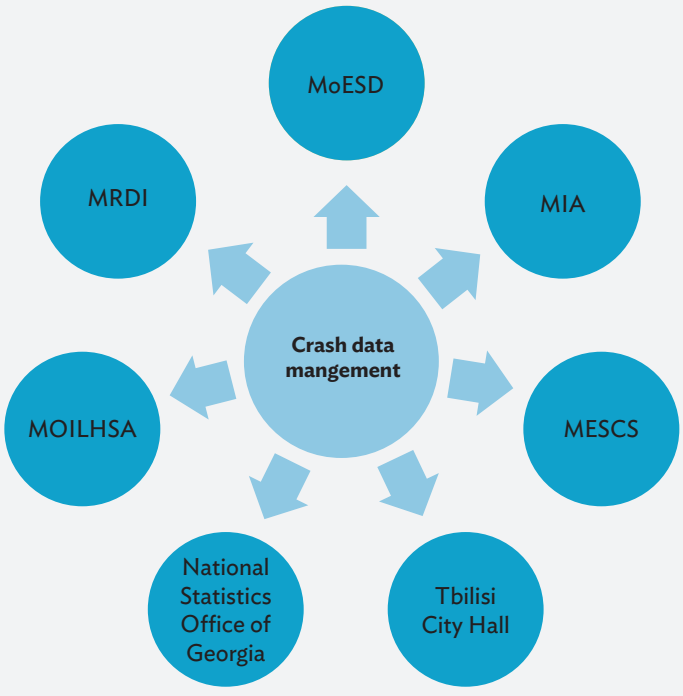
7. National Statistics Office of Georgia

The main functions, in terms of crash data management, of the National Statistics Office of Georgia are:

- Collection, storage, and processing of road crash data.
- Performing statistical road crash surveys.

Figure 8 schematically shows the main actors involved in road safety in Georgia.

Figure 8: Agencies Responsible for Road Safety in Georgia



Source: FRED Engineering. Consultations conducted with local stakeholders

The MIA, the Patrol Police Department and the Centres for Disease Control and Prevention (CDC), which belongs to the MOILHSA, were consulted to gather available data on road crashes and obtain information on the current procedures for collecting, managing, and analyzing road crash data in Georgia (Table 6).

Table 6: Stakeholders Consulted

Stakeholder Agency	Meeting Focus
Ministry of Internal Affairs (MIA)	Road crash definitions
	Organization of the Patrol Police Department
	Road network under the domain of the Patrol Police
	Activities of the Patrol Police
	Police enforcement
	Crash data collection
	Use of the crash databases
	Activities of the emergency services
	Suggestions on improving data collection methodology and road safety in Georgia
Patrol Police Department	Road network under the domain of the Patrol Police
	Activities of the Patrol Police
	Crash scene attending procedure
	Involvement of the emergency services
	Crash data collection
	Use of the crash databases
	Patrol police training and updating
	Road crashes analysis
	Police enforcement
	Improving data collection methodology and road safety in Georgia
Georgia's National Centre for Disease Control and Prevention (CDC)	Road crash definitions
	Data collection
	Sharing data with other stakeholders

Source: FRED Engineering. Consultations conducted with local stakeholders.

An overview of current procedures adopted in Georgia for road crash data collection and management is described below, considering the reference standards described in chapter 2.

4.1 Road Crash Data Collection

A.1 – Is a common/unique crash notification system in place?

When a road crash occurs, the victim or the witnesses call a general number, 112. The responding operator decides which type of emergency units should be sent to the location of the crash depending on the type of assistance required:

- At least one crew of the Patrol Police is always required to intervene at the scene.
- Medical Aid intervenes in case of severe injuries.
- Emergency services intervene in special circumstances, such as if there is a need to extract a victim from the vehicle.

Using GPS coordinates, requested units rush to the scene so that investigation and first aid operations (if needed) can begin.

If, after a crash, the victim goes directly to the hospital, the Patrol Police contacts the hospital to start investigating the road crash.

A.2 – Are road crash and injury definitions compliant with international standards?

Every country must have a clear definition of a road traffic crash based on the location of the crash, the user types involved, the nature of injuries sustained by the casualties, and the damage sustained by vehicles and properties.

Similarly, a definition of severity of road traffic injuries is also needed. Ideally, the definitions should be based on injury scaling techniques, such as Abbreviated Injury Scale (AIS). When injury scaling techniques are not carried out, the following definitions for road traffic injuries can be considered:

- Fatal injury – a death occurring as a result of injuries sustained in a crash, and the date and time are within 30 days of the crash.
- Serious injury – consequence of a crash that resulted in the hospitalization of the victim for more than 24 hours.
- Minor injury – consequence of a crash for which the victim needed first aid at the scene or treatment in a medical facility as an outpatient or discharged from hospital within 24 hours.
- No injury – no visible injuries sustained by the users involved.

According to Georgian legislation, a road crash is defined as:

> ...an occurrence during the driving of a vehicle on a road and with the participation of such vehicle, in which an individual has been injured or killed, or a vehicle, cargo, structure or other property has been damaged.

Currently, in Georgia, no time threshold is defined to determine whether:

- A fatality can be attributed to a road crash.
- A crash injury is to be considered serious or minor.

A.3 – Are all road crash scenes with victims attended by police and emergency services?

Georgia's entire road network is controlled by law enforcement agencies. Specifically, 80% of the road network is under the jurisdiction of the Patrol Police, while the remaining 20% is under the jurisdiction of the Criminal Police. This coverage ensures that the response to the notified road crashes occurs effectively and quickly.

If there are road users requiring medical assistance, the arrival of the Police takes place as the same time as that of the Medical Aid and, if necessary, the Emergency Services.

While the Police is responsible for the investigative part, Medical Aid and Emergency Services are responsible for providing first aid to victims.

However, the analysis of the current situation revealed a lack of medical personnel and emergency vehicles in Georgia to rush crash scenes. This increases the risk that:

- An injury could become disabling.
- A serious injury could turn into death.

A.4 – Is there a unique and comprehensive road crash registration system?

Data on road crashes in Georgia are collected by the following actors:

- Medical Facilities, which record data on traffic injuries and send it to the CDC.
- Patrol Police, which collect crash data on the scene through electronic and paper forms. Information on road crashes, which is included in the crash form, is updated during the investigation and automatically submitted to the central database hosted by the MIA.
- Territorial Police Departments of MIA, which administer those areas not covered by the Patrol Police Department; they fill out electronic crash forms and submit them to the MIA central database.

Box 1: Crash Data Management - Best Practice Example

In France, the national database of road crashes is managed by the Interministerial Observatory for Road Safety (ONISR).

The data are collected by the various police forces operating in the different areas (urban, suburban, motorway). The information collected is based on the common BAAC form (Bulletin d'Analyse des Accidents Corporels). The BAAC form is filled in digitally.

ONISR is responsible for validating the data, checking their consistency, and for publishing and disseminating the road crash information.

Source: International Transport Forum (ITF).

In Georgia, there is no single national database for crash data collection, which means that data sharing among different stakeholders is not automatic. This generates possible loss of data and thus potentially incorrect analyses.

However, the MIA is currently piloting an online platform that provide access to relevant road safety data for road safety agencies, with the aim of improving evidence-based analysis and decision-making.

Classification of crashes into different categories allows for accurate planning of possible preventive measures. In the forms used by the Patrol Police to record crashes, the crash types are classified into ten categories:

1. Road crash involving moving vehicles.
2. Road crash with a parked vehicle.
3. Road crash and invert.
4. Collision with an obstacle.
5. Collision with a pedestrian.
6. Road crash involving a cyclist.
7. Road crash involving a motorcyclist.
8. Collision on cattle or small cattle.
9. Road crash involving a freight vehicle.
10. Road crash involving other types of vehicles.

These different crash categories do not have clear definitions. In addition, no standard crash configuration is currently provided, and no crash diagrams are drawn up.

Digital collection of road crashes partially meets the requirements of the Common Crash Data Set (CADaS) proposed by the European Commission, since the following types of data are included:

- Crash-related data.
- Road-related data (GPS coordinates of the crash).
- Data on vehicles involved in road crashes.
- Person-related data.

Table 7 shows the road crash variables currently collected at crash scenes in the Republic of Georgia and compares them with the CADaS standards (Table 7 shows both the full CADaS variables and the simplified ones).

Table 7: Road Crash Variables Collected in Georgia compared to CADaS

Variable	CADaS	MINI-CADaS	Republic of Georgia
CRASH			
Crash ID	✓	✓	✓
Crash date	✓	✓	✓
Crash time	✓	✓	✓
Nomenclature of Territorial Units for Statistics	✓	✓	
Local Administrative Units	✓		
Weather conditions	✓	✓	✓
Light conditions	✓	✓	✓
Traffic crash type/category	✓	✓	✓
Cause	✓	✓	✓
ROAD			
Latitude	✓	✓	✓
Longitude	✓	✓	✓

continued on next page

Table 7 *continued*

Variable	CADaS	MINI-CADaS	Republic of Georgia
Road name	✓	✓	✓
Road kilometer	✓		✓
Functional class – 1st road	✓	✓	
Functional class – 2nd road	✓	✓	
AADT – 1st road	✓		
AADT – 2nd road	✓		
Speed limit – 1st road	✓	✓	
Speed limit – 2nd road	✓	✓	
Motorway	✓	✓	
Urban area	✓	✓	✓
Junction	✓	✓	✓
Rel.to junction/interchange	✓		✓
Junction in control	✓		✓
Surface conditions	✓	✓	✓
Obstacles	✓	✓	
Carriageway type	✓	✓	
Number of lanes	✓	✓	
Emergency lane	✓		
Markings	✓		✓
Tunnel	✓		✓
Bridge	✓		✓
Work zone related	✓	✓	
Road curve	✓		✓
Road segment grade	✓		
TRAFFIC UNIT			
Traffic unit ID	✓	✓	✓
Traffic unit type	✓	✓	✓
Vehicle special function	✓		
Trailer	✓	✓	
Engine power	✓		
Active safety equipment	✓		
Vehicle drive	✓		
Make	✓		
Model	✓		✓
Registration year	✓	✓	
Traffic unit maneuver	✓	✓	✓
First point of impact	✓		
First object hit in	✓		
First object hit off	✓		
Insurance	✓		

continued on next page

Table 7 *continued*

Variable	CADaS	MINI-CADaS	Republic of Georgia
Hit & run	✓	✓	
Registration country	✓	✓	
PERSON			
Person ID	✓	✓	✓
Year of birth	✓	✓	
Gender	✓	✓	✓
Nationality	✓	✓	✓
Injury severity as reported	✓	✓	✓
Road user type	✓	✓	✓
Alcotest	✓		✓
Alcotest sample type	✓	✓	✓
Alcotest result	✓	✓	✓
Drug test	✓		✓
Driving license issue date	✓	✓	✓
Driving license validity	✓		✓
Safety equipment	✓	✓	
Seating position in/on vehicle	✓	✓	
Distracted by device	✓		
Psychophysical / physical impairment or condition	✓		
Trip/Journey purpose	✓		
Injury MAIS Scale	✓		

CADaS=Common Crash Data Set

Source: Mobility and Transport Department, European Commission.

A.5 – Does the collected road crash attributes and variables allow for data analysis?

Patrol Police units collect data on Georgia's road network and send these data to the Patrol Police Department, within which there is an analytical unit that deals with statistical analyses, which are performed in the form of reports and maps. The results of the analyses are used to enforce road safety measures at sites with a high crash risk.

Medical Facilities analyze those data recorded in the database to write tendencies on road traumatisms.

The analyses carried out by Patrol Police and Medical Facilities are not in line with each other since the Patrol Police unit attending the crash scene does not follow the patients brought to the hospital and hospitals do not record structured details about the location or type of crash. These lack of coordination results in underreporting of crash data and thus the production of unreliable analyses.

The National Statistics Office of Georgia collects fatality and injury data in relation to demographic characteristics (age, gender, place of residence, etc.). However, these data are incomplete because in most cases the characteristics of injuries are not specified in accordance with ICD-10.[7]

[7] International Statistical Classification of Diseases and Related Health Problems: 10th Revision.

A.6 – Does the system allow for precise location of road crashes on map?

According to MIA, when a road crash occurs, GPS coordinates and other relevant information are recorded in an electronic system that includes a form which is partially compliant with CADaS standards.

4.2 Storage, Processing, and Use of Road Crash Data

B.1 – Are the data by all actors registered in a common information system?

Crash data collected by the local units of the Patrol Police and the Criminal Police are registered into the **central crash database of the MIA**. However, this cannot be considered a national road crash database as it does not allow to store data collected by other sources such as medical facilities, which use separate databases for recording crash fatalities and injuries.

Employees of both the Patrol Police and Criminal Police Departments have access to the MIA crash database, enabling them to identify persons and vehicles involved in road crashes.

A new unified database that will allow all crash data from the whole Georgia to be collected has been designed. This new system implies digital collection of road crash data and meets with the requirements of the European Commission Common Crash Data Set (CADaS) standards. The program/module has been piloted in one of the Tbilisi districts (Isani-Samgori district) in 2019. In 2020, relevant staff of the Patrol Police Department has been trained in the application of the new methodology. Starting from March 2021, the module is used in a test mode in the whole area covered by the Patrol Police Department. The data collected in accordance with the new methodology are analyzed centrally, which enables operability of the road safety platform (http://rcc.mia.ge/). When this methodology will be fully operational, relevant road safety authorities will be enabled to access the existing data.

B.2 – Are data regularly transferred to a national road crash database?

Crash data collected at the scene by the Patrol Police units is required to be entered into an electronic system within a maximum of 72 hours after the start of the crash investigation.

Regional Criminal Police Departments enter road crash information into MIA central database independently, without depending on the Patrol Police to transfer this data.

Medical facilities, each of which has its own database for recording data on road casualties, are required to send these data to CDC monthly.

The collection of crash data is conducted with the aim of identifying and analyzing the factors contributing to road crashes. However, the data reported are exclusively about road crashes and not about other aspects related to road safety (such as risk exposure data, safety performance indicators, etc.), which does not allow an easy identification of risks to which road users are exposed.

Box 2: Crash Data Flow - Best Practice Example

In Germany, the road crash national database management body is the Federal Statistics Office (STBA). The data source is constituted by the data collected by police.

STBA is also responsible for verifying the data quality, consolidating the data and for publishing and disseminating road crash information.

The police officers survey road crashes and fill in a standard form at the Regional Statistical Office (Lander). In turn, the regional statistical offices are responsible for sending the data to the Federal Statistical Office.

Source: European Road Safety Observatory.

B.3 – Are data accessible by all actors involved in data collection and analysis?

Currently, in Georgia, the MIA, through the Patrol Police, and the MOILHSA, through the Medical Facilities, oversee collecting and analyzing crash data, while the National Statistics Office only deals with crash analyses.

Within the Analytical Department of MIA, a Traffic Safety Analysis Unit has been created to coordinate analytical activities and provide methodological guidance of analytical work.

Each agency responsible for road crash data management in Georgia has its own database, therefore, there is no automatic sharing of data between stakeholders. This hinders in-depth crash analyses and the identification of appropriate solutions to improve road safety in the country.

B.4 – Is a road crash data management system available including analysis tools?

The analytical unit within the Patrol Police Department, based on the data stored in the central database, prepares crash analyses; the results of these analyses, available at the Ministry of Internal Affairs website-https://police.ge, are represented using MS Excel spreadsheets.

The collected data, including GPS coordinates of crash scenes, is recorded on an interactive map, which allows the identification of high-risk locations.

4.3 Other Road Safety Data

C.1 – Are risk exposure data included in data collection and storage?

Georgia's crash collection system does not include risk exposure data.

C.2 – Are SPIs included in data collection and storage?

Risk exposure data and SPIs are not collected and stored in a central database.

4.4 Data Analysis

D.1 – Are data on road crashes and other road safety data systematically analyzed for planning and decision-making?

The Road Traffic Safety Unit of the MIA's Analytical Department is responsible of providing methodological guidance of analytical work.

Although crash data are systematically analyzed, the lack of knowledge on road safety data not necessarily related to road crashes hinders in-depth analyses and evidence-based policy making to improve road safety management.

Georgia's National Road Safety Strategy envisages that mapping tools and road safety assessment systems will be implemented in the future so that preventive measures can be taken to improve the situation in the so-called black spots, i.e., those sites with a high crash concentration.

Georgia is a member state of the Eastern Partnership Road Safety Regional Observatory (EaP RSO), which provides analytical support for adjusting the national road safety policies, strategies, and annual actions plans.

5 Recommendations to Improve Road Crash Data Management

In this section, some recommendations are proposed to improve road crash data collection and management procedures in Georgia.

The road crash management system in Georgia differs from international best practices in the following aspects:

- Lack of emergency services to intervene at the crash scene.
- Absence of legislation providing clear definitions for road crashes (road fatalities, road injuries, crash categories, etc.).
- Absence of a single national database for recording road crashes that allows data to be shared between the different stakeholders.
- Incompleteness of crash variables collected in Georgia (they are only partially compliant with CADaS standards).
- Lack of modern tools for analyzing crash data.
- Only road crash data are collected, while other road safety data are neglected. This does not allow a careful assessment of the risks to which users are exposed and thus the identification of suitable preventive measures.

Improving the process of road crash data collection is a key issue in road safety management. Therefore, it is recommended to:

- Clearly define the roles and responsibilities of the various agencies responsible for crash and road safety data management.
- Improve the way emergency services intervene at crash scenes.
- Adopt a clear definition in legislation for:
  - Road crash fatalities.
  - Road crash serious injuries.
  - Road crash minor injuries.
- Although a **new electronic form** is being tested, it will be important to ensure that the following type of information are included:
  - Detailed aspects related to the road crash such as first point of impact, first object hit in carriageway, and first object hit off carriageway.
  - General road features such as the speed limits, type of roadway and number of lanes.
  - Aspects related to the vehicles involved such as the presence of driver assistance systems, ownership of insurance, year and country of registration, etc.

  - Aspects related to the persons involved such as the use of mobile devices, mental and physical condition while driving, drowsiness, etc.
  - Procedures to identify crash contributing factors (for instance using a Haddon Matrix as described in chapter 5.1, section A.5).
- Use of GPS coordinates and other mapping tools so that crashes can be easily located.
- Provide a single **national database** that allows crash and road safety data to be shared automatically among different stakeholders so that data are not underreported and analytical reports do not contain incorrect or incomplete information.
- Inclusion into the national database of road crash data and of other road safety data, so that road safety policies can be more accurately implemented (e.g., exposure data such as traffic volumes, population, etc., and safety performance indicators).

Based on the reference standards described in chapter 2, the following chapters present the recommended process for collecting and managing road crash data in Georgia.

5.1 Road Crash Data Collection

A.1 – Common / unique crash notification system

Georgia already has a unique emergency number, 112, which simplifies operations at crash scenes.

A.2 – Road crash and injury definitions compliant with international standards

Georgian legislation lacks clear definitions of crash deaths and injuries which leads to incorrect analyses.

The definitions currently used in Georgia for road fatal and non-fatal injuries are not completely in line with the international standards. A revision of the current national standards should be implemented according to the following definitions (Table 8). Since AIS system is currently not in place in Georgia, a gradual approach is recommended to distinguish between serious and minor injuries.

Table 8: Definitions of Crash Fatalities and Injuries

Category	Internationally agreed definition
Fatalities	People who die immediately or within thirty days as a result of a road traffic crash.
Serious injuries	People with a Maximum Abbreviated Injury Scale (MAIS) equal or higher than three. If MAIS is not available: people hospitalized for more than 24 hours.
Minor injuries	People with a Maximum Abbreviated Injury Scale (MAIS) lower than three. If MAIS is not available: people given first aid at scene or treated in a medical facility as outpatient or discharged from hospital within 24 hours.

Source: Mobility and Transport Department, European Commission

A.3 – All road crash scenes with victims attended by police and emergency services

Patrol Police units ensure effective intervention on the road network they manage (almost 80% of Georgia's entire network). The remaining part of the road network is covered by the Criminal Police.

Even if in the last years, the health care sector in Georgia has developed significantly and the process of providing medical care has become more consistent, there is still a lack of emergency services to intervene at the crash scene. It is recommended to continue the expansion of the number of qualified medical personnel and of ambulances.

A.4 – Unique and comprehensive road crash registration system

The recommended road crash data collection and management process for Georgia is illustrated in Figure 9. It allows to merge data collected by different agencies dealing with road crash management in a single national road crash database.

This proposed conceptual framework is based on the use of a **web-based crash data collection, management, and analysis system** that enables automatic and standardized collection, storage, and analysis of crash information. The exchange of information should be protected by an appropriate computer security mechanism that ensures confidentiality, integrity, authentication, and non-repudiation of data.

Currently, hospitals keep Patrol Police Department informed about victim's conditions. This procedure could be strengthened by providing Medical Facilities with access to an information system to record victim's data. In this way it would be possible to merge data collected by the local units of the Patrol Police with data collected by the Medical Aid and Emergency Services, and thus update the victim's status directly in the national road crash database.

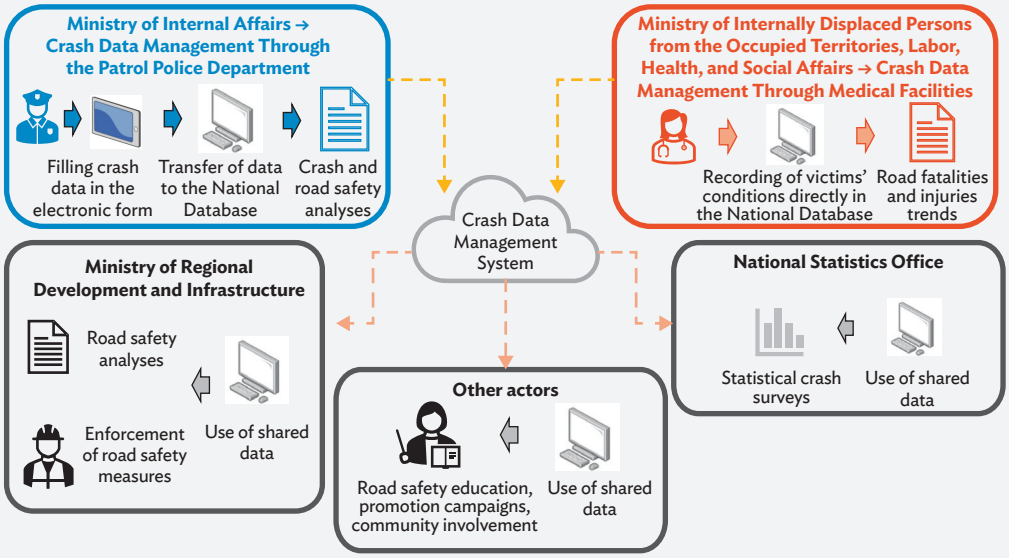
The database should be updated frequently (daily if possible), so that the analytical unit of the Patrol Police can conduct accurate crash analyses.

Medical Facilities should be able to track crash victims up to 30 days after the crash and send the updated information to the database through the road crash management system, so that the severity of injuries of persons involved in crashes can be updated almost automatically.

The database should also be accessible to other relevant stakeholders such as:

- The National Statistics Office of Georgia so that statistical crash surveys can be carried out.
- The Ministry of Regional Development and Infrastructure so that road crash data analyses can be conducted, and road safety measures can be implemented.
- Other actors (Tbilisi City Hall and Ministry of Education, Science, Culture and Sport) so that other interventions (e.g., road safety awareness campaigns) can be informed as well.

Figure 9: Recommended Road Crash Data Framework for Georgia



Source: FRED Engineering

A.5 – Collect road crash attributes and variables allowing for data analysis

Currently, in Georgia, it is possible to carry out some statistical analyses using data collected by the local units of the Patrol Police. However, these data do not allow a full understanding of the factors that determine road crashes.

A comprehensive and reliable road crash data collection process should enable:

- The collection of a sufficient set of crash data elements necessary for analysis.
- The use of a single standardized form for data collection by all entities involved in this task.
- The establishment of reliable and agreed links between stakeholders involved in road safety issues.

A. Traffic Police

The recommended data set for Patrol Police Department is based on the CADaS proposed by the European Commission.

These elements are divided into four basic categories:

- Crash-related variables.
- Road-related variables.
- Traffic Unit related variables.
- Person-related variables.

The recommended data collection form for Georgia should initially conform to a minimum data set that is consistent with both the current data collection form and CADaS. Further improvements and updates may be possible in the future.

Table 9 shows the road crash attributes included in the updated version of the data collection form and those that are recommended to be added.

The recommended form should include some important information that allows not only to perform road crash statistics but also to identify crash contributing factors, thus supporting the selection of reactive and preventive interventions. In addition to the attributes listed in Table 9, the following aspects should be considered:

- Crash configuration, which allows the type of crash to be described in terms of parties involved, type of collision, vehicle/pedestrian maneuver immediately before the crash and hit and run crash.
- Crash diagrams, which allow visualization of the configuration after the crash, including the position of vehicles, description of the road environment, any tracks on the road, etc.
- Description of crash contributing factors using the Haddon Matrix (see below for specific example).

The possibility of major crash reconstruction should also be considered for future developments, after the data collection process is adopted in a standardized manner throughout the country. Crash reconstruction should involve the training of dedicated teams (with possibly different skills) in in-depth investigation techniques.

Table 9: Recommended Data Set for Patrol Police Department

Attributes	Notes
Police Department	
Report / Crash ID	
Officer name	
Report date	
Crash-related variables	
Date	
Time	
Region	
City	
Street	
Road name or code	
GPS coordinates	
Crash and impact type	Specific variables to describe a specific crash type, while more than one type can be applicable in the same crash. In such crashes (e.g., collision between two vehicles, one of which finally hits a pedestrian) more than one variable can be selected; each one describing the respective crash type.
Crash severity	
Weather conditions	
Light conditions	

continued on next page

Table 9 *continued*

Attributes	Notes
Road-related variables	
Functional class – 1st road	
Functional class – 2nd road (if intersection)	
Carriageway type	
Number of lanes	
Surface conditions and status	
Street lighting	
Road type	
Speed limit – 1st road	
Speed limit – 2nd road (if intersection)	
Type of intersection	
Type of intersection management	
Work zone related	
Urban area	
Traffic-unit related variables	
Traffic Unit ID	
Vehicle class	
Vehicle brand	
Vehicle model	
Manufacturing year	
Registration year	
Vehicle type	
Vehicle special function	
Vehicle maneuver	
Vehicle runaway	
N° passengers allowed	
N° passengers on board	
Vehicle load allowed	
Overloading	
Person attributes	
Name	
Person ID	
Traffic unit linked to the person	
Date of birth	
Gender	
Nationality	

continued on next page

Table 9 *continued*

Attributes	Notes
Road user type	
Seating position in/on vehicle	
Pedestrian maneuver (if pedestrian)	
Driving license data	
Injury severity at the time of crash	
Hospital transfer to	
Time of death	Informed by hospital
Days of stay in hospital	Informed by hospital
Alcohol use	
Drug use	
Safety equipment use	
Communication devices use	

Source: Mobility and Transport Department, European Commission.

To identify the factors contributing to the occurrence of the crashes, it is recommended to use the Haddon Matrix (or similar procedure), which allows the human, vehicle, and infrastructure factors to be divided into three-time phases: pre-crash, crash, and post-crash (Table 10).

Based on the factors contributing to the occurrence of each crash in each phase, solutions to the problem can be determined. Some solutions may be specific to a particular crash site and can be implemented immediately such as road signs, markings, removal of obstructions to vision, and basic enforcement activities. Other solutions, such as making two-wheelers more stable or safer, require more data for research and development and may take more time, effort, and resources for implementation.

Table 10: Haddon Matrix

PHASES		FACTORS		
		HUMAN	VEHICLE	INFRASTRACTURE
PRE-CRASH	Crash prevention	- Information - Attitudes - Impairment - Police enforcement	- Roadworthiness - Working lights - Good brakes - Handling - Speed control	- Road design and layout - Speed limits - Pedestrian facilities
CRASH	Injury prevention during the crash	- Use of safety systems	- Crash worthiness - Crash protective design - Occupant restraints - Other safety devices	- Crash protective roadside objects
POST-CRASH	Life sustaining	- First aid skill - Access to medics	- Ease of access - Fire risk	- Rescue facilities - Congestion

Source: 1st Highway Safety Manual, American Association of State Highway Transportation Officials (AASHTO).

B. Medical Facilities

The data collection form recommended for Medical Facilities should allow the cross-referencing of Medical Facilities information with that collected by Traffic Police, and thus to monitor the status of victims of road crashes. This is useful to identify the level of injury of persons involved in road crashes. The proposed form especially adopts the MAIS3+ standard (even if the use of other standards to identify serious injuries are possible).

Figure 10 shows the recommended attributes and variables for Medical Facilities when collecting data about injured people treated.

Figure 10: Recommended Data Set for Medical Facilities

Health service data form			
Hospital name			
P0 - Name		**P2 - Birth date**	
P1 - Person ID		**P3 - Gender**	
P5 - Crash date		1	Male
P6 - Crash time		2	Female
P7 - Admission date		3	Unknown
P8 - Admission time		**P4 - Nationality**	Open text
P9 - Type of injury		**P10 - Injury severity**	
1	Injury to the spine	1	Fatally injured
2	Head injury	2	Seriously injured
3	Leg fracture	3	Slightly injured
4	Multiple fracture	**P11 - First responders**	
5	Minor injury other than previous	1	Red cross
6	Other	2	Civil defense
99	Unknown	3	Police
P12 - Exit date		4	Doctor
P13 - Exit time		5	Nurse
		6	Other

Source: Mobility and Transport Department, European Commission

A.6 – System allowing for precise location of road crashes on map

The current data collection procedures adopted by Traffic Police do not allow for accurate location of road crashes. Therefore, a data collection form including geographical coordinates of the crashes should be implemented.

To increase the accuracy of road crash location, it is also recommended to collect the data at the crash scene by using a specifically designed information system.

C. Insurance Companies

Like for health agencies, the data collection form proposed for insurance companies should allow the cross-referencing of information with that collected by Traffic Police. The objective in this case is to complement the Traffic Police data with information about vehicles and persons involved in crashes, as well as to collect a minimum set of data for crashes without victims.

Figure 11 shows the recommended attributes and variables for insurance companies. The form can be filled in by extracting data from existing information systems, when available.

Figure 11: Recommended Data Set for Insurance Companies

INFORMATION COLLECTED FROM INSURANCES			
P0 - Name		**P2 - Birth date**	
P1 - Person ID		**P3 - Gender**	
P4 - Nationality		1	Male
P5- Crash date		2	Female
P6 - Crash time		3	Unknown
V1 - Type of vehicle		**V2 - Insurance details**	
1	Motorcycle < 125cc	1	Against others - Material
2	Motorcycle > 125cc	2	Against others - Compulsory
3	Car	3	Comprehensive
4	4 x 4	4	All risk
5	Mini-bus	5	No insurance
6	Bus	**V3 - Registration year**	
7	Truck	**V4 - Registration country**	
8	Pick-up	**V5 - Vehicle make**	
9	Tractor	**V6 - Vehicle model**	
10	Trailer truck	**V7 - Manufacturing year**	
V8 - Chassis		**V9 - Engine power**	
P7 - Driving license (if driver or rider)		**P8 - Injury severity**	
Number		1	Fatally injured
Category: private		2	Seriously injured
Category: public transportation		3	Slightly injured
Category: military		4	Injured (unknown level)
Category: international		5	Not injured
Category: foreign		5	Unknown
Issue date		**P9 - Hospital for transfer (if any)**	
Expiry date			

Source: Mobility and Transport Department, European Commission

5.2 Storage, Processing, and Use of Road Crash Data

B.1 – Data by all actors registered in a common information system

The development of a road crash data management system is an important prerequisite to allow for storage of data in a common national road crash database. This system should be accessible by all entities responsible for crash data collection, storage, and analysis.

The software should be structured to provide various functionalities that can be grouped into the following modules:

- **Data collection module**, which consists of two elements:
  - A mobile application that allows to collect data at the crash scene and send it automatically to a central server hosting the road crash data management system, without the need for computer downloads. In case of a temporary absence of internet connection, the information can be collected and sent autonomously as soon as the connection is re-established. In this way it is possible to collect data on a mobile device without the need of having internet access.
  - A web-based software that enables desktop data entry (usually used when portable data collection devices are not available). This function also gives the possibility to continue using paper-based data collection forms, as well as to import data extracted from other information systems already used by stakeholders.
- **Analysis module**, which produces graphs and tables automatically (i.e., as default option), or as a result of ad hoc queries by the operator. This module should also allow to merge data collected by different actors. This data merging function could also be implemented by connecting the system with external data analysis tools such as MS PowerBI or similar.
- **Administration module**, which manages the roles assigned to different users as well as the national road crash database.

It is recommended that the system is:

- **Web-based**, so that users can access the software via internet or intranet, without having to install it on local computers and devices, and
- **GIS-based**, so that data can be easily viewed and analyzed directly on a map.

B.2 – Data regularly transferred to a national road crash database

The systematic storage of data and its transfer to the national road crash database is essential to perform evidence-based and updated road safety analyses. The use of a road crash data management system for data collection is recommended, as it would ensure the regularity of data transfer and the completeness of crash and road safety analyses.

It is also recommended that the adopted system includes a mobile App and the Patrol Police officers in charge of data collection use it directly at the crash scene.

Before the full use of mobile devices for data collection, an interim period can be envisaged during which paper forms can continue to be used. During this period, data should be transferred from the paper to an information system.

B.3 – Data accessible by all actors involved in data collection and analysis

The use of a common web-based system for road crash data management would facilitate data accessibility by all stakeholders. The system should allow to set authorizations to different actors according to their roles and functions in road crash management.

B.4 – Road crash data management system including analysis tools

The use of an information system to manage the national road crash database also allows to use the data directly in that system and plan road safety interventions. For this purpose, however, it is necessary to merge road crash information with other road safety data.

It is recommended to adopt a framework for road crash data analysis based on international best practices. Reference can be made, for example, to the annual UK road fatalities report (Department of Transport, 2017) and the CARE reports included in the European Road Safety Observatory (European Commission, 2018).

5.3 Other Road Safety Data

C.1 – Risk exposure data included in data collection and storage

Risk exposure data are important in explaining road safety outcomes. The most relevant indicator is usually the distance traveled annually. Since data on traveled distance (by travel mode, age, etc.) are usually difficult to collect, approximations can be used, such as fleet size or road length. Risk exposure data can be divided into three categories concerning road users, vehicles, and road infrastructure.

Road user

It is recommended to include, in the road crash data management, some traffic and multimodal traffic information, such as:

- **Vehicle distance traveled** (expressed in km) in total and by transport mode; the indicator should be "Vehicle-Kilometer," which is a unit of measure representing the movement of a vehicle over one kilometer.
- **Person distance traveled** (expressed in km) in total, by mode of transport and by age and gender of the road user. The indicator should be "Passenger-Kilometer," which is a unit of measure representing the transport of a passenger by road over 1 kilometer.

Traffic flow data from count campaigns should also be included, possibly in the form of a geographic information system such as a layer in a GIS map.

Vehicle

It is recommended that the road crash data management system include vehicle fleet information:

- Fleet size (number of vehicles).
- Fleet stratification (type of vehicles).

These data should be available on vehicle registers.

Road Infrastructure

To carry out a comprehensive road safety analysis, it is necessary for the road crash data management system to include information on the road network such as:

- Overall length.
- Hierarchization of the road network.

It is recommended that these data be included as a layer in GIS map.

C.2 – Safety Performance Indicators included in data collection and storage

Data on safety performance indicators (SPIs) explain what factors contribute to road crashes. These data allow to assess the risks to which road users are exposed, e.g., average vehicle speed, rate of use of protective equipment (seat belts, helmets, child restraints, etc.), rate of alcohol consumption while driving, etc. All these data can be collected through field surveys.

Table 11 shows the indicators that should be included in the road crash data management system.

Table 11: Recommended Safety Performance Indicators

Safety Performance Indicators (SPI)
Seatbelt use rate total and stratified by vehicle occupant
Helmet use rate total and stratified by vehicle occupant
Rate of driving under the influence of alcohol
Rate of driving under the influence of drugs
Rat of driving while using a mobile device
Rate of driving over speed limits
Driving time and rest periods for professional drivers
Risk levels associated to road infrastructures
Average response time to emergencies

Source: Mobility and Transport Department, European Commission.

5.4 Data Analysis

D.1 – Systematic analysis of road crash and road safety data for planning and decision-making

Currently, road crash data and other road safety data are not systematically analyzed by all stakeholders. The implementation of the new road crash data system and subsequent establishment of systematic data sharing among stakeholders could facilitate road crashes and, in general, road safety data analyses.

It is recommended that specific data analysis frameworks be developed for each stakeholder, consistent with his activities and functions.

Training activities and refresher courses should also be implemented to ensure that agencies dealing with road safety issues perform reliable and explanatory analyses.

References

American Association of State Highway Transportation Officials (AASHTO). *Highway Safety Manual – 1st edition.* https://highways.dot.gov/safety/data-analysis-tools/highway-safety-manual

European Road Safety Observatory. National Road Safety Profile – Germany. https://road-safety.transport.ec.europa.eu/document/download/adbd19af-b384-4fb7-a7dc-2ae199aa8453_en?filename=erso-country-overview-2023-germany_0.pdf

EuroStat. https://ec.europa.eu/eurostat/data/database

Global Road Safety Facility. 2013. *Road Safety Management Capacity Reviews and Safe System Projects Guidelines.* https://www.globalroadsafetyfacility.org/sites/default/files/2023-10/Road%20Safety%20Management%20Capacity%20Reviews%20and%20Safe%20System%20Projects%20Guidelines.pdf

International Transport Forum. 2022. *Road Safety Data Analysis in France.* https://www.itf-oecd.org/sites/default/files/repositories/road_safety_data_analysis.pdf

Martensen H., G. Duchamp, V. Feypell, V. I. Raffo, F. A. Burlacu, B. Turner, and M. Paala. 2021. *Guidelines for Conducting Road Safety Data Reviews.* World Bank. https://documents1.worldbank.org/curated/en/099140001132222667/pdf/P17217904895f706d0a3d50134491fe8699.pdf

Mobility and Transport Department, European Commission. 2023. CARE Database. Common Accident Data Set, version 3.8.1 https://road-safety.transport.ec.europa.eu/document/download/7f8e38c2-87cf-4426-afc4-277ae4c24591_en?filename=CADaS%20Glossary_v%203_8_1.pdf

Mobility and Transport Department, European Commission. Road Crashes and Injuries. https://transport.ec.europa.eu/document/download/28a94107-9f58-4a9b-b0df-79a251f3f45d_en?filename=UMI_fiche_Road_Crashes_and_Injuries.pdf&prefLang=fr

Mobility and Transport Department, European Commission. Data on Serious injuries. https://road-safety.transport.ec.europa.eu/european-road-safety-observatory/data-and-analysis/serious-injuries_en

Statistisches Bundesamt https://www.destatis.de/EN/Home/_node.html.

The World Factbook. Georgia. https://www.cia.gov/the-world-factbook/countries/georgia/

Georgia Road Crash Data Review and Reporting

Status and Recommendations

This report presents an overview of the current road crash data management situation in Georgia offering strategic recommendations for improvement based on the best globally recognized practices. The report develops guidance and tools in an effort to improve road crash data management and move toward greater harmonization of crash data across the region.

About the Central Asia Regional Economic Cooperation Program

The Central Asia Regional Economic Cooperation (CAREC) Program is a partnership of 11 member countries and development partners working together to promote development through cooperation, leading to accelerated economic growth and poverty reduction. It is guided by the overarching vision of "Good Neighbors, Good Partners, and Good Prospects." CAREC countries include Afghanistan, Azerbaijan, the People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

CAREC

ASIAN DEVELOPMENT BANK
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org